

# NASA: NASA\_1510

## U.S. Federal Form: NASA: NASA\_1510

FORM NUMBER:	NASA_1510
FORM TITLE:	U.S. Federal Form: NASA: NASA_1510
U.S. GOVERNMENT AGENCY:	NASA
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FILE FORMATS:	PDF
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SPONSOR:	
SUBSPONSOR:	
FUNCTION CODE:	
MANDATORY PRINT SPECIFICATIONS:	
PRIVACY ACT IMPLICATIONS?	<input type="checkbox"/>
RCS:	
IRCN:	
OMB:	

 National Aeronautics and Space Administration		<h2>Facility Project Cost Estimate</h2>			
INSTALLATION/PROGRAM OFFICE		DATE			
PROJECT TITLE		SUBMISSION/REVISION			
		PROJECT CODE			
BASIS OF COST ESTIMATE		PROJECT ID			
<b>I. SUMMARY OF COST ESTIMATE</b>					
DESCRIPTION		AMOUNT a.	PERCENT b.		
1 ENGINEERING ESTIMATE					
2 COST ADJUSTMENT <i>(Enter percentage of item 1a to right in col. 2b)</i>					
3 SUBTOTAL (1+2)					
4 CONTINGENCIES <i>(Enter percentage of item 3 to right in col. 4b)</i>					
5 SUPERVISION, INSPECTION AND ENGINEERING SERVICES <i>(Enter percentage of items 3a and 4a to right in col. 5b)</i>					
6 OTHER BURDEN COSTS					
7 TOTAL BUDGET ESTIMATE (3+4+5+6) SAY					
8 IDENTIFICATION OF COST ADJUSTMENT (item 2, above) AND OTHER BURDEN COSTS (item 6, above)					
<b>II. PLANNING AND DESIGN</b>					
DESCRIPTION	STATUS				
	NEEDED a.	IN-WORK b.	COMPLETE c.	IN-HOUSE/ AE d.	COST e.
1 PRELIMINARY ENGINEERING REPORT					
2 SPECIAL STUDIES <i>(Specify)</i>					
3 FINAL DESIGN					
4 SUPERVISION AND ADMINISTRATION OF DESIGN SERVICES					
5 TOTAL PLANNING AND DESIGN COST 					
<b>III. RELATED COST DATA</b> <i>(Not included in this Approved Facility Cost Estimate, but required to make the facility initially operable.)</i>					
1. RELATED COSTS INVOLVED <input type="checkbox"/> a. YES <i>(Identify in items 2 through 10)</i> <input type="checkbox"/> b. NONE		2 PER (Amount)	3. DESIGN (Amount)		
OTHER RELATED EQUIPMENT	ITEM	AMOUNT	ITEM	AMOUNT	
	4 TO BE PURCHASED		8 ACTIVATION		
	5. TRANSFER TO EXCESS		9. OTHER REAL ESTATE		
	6. EXISTING		10. OTHER <i>(Specify)</i>		
	7. FUTURE FUNDING				



**KSC Form 26-312V3 NS Utility Locate/Excavation Permit Request**

<b>UTILITY LOCATE/EXCAVATION PERMIT REQUEST</b>				
1. Date	2. Master Planning Site Plan No.	3. Project (PCN) No.	4. Work Order No.	5. Check One <input checked="" type="checkbox"/> Permit to Dig <input type="checkbox"/> Locate Only/ <input type="checkbox"/> No Digging
6. Requester's Name (REQUIRED)		7. Email (REQUIRED)	8. Phone No. (REQUIRED)	9. Fax No. (REQUIRED)
10. Requester's Company (REQUIRED)			11. Mail Code/Address	
12. Technical Contact (REQUIRED)	13. Email (REQUIRED)	14. Phone No. (REQUIRED)	15. Fax No. (REQUIRED)	
16. KSC NASA Contact Name (REQUIRED)		17. Email (REQUIRED)	18. Phone No. (REQUIRED)	
19. Building No. (REQUIRED)	20. Grid No. (REQUIRED)	21. Secondary Location (Bldg. No./Add. Info.) (REQUIRED)		
22. Estimated Start Date (REQUIRED)		23. Estimated End Date (REQUIRED)		
24. Emergency request justification <i>(if required)</i>				
25. Reason for permit/Statement of work (REQUIRED)				
<b>MAP/SKETCH, WITH AREA TO BE LOCATED/EXCAVATED CLEARLY MARKED, IS ATTACHED (REQUIRED)</b>				

**See next page for completion and process instructions.**

KSC FORM 26-312V3 NS (REV.08/09) PREVIOUS EDITIONS ARE OBSOLETE

## INSTRUCTIONS

Please complete as many fields as possible.

**NOTE: ALL FIELDS INDICATING "(REQUIRED)" MUST PROVIDE INFORMATION.**

- Block 1 Date submitted.
- Block 2-4 Provide related Site Plan, PCN or Work Order Numbers.
- Block 5 Check one. If you are NOT going to dig, but need an underground utility locate, check "Locate Only".
- Block 6-18 Enter the name, email address, phone, fax number, company name, and address of the person who will be receiving this permit including KSC NASA Contact for Project.
- Block 19-20 Enter the building number where work will be performed (or closest building number).
- Block 21 Enter additional information as necessary.
- Block 22 Enter the date excavation is expected to begin.
- Block 23 Enter the date excavation is expected to be complete. Permit will be closed on this date. End date may not be longer than one year from the start date.
- Block 24 If excavation is of an emergency nature and requires priority, enter justification.
- Block 25 Enter a description of why this permit is being requested, i.e., what work will be performed and why.

**REQUIRED: ATTACH A MAP/SKETCH WITH AREA TO BE LOCATED/EXCAVATED CLEARLY MARKED.**

1. Email, fax or hand-carry this request, along with a map, drawing or sketch to the Excavation Permit Request (EPR) Administrator using the contact information below.
2. You may contact the EPR Administrator using the contact information below if you have any questions on the dig permit process.
3. To schedule an appointment with the Excavation Permit Inspectors to locate underground utilities and/or obtain an approval signature on this permit to dig, Requester should phone the Excavation Permit Inspectors' Office (321-476-4494/3799) at least 72 hours prior to digging.
4. Requester should notify the EPR Administrator when excavation is complete.
5. Permits may be extended for up to one year by calling the EPR Administrator, but all permits will be closed upon expiration unless notified.

### EPR Administrator

Location	KSC Headquarters, M6-0399, Room 3145
Mail Code	ISC-4026
Phone	(321)867-2406
Fax	(321)867-1175
Email	<a href="mailto:KSC-ISC-DIGPERMIT@mail.nasa.gov">KSC-ISC-DIGPERMIT@mail.nasa.gov</a>

\*\*\*Emergency requests will be processed on a real time basis\*\*\*  
through the ISC Duty Office 861-5050, Fax (861-1627)  
or Email - [KSC-ISC-DutyOffice@mail.nasa.gov](mailto:KSC-ISC-DutyOffice@mail.nasa.gov)

<b>KSC ENVIRONMENTAL CHECKLIST</b>		
1. PROJECT TITLE: _____		PROJECT NO.: _____
3. PROJECT LOCATION: <input type="checkbox"/> KSC <input type="checkbox"/> CCAFS <input type="checkbox"/> PAFB <input type="checkbox"/> OTHER: _____		4. FACILITY NAME/NO.: _____
5. REQUESTOR/PROJECT LEAD: _____ ORG/MAIL CODE: _____		6. PHONE NO.: _____
7. PREPARER OF CHECKLIST: _____ ORG/MAIL CODE: _____		8. PHONE NO.: _____
9. PROJECT DESCRIPTION: (Provide site plans, maps, etc. as separate attachment(s))   		
10. a-f. Check the appropriate box (Yes, No, Undetermined) to identify if any component of the proposed project (including, but not limited to construction, installation, demolition, removal, activation or operation) will involve any of the items listed. Use the attached instructions. Provide more specific information for each item marked Yes or Undetermined in the third column.		
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED	a. <u>Construction/Modification/Demolition</u> : Constructing, altering, expanding, modifying (other than routine maintenance) or demolishing any building, pavement or structure.	
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED	b. <u>Land Impacts</u> : Land disturbance, soil addition or removal, digging, grading, trenching, alteration or removal of vegetation, equipment/material staging area required, stockpiling and any activity in or near surface water (including ditches and low-lying areas).	
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED	c. <u>Hazardous Material and Hazardous, Controlled, or Universal Waste</u> : Use, storage, generation and/or disposal of any hazardous or toxic material, petroleum products or paint coatings.	
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED	d. <u>Asbestos Containing Material (ACM)</u> : Disturbance of construction material that may contain asbestos (i.e., roofs, walls, ceilings, floor tile, piping insulation, caulk, etc.).	
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED	e. <u>PCBs</u> : Disturbance or replacement of electrical distribution systems, communication systems, lightning protection, transformers, non-liquid PCB materials or any other items believed to contain PCBs, including paint coatings.	
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED	f. <u>Painting</u> : Initial application or repainting of a facility (interior or exterior), structure or utility.	
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED	g. <u>Paint, Sealant, Caulking Removal</u> : Includes surface preparation such as sandblasting, scraping, water blasting or chemical stripping of existing paint coatings. Specify method.	
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED	h. <u>Dewatering</u> : Use of conventional wellpoints, hydraulic pumps, or other means to transfer groundwater (including water in utility manholes) for project activities including utility trenching, foundation work, roadbed construction, stormwater treatment pond, and borrow excavation.	
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED	i. <u>Stormwater</u> : Construction of new building, pavement, impervious or semi-impervious surface and/or modification of an existing stormwater system. Give approximate number of square feet of impervious surface being added.	sq. ft.
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED	j. <u>Drinking/FIREX Water</u> : Installation or modification of potable water system. Include diameter of new water piping if known.	inches
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED	k. <u>Domestic/Industrial Wastewater</u> : Installation or modification of domestic sewer system, including septic tank systems, generation of process wastewater or modification to a system that handles or transports wastewater, including condensate lines, washdowns, outfalls, holding ponds and non-point source discharges associated with industrial applications/processes.	
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED	l. <u>Air Emissions</u> : Installation or alteration of a stack, scrubber, exhaust fan, vent, generator, fume hood, cooling tower, boiler, halon fire suppression system, HVAC system, refrigeration system, or discharge from painting or sandblasting. Describe emission source.	
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED	m. <u>Open Burning</u> : Burning of any land clearing debris.	
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED	n. <u>Tanks</u> : Construction, modification, or repair of above or underground storage tanks (including piping and/or containment). Type commodity stored and capacity here.	gallons

<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED	o. <u>Transformers/Generators:</u> Installation, replacement or repair of transformers, generators, or any other oil-filled equipment. Give capacity.	gallons
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED	p. <u>Exterior Lighting:</u> Installation, refurbishment or modification of exterior lighting.	
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED	q. <u>Radiation:</u> Generation of ionizing or non-ionizing radiation or use of any radiation source.	
<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNDETERMINED	r. <u>Other:</u> Please describe any other aspect of the proposed action that could potentially affect the environment. Use separate sheet if necessary.	

## ENVIRONMENTAL CHECKLIST PREPARATION INSTRUCTIONS

1. **Project Title:** Title of proposed action as it appears on the work order or programming document.
2. **Project Number:** Insert SON, WON, PCN, DBEH, SXHT, MAXIMO or other authorized work identification number, as appropriate.
3. **Project Location:** Check box for applicable installation where work will be conducted. For off-site work, identify location.
4. **Facility Name/Number:** Use the proper name for the facility where work is being conducted and the assigned facility number. If proposed action is not directly associated with a facility, use the closest facility for reference.
5. **Requestor/Project Lead:** List name of individual who has requested the proposed action. If this individual cannot be identified, or no single individual is responsible for submitting the work requirement, then list the person who is most familiar with the proposed action, such as the design engineer or project lead, and their mail code.
6. **Phone Number:** Telephone number of individual identified in #5
7. **Preparer of Checklist:** List name of individual who completed the checklist and their mail code.
8. **Phone Number:** Telephone number of individual identified in #7.
9. **Project Description:** Provide a brief, complete description of the proposed project. Include size of project and site, proposed uses, and any known plans for the future. Attach additional information including site plans, maps, statement of work, etc.
- 10 a.-r. The items listed in this section could be included in, or result from, the work that is being proposed. To the best of your knowledge, indicate by checking the applicable box if any of these items could be affected by the proposed work. Check the "UNDETERMINED" box if you are not certain. If further information is required to complete items 10 a. - r., please reference the additional instruction sheet.

**ENVIRONMENTAL CHECKLIST ADDITIONAL INFORMATION AND INSTRUCTIONS**

**SECTION 10a. -r.**

**The following additional information/instructions should be applied to Environmental Checklist Section 10a – r.**

- a. **Construction:** Some proposed construction activities may not have their scope defined well enough to allow easy identification of potential environmental concerns, and certain facilities and certain types of construction activities have restrictions or constraints that may not be easily identifiable. An example may be disposal of wastes from a construction or demolition project as opposed to waste generated from normal operations and maintenance (O&M) type projects. Types of waste accepted at the KSC Class III Schwartz Road Landfill are listed on the EPB web page at <http://environmental.ksc.nasa.gov/permitting/wastePermit.htm>. The proposed project must reflect the proper disposal method in the design specifications to ensure compliance with existing permits.
- b. **Land Impacts:** Areas of major environmental concern associated with this item include the loss of vegetation and disturbance of land that may provide habitat for various types of wildlife. Disturbance of the ground could impact burrowing animals, such as the gopher tortoise. Other issues include the disposal of vegetation from land clearing, underground utilities, archaeological sites, wetlands, etc. If your project includes any type of vegetation removal, land clearing, tree trimming (other than routine landscape maintenance), digging, grading or activity in or near wetlands/surface waters, check yes for this item.
- c. **Hazardous Material and Hazardous, Controlled, or Universal Waste:** A number of items have the potential to adversely affect the natural environment. Consequently, use of these items in the construction and/or operation of the proposed project will require special storage, handling and disposal. Hazardous materials usually constitute items that possess any one or more of the following characteristics: corrosive, flammable, toxic and/or reactive. If you are not sure, contact the EPB to determine if hazardous materials may be used in your project. In addition, should hazardous materials be included in your proposed project, the environmental office may be able to identify an acceptable non-hazardous alternative through the Pollution Prevention (P2) program. Wastes generated from use of hazardous materials will generally be classified as hazardous wastes, which require special handling and disposal.
- d. **Asbestos Containing Material (ACM):** Due to the age of many of the buildings and structures on KSC and CCAFS, it is likely that if your project affects an existing facility, ACM may be encountered. If the project involves new construction or is remote from existing structures and/or utilities then it is unlikely that any ACM would be disturbed by your action(s). Many of the existing facilities have already been sampled and the ACM has been identified. Contact the KSC Industrial Hygiene Office at 867-2400 to determine if the project will impact a known ACM source or access the KSC on-line ACM survey database at <http://amis>. If the potential for the presence of ACM exists, sampling must be requested so a determination can be made for all possible sources.
- e. **PCBs:** Polychlorinated biphenyls (PCBs) are chemicals that are primarily found in some types of fluids used in electrical equipment, i.e., electrical transformers, switches, ballasts, etc. Non-liquid PCBs may also be present in older paint coatings, caulking and other materials. Consequently, all projects or jobs that will come in contact with any fluid-filled electrical equipment or non-liquid materials suspected of containing PCBs should include sampling and analysis for PCBs. A current analysis (within six months) must accompany each fluid-containing piece of electrical equipment requiring disposal.
- f. **Painting:** Painting, depending on the method and contents of the paint, can pose significant human health risks as well as generate hazardous or controlled wastes. Use of paint thinner and chemical stripper typically results in generation of wastes requiring special handling and disposal. If known, please indicate if these painting related materials are to be used. If your project includes any painting check yes for this item and include specific information regarding paint contents, other hazardous materials to be used and painting methodology, as applicable.
- g. **Paint, Sealant, Caulking Removal:** Removal of existing paint coatings, sealants and caulking can generate hazardous or controlled wastes. In some cases, old paint coatings containing lead and/or other metals as well as non-liquid PCBs will require specific abatement procedures and special disposal of wastes generated. If your project includes any paint, sealant, or caulking removal activities check yes for this item and include specific information regarding paint contents, other hazardous materials to be used, and paint or sealant removal methodology.
- h. **Dewatering:** If the proposed project will require the pumping of water to support construction activities, a permit may be required. There are a number of variances and quantity thresholds based upon the amount of water being transferred and the area where the water will be discharged. Therefore, if your project requires dewatering, check yes and the EPB will determine permit applicability.

- i. **Stormwater:** Stormwater, i.e., rain, is an environmental concern primarily due to potential impacts of rainwater run off from an impervious surface into the surrounding area. Secondly, an impervious surface prevents stormwater from percolating into the ground. Consequently, the St. Johns River Water Management District (SJRWMD) requires a permit to be obtained and a stormwater management system to be constructed when a large impervious surface is created. The threshold for obtaining a permit varies from 4000 square feet for surfaces specifically supporting vehicular traffic, such as roads, parking lots, stabilized areas, etc., to 9000 square feet for buildings inclusive of all other impervious surfaces. The permit threshold can also be “tripped” by adding to or modifying an existing impervious surface, so do not assume the project will not require permitting if new impervious area is below the above thresholds. If you check “yes”, please identify the number of square feet involved.
- j. **Drinking/FIREX Water:** Check yes if the proposed project involves work that would affect a potable water line. Environmental concerns with work that affects water lines are: 1. The disturbance of a water line typically lowers water quality and therefore, requires disinfection and sampling prior to use; 2. Some connections and/or additions to the existing water system require a permit. Supply as much design information as possible relating to potable water system changes (e.g., new vs. extension, pipe diameter, etc.). Permit determinations and applications will be handled by the Environmental Program Branch (EPB).
- k. **Domestic Wastewater/ Industrial Wastewater:** Environmental concerns include potential impacts to the operation of the Wastewater Treatment Plant and Florida Department of Environmental Protection (FDEP) permit conditions. New connections and septic tank installations may require permitting, inspection, and/or certification. Therefore, check yes if the proposed project will involve installation of new wastewater sources or in any way affect the existing sanitary sewer system. Industrial wastewater is any water-based waste stream, discharge, wash water, deluge outfall, etc., that would result from conducting an industrial-type operation. The source of this wastewater typically requires permitting and therefore, must be identified to the environmental office as soon as possible. In addition, early environmental coordination could result in the identification of a process alternative that may preclude or minimize the waste stream.
- l. **Air Emissions:** If the project (either during construction or operation) would discharge any substance into the air, other than vehicular or normal construction equipment exhaust, check yes and describe the source of the emission. Some emission sources may require State and/or Federal permitting for both construction and operation.
- m. **Open Burning:** If any land clearing debris will be burned during construction, check yes. The Florida Department of Forestry requires notification in accordance with FAC 51-2 Open Burning. coordination with the KSC Fire Marshall is also required
- n. **Tanks:** Any vessel that stores liquids, other than drinking water, must be evaluated for potential environmental effects. Some tanks require registration with the State based upon the quantity and type of material being stored. All tanks must be identified in the tank management program and various containment and piping requirements may apply. If you suspect the involvement of any new or existing tanks, including associated piping or containment, check yes and the environmental tank program managers will identify any regulatory requirements.
- o. **Transformers/Generators:** If any oil-filled equipment is to be modified, replaced or installed, check yes. There are specific handling, removal and waste disposal guidelines to follow as well as Spill Prevention, Control and Countermeasures (SPCC) requirements to be met.
- p. **Exterior Lighting:** Exterior lights at or near Atlantic coastal beaches in Florida have been proven to disrupt sea turtle nesting. Consequently, NASA has developed exterior lighting policies to minimize adverse impacts to threatened and endangered sea turtles that nest KSC beaches. Should the project include exterior lights, either new or replacement of existing, check yes and the EPB will monitor the design of your project to ensure compliance with the applicable policies. Typically, exterior lights that are not directly related to a color rendition or explosion proof requirement will be the lowest wattage, low pressure sodium fixtures that meet the needs of your request. Exterior lighting requirements are located on the EPB web page at: <http://environmental.ksc.nasa.gov/projects/documents/ExteriorLightingGuidelines.pdf>.
- q. **Radiation:** Various types of mission related equipment have the potential to emit radiation that could affect human health and the well being of other living organisms. Typically, the project/job requestor is aware of the dangers associated with the equipment being constructed, installed or worked on. However, in some cases, work may be requested that would take place within a zone of influence for an existing piece of equipment, thereby requiring shut-down or some other operational constraint. Therefore, if you know the project will involve a radiation source, or is in the vicinity of a potential source of radiation (radar, microwave transmitter, etc.) check yes.
- r. **Other:** If aspects of the proposed project do not fit into any of the above categories, but may have an effect on the natural environment, explain in the space provided. This space should also be used to explain or identify specific aspects of the above items, as necessary. If there is not enough space to adequately explain the item you are describing, please attach an additional sheet and reference a continuation sheet in case they should become separated.

## APPENDIX 1B – SUSTAINABILITY STANDARDS

The following standards shall be implemented by the Tenant with regards to sustainable design practices and project certification for design and construction associated with CCS. The 2008 Florida Energy Conservation and Sustainable Buildings Act requires Florida agencies to use one of the sustainable rating systems approved in FS Section 255.253. There are four different systems that can be used.

### Space Florida Goal

Tenants shall be allowed to choose the system that is most applicable for the planned improvements. This shall allow Tenant flexibility for selecting the system that best meets their project needs. The project, at a minimum, shall be certified by one of the rating systems provided below.

**Space Florida shall require** Tenants follow FS 255.253 which states:

*“Sustainable building rating or national model green building code” means a rating system established by the United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) rating system, the International Green Construction Code (IGCC), the Green Building Initiative’s Green Globes rating system, the Florida Green Building Coalition standards, or a nationally recognized, high-performance green building rating system as approved by the department.”* The IGCC is not a standard, but is intended to be used as a jurisdictional and municipal building code for new construction and major renovations.

Tenant shall submit records showing adherence to the sustainability standards set forth within this Development Manual.

Construction in Exploration Park shall meet, as a minimum, the sustainable design standards represented by one of the three sustainable rating systems identified in section 255.253, Florida Statutes, that are also identified below as NASA-approved. Rating system standards approved by NASA include United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) NC rating system, the Green Building Initiative's (GBI) Green Globes NC rating system, and the Florida Green Building Coalition (FGBC) commercial standards. The latest released version of the selected rating system in effect at the time design work commences on a given project shall be utilized for that project. Construction shall meet, as a minimum, one of the following levels under the selected rating system: LEED “Silver,” FGBC “Silver,” or GBI “2 Globes”, unless it has been clearly demonstrated that such levels are not feasible due to the nature of the construction or planned operations, and a waiver has been granted by NASA-KSC. Each Form 1509 submittal shall be accompanied by information identifying which sustainable building rating system is being followed, which rating level is being pursued, what specific track and or level within the applicable sustainable building rating system is being followed (e.g. Building Design and Construction, Commercial Building, etc.) and if certification is or is not being pursued. NASA-KSC will review the proposed level to determine whether it meets the requirements of this Section 6.3 before approving the NASA Form 1509. Certification of the project by the rating system organization is not mandatory but is strongly encouraged. In lieu of certification, a qualified third party under direction from the Space Florida building official may perform rating system verification checks during planning, design, construction and operational phases to score and certify the project using the selected rating system scorecard/checklist. Credentials for the qualified third-party shall be provided to NASA KSC. The project will be registered with the rating system agency and the scoring

documentation demonstrating that the project meets the agreed upon rating level shall be provided to NASA-KSC prior to the certificate of occupancy being issued by Space Florida. Appropriate credit for Space Florida's Exploration Park infrastructure design and site features may be counted toward each facility project's score in determining compliance with the selected rating system.

## Rating System Overview

Each system uses its own set of criteria for the purpose of rating. Each has a different point system, professional accreditation requirements, application methods, and cost. Side-by-side comparisons are difficult since each project is unique. A summary of each system is presented below.

### 1. Green Building Initiative's Green Globes rating system

Several years ago, U.S. General Services Administration elevated Green Building Initiative's Green Globes (GBIGG) to the same status as LEED as the two recommended third-party certifications systems for the U.S. government. GBIGG certification has one of four levels (i.e., 1 to 4 globes) and requires achieving minimum thresholds up to 1,000 points. It has no minimum criteria, but instead rates buildings on the green building practices that the builder has chosen to include resulting in more flexibility. It does not require any ongoing documentation, but documentation is required as proof of compliance during the third-party assessment. GBIGG requires third-party design review of building documentation and onsite assessment(s). Subject areas include:

Sustainable sites

- Energy efficiency
- Water efficiency
- Materials and resource use
- Indoor environmental quality
- Emissions
- Project/environmental management

### 2. USGBC LEED Rating System

LEED covers the design, construction, and operations of all types of buildings. LEED points are awarded on a 100-point scale, and credits are weighted to reflect their potential environmental impacts. Ten bonus credits are available, four of which address regionally specific environmental issues. A project must satisfy all prerequisites and earn a minimum number of points to be certified. Third-party certification is required. It includes four levels of certification—Certified, Silver, Gold, or Platinum. Subject areas are very similar to GBIGG and IGCC including:

- Sustainable sites
- Energy efficiency
- Water efficiency
- Materials and resource use
- Indoor environmental quality
- Emissions
- Operations and maintenance

### 3. FGBC Rating System

The Florida Green Commercial Building Standard covers all commercial occupancies listed in the Florida Building Code. It uses a tiered rating system. Certification is awarded at different levels

according to points achieved over the project's adjusted minimum required points. Bronze = 0 - 50 points over min., Silver = 51-100 points over min., Gold = 101-150 points over min., and Platinum = 150 > points over min. Subject areas are very similar to Green Globes, IGCC, and LEED including:

- Energy efficiency
- Water conservation
- Site preservation
- Health
- Materials selection
- Project management
- Disaster mitigation

VERSION 1.1

## APPENDIX 1C – KSC EXTERIOR LIGHTING REQUIREMENT

VERSION 1.1

# KSC EXTERIOR LIGHTING REQUIREMENT

## SECTION 1.0 REQUIREMENT AND REGULATIONS

Kennedy Space Center (KSC) is required to protect marine turtle nesting habitat by the National Environmental Policy Act (NEPA) and the U.S. Fish and Wildlife Service (FWS) through the Endangered Species Act (ESA). The NEPA of 1969, as amended (42 U.S.C. 4321-4370d), and according to the procedures of implementation of NEPA for NASA [[Title 14, Code of Federal Regulations, part 1216](#) subparts 1216.1 and 1216.3], requires federal agencies to assess how programs and associated actions may affect the environment. As part of this assessment, KSC has coordinated with the FWS on the effects of exterior lighting on protected species. The FWS has issued an interim biological opinion (BO) based on their review of historical and anticipated future light management activities by KSC, and the associated effects on the loggerhead (*Caretta caretta*), green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*), hawksbill (*Eretmochelys imbricata*), and Kemp's ridley (*Lepidochelys kempii*) sea turtles in accordance with Section 7 of the ESA of 1973, as amended (16 U.S.C. 1531 *et seq.*).

## SECTION 2.0 PURPOSE

The purpose of this Requirement is: 1) to insure that KSC is compliant with the special conditions of the BO (Attachments 1 and 2) to provide clear guidance to project and/or facility managers who are required to comply with the KSC exterior lighting requirements.

Light Management Plans (LMPs) will be developed in accordance with this light management policy at KSC for all new facilities that are in close proximity to the beach, have lighting directly visible from the beach, and/or may cause significant sky glow. LMPs will be submitted to the Environmental Management Branch (EMB) for review and approval.

## SECTION 3.0 IMPLEMENTATION

- 3.1 All projects that will be installing exterior lighting or lighting that is visible from outside the building must submit an environmental checklist to EMB ([KSC Form 21-608V2 NS](#)) ([KDP-P-1727](#)). The checklist is submitted by the project manager, facility manager, or the equivalent (PM) to EMB.
- 3.2 Within seven days of submittal of the checklist, the PM will receive either a request for further information or a record of environmental consideration (REC) from EMB.
  - 3.2.1 If the REC determines that there will be no adverse affect on the sea turtles no further action will be required. However, if the REC determines that there may be an adverse affect on sea turtles (i.e. a violation of the BO) a LMP will be required.
- 3.3 The PM will be responsible for the development of a LMP that meets the criteria set forth in Section 5.0 of this Requirement. EMB will have a subject matter expert (SME) available to assist the PM with the plan.

- 3.4 The PM will submit the proposed lighting plan to EMB for review and comment.
  - 3.4.1 If the LMP meets the guidelines, then a memorandum of acceptance will be generated by EMB and sent to the PM.
  - 3.4.2 If the LMP does not meet the guidelines, EMB will provide comments for plan revision by the PM.
- 3.5 In some cases, safety for employees and/or the program assets may supersede the FWS BO requirements; and a variance from the LMP requirements must be requested (see Section 6.0 of this policy).
  - 3.5.1 LMPs that include variances from the guidelines established herein will be reviewed by both the EMB and the FWS. This review cycle will continue until the EMB has satisfied its reporting requirements to the FWS.
  - 3.5.2 Notification of approval will be sent to the PM by EMB.
- 3.6 The final approved plan will be cataloged in the EMB Light Plan Compliance electronic data file and the PM should retain a copy for future reference.
- 3.7 Any modifications to the project site/structure(s) that result in exterior lighting changes must go through the process again as outlined above.

#### **SECTION 4.0 COMPLIANCE COORDINATION**

- 4.1 Once every two years, the appropriate personnel, including but not limited to, engineers, facility managers, and any other representatives that design and/or enforce lighting at KSC, will attend a sea turtle lighting workshop conducted by EMB or its agent.
- 4.2 These same personnel will allow EMB and/or agents of EMB to post educational data and notices related to sea turtle nesting season at their facilities as indicated in the BO.
- 4.3 Affected facilities will be inspected annually by EMB, their agents, or FWS. EMB is required to conduct periodic compliance inspections and report all findings to FWS on an annual basis.
- 4.4 Currently, hatchling or adult sea turtle disorientation rates cannot exceed 3%, as described in the BO. If that occurs, the FWS will require reinitiating consultation and a review of the reasonable and prudent measures KSC has taken. Any changes that result from the consultation will be incorporated into this Requirement and will affect all existing and future projects.

**SECTION 5.0 GENERAL EXTERIOR LIGHTING DESIGN GUIDELINES**

- 5.1 The LMP must, at a minimum, identify on a plan drawing all exterior lighting fixtures and other lights that may be visible at night. The plan must include details of each type of fixture to be used, such as lamp type, wattage, installation height, and proposed operation schedule.
- 5.2 Facilities that are in close proximity to the beach, have lighting directly visible from the beach, and/or may cause significant sky glow will prohibit use of exterior lights between 9 p.m. and dawn from May 1 through October 31. If night activities that are essential to safety/security, support launch-related activities at active launch complexes, or night operations training require exterior lighting at night the PM may apply for a variance from these lighting restrictions as described in Section 6.0.
- 5.3 Lights with wavelengths from 585 - 590 nm and lowest wattage possible should be used for all exterior lighting applications. Lights with wavelengths between 320 and 560 nm, such as metal halide and mercury vapor lights, should not be used in any exterior lighting applications. Low-pressure sodium (LPS) lights are preferred if LPS can meet operational requirements. In cases where there are specific requirements calling for the discernment of colors, the PM may apply for a variance from the LMP as described in Section 6.0 below.
- 5.4 Energy conservation standards will be incorporated into all lighting designs.
- 5.5 All exterior light fixtures should be positioned so that:
  - 5.5.1 The point source of light or any reflective surface of the light fixture is not directly visible from the beach.
  - 5.5.2 Areas seaward of the frontal dune are not illuminated. Frontal dune is defined as the first natural or manmade mound of sand that is located landward of the beach and has sufficient vegetation, height, continuity, and configuration to offer protective value.
  - 5.5.3 Light is directed downward and away from the beach at beachfront facilities and downward and in the direction of the task being performed at non-beachfront facilities.
  - 5.5.4 All lights should be shielded and/or recessed.
  - 5.5.5 Photocells should only be used to support security or other mission-specific requirements that occur on a regular schedule each night (e.g., parking lots will not routinely utilize photocells unless mission operations occur 24 hours a day, 7 days a week). Automatic tiers can be used instead of, or in addition to, photocells to control lighting during actual hours of operation. Timers can also be used in locations where personnel are not readily available to manually extinguish lights. Where random security

monitoring is required, motion detector switches that keep lights off except when approached can be used. Such switches should turn lights on for the minimum duration possible.

- 5.6 Task lighting should be used for temporary operational activities rather than permanent light fixtures. Task lighting must conform to the same restrictions as permanent lighting. Switches should be used rather than timers or photocells.
- 5.7 Exceptions to the guidelines will be evaluated on a case-by-case basis through the variance process described in Section 6.0 below.

#### **SECTION 6.0: VARIANCE PROCESS**

- 6.1 Exceptions to the guidelines in Section 5.0 above will be evaluated by EMB and FWS.
- 6.2 The PM will submit a narrative documenting the necessity for using a light source that does not meet the requirements of the KSC Exterior Lighting Guidelines. The documentation of the variance request will include, but not be limited to, the regulation, Requirement, protocol requirement for the light source, and description of the specific circumstances surrounding the need.
- 6.3 The PM, with the assistance of EMB, will be responsible for mitigating any negative effects that may result from light use approved through the variance process. Corrective actions for negative effects will be determined by the EMB throughout consultation with the FWS.
- 6.4 EMB will concur/non-concur with variance request via email notification to PM.

## APPENDIX 1D – DESIGN SUBMITTAL CONTENT CHECKLIST

<b>Design Submittal Content Checklist</b>				
Item #	Conceptual Plan Submittal Content Description	Included in Submittal?		
		YES	NO	N/A
1	<b>Tenant Questionnaire</b> (incl. proposed parcel use, proposed activities and operations, and indicate proposed sustainable bldg. rating system)			
2	<b>Conceptual Site Plan</b> (indicate proposed sustainable bldg. rating system)			
3	<b>NASA 1509 Form</b>			
4	<b>NASA Environmental Checklist</b>			
5	<b>Completed Responses to Requests for Additional Information (if applicable)</b>			
<b>Schematic Designs &amp; Plans Submittal Content Description</b>				
Item #	Schematic Designs & Plans Submittal Content Description	Included in Submittal?		
		YES	NO	N/A
1	<b>Updated description of parcel use, parcel activities and operations, and indicate selected sustainable building rating system</b>			
2	<b>Schematic Design Drawings (single line drawings)</b>			
a	- Civil Plans (incl. site plan, location of utilities)			
b	- Landscape & Irrigation description			
c	- Architectural Plans (incl. floor plans, rendering of building and ext. improvements with building material info and signage)			
d	- Structural, Fire Protection, Plumbing, Mechanical, Electrical, and Site Lighting descriptions			
3	<b>Applicable Building Rating System Sustainability Checklist and Supporting Documentation</b> (as required)			
4	<b>Completed Responses to Requests for Additional Information (if applicable)</b>			
<b>Design Development Plans Submittal Content Description</b>				
Item #	Design Development Plans Submittal Content Description	Included in Submittal?		
		YES	NO	N/A
1	<b>Design Development Plan Drawings</b>			
a	- Civil Plans (incl. site plan, location of utilities)			
b	- Landscape Plans (incl. irrigation plan)			
c	- Architectural Plans (incl. floor plans, life safety plans, rendering of building and ext. improvements with building material info and signage)			
d	- Structural Plans			
e	- Fire Protection Plans (incl. fire suppression, fire alarm and other life safety systems as required. )			
f	- Plumbing Plans			
g	- Mechanical Plans			
h	- Electrical Plans (incl. exterior lighting plan)			
2	<b>Design Development Specifications</b>			
3	<b>Tenant Developed Permit Package</b>			
a	- Environmental Permit Application			
b	- Documents Required by NASA Record of Environmental Consideration (REC)			
c	- Waste Water Discharge Permit Application			
d	- Air Emissions Permit Application			
e	- Potable Water Permit Application			
f	- Stormwater Discharge Permit Application			
3	<b>Updated Building Rating System Sustainability Checklist and Supporting Documentation</b> (as required)			
4	<b>Completed Responses to Requests for Additional Information (if required)</b>			
<b>Final/Construction Plans &amp; Specifications Submittal Content Description</b>				
Item #	Final/Construction Plans & Specifications Submittal Content Description	Included in Submittal?		
		YES	NO	N/A
1	<b>Final Construction Plan Drawings</b>			
a	- Civil Plans (incl. site plan, utility plans, grading/drainage plans, and details of exterior features i.e.- walks, courtyards, screening, etc.)			
b	- Landscape Plans (incl. irrigation plan)			
c	- Architectural Plans (incl. floor plans, life safety plans, rendering of building and ext. improvements with building material info and signage plan)			
d	- Structural Plans			
e	- Fire Protection Plans (incl. fire suppression, fire alarm and other life safety systems as required. )			
f	- Plumbing Plans			
g	- Mechanical Plans			
h	- Electrical Plans (incl. exterior lighting plan)			
2	<b>Construction Plan Specifications</b>			
3	<b>Final Building Rating System Sustainability Checklist and Supporting Documentation</b> (as required)			
4	<b>Completed Responses to Requests for Additional Information (if required)</b>			

*NOTE: All NASA and Space Florida reviews of the above submittals are intended for code compliance, life safety, environmental, site work and*

## APPENDIX 1E – INSPECTION CHECKLIST

X	BUILDING	BY	DATE	X	PLUMBING	BY	DATE	X	MOBILE HOMES / TRAILERS	BY	DATE
	Erosion Controls				Sewer Tap/Trench				Blocking/Tie Down		
	Setbacks				Pre-Slab				Stairs		
	Footings				Rough				Final		
	Termite Treatment				Water Service				Other:		
	Pre-Slab/Slab				Above Ceiling				<b>POOLS</b>	<b>BY</b>	<b>DATE</b>
	Mono				Solar				Steel Bonding		
	Piers				Medical Gas				Pre-deck		
	Lintel/Tie Beam				Final				Pressure Test		
	Grout/Bond Beam				Other:				Barrier/alarms		
	Partial Rough				<b>MECHANICAL</b>	<b>BY</b>	<b>DATE</b>		Final		
	Rough/Framing				Pre-Slab				Other:		
	Bucks				Rough				<b>SIGNS</b>	<b>BY</b>	<b>DATE</b>
	Wall Sheathing Nailing				Duct				Setbacks		
	Stucco/Lath				Above Ceiling				Footings		
	Separation Framing				Solar				Set-Up		
	Separation Insulation				Fuel Tanks				Final		
	Separation Wallboard				Dispensers				Other:		
	Insulation				Final				<b>SMOKE/CO'S</b>	<b>BY</b>	<b>DATE</b>
	Above Ceiling				Other:				Rough		
	Solar				<b>GAS</b>	<b>BY</b>	<b>DATE</b>		Final		
	Grade/Drainage				Underground/Trench				<b>FIRE SYSTEMS</b>	<b>BY</b>	<b>DATE</b>
	Building Final				Pressure Test				Alarm Rough		
	Pre-Roof Over				Rough				Alarm Final/Test		
	Roof Deck Fastening				Tank				System Hydro		
	Roof Dry In/Flashing				Above Ceiling				System Flush Test		
	Roof final				Final				Above Ceiling		
	<b>MISC.</b>	<b>BY</b>	<b>DATE</b>		Other:				Pump Final		
	Driveway Pre-Pour				<b>ELECTRICAL</b>	<b>BY</b>	<b>DATE</b>		System Final		
	Driveway Pre-Pavers				Underground/Slab				Other:		
	Driveway Final				Rough						
	Sidewalk Pre-Pour				Bonding						
	Sidewalk Final				Above Ceiling						
	Fence Final				Pre-Power						
	Shed Final				Solar						
	Tent Set-up				Temporary Power						
	Tent Final				Service Change						
	BTR Inspection				Final						
	Site Visit				Other:						

This card must be returned to the Space Florida at the completion of this project.

Call XXXXXXXXXX to schedule inspections.



# **Cape Canaveral Spaceport Development Manual**

## **VOLUME 2**

### **KENNEDY SPACE CENTER**

#### **CHAPTER 2 SHUTTLE LANDING FACILITY**

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VERSION 1.1

## SECTION 1 – INTRODUCTION

### 1.1 Introduction

Refer to Volume 1 Cape Canaveral Spaceport Chapter 1 Overview for general information on development within CCS. Refer to Volume 2 Kennedy Space Center Chapter 1 General Requirement for information associated with development within the confines of KSC.

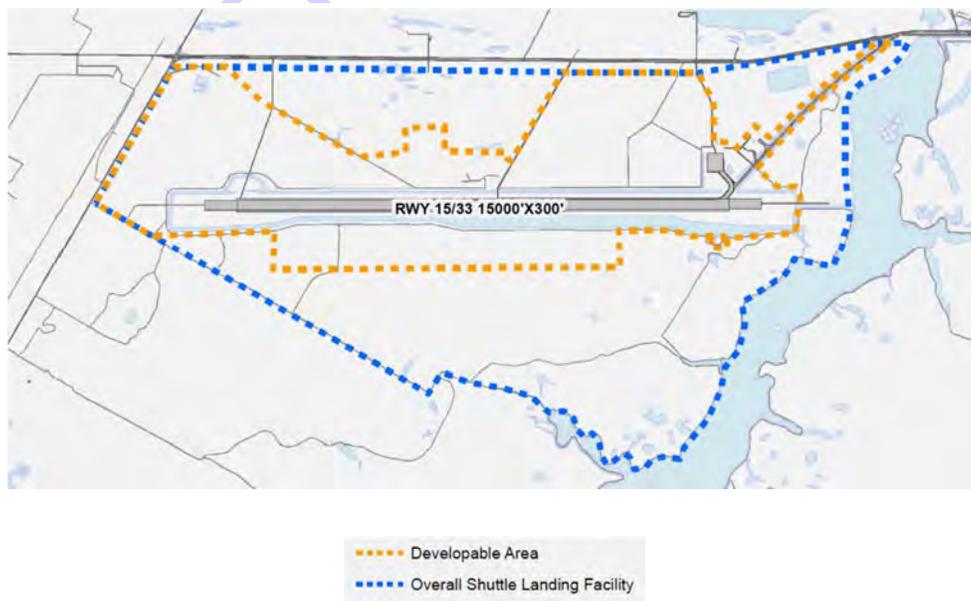
The Development Standards establish general criteria to be used in directing future building placement and design, and site design as the CCS Shuttle Landing Facility (SLF) Development Concept is implemented. Refer to Appendix A for the SLF Development Concept Plan.

Potential Space Florida Tenants can request to review the agreement between Space Florida and NASA titled, *“The Property Agreement between the National Aeronautics and Space Administration John F Kennedy Space Center and Space Florida for the Transfer of Operations and management of the Shuttle Landing Facility”*, dated June 22, 2015 from Space Florida, herein referred to as the Agreement.

### 1.2 SLF Area Overview and Description

The land area that has been transferred to Space Florida’s management and development responsibility encompasses approximately 4,432 acres as shown in Figure 2 below. This includes the former SLF runway and associated support facilities used during NASA’s Space Shuttle Program and a defined area of about 2,077 acres available for future development. Space Florida has registered the SLF as a Private Florida Airport and is currently in the process of preparing applications to the FAA for issuance of a Launch Site Operators License (LSOL) and as a Reentry Site to support planned commercial space transportation operations.

**Figure 2: SLF Property Area**



## SECTION 2 – PROCESSES

### 2.1. SLF Project Type, Permitted Uses and Prohibited Uses

All Space Florida Tenants shall adhere to the following project types, permitted uses, and prohibited uses as mandated by the Agreement.

#### 2.1.1. Project Types

Facilities designed, developed, or constructed by Space Florida shall be referred to as "Space Florida Projects (SPFLP's)." All other construction projects shall be referred to as "Tenant Projects (TP)."

#### 2.1.2. Permitted Uses

The following Commercial Space Activities (CSA) are permitted at the SLF consistent with current applicable laws.

1. Processing, flight, and refurbishment of commercial and Government suborbital and orbital launch systems requiring horizontal takeoff and/or recovery;
2. Processing and integration, and/or recovery and storage, of space mission payloads requiring use of permitted flight systems;
3. Advanced aerospace vehicle flight testing and operations, including Unmanned Aerial Systems (UAS) and spaceflight training or development-related experimental aircraft;
4. Commercial and Government spaceflight or aerospace research mission support aviation operations;
5. Commercial and Government mission management and program support aircraft operations;
6. Chartered air service, including passenger aircraft associated directly with CSA;
7. Spaceflight vehicle or payload hardware delivery cargo aircraft operations;
8. Other cargo operations supporting the CSA or other activities at KSC or Cape Canaveral Air Force Station (CCAFS);
9. Aviation flight test and development;
10. Advance air traffic or space traffic management systems development and testing, including but not limited to development of systems and technologies to integrate UAS and commercial space transportation into the National Air Space (NAS) system;
11. Straight line aerodynamic and engine technology vehicle testing;
12. Related manufacturing, assembly, and storage of materials, components, and flight or ground support equipment;
13. Related warehousing and logistics;
14. Related development, construction, and operation of common area improvements (e.g., aprons, taxiways, fuel and commodity storage areas, and space launch vehicle preparation areas);
15. Related development, construction, and operation of user parking areas, offices and support facilities, visitor facilities including but not limited to those designed for tourism (e.g., flight viewing and educational exhibits);
16. Related administrative, operations, and support facilities; and,
17. High energy systems research, development, and testing.

All Tenants, and use on the SLF are subject to the approval of both Space Florida and NASA. The enumerated CSA are intended to operate as specific guidelines on the types of activities that Space Florida and NASA consider desirable, and are not intended to operate as a limitation on Space Florida's and NASA's right to approve or disapprove other uses, occupancies, or activities at the SLF.

### **2.1.3. SLF Prohibited Uses**

The following are not permitted at the SLF.

1. General Aviation Businesses;
2. Scheduled passenger air service (except for chartered passenger air service as described above); and,
3. Industrial manufacturing unrelated to space transportation, aerospace flight systems, or space mission payloads.

### **2.1.4. Space Florida Qualifications**

Space Florida shall request Tenants to submit:

- a Tenant Questionnaire Application (to be provided in the future) for
- Accessibility Checklist (to be provided in the future)
- Airspace Study Application (to be provided in the future)
- Environmental Close-out Checklist (to be provided in the future)

Refer to Appendix 2B.

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## SECTION 3 – DESIGN STANDARDS

### 3.1. FAA Licensing

Space Florida is currently in the process of seeking an FAA LSOL for operation of the SLF in support of commercial space transportation activities.

In addition, Tenants and users of the SLF planning to engage in commercial spaceflight operations will be required to obtain the appropriate FAA license and/or permit. The FAA issues a commercial launch operator license or experimental permit when it is determined that a launch or reentry proposal or I to test equipment, design or operating techniques will not jeopardize public health and safety, property, U.S. national security or foreign policy interests, or international obligations of the United States. Each launch operator shall obtain a commercial launch operator's license from the Federal Aviation Administration Office of Commercial Space Transportation (FAA/AST) in accordance with CFR Title 14 Chapter III Parts 413, 415, 417, and 431. These standards and licensing guidance are available from the FAA/AST and may be obtained from the FAA website: <http://www.faa.gov>

### 3.2. Airfield Design

All airfield improvements including aprons and taxiways shall be in accordance with the latest edition of the applicable FAA Advisory Circulars identified in Table 5. On an as needed basis, Space Florida and Tenant shall utilize additional design standards associated with airfield infrastructure development from the FAA website:

[http://www.faa.gov/regulations\\_policies/advisory\\_circulars/](http://www.faa.gov/regulations_policies/advisory_circulars/)

**Table 5: Airport Design Guidelines**

Advisory Circular	Title
150/5300-13A	Airport Design
150/5370-10G	Standards for Specifying Construction of Airports

### 3.3. Architectural

#### 3.3.1. Building Height and Setbacks

Building heights are limited to Line-of-Sight requirements associated with the Air Traffic Control Tower (ATCT) and airfield safety surfaces as defined under FAR part 77. Tenant shall provide its ATCT Line-of-Sight study and FAR Part 77 documentation for proposed building as required by Space Florida.

Building setbacks shall meet the following minimum distances:

- a) Runway Centerline: 1,500 feet
- b) Taxiway Centerline: Aircraft Design Group VI Object Free Area as defined in FAA Advisory Circular 150/5300-13A Airport Design
- c) Lease/property line: 25 feet (Note: Building Code separations may supersede).

### **3.3.2. Glare**

It is imperative that all structures be glare controlled. Inherently high reflective materials, such as glass veneered curtain walls, shall not be used as a major building element. It is preferable to use non-reflective bronze glass as opposed to highly reflective silver or gold glass. All high sheen materials such as aluminum or stainless steel panels must be coated or clad with light-absorbing finish. Light colored aggregates on roofs are acceptable. Designers should review FAA requirements prior to final design.

### **3.4. Utility Demarcations**

Space Florida and Space Florida Tenant shall be responsible to coordinate all infrastructure improvements requiring electrical, communication, water and sewer with NASA. Appendix 2C SLF Utility Demarcations identifies the existing demarcations specified in the Agreement.

### **3.5. SLF Operations**

Appendix 2D is provided for informational purposes and highlights some of the operational requirements that were mandated in the Agreement.

VERSION 1.1

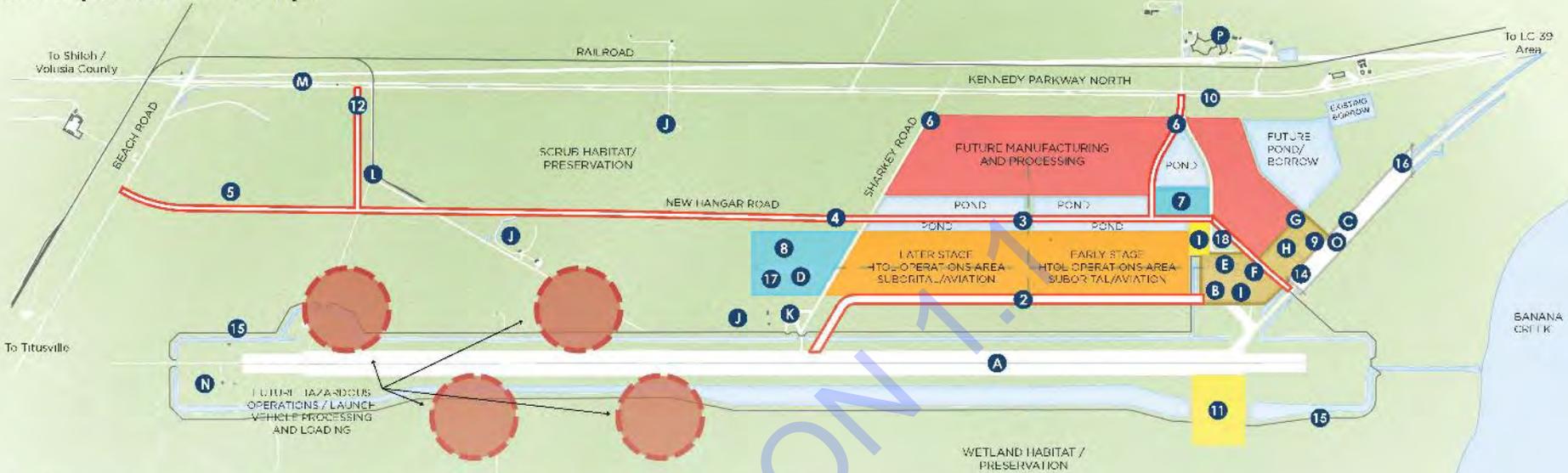
## **APPENDIX 2A – SLF EXHIBITS**

1. SLF Development Concept (Master Plan)
2. SLF Overall Layout Plan
3. SLF South-Field Layout Plan
4. SLF Mid-Field Layout Plan

VERSION 1.1

# Space Florida Concept Plan

## Shuttle Landing Facility (SLF) Development Concept



### Existing Facilities and Infrastructure

- A** Runway - 15,000' x 300' (concrete)
- B** Apron - 480' x 540' (concrete)
- C** Taxiway (Towway) to LC-39 Area (concrete)
- D** Air Traffic Control Tower / Media Operations Building
- E** Flight Operations Building and Parking Area
- F** Fire Station (ARFF)
- G** RLV Hangar (Space Florida asset)
- H** Convoy Vehicle Enclosure (equipment storage)
- I** Covered Equipment Storage
- J** Weather / Radar Sites Operated by Others
- K** Equipment Parking and Weather Instrumentation
- L** Railroad Service
- M** Security Gate
- N** Vertical Landing Test Facility (to be removed by others)
- O** Security Gate
- P** KSC Visitor Complex Tour Stop

### Capital Improvement Projects

- 1** Fuel Farm
- 2** Taxiway Extension
- 3** Southfield Roadway / Utility / Railroad / Drainage Corridor
- 4** Midfield Roadway / Utility / Railroad / Drainage Corridor
- 5** Northfield Roadway / Utility / Railroad / Drainage Corridor
- 6** Entry Feature / Roadway
- 7** Administrative / Guest Area
- 8** Guest Viewing and Parking Area
- 9** Operations Hangar (renovate Convoy Vehicle Enclosure)
- 10** Security Gate (notional)
- 11** Propellant and Fuel Loading Area
- 12** Existing Road Improvements
- 13** Off-site Wetlands Mitigation / Preservation (not shown)
- 14** Taxiway (Towway) Widening to RLV Hangar
- 15** Airfield Security Fencing
- 16** Suborbital Rocket Test Stand
- 17** New Flight Operations Facility
- 18** Maintenance & Storage Facility

**MAP LEGEND**

- Manufacturing/Processing
- Suborbital/Specialized Aviation
- Existing Operations
- Operations/Guest
- Fueling
- Pavement - Airfield and Roads
- Hazardous Operations/ Launch Vehicle Processing

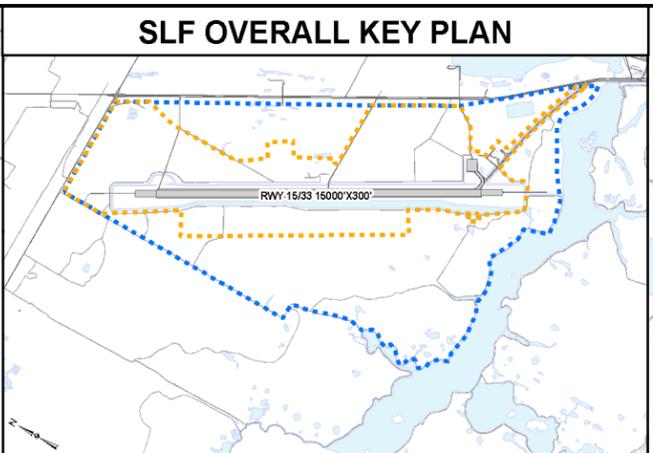
## Cape Canaveral Spaceport Horizontal Launch & Landing Facility



### Space Transportation and Technologies Support Systems

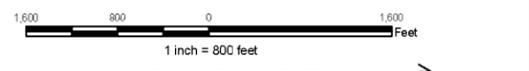


# SLF OVERALL KEY PLAN



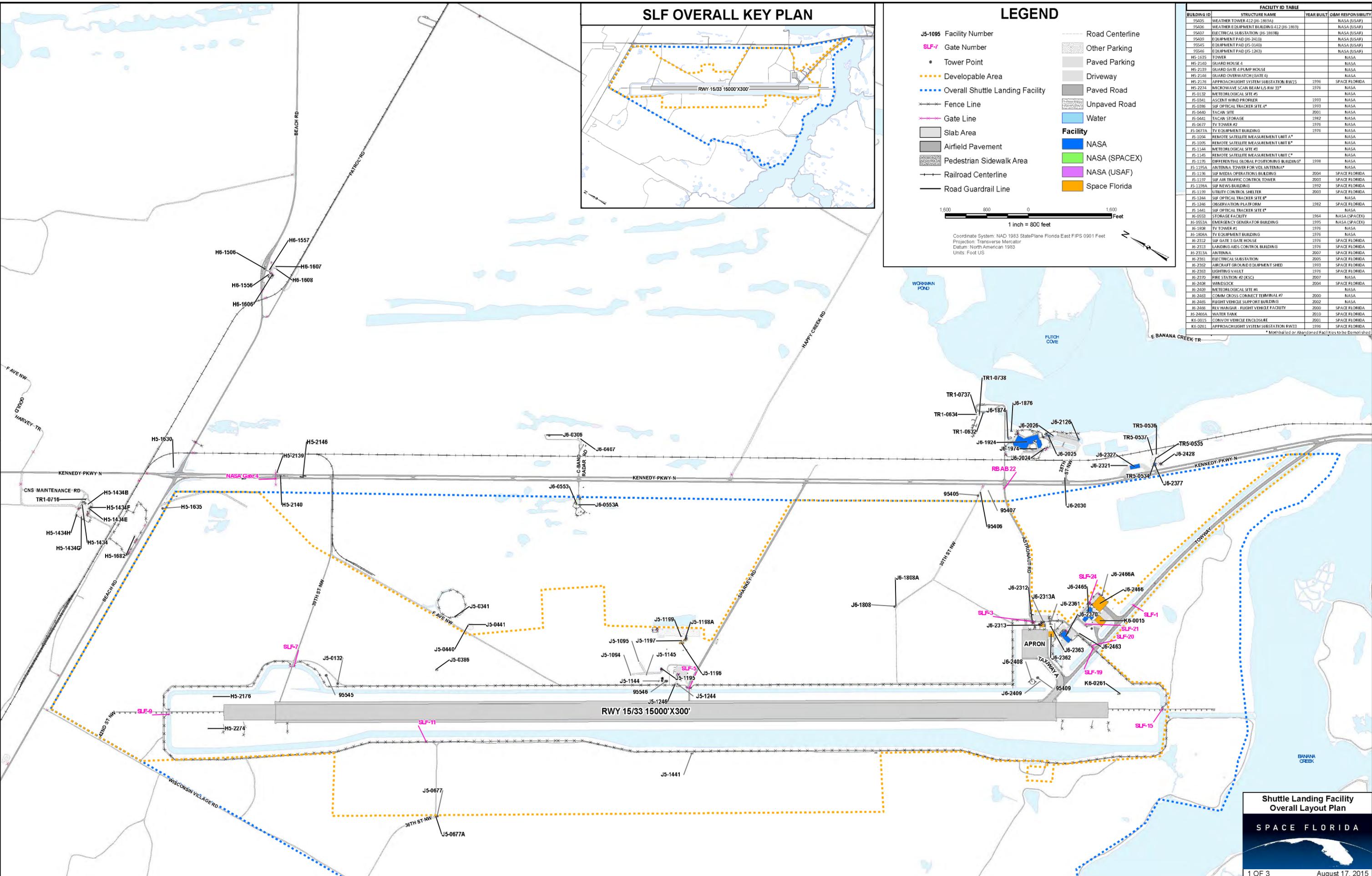
# LEGEND

- J5-1095 Facility Number
  - SLF-7 Gate Number
  - Tower Point
  - Developable Area
  - Overall Shuttle Landing Facility
  - Fence Line
  - Gate Line
  - Slab Area
  - Airfield Pavement
  - Pedestrian Sidewalk Area
  - Railroad Centerline
  - Road Guardrail Line
  - Road Centerline
  - Other Parking
  - Paved Parking
  - Driveway
  - Paved Road
  - Unpaved Road
  - Water
- Facility**
- NASA
  - NASA (SPACE)
  - NASA (USAF)
  - Space Florida



Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet  
 Projection: Transverse Mercator  
 Datum: North American 1983  
 Units: Foot US

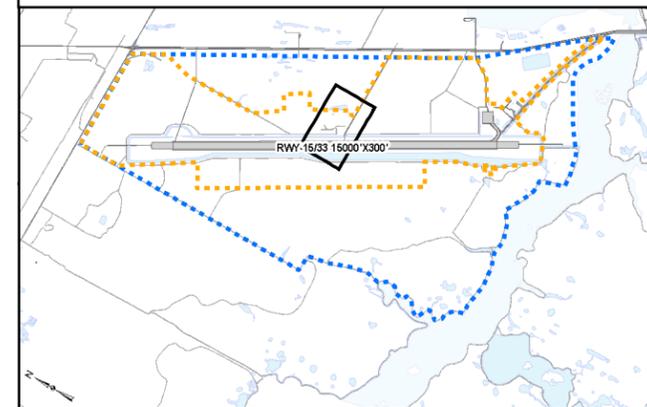
FACILITY ID TABLE			
BUILDING ID	STRUCTURE NAME	YEAR BUILT	O&M RESPONSIBILITY
95405	WEATHER TOWER 412 (J5-1863A)		NASA (USAF)
95406	WEATHER EQUIPMENT BUILDING 412 (J6-1869)		NASA (USAF)
95407	ELECTRICAL SUBSTATION (J6-1869B)		NASA (USAF)
95408	EQUIPMENT PAD (J5-2410)		NASA (USAF)
95445	EQUIPMENT PAD (J5-0340)		NASA (USAF)
95446	EQUIPMENT PAD (J5-1243)		NASA (USAF)
H5-1635	TOWER		NASA
H5-2140	GUARD HOUSE 4		NASA
H5-2139	GUARD GATE 4 PUMP HOUSE		NASA
H5-2146	GUARD OVERWATCH (GATE 4)		NASA
H5-2176	APPROACH LIGHT SYSTEM SUBSTATION RW15	1996	SPACE FLORIDA
H5-2274	MICROWAVE SCAN BEAM L/S RW 33*	1976	NASA
J5-0132	METEOROLOGICAL SITE #5		NASA
J5-0341	ASCENT WIND PROFILER	1993	NASA
J5-0386	SIF OPTICAL TRACKER SITE A*	1993	NASA
J5-0440	TACAN SITE	2001	NASA
J5-0441	TACAN STORAGE	1982	NASA
J5-0677	TV TOWER #2	1976	NASA
J5-0677A	TV EQUIPMENT BUILDING	1976	NASA
J5-1094	REMOTE SATELLITE MEASUREMENT UNIT A*		NASA
J5-1095	REMOTE SATELLITE MEASUREMENT UNIT B*		NASA
J5-1144	METEOROLOGICAL SITE #2		NASA
J5-1145	REMOTE SATELLITE MEASUREMENT UNIT C*		NASA
J5-1195	DIFFERENTIAL GLOBAL POSITIONING BUILDING*	1998	NASA
J5-1195A	ANTENNA TOWER FOR VDL ANTENNA*		NASA
J5-1136	SIF MEDIA OPERATIONS BUILDING	2004	SPACE FLORIDA
J5-1197	SIF AIR TRAFFIC CONTROL TOWER	2007	SPACE FLORIDA
J5-1198A	SIF NEWS BUILDING	1992	SPACE FLORIDA
J5-1139	UTILITY CONTROL SHELTER	2003	SPACE FLORIDA
J5-1244	SIF OPTICAL TRACKER SITE B*		NASA
J5-1246	OBSERVATION PLATFORM	1982	SPACE FLORIDA
J5-1441	SIF OPTICAL TRACKER SITE E*		NASA
J6-0553	STORAGE FACILITY	1964	NASA (SPACE)
J6-0553A	EMERGENCY GENERATOR BUILDING	1995	NASA (SPACE)
J6-1808	TV TOWER #1	1976	NASA
J6-1808A	TV EQUIPMENT BUILDING	1976	NASA
J6-2312	SIF GATE 3 GATE HOUSE	1976	SPACE FLORIDA
J6-2313	LANDING AIDS CONTROL BUILDING	1976	SPACE FLORIDA
J6-2313A	ANTENNA	2007	SPACE FLORIDA
J6-2361	ELECTRICAL SUBSTATION	2005	SPACE FLORIDA
J6-2362	AIRCRAFT GROUND EQUIPMENT SHED	1983	SPACE FLORIDA
J6-2363	LIGHTING WALLET	1976	SPACE FLORIDA
J6-2370	FIRE STATION #2 (KSC)	2007	NASA
J6-2408	WINDSOCK	2004	SPACE FLORIDA
J6-2409	METEOROLOGICAL SITE #1		NASA
J6-2453	CONV CROSS CONNECT TERMINAL #7	2000	NASA
J6-2455	FLIGHT VEHICLE SUPPORT BUILDING	2002	NASA
J6-2466	BLV HANGAR - FLIGHT VEHICLE FACILITY	2000	SPACE FLORIDA
J6-2466A	WATER TANK	2010	SPACE FLORIDA
K6-0015	CONVOY VEHICLE ENCLOSURE	2001	SPACE FLORIDA
K6-0261	APPROACH LIGHT SYSTEM SUBSTATION RW23	1996	SPACE FLORIDA



Shuttle Landing Facility Overall Layout Plan



### SLF MID-FIELD KEY PLAN



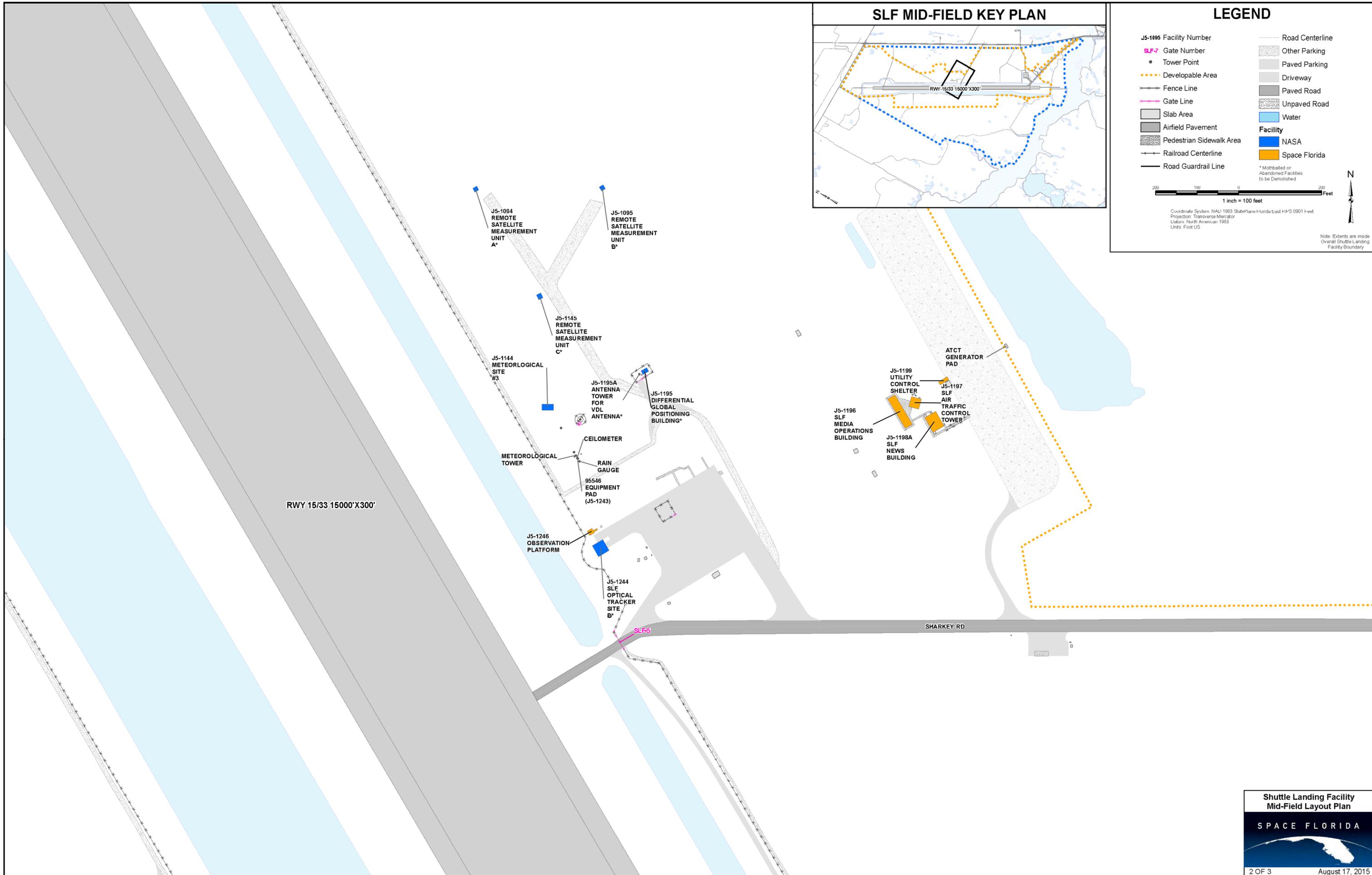
### LEGEND

- |                            |                   |
|----------------------------|-------------------|
| J5-1095 Facility Number    | — Road Centerline |
| SLF-7 Gate Number          | ▨ Other Parking   |
| • Tower Point              | ▨ Paved Parking   |
| --- Developable Area       | ▨ Driveway        |
| --- Fence Line             | ▨ Paved Road      |
| --- Gate Line              | ▨ Unpaved Road    |
| ▨ Slab Area                | ▨ Water           |
| ▨ Airfield Pavement        | <b>Facility</b>   |
| ▨ Pedestrian Sidewalk Area | ▨ NASA            |
| --- Railroad Centerline    | ▨ Space Florida   |
| --- Road Guardrail Line    |                   |
- \* Mothballed or Abandoned Facilities to be Demolished



Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet  
Projection: Transverse Mercator  
Datum: North American 1983  
Units: Foot US

Note: Extents are inside Overall Shuttle Landing Facility Boundary



**Shuttle Landing Facility  
Mid-Field Layout Plan**

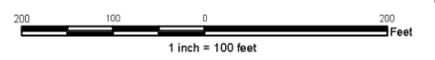
SPACE FLORIDA

2 OF 3 August 17, 2015

# SLF SOUTH-FIELD KEY PLAN

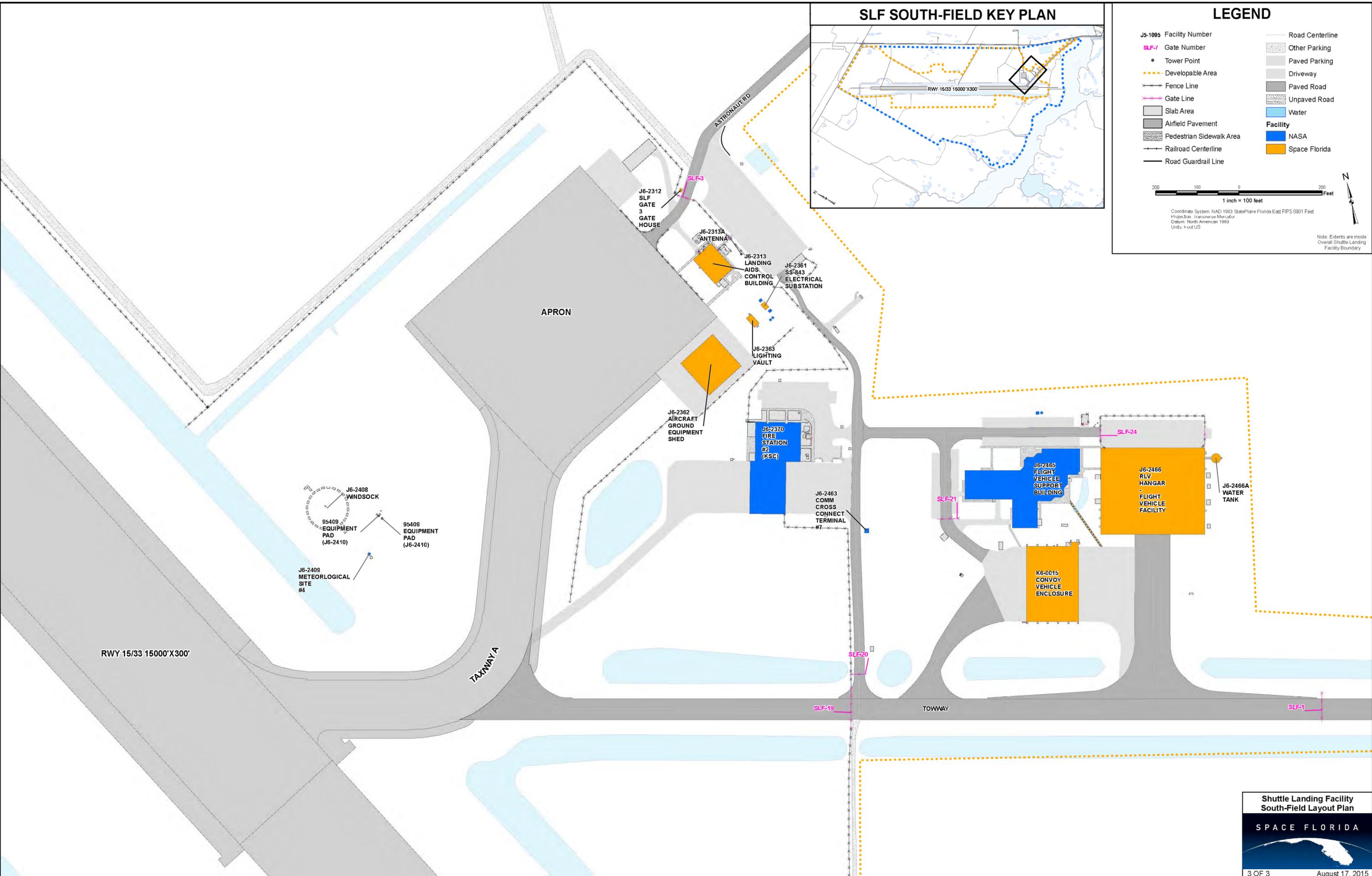
# LEGEND

- |                            |                   |
|----------------------------|-------------------|
| J6-1095 Facility Number    | — Road Centerline |
| SLF-7 Gate Number          | ▨ Other Parking   |
| • Tower Point              | ▨ Paved Parking   |
| --- Developable Area       | ▨ Driveway        |
| --- Fence Line             | ▨ Paved Road      |
| --- Gate Line              | ▨ Unpaved Road    |
| ▨ Slab Area                | ▨ Water           |
| ▨ Airfield Pavement        | <b>Facility</b>   |
| ▨ Pedestrian Sidewalk Area | ▨ NASA            |
| --- Railroad Centerline    | ▨ Space Florida   |
| --- Road Guardrail Line    |                   |



Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet  
 Projection: Transverse Mercator  
 Datum: North American 1983  
 Units: Foot US

Note: Extents are inside Overall Shuttle Landing Facility Boundary



Shuttle Landing Facility  
 South-Field Layout Plan

SPACE FLORIDA

3 OF 3 August 17, 2015

## APPENDIX 2B – FORMS

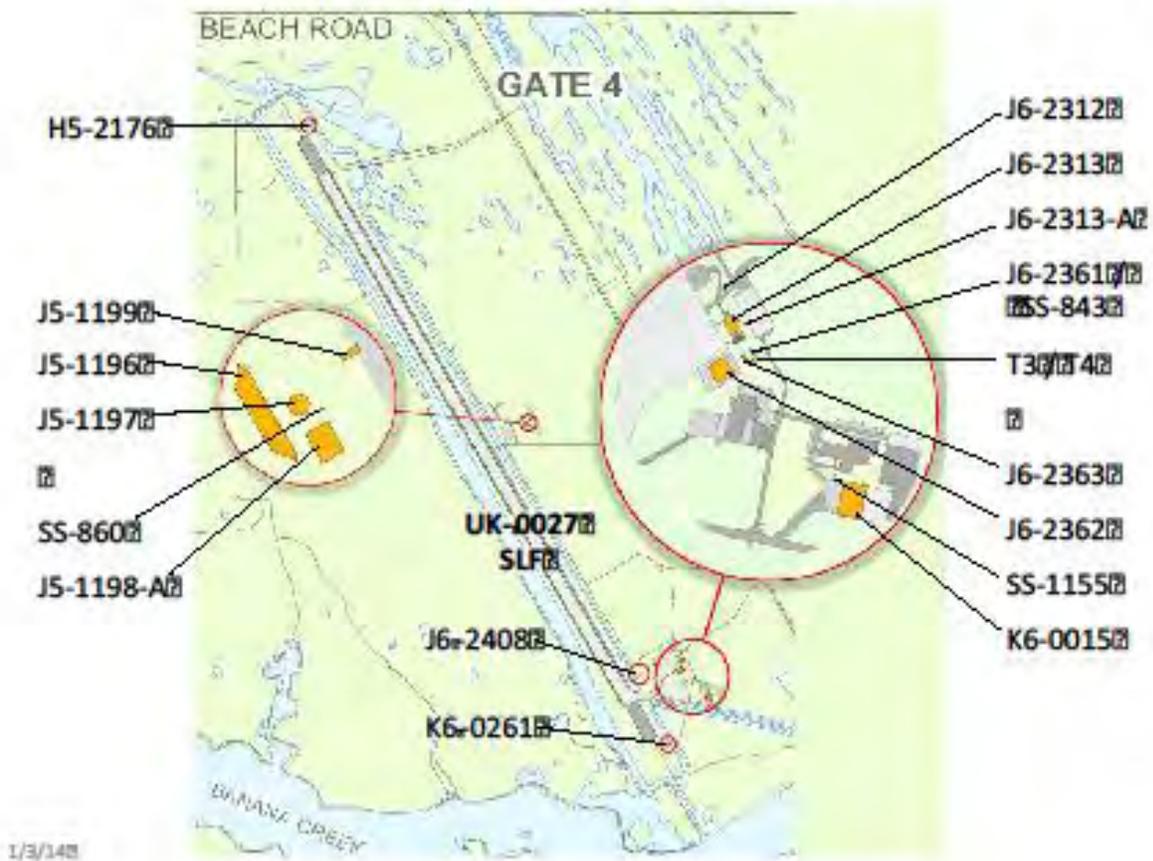
1. Tenant Questionnaire (to be provided in the future)
2. Accessibility Checklist (to be provided in the future)
3. Airspace Study Application (to be provided in the future)
4. Environmental Close-out Checklist (to be provided in the future)

VERSION 1.1

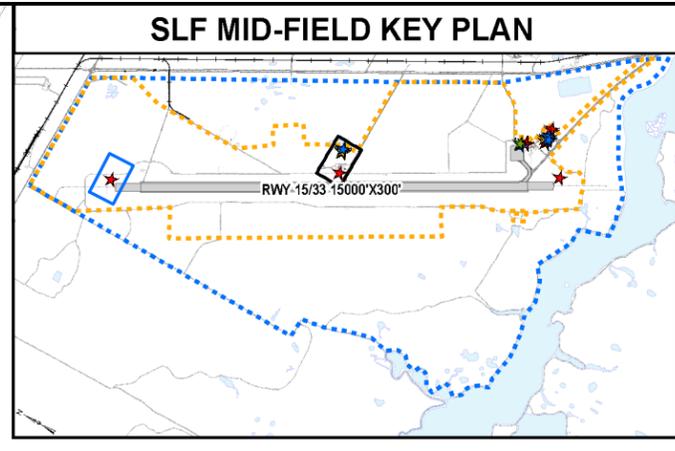
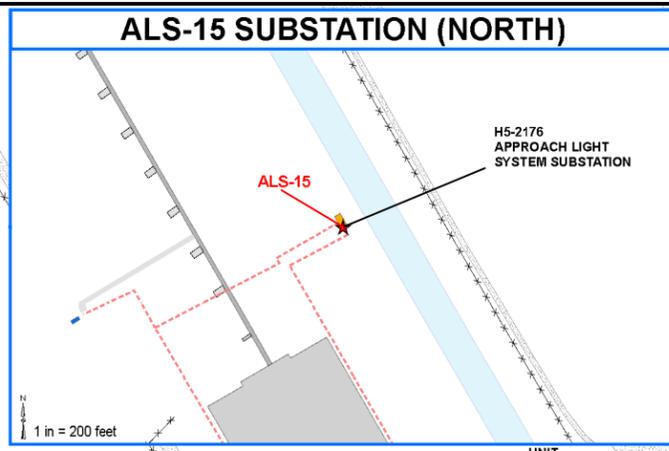
## APPENDIX 2C: SLF DEMARCATIONS PLANS

VERSION 1.1

## SLF Demarcation Points



VEI



### LEGEND

- J5-1096 Facility Number
- SLF-7 Gate Number
- Tower Point
- Developable Area
- Electrical Ductbank Line
- Storm Sewer Culvert Line
- Storm Sewer Open Drainage Line
- Water Line
- Fence Line
- Gate Line
- Slab Area
- Airfield Pavement
- Pedestrian Sidewalk Area
- Railroad Centerline
- Road Guardrail Line
- Road Centerline
- Other Parking
- Paved Parking
- Driveway
- Paved Road
- Unpaved Road
- Water
- Facility
  - NASA
  - Space Florida
- Utility Demarcation
  - IT
  - Power
  - Sewer
  - Water

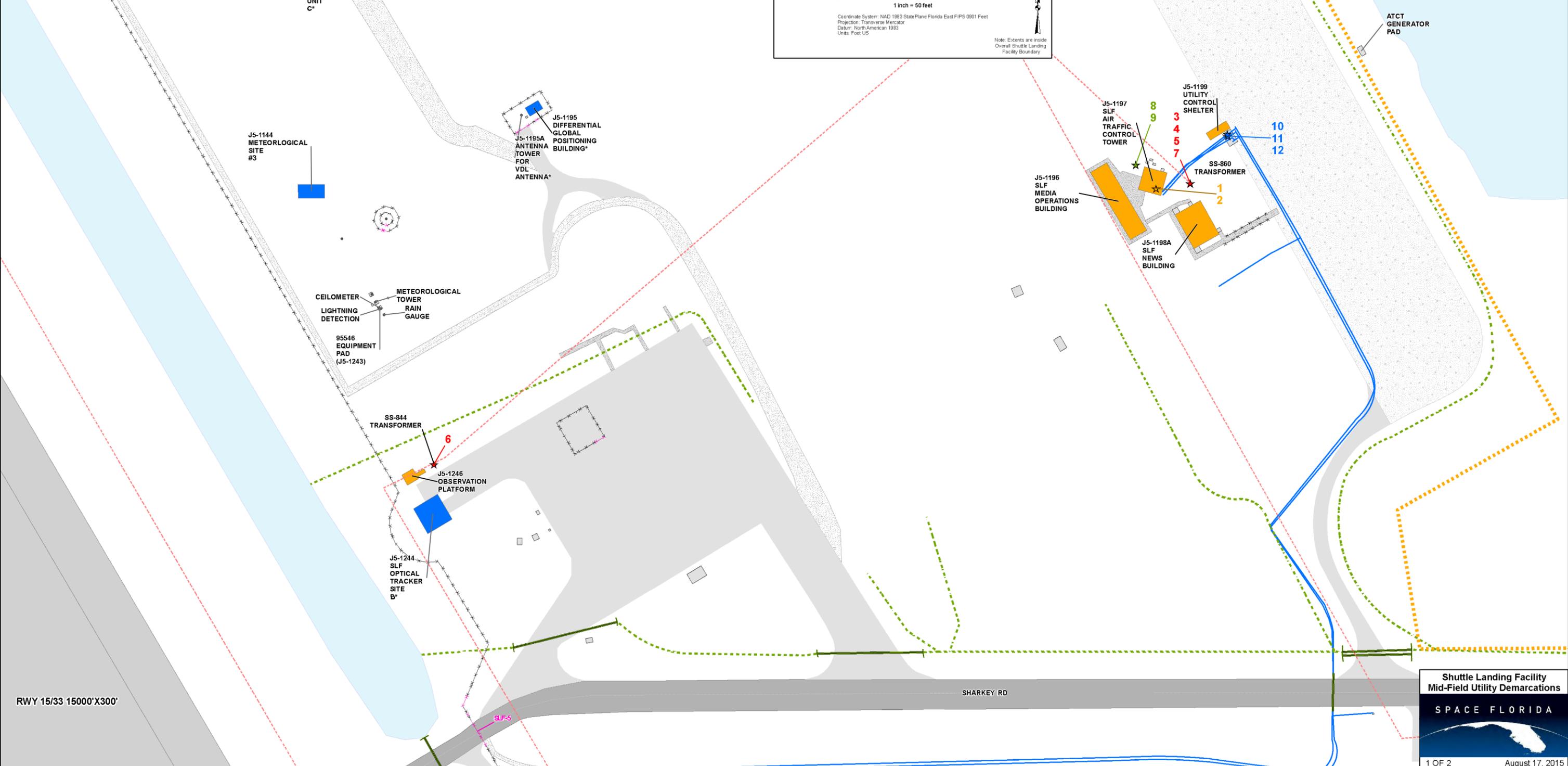
\* Mothballed or Abandoned Facilities to be Demolished

1 inch = 50 feet

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet  
 Projection: Transverse Mercator  
 Datum: North American 1983  
 Units: Foot US

Note: Extents are inside Overall Shuttle Landing Facility Boundary

DEMARCATION	FACILITY	TYPE	DESCRIPTION
1	SLF Air Traffic Control Tower Demarcation	IT	72 strand fiber termination in Level 15 Communications Room.
2	SLF News Building Demarcation	IT	72 strand fiber termination in Level 15 Communications Room of the ATCT.
3	SLF Air Traffic Control Tower Demarcation	Power	Secondary side of 300KVA Transformer SS 860 located on the east side of ATCT.
4	SLF News Building Demarcation	Power	Secondary side of 300KVA Transformer SS 860 located on the east side of ATCT.
5	Utility Control Shelter Demarcation	Power	Secondary side of 300KVA Transformer SS 860 located on the east side of ATCT.
6	Observation Platform Demarcation	Power	Secondary side of 112.5 KVA Transformer SS 844 located east of platform.
7	SLF Media Operations Building Demarcation	Power	Secondary side of 300KVA Transformer SS 860 located on the east side of ATCT.
ALS-15	Approach Lighting System Substation 15	Power	NASA to maintain the 5 KV switchgear and cable to the regulator. Demarcation is the regulator inside H5-2176.
8	SLF Media Operations Building Demarcation	Sewer	5 feet from building perimeter.
9	SLF Air Traffic Control Tower Demarcation	Sewer	5 feet from building perimeter.
10	SLF Media Operations Building Demarcation	Water	Discharge valve of backflow preventer (BFP) ENS12002 (potable) & ENS12001 (fire).
11	SLF Air Traffic Control Tower Demarcation	Water	Discharge valve of backflow preventer (BFP) ENS12002 (potable) & ENS12001 (fire).
12	Utility Control Shelter Demarcation	Water	Fire water discharge valve of backflow preventer ENS12001 located on south side of Utility Control Shelter.

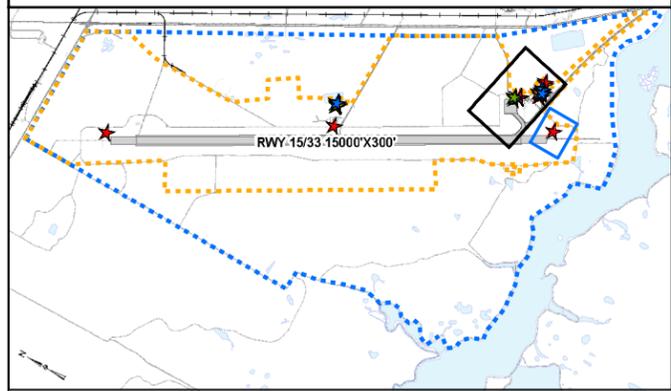


Shuttle Landing Facility  
Mid-Field Utility Demarcations

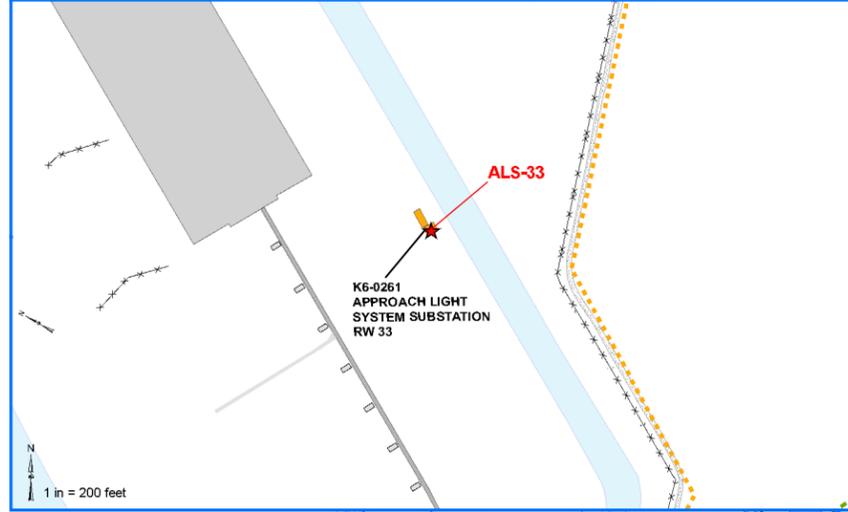
SPACE FLORIDA

1 OF 2 August 17, 2015

# SLF SOUTH-FIELD KEY PLAN



# ALS-33 SUBSTATION (SOUTH)



# LEGEND

**J5-1095 Facility Number**

- SLF-7 Gate Number
- Tower Point
- Developable Area
- Storm Sewer Open Drainage Line
- Storm Sewer Culvert Line
- Wastewater Line
- Electrical Ductbank Line
- Water Line
- Natural Gas Line
- Fence Line
- Gate Line
- Slab Area
- Airfield Pavement
- Pedestrian Sidewalk Area
- Railroad Centerline

**Road**

- Road Guardrail Line
- Road Centerline
- Other Parking
- Paved Parking
- Driveway
- Paved Road
- Unpaved Road

**Water**

- Water

**Facility**

- NASA
- Space Florida

**Utility Demarcation**

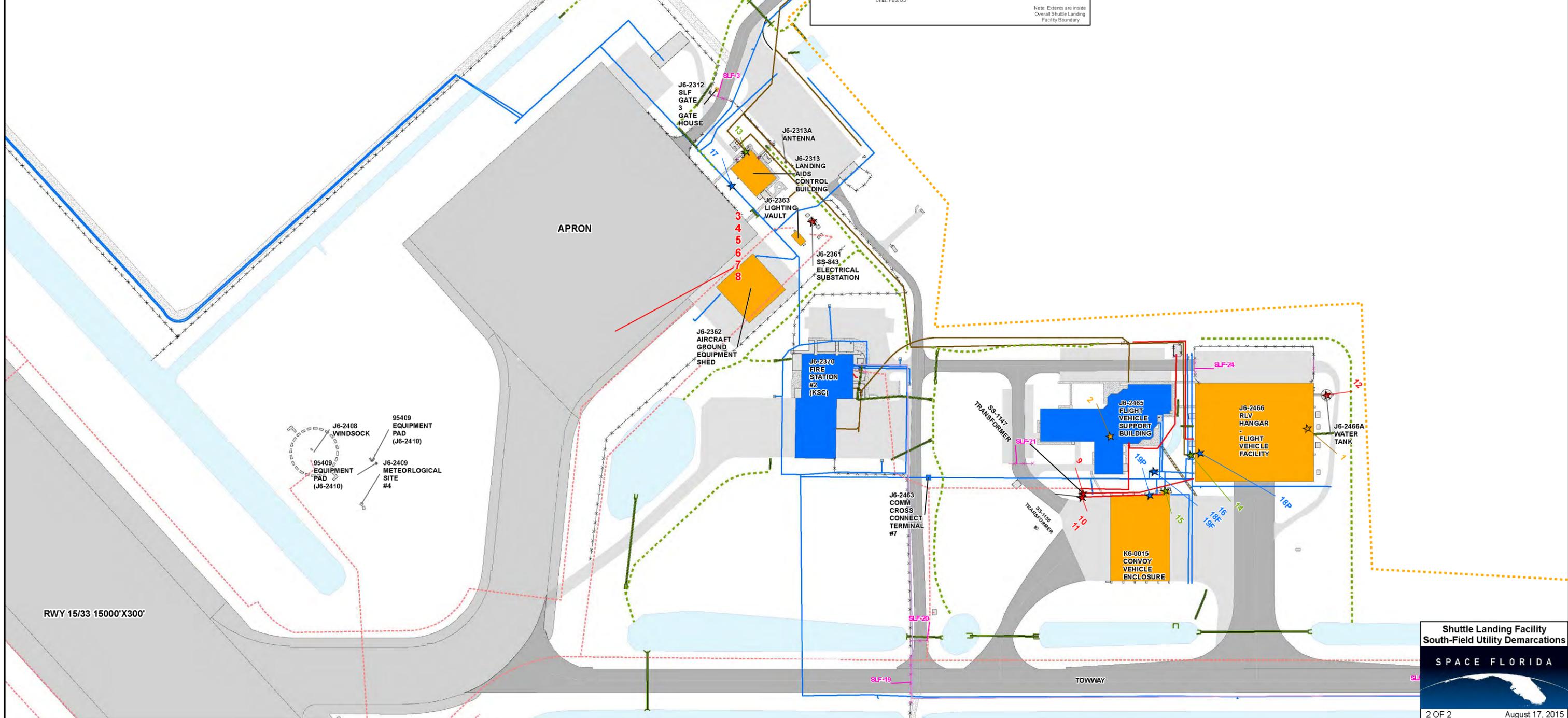
- IT
- Power
- Sewer
- Water

\* Mothballed or Abandoned Facilities to be Demolished

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet  
 Projection: Transverse Mercator  
 Datum: North American 1983  
 Units: Foot US

Note: Extents are inside Overall Shuttle Landing Facility Boundary

DEMARCATION	FACILITY	TYPE	DESCRIPTION
1	RLV Hangar - Flight Vehicle Facility Demarcation	IT	Outside plant terminations in the communications area on the east side of building.
2	Flight Vehicle Support Building Demarcation	IT	Outside plant terminations in the communications room.
3	SLF Gate 3 Gate House Demarcation	Power	Secondary side of SS 843 breaker feeding the associated power panel.
4	Landing Aids Control Building Demarcation	Power	Secondary side of SS 843 breaker feeding the associated power panel.
5	Antenna Demarcation	Power	Secondary side of SS 843 breaker feeding the associated power panel.
6	Electrical Substation SS 843 Demarcation	Power	NASA maintains the substation and all the switches including transformers T3 and T4 and all pad mounted transformers to secondary side of transformers.
7	Airfield Ground Equipment Shed Demarcation	Power	Secondary side of SS 843 breaker feeding the associated power panel.
8	Lighting Vault Demarcation	Power	Secondary side of SS 843 breaker feeding the associated power panel.
9	RLV Hangar - Flight Vehicle Facility Demarcation	Power	Power from 1000 KVA transformer SS 1147 located off the northwest corner of Convoy Vehicle enclosure. NASA maintains all power including hangar low voltage.
10	Convoy Vehicle Enclosure Demarcation	Power	Secondary side of 750 KVA transformer SS 1155 located on the northwest corner of Convoy Vehicle enclosure.
11	Flight Vehicle Support Building Demarcation	Power	Secondary side of 750 KVA transformer SS 1155 located on the south side of Flight Vehicle Support Building.
12	Water Tank Demarcation	Power	NASA maintains power.
13	Approach Lighting System Substation 33	Power	NASA to maintain the SVU switchgear and cable to the regulator. Demarcation is the regulator inside K6-0261.
14	Landing Aids Control Building Demarcation	Sewer	5 feet from building perimeter.
15	RLV Hangar - Flight Vehicle Facility Demarcation	Sewer	5 feet from building perimeter.
16	Convoy Vehicle Enclosure Demarcation	Sewer	Sewer is a 2-inch line from the electric water cooler and ties into system at the Flight Vehicle Support Building.
17	Water Tank Demarcation	Water	Downstream side of PIV PIV6-2466-F1 located in area between RLV Hangar and Flight Support Building.
18	Landing Aids Control Building Demarcation	Water	Potable: downstream side of PIV PIV6-2313-F1. Fire: 6" DC.
19	RLV Hangar - Flight Vehicle Facility Demarcation	Water	Fire: downstream side of PIV PIV6-2466-F1 located in area between RLV Hangar and Flight Support Building.
19P	RLV Hangar - Flight Vehicle Facility Demarcation	Water	Potable: downstream side of potable water valve west side of building. Fire: downstream side of PIV PIV6-0015-F1.
19F	Convoy Vehicle Enclosure Demarcation	Water	Fire: downstream side of PIV PIV6-0015-F1.
19P	Convoy Vehicle Enclosure Demarcation	Water	Potable: downstream side of BP P 16512015. Fire: downstream side of PIV PIV6-0015-F1.



## APPENDIX 2D: OPERATIONS RELATED STANDARDS (TO BE UPDATED)

### 1.1 Safety reporting – Mishaps and Close Calls

All occupants of the SLF shall comply with Kennedy NASA Procedural Requirements (KNPR) 8715.3-3, KSC Safety Procedural Requirements for Space Florida Organization's Operating in Exclusive-Use Facilities, with the tailored version of KNPR 8715.3-3 Chapter 7 replacing Chapter 7 of the KNPR.

Compliance with the tailored version of KNPR 8715.3 - 3, Chapter 7 Mishaps and Close Calls is as follows:

1. KSC-Reportable Mishaps are unplanned events arising from the acts or omissions of Space Florida or its employees, agents, Related Entities, SLF Site Occupants, or invited guests that result in at least one of the following:
  - The death of an individual.
  - Injury or illness to any individual that is not employed by Space Florida or its agents, Related Entities, SLF Site Occupants, or invited guests.
  - Damage to property outside the Space Florida's defined area.
  - High visibility or high public interest event, including events that could bring Occupational Safety and Health Administration (OSHA) or media attention to NASA.
  - a. Space Florida shall report all KSC-Reportable Mishaps to NASA, within a reasonable time upon the event being known (after appropriate emergency/medical response is notified and prior to the notification of OSHA) by telephoning the NASA Center Safety Office at [REDACTED] (321-867-SAFE) and by notifying the appropriate NASA Point of Contact (POC) as identified in the Agreement.
  - b. Space Florida will support the safety culture at KSC, and report any unsafe activity, condition, event, or source of danger that they observe at KSC to the NASA Safety Office.
  - c. If Space Florida conducts an independent mishap investigation, the Space Florida shall provide a copy of the final mishap report to the appropriate NASA POC(s) as identified in the Agreement.
2. For KSC-Reportable Mishaps that involve at least one of the following:
  - Death, injury or illness of a NASA employee/NASA Related Entity employee.
  - Damage to NASA real or personal property inside the Space Florida's defined area that has not been "loaned/permitted" to the Space Florida.
  - Damage to property outside the Space Florida's defined area and within KSC property.
  - a. NASA Safety & Mission Assurance (S&MA) reserves the right to investigate (which may include an interim investigation response, data and artifact impoundment, and control of the scene) in accordance with Center policies and procedures. Space Florida shall cooperate in any such investigation.

- b. Space Florida shall report any close call (“near miss”) to the appropriate NASA POC(s) as identified in the Agreement and the NASA Center Safety Office.

## 1.2 Flight Safety Compliance

Space Florida shall follow a tailored version of NPR 8715.5, Range Flight Safety Program Requirements (RFSPR). The tailoring process shall be where Space Florida and NASA S&MA review and jointly document applicable requirements and responsibilities for SLF operations based on the terms below:

- a) All FAA Licensed Commercial Launch Operations shall be conducted in accordance with KCA-4394 MOU between 45th Space Wing and NASA on Enabling Range Flight Safety Services for FAA Licensed Launch Operations from KSC.
- b) Space Florida will be responsible for ensuring risk analysis is performed for all flight activities occurring at the SLF (excluding conventional piloted aircraft). Space Florida shall provide the risk analysis and NASA facility impact probabilities to NASA for Class C and D activities as defined in Exhibit H.
- c) NASA will be responsible for reviewing and verifying all provided data, and verifying all risk to NASA personnel and property is acceptable. NASA shall provide the results of their analysis to Space Florida. Flight activities will not occur for Class C and D activity (as defined in Exhibit H), until NASA has deemed the risk to NASA personnel and property is acceptable.

## 1.3 Security and Security Badging

The NASA Protective Services Office (PSO) security forces will provide twenty-four (24) hours per day, seven (7) days per week routine patrols and response to security emergencies and traffic incidents. Escorts of hazardous, wide, and/or heavy loads coordinated through the KSC Institutional Services Contract (ISC) Duty Office will be provided to Space Florida and its Tenants on a reimbursable basis.

- a) Space Florida or its Tenants may hire non-NASA unarmed security personnel inside the SLF Property at their discretion. Any Space Florida or Tenant facility requiring the use of an armed officer must utilize the NASA PSO. Requests that exceed baseline service levels as determined by NASA PSO will be provided to Space Florida or its Tenants on a reimbursable basis.
- b) Space Florida and its Tenants shall comply with NASA regulations that prohibit weapons or dangerous materials from being carried, transported, introduced, stored or used without specific authorization by the NASA Chief of Security. SPFL, Tenant, and guest personnel are also subject to inspection when inside the secure perimeter gates of KSC in accordance with 14 CFR, 1204.1003.
- c) Space Florida on-site management or NASA PSO will, without delay, report all acts of workplace violence to the NASA PSO; this includes any employee who exhibits behaviors of concern. Space Florida will immediately notify the NASA PSO when an employee is terminated for any issue relating to workplace violence. The NASA PSO will support, upon request, any assistance with any terminations to include escorting employees from the Center. Space Florida personnel are encouraged to participate in

various NASA PSO security related training and seminars that are offered to NASA and Related Entity employees (e.g., prevention of workplace violence and loss prevention).

- d) Space Florida will comply with the requirements of Homeland Security Presidential Directive (HSPD) 12 and NASA administrative procedures for access to KSC. Space Florida shall participate in the current NASA Identity and Access Management system, badging process, and automated access control. Space Florida shall reimburse NASA a processing fee, per employee, for each employee requiring access for more than one hundred seventy-nine (179) days. This allows Space Florida personnel and occupants to access KSC and the SLF through all KSC gates. Badging shall be available for permanent personnel, as well as subcontractors, construction crews, flight crews, and visitors.

## 1.4 Environmental Compliance and Reporting

### 1.4.1 Definitions

- a) **Hazardous Material:** any substance that is (a) defined under any Environmental Law (as defined below) as a hazardous substance, hazardous waste, hazardous material, pollutant, or contaminant; (b) a petroleum hydrocarbon, including crude oil or any fraction or mixture thereof; (c) hazardous, toxic, corrosive, flammable, explosive, infectious, radioactive, carcinogenic, or a reproductive toxicant; or (d) otherwise regulated pursuant to any Environmental Law.
- b) **Environmental Law:** all Federal, State, and local laws, statutes, ordinances, regulations, rules, judicial and administrative orders and decrees, permits, licenses, approvals, authorizations, and similar requirements of all Federal, State, and local governmental agencies (including NASA) or other governmental authorities pertaining to the protection of human health and safety or the environment, now existing or later adopted.
- c) **Agreement Activities:** the activities that are part of the ordinary course of Space Florida's business in accordance with the Permitted Uses.
- d) **Materials:** the materials handled, used, or stored in the ordinary course of conducting Agreement Activities.
- e) **Permit Applications:** permit application forms and supporting documentation, Notice of Intent forms and supporting documentation, registration forms, license forms, or other regulatory approval requests.

### 1.4.2 Environmental Baseline Survey (EBS)

An EBS dated February 28, 2014 has been prepared for the SLF and represents environmental conditions and matters affecting the SLF as of June 22, 2015. Any potential soil or water contamination not identified in the EBS shall be immediately reported to Space Florida.

Upon vacating a facility or lease area, the Tenant shall prepare an updated EBS for that facility or lease area to set forth the environmental conditions and matters affecting SLF at the time of the vacation. The updated EBS shall be submitted to Space Florida for approval

and acknowledgement by NASA. Sampling of soil and/or surface and ground water may be required to verify environmental conditions. The Tenant shall be liable for and required to remedy any environmental conditions and matters affecting the SLF that are found to be a result of the Tenant's activities.

### **1.4.3 General Compliance**

All operations, activities, equipment, and facilities shall be in compliance with all Federal, State of Florida, and local environmental laws, statutes, regulations, and ordinances. Tenant shall be solely responsible for compliance with aforementioned environmental regulatory requirements including environmental permits. If formal enforcement actions are taken against Space Florida/NASA for environmental violations due to Tenant actions or inactions, Tenant shall reimburse Space Florida/NASA for any fines or penalties assessed.

### **1.4.4 Environmental Checklist**

Prior to commencing any activities, the Tenant shall complete an initial NASA Environmental Checklist (EC) (KSC Form 21-608) for all activities and submit it to Space Florida for evaluation. The Tenant shall also complete NASA ECs prior to the initiation of the following actions, projects, activities, or circumstances and submit them to Space Florida for evaluation.

- a) Construction, demolition, or facility modification projects (major or minor).
- b) Excavations, land clearing, or grading.
- c) Connecting, disconnecting, or modifying the configuration or operation of a NASA owned system, utility, or stormwater management system.
- d) Changes in operations, activities, facility operator, or Site Occupant.

The Tenant shall comply with all the environmental requirements and direction provided by Space Florida in the checklist response.

### **1.4.5 National Environmental Policy Act (NEPA)**

The Tenant is responsible for funding, implementing, and maintaining any environmental mitigation measures identified in applicable NEPA documentation associated with its activities that are not covered under the current NASA Record of Environmental Checklist (REC). Shall Tenant activities trigger the need for NEPA documentation that did not already exist prior to commencement of the activity, the Tenant is responsible to fund those NEPA requirements, and assist Space Florida/NASA throughout the process as necessary.

### **1.4.6 Historical and Cultural Resources**

The SLF has been deemed eligible for listing on the National Registry of Historic Places (NRHP). Prior to any modifications, repairs, improvements, alterations, the undertaking must be coordinated with Space Florida/NASA using the NASA EC process, for evaluation to determine if the proposed project will have an adverse effect to the historic properties under the National Historic Preservation Act (NHPA), implementing regulations (36 CFR Part 800, Protection of Historic Properties), or Programmatic Agreement for Management of Historic Properties at KSC (KCA-4185). If an adverse effect is determined by Space

Florida/NASA, Space Florida/NASA shall identify the effect of the activity on the historic property and consult with State Historic Preservation Office (SHPO) as appropriate in accordance with the Programmatic Agreement. Any adverse effect determination may take up to three (3) to six (6) months depending on the complexity of the project.

The Tenant shall not remove or disturb, or cause or permit to be removed or disturbed, any historical, archaeological, architectural, or other cultural artifacts, relics, vestiges, remains, or objects of antiquity. In the event such items are discovered at the SLF, the Tenant shall cease its activities at the site, immediately notify Space Florida, and protect the site and material from further disturbance until Space Florida/NASA give clearance to proceed. Any costs resulting from this delay shall be the responsibility of Tenant.

#### **1.4.7 Waste Management and Disposal**

All wastes generated by the Tenant shall be properly containerized, stored, labeled, manifested, shipped, and disposed of by the Tenant in full regulatory compliance at the Tenant expense. Hazardous wastes generated by the Tenant shall be manifested, shipped, and disposed of under the Tenant U. S. Environmental Protection Agency (USEPA) hazardous waste generator identification number.

#### **1.4.8 Spill Reporting and Cleanup**

Tenant shall take measures to prevent the release of hazardous materials at, about, or beneath SLF facilities. The liability of the Tenant under this section shall survive the termination of its lease with respect to acts or omissions that occur before such termination.

##### **1.4.8.1 Spill Reporting and Notifications**

Tenant shall immediately report spills, releases, or emissions of hazardous materials that exceed a Reportable Quantity to Space Florida and the following entities:

- a. NASA emergency responders by calling [REDACTED]
- b. Off-site agencies or authorities (such as the National Response Center, Florida State Watch Office, and Florida Department of Environmental Protection) as required by Federal and State of Florida regulations; and,
- c. NASA EAB by calling [REDACTED]

Reportable Quantities for hazardous materials are defined by various federal and State of Florida regulations such as, but not limited to, 40 CFR Part 302, 40 CFR Part 355, 49 CFR Parts 171-180, Florida Administrative Code (FAC) Chapter 62-150, and FAC Chapter 62-770.

Tenant shall also immediately report any spill or release of hazardous materials (regardless of quantity) to pervious surfaces or environmental media (such as grass, soil, groundwater, surface water, sediment, and gravel) to Space Florida and the NASA EAB by calling [REDACTED]

Pavement with unsealed cracks or expansion joints can be considered pervious surfaces if hazardous materials can migrate to environmental media below. A spill to impervious surface that is not adequately cleaned up within a reasonable timeframe (not to exceed six (6) hours) or prior to a storm event is considered a spill to pervious surface for purposes of this section.

Whenever Tenant is required to report a spill or release to Space Florida and NASA, Tenant shall also complete a written NASA Pollution Incident Report (KSC Form 21-555) and submit it to Space Florida and the NASA EAB within three (3) calendar days after the incident or discovery.

#### **1.4.8.2 Spill Cleanup**

Tenant shall clean up all spills regardless of media impacted and quantity spilled. Tenant has the discretion to utilize their own spill cleanup capability or to request support (via the emergency operator) from the NASA spill team to clean up the spill. Whenever the NASA spill team responds to a spill, Tenant shall either reimburse NASA for those costs or establish a support agreement directly with the NASA spill team company. Tenant shall be responsible for shipment and disposal of all cleanup waste and contaminated environmental media as described in paragraph 1.22.7 Waste Management and Disposal.

All spills and releases to pervious surfaces or environmental media (such as grass, soil, groundwater, surface water, sediment, and gravel) shall be cleaned up to State of Florida residential standards unless approved in writing by Space Florida and the NASA EAB. After the cleanup action has been completed, Tenant shall prepare a written cleanup report (which includes a description of the corrective actions taken, a map showing the spill location, general dimensions of the affected area using Global Positioning System (GPS) coordinates, photos of the spill before and after cleanup, and confirmatory sampling results providing evidence of adequate cleanup). For cleanup actions completed during a calendar quarter, Tenant shall deliver cleanup reports to Space Florida no later than the end of the following calendar quarter.

#### **1.4.9 Spill Prevention, Control, and Countermeasures (SPCC)**

Tenant shall comply with applicable oil pollution prevention regulations under Title 40 Part 112 of the CFR. If required, Tenant shall develop, maintain, and implement a SPCC plan for its oil storage activities.

#### **1.4.10 Registered Petroleum Storage Tank System**

Tenant shall comply with applicable petroleum storage tank system regulations (FAC Chapters 62-761 and 62-762). For new petroleum storage tank systems, Tenant shall register the system with the Florida Department of Environmental Protection (FDEP) and arrange for required installation inspections with the Brevard County Natural Resource Management Office prior to putting the tank system into service. If control and operation of an existing registered petroleum storage tank system is being transferred as a part of the facilities involved in the lease agreement, Tenant shall transfer the registration from Space Florida to Tenant and become responsible for maintaining compliance. Tenant shall provide a copy of all storage tanks registration forms to Space Florida and the NASA EAB.

#### **1.4.11 Sanitary Sewer Discharges**

The domestic wastewater system and treatment serving the SLF is operated and maintained by NASA. Wastewater collection from Tenant/lease holder facilities is the responsibility of the Tenant from the facility to a designated demarcation point on the SLF from which NASA assumes responsibility.

Prior to discharging any non-domestic wastewater into the sanitary sewer system, Tenant shall obtain a written discharge approval from Space Florida and both the NASA domestic wastewater collection/transmission system operator and the CCAFS domestic wastewater treatment plant operator. Costs associated with obtaining a written discharge approval shall be on a reimbursable basis to NASA. Otherwise the wastewater must be containerized and shipped to an off-site treatment or disposal facility.

#### **1.4.12 Recordkeeping**

Tenant shall maintain copies of all required environmental permits, licenses, registrations, regulatory approvals, waste manifests, laboratory analyses, reports, plans, compliance records, NASA ECs, and regulatory notifications on-site and make them available for review by Space Florida upon request.

#### **1.4.13 NASA Compliance Oversight**

As the landowner, NASA has a responsibility to ensure that SLF Tenant is complying with environmental laws and regulations. NASA and Space Florida shall participate in periodic environmental audits of SLF operations to exchange information; review current and future SLF activities; confirm compliance with environmental regulations and permits; review environmental spills and remediation progress; discuss regulatory agency inspections and findings; coordinate on air permitting; etc. In addition, Space Florida Tenants shall allow NASA personnel access to conduct spot inspections of Tenants facilities, systems, compliance records, or wastes if NASA personnel have reason to believe that a potential environmental non-compliance situation exists or that an unpermitted spill or release to the environment has occurred. Tenant shall attend all spot inspections of their facilities and provide corrective action responses for all identified violations, findings, and deficiencies by the due date in the inspection letter. Tenant shall be responsible for immediately correcting all violations, findings, and deficiencies identified in the inspection letter at Tenant's expense.

#### **1.4.14 Other Agency Inspections**

Tenant/lease holders shall report findings of all other regulatory agency inspections or audits. Including, but not limited to EPA, FDEP, Brevard County Natural Resources, etc. Additionally, any notices of violation must be reported to Space Florida and cured as soon as practicable.

#### **1.4.15 Environmental Land Management**

The land surrounding the SLF is part of the Merritt Island National Wildlife Refuge (MINWR). The U. S. Fish & Wildlife Services (USFWS) perform habitat management per a long-standing interagency agreement (KCA 1649 rev B) between NASA and the USFWS. The USFWS conducts prescriptive burns to effectively maintain and enhance wildlife habitat and reduce the occurrence and severity of wildfires. The USFWS has primary responsibility for wildfire suppression on KSC. Prescribed burn approval shall be coordinated with NASA under established procedures, with notification to Space Florida and its Tenants of scheduled burns within the SLF lands. A list of SLF fire management units scheduled for prescribed burning shall be provided to NASA and Space Florida each calendar year. Prescribed burns shall be conducted under specific conditions to avoid impacts to the SLF. Additionally, the USFWS is responsible for treatment and removal of non-native invasive

plants and animals on refuge lands. MINWR shall continue to provide nuisance wildlife response within the SLF boundary.

### **1.5 Licensing, Airfield Operations and Management**

Refer to Space Florida Operations Manual (OM).

- a. Licensing: All space vehicle launch and reentry operators and individual launch operations shall be licensed by the FAA. Copies of all FAA licenses shall be provided to Space Florida prior to any launch or reentry operations.
- b. Launch and Airfield Operations: Refer to Space Florida OM.

### **1.6 Hazardous Material, Fuel, and Propellant Storage**

Storage of hazardous materials, fuel and propellants shall be in accordance with all Federal and State regulations and applicable codes and as approved by Space Florida.

Proposed propellant storage shall be accompanied by an Explosive Site Plan (ESP) with appropriate Quantity-Distance (QD) calculations in accordance with Air Force Manual 91-201. The ESP will be subject to review and approval of the 45th Space Wing and the Department of Defense Explosives Safety Board (DDESB). Proposed propellant storage shall not adversely impact any other Tenant or operations at the SLF.

### **1.7 Explosive Siting and Range Safety**

Explosive siting shall be in accordance with Air Force Manual 91-201 and CFR 14 Chapter III Part 420. Range Safety shall be in accordance with CFR 14 Chapter III Parts 415, 417, 420 and 431. The approval process of Explosive Siting and Range Safety will include Space Florida, USAF 45<sup>th</sup> Space Wing FAA, and DDESB as applicable.



# **Cape Canaveral Spaceport Development Manual**

## **VOLUME 2**

### **KENNEDY SPACE CENTER**

#### **CHAPTER 3 EXPLORATION PARK**

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VERSION 1.1

## SECTION 1 - INTRODUCTION

### 1.1 Introduction

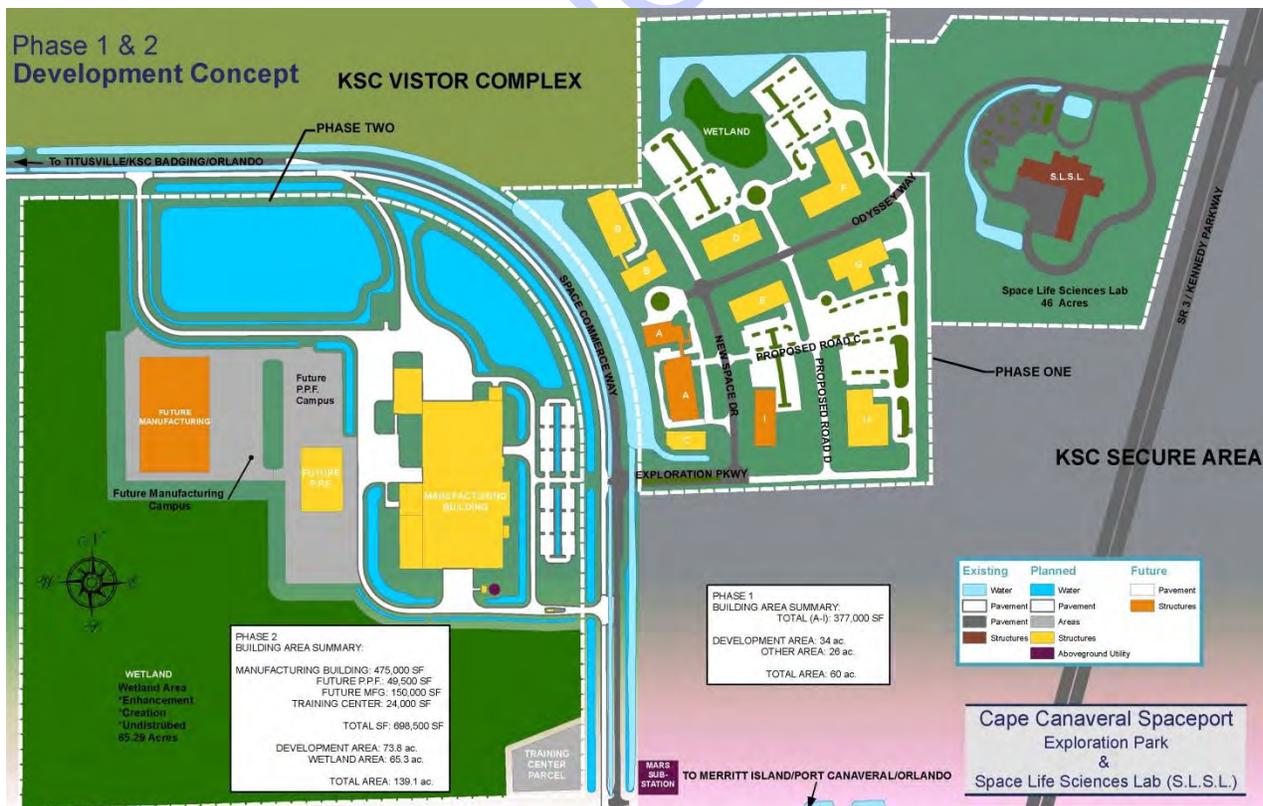
Exploration Park (“Exploration Park” or “the Park”) is a leading-edge research and innovation park at Kennedy Space Center KSC, located within Cape Canaveral Spaceport (CCS), Florida. Exploration Park shall possess an evident sense of place, character and functionality representing the priorities and aspirations of Space Florida, National Aeronautics and Space Administration Kennedy Space Center NASA, and its Tenants. Refer to Appendix 3A for the Park’s Development Concept Plan.

Potential Exploration Park Tenants can request to review the agreement between Space Florida and NASA titled, “NASA John F. Kennedy Space Center Enhanced Use Lease”, dated December 19, 2008 from Space Florida. Potential Exploration Park Tenants should also review the “Exploration Park at Kennedy Space Center Declaration of Covenants, Conditions, and Restrictions” (CCRs), dated September 20, 2012, herein referred to as the Agreement

### 1.2 Exploration Park Area Overview and Description

The land area that is owned by Space Florida comprises of the SLSL, Phase 1, and Phase 2. The SLSL is approximately 45 acres, Phase 1 is approximately 60 acres, and Phase 2 is approximately 139 acres. Figure 3 below shows these areas within Exploration Park.

**Figure 3: Exploration Park Property Areas**



## SECTION 2 - PROCESSES

### 2.1 Tenant Eligibility and Park Use Guidelines

Space Florida in conjunction with NASA shall have the right to approve, disapprove, or approve subject to conditions, all uses and Tenants for Exploration Park. Without limiting NASA's right or discretion to approve or disapprove each use and Tenant, the following criteria shall serve as a guideline for Tenant eligibility to sublease from Space Florida, a dedicated development site, building, or space within a multi-Tenant facility. The criteria which serve as guidelines are:

- a) Activities which have a requirement or demonstrated benefit for close proximity to Kennedy Space Center (KSC) / Cape Canaveral Air Force Station CCAFS facilities or personnel, are related to the NASA mission, or are related to space commerce and commercialization;
- b) Activities related to research and technology development with known or potential application to activities in space or improvement of life on earth, including but not limited to, energy-related, life sciences, or environmental activities;
- c) Activities of an academic/educational nature with current or potential partnership with NASA/CCAFS;
- d) Activities offering support services that may reasonably be required by Park Tenants or resident Government and contractor organizations of KSC/CCAFS, e.g. technical support, business services, and incidental, limited retail support services as deemed appropriate to support the needs of Tenants. Retail sales shall not significantly compete with merchandise sales of the KSC Visitor Complex.

The above criteria are intended to operate as general description of the types of Exploration Park activities which Space Florida considers desirable and are not intended to operate as a limitation on Space Florida's right to approve or disapprove uses, Tenants, or activities within the Park. The above criteria are not intended to grant any rights or benefits to, or be enforceable by, any Exploration Tenants, users, occupants, or any third party

### 2.2 Project Type, Permitted Uses and Prohibited Uses

Tenants shall adhere to the following project types, permitted uses, and prohibited uses as mandated by the Agreement.

#### 2.2.1 Permitted Uses

Space Florida has the right to approve all uses and Tenants in Exploration Park. Subject to such approval, each parcel and the improvements constructed thereon may be used for light manufacturing and assembly, office, processing, professional, laboratory, research, development, education and such other uses and activities as are permitted under those laws or ordinances which may be appropriated to such parcel and which are expressly sanctioned and approved by Space Florida. Such uses will be undertaken

subject to the terms of this declaration and the limitations imposed by applicable laws and ordinances and the Agreement. The existence of a less stringent requirement under applicable laws and ordinances will not excuse adherence to any stricter requirement under this Declaration.

### **2.2.2 Prohibited Uses**

The Agreement prohibits certain uses in Exploration Park including highly hazardous activities; heavy industrial manufacturing; warehousing as a stand-alone use; hotels or other major tourist facilities; and political, social or religious affiliated organizations. In addition to those uses prohibited by the Agreement, the following uses are prohibited:

- a) The manufacture, storage or distribution of products which increase fire, explosion or other hazards on adjacent parcels or areas adjacent to the property;
- b) Any business or operation which creates a public or private nuisance or the emission of a dust, odor, smoke or gases deemed by Space Florida to be hazardous or unreasonable;
- c) Any residential dwelling or hotels or motels;
- d) Any amusements or game rooms or similar establishments including, without limitation to, the use of pinball machines, electronic games or similar apparatus;
- e) Any building, improvement or use which violates applicable federal, state or local law;
- f) Mobile home parks or trailer courts, either temporary or permanent;
- g) Junkyard;
- h) Vehicle or equipment disassembly, provided that vehicle service maintenance performed entirely in an enclosed building may be proposed as a permitted use subject to approval by Space Florida;
- i) Mining or drilling for and/or removal of coal, oil, gas or other minerals;
- j) Commercial excavation of building or construction materials or quarrying of any materials;
- k) Composting;
- l) Dumping, disposal, incineration or reduction of garbage, sewage, offal or other refuse;
- m) Husbandry of animals, fowl or fish;
- n) Any activity involving the generation, storage, treatment, disposal, handling or use of hazardous waste, hazardous substances, toxic substances or hazardous materials which are in violation of applicable federal, state or local laws or regulations; and,
- o) The installation of storage tanks, including, without limitation, those used for storage of water, propane gas or other fuels or chemicals, unless first approved in writing by Space Florida.

## SECTION 3 – DESIGN STANDARDS

### 3.1 Key Design Principles

There are four key design principles that govern the organization and character of open spaces and buildings for Exploration Park: Connectivity, Community, Cohesiveness, and Sustainability. These principles establish consistency and evoke a distinctive setting and sense of place across the Park's development.

#### 3.1.1. Connectivity

Both physical and visual connections are encouraged to facilitate movement throughout the Park and to foster a sense of unity. A network of roadway and pedestrian circulation systems serves to physically link buildings and open spaces throughout the Park. While the predominant roadway system provides a sense of order and organization to the development of the Park, the freedom of pedestrian movement shall be given priority. Connectivity is achieved by establishing an axis of sightlines that visually links focal points throughout the Park.

#### 3.1.2. Community

The guidelines support a hierarchy of communal spaces that encourages interaction among the Park's users. These spaces shall be organized around specific program clusters, re-orienting individuals in laboratories and offices to larger communities within their respective areas. These communal spaces, in turn, are visually and physically connected to larger, more collective space. They also provide a favorable image of the Park's mission to the surrounding KSC and Central Florida – Space Coast community.

#### 3.1.3. Cohesiveness

Cohesiveness aims to promote visual consistency among the Park's architecture and landscape over the course of development. Collectively, adjacent buildings maintain similarity by abiding to a common strategy of massing, orientation, and general organization. Building designers are encouraged to incorporate a complementary palette of materials and colors. The Park's landscape maintains cohesiveness through the consistent use of native plant material, paving materials, signage and lighting. Cohesiveness among the Park's buildings and open space enhances the legibility and identity of the Park and promotes collaboration among its users. Through the review process of Space Florida, the Park's cohesiveness shall be ensured.

#### 3.1.4 Sustainability

Construction in Exploration Park shall meet, as a minimum, the sustainable design standards represented by one of the three sustainable rating systems identified in section 255.253, Florida Statutes, that are also identified below as NASA-approved. Rating system standards approved by NASA include United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) NC rating system, the Green Building Initiative's (GBI) Green Globes NC rating system, and the Florida Green Building Coalition (FGBC) commercial standards. The latest released version of the selected rating system in effect at the time design work commences on a

given project shall be utilized for that project. Construction shall meet, as a minimum, one of the following levels under the selected rating system: LEED “Silver,” FGBC “Silver,” or GBI “2 Globes”, unless it has been clearly demonstrated that such levels are not feasible due to the nature of the construction or planned operations, and a waiver has been granted by NASA-KSC. Each Form 1509 submittal shall be accompanied by information identifying which sustainable building rating system is being followed, which rating level is being pursued, what specific track and or level within the applicable sustainable building rating system is being followed (e.g. Building Design and Construction, Commercial Building, etc.) and if certification is or is not being pursued. NASA-KSC will review the proposed level to determine whether it meets the requirements of this Section 6.3 before approving the NASA Form 1509. Certification of the project by the rating system organization is not mandatory but is strongly encouraged. In lieu of certification, a qualified third party under direction from the Space Florida building official may perform rating system verification checks during planning, design, construction and operational phases to score and certify the project using the selected rating system scorecard/checklist. Credentials for the qualified third-party shall be provided to NASA KSC. The project will be registered with the rating system agency and the scoring documentation demonstrating that the project meets the agreed upon rating level shall be provided to NASA-KSC prior to the certificate of occupancy being issued by Space Florida. Appropriate credit for Space Florida’s Exploration Park infrastructure design and site features may be counted toward each facility project’s score in determining compliance with the selected rating system.

Designers are encouraged to consider demonstration projects that engage new technologies in partnership with NASA and Exploration Park. Projects should also be respectful of their location within the Merritt Island Wildlife Refuge and the National Seashore, through restoration of habitat and use of native materials.

## 3.2 Planning Guidelines

The guidelines below address recommended strategies for both Phase 1 and 2 of the Park. Phase 1 of the Park is intended to be a campus setting consisting of offices and Research & Development (R&D) facilities for the advancement of space-related research.

Phase 2 of the Park is intended for space craft fabrication, assembly, and processing in larger and more isolated facilities. Therefore, some of the recommended guidelines for Phase 1 are not applicable to Phase 2. Recommendations that are not applicable to Phase 2 are shown in *italics*.

### 3.2.1. Key Design Principles

The Open Space Guidelines recommend strategies for the creation of inviting outdoor spaces that contribute to the interaction of all users of the Park. The adoption of these recommendations will positively influence the ways in which these spaces are used, the frequency of their use, and their impact for a healthy work environment. Well-articulated open space, defined either by adjacent buildings, landscape elements, or pedestrian paths, and should serve as places of respite and engagement with colleagues. Open spaces and building courtyards should be designed as intentional places, enhancing connectivity between and among buildings, not as “land left over”. Recommendations fostering a secure, comfortable, and welcoming atmosphere for open space activity will contribute to the Park’s overall sense of community. Durability and ease of maintenance

will ensure the long-term success of these important outdoor spaces.

The Park lies within the Merritt Island Wildlife Refuge and natural habitat protection and restoration should also be part of the overall open space strategy. Existing wetlands should be protected and enhanced through integrated stormwater management and treatment plans that capture runoff from the developed areas. Landscape materials located along the drainage courses should be native to the area further expanding the existing habitat. The following recommendations should be used as guidelines for design at Exploration Park:

- a) *Categorize outdoor areas by their likely or intended use and level of activity: direct pedestrian transit, casual pedestrian passage, personal solitude, quiet reflection, informal social engagement by both small and large groups, and structured activities (i.e. scheduled discussion, recreation, social gatherings).*
- b) *Develop outdoor rooms (courts, arcades, cloisters, plazas) in locations that will invite convenient access and use.*
- c) *Outdoor spaces should be scaled and proportional in response to their intended or presumed use: smaller spaces for intimate gatherings, large spaces for collective social uses.*
- d) *While preserving the continuity of experience and expression in the design of all open space, such areas should also be individualized, both in response to their intended use and as a means to grant each a unique identity. Landscape features such as fountains and other water elements, sculptures, framed vistas, and specialized planting areas may be employed as focal signatures for individual outdoor spaces.*
- e) *Where large-scaled activities and social uses are anticipated, create broadly open, flat lawns or plazas. Provide shaded edges with seating for passive outdoor activities.*
- f) *Identify areas of highest population density and pedestrian traffic (particularly those adjacent to major building entries) and consider them for use as outdoor cafés and meeting areas. Based on anticipated intensity of use, provide adequately scaled seating, lighting, power and data resources, and shade structures.*
- g) *Provide comfortable outdoor seating. Although the scale, configuration and design of this seating should vary in response to each open space's intended or anticipated use, the style, color, and materials of the seating should be drawn from a common design vocabulary. Provide appropriate outdoor accessories: trash receptacles, information kiosks, and directional signage, also drawn from a common design vocabulary.*
- h) *Orient open space to take best advantage of solar warming in winter and conversely, provide such spaces with areas of shade in summer, either through the use of landscape elements or physical structures (trellises, overhangs, canopies, shelters, and other building elements). Anticipate the effect of adverse*

weather events – for example wind and/or rain and provide appropriately scaled and oriented responses: screening or shelter and solar orientation.

- i) Screen outdoor spaces from adjacent distractions through the use of arcades, colonnades, gateways, plantings, walls or fences while still preserving an inviting, welcoming character.
- j) If the specific building design includes an arrival forecourt, provide outdoor space features to accommodate both passive and active uses as they relate to the building. Consider including site walls to define edges and bollards to define limits for vehicles. Achieve a pedestrian-scale arrival that reduces the scale of buildings; strategies include an overhead plane of trees and seating areas.
- k) For the construction of all outdoor spaces, use durable materials including masonry, architectural concrete, break-resistant glazing and non-corrosive metals. The colors and finishes of these materials are to be drawn from a common and complementary palette subject to approval by Space Florida.

### 3.2.2. Pedestrian Accommodation

*To the extent that pedestrian pathways offer opportunities for incidental social interaction, accommodations are also recommended to foster collaboration by incorporating shaded respites and break points.* The following recommendations shall be used as guidelines for design at Exploration Park:

- a) *At major pedestrian intersections, strategically position breakout areas designed to offer seating and collaborative opportunities.*
- b) *Safety and security should be a primary design consideration; include security 'blue light' call boxes appropriately space along walkways.*

### 3.2.3. Vehicular Accommodations

These vehicular accommodations link campus destinations, but are subordinate to pedestrian movement as a means to promote connectivity. The following recommendations shall be used as guidelines for design at Exploration Park:

- a) *Develop a hierarchy of vehicular use based on the anticipated volume and specific need for access including daily commuting, alternative non-pedestrian transit (bicycles), visitor arrival and departure, service and delivery access and emergency access. This hierarchy shall discourage intra-campus vehicular transit and limit the intersection of roadways with major pedestrian paths, favoring pedestrians and bicycles over service and private vehicles in multi-modal areas. Utilize this hierarchical system to inform the specific design of each roadway.*
- b) Design streets throughout the Park for safe multi-modal movement. Where feasible, segregate commuter and visitor traffic from service and delivery traffic.
- c) Provide facilities and amenities that promote alternative means of travel to and from the Park, such as car-pool information kiosks, ride share programs, *bulletin boards, bus shelters, shuttle stops, maps, and visitor directions.*

- d) *Place required bicycle parking areas along multi-modal streets and near major activity centers, building entryways and major open spaces.*
- e) Establish drop-off zones near major activity centers and building entries for convenient use. Provide shelter and seating for waiting areas, attractive landscaping, and adequate lighting.

### **3.3 Security and Life Safety**

To promote community, designs shall address the Crime Prevention through Environmental Design (CPTED) principles of informal surveillance, lighting, defensible space, appropriate landscaping and logical way-finding. Design shall maximize visibility and foster positive interactions among the users of the Park, except for required utility screening. In addition, certain hazardous materials will not be permitted in Exploration Park and are addressed in the Exploration Park Covenants Conditions and Restrictions (CCR). Any design issues pertaining to life safety and security are to be coordinated with Space Florida and meet the requirements of the FBC.

### **3.4 Architectural**

#### **3.4.1. Building Aesthetics**

Recognizing Tenant buildings need to be designed to meet the operational needs of the specific Tenant, the following guidelines are provided relative to the aesthetics of the structures.

- a) *The designs of buildings within the Park are to be timeless and not connected to a specific style of architecture. New buildings shall reflect a ‘family resemblance’ to existing buildings in the Park through common references to size, scale, massing of similar forms, and compatible building materials.*
- b) *Program requirements should be balanced with the desire to maintain the overall Park sense of place, so that buildings should generally respond to the heights of buildings around them. Heights of buildings organized around defined open-spaces or corridors shall be in the same range to ensure consistency and legibility of the buildings edge.*
- c) *Building widths will be determined by the optimal floor-plates of their specific use and program requirements. Building design should allow for optimized daylighting. Overall building length shall be limited to avoid excessive consumption of land and to avoid creating a barrier-effect.*
- d) *To assist with campus way-finding, building entries shall be obvious, accessible and clearly visible from the main corridors and access routes.*
- e) *Primary building facades should avoid long or massive uninterrupted walls with no relationship to human scale and shall, therefore, be articulated through changes in material, color texture, or planes.*

#### **3.4.2. Signage**

Signage shall conform to the requirements of Chapter 1 section 3 Design Standards paragraph 3.8.3 Signage.

Signs should be designed to signal the Park's entry, convey information and assist with way-finding, promoting the Park's connectivity and collegiality. The standards further promote cohesiveness by providing a consistent approach to the design of signs. Standards for the use of legible, durable and low maintenance signs will contribute to the Park's cohesiveness. The design of the sign family should have an obvious continuity and relationship to one another through the use of branding designations, font, color, materials, profile and scale.

### **3.5 Buffer Areas/Irrigation**

Unless otherwise expressly approved in writing by Space Florida, each parcel shall have landscaped buffer areas along its boundary lines as follows:

- a) 25 feet adjacent to the curb of all streets; and
- b) 15 feet along Parcel lot lines adjacent to other Parcels.

All of the above buffer areas located within any parcel shall be landscaped and maintained by the lessee of such parcel. All such buffer areas which are located adjacent to any of the identified roads or streets (including, without limitation, the portion thereof located within any public right-of-way) shall be required to be irrigated at the cost of the lessee of such parcel. Parking shall not be permitted within these buffer areas, but vehicular access will be permitted to cross the buffers in such locations as are approved by Space Florida.

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## **APPENDIX 3A – EXPLORATION PARK LEGAL DESCRIPTIONS**

(Per NASA John F. Kennedy Space Center Enhanced Use Lease”, dated December 19, 2008)

1. Phases 1, 1a, 1b and 2
2. Site Development Master Plan

VERSION 1.1

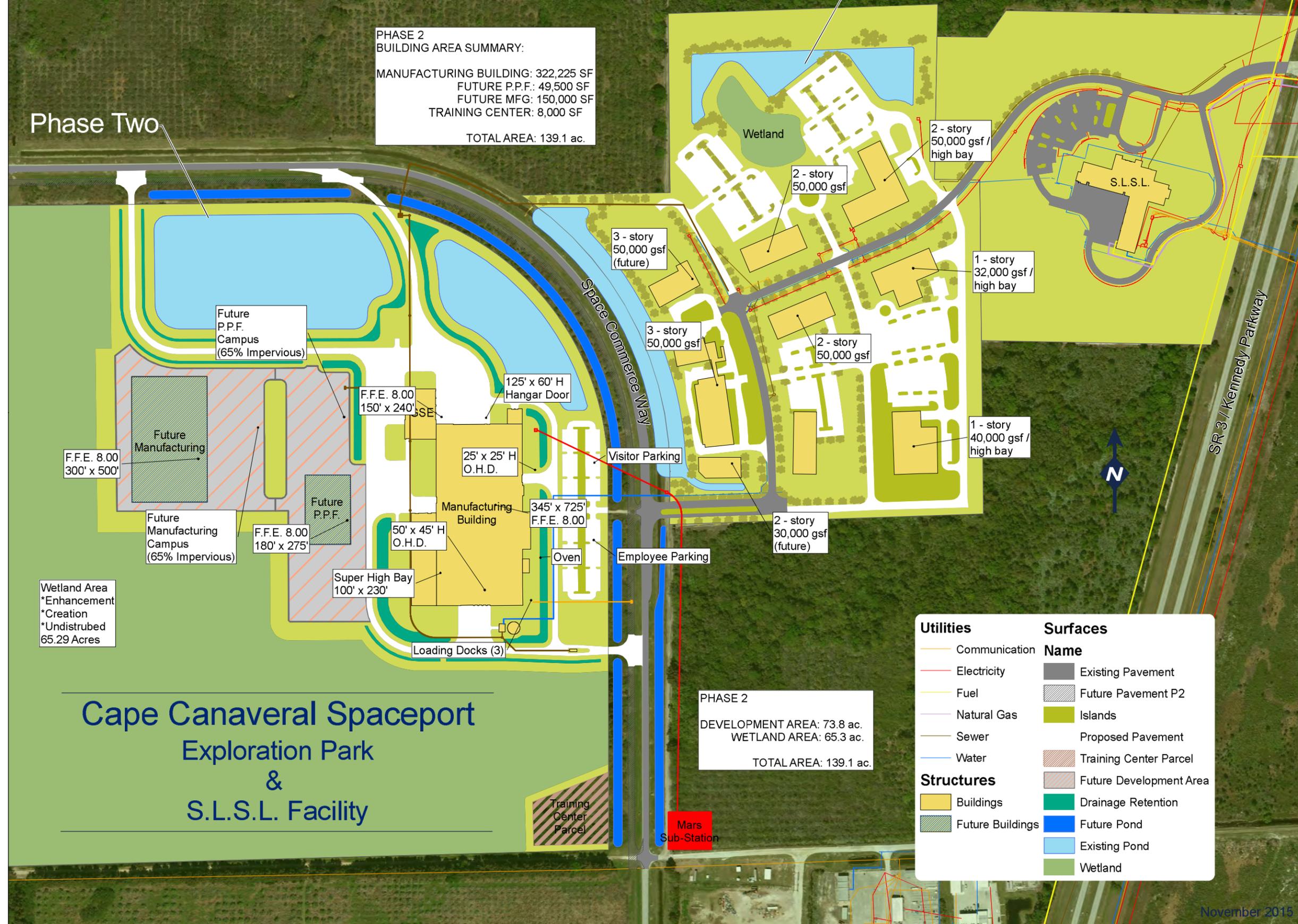








# Phase 1 & 2 Development Concept



**PHASE 2  
BUILDING AREA SUMMARY:**  
 MANUFACTURING BUILDING: 322,225 SF  
 FUTURE P.P.F.: 49,500 SF  
 FUTURE MFG: 150,000 SF  
 TRAINING CENTER: 8,000 SF  
 TOTAL AREA: 139.1 ac.

**PHASE 2  
DEVELOPMENT AREA: 73.8 ac.  
 WETLAND AREA: 65.3 ac.  
 TOTAL AREA: 139.1 ac.**

Wetland Area  
 \*Enhancement  
 \*Creation  
 \*Undistributed  
 65.29 Acres

## Cape Canaveral Spaceport Exploration Park & S.L.S.L. Facility

Utilities	Surfaces
— Communication	<b>Name</b>
— Electricity	Existing Pavement
— Fuel	Future Pavement P2
— Natural Gas	Islands
— Sewer	Proposed Pavement
— Water	Training Center Parcel
	Future Development Area
<b>Structures</b>	Drainage Retention
Buildings	Future Pond
Future Buildings	Existing Pond
	Wetland

**THESE CHAPTERS WILL BE PROVIDED IN THE FUTURE.**

**Chapter 4 – Launch Complexes**

**Chapter 5 – Processing and Other Facilities**

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# **Cape Canaveral Spaceport Development Manual**

## **VOLUME 3**

### **CAPE CANAVERAL AIR FORCE STATION**

**THIS VOLUME WILL BE PROVIDED IN THE FUTURE.**

**Chapter 1 – General Requirements**

**Chapter 2 – Space Launch Complexes**

**Chapter 3 – Processing and Other Facilities**

VERSION 1.1



# **Cape Canaveral Spaceport Development Manual**

## **VOLUME 4**

## **DESIGN CRITERIA**

VERSION 4.1

## THIS VOLUME WILL BE PROVIDED IN THE FUTURE.

### Chapter 1 – City of Titusville

Space Florida shall be the building official for all infrastructure projects. They will rely on recommendations and standards, as applicable to Space Florida's needs, from the City of Titusville.

Tenants are recommended to review the following design criteria:

<http://www.titusville.com/Files/Development%20Guide%20and%20Policies.pdf>

<http://www.titusville.com/Page.asp?NavID=2110>

### Chapter 2 – Technical Specifications

It is Space Florida's intent to have Tenants adhere to the Construction Specifications Institute (CSI) Master Format. As applicable and per CSI the following technical specifications shall be considered by Space Florida Tenants:

Division 00 — Procurement and Contracting Requirements

*General Requirements Subgroup*

Division 01 — General Requirements (**this document**)

*Facility Construction Subgroup*

Division 02 — Existing Conditions

Division 03 — Concrete

Division 04 — Masonry

Division 05 — Metals

Division 06 — Wood, Plastics, and Composites

Division 07 — Thermal and Moisture Protection

Division 08 — Openings

Division 09 — Finishes

Division 10 — Specialties

Division 11 — Equipment

Division 12 — Furnishings

Division 13 — Special Construction

Division 14 — Conveying Equipment

Division 15 — RESERVED FOR FUTURE EXPANSION

Division 16 — RESERVED FOR FUTURE EXPANSION

*Facility Services Subgroup:*

Division 20 — RESERVED FOR FUTURE EXPANSION

Division 21 — Fire Suppression

Division 22 — Plumbing

Division 23 — Heating Ventilating and Air Conditioning

Division 24 — RESERVED FOR FUTURE EXPANSION

Division 25 — Integrated Automation

Division 26 — Electrical

Division 27 — Communications

Division 28 — Electronic Safety and Security

Division 29 — RESERVED FOR FUTURE EXPANSION

*Site and Infrastructure Subgroup:*

Division 30 — RESERVED FOR FUTURE EXPANSION

Division 31 — Earthwork

Division 32 — Exterior Improvements

Division 33 — Utilities

Division 34 — Transportation

Division 35 — Waterways and Marine Construction

Division 36 — RESERVED FOR FUTURE EXPANSION

Division 37 — RESERVED FOR FUTURE EXPANSION

Division 38 — RESERVED FOR FUTURE EXPANSION

Division 39 — RESERVED FOR FUTURE EXPANSION

*Process Equipment Subgroup:*

Division 40 — Process Integration

Division 41 — Material Processing and Handling Equipment

Division 42 — Process Heating, Cooling, and Drying Equipment

Division 43 — Process Gas and Liquid Handling, Purification and Storage Equipment

Division 44 — Pollution Control Equipment

Division 45 — Industry-Specific Manufacturing Equipment

Division 46 — Water and Wastewater Equipment

Division 47 — RESERVED FOR FUTURE EXPANSION

Division 48 — Electrical Power Generation

Division 49 — RESERVED FOR FUTURE EXPANSION

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# **Cape Canaveral Spaceport Development Manual**

## **VOLUME 5**

### **SPACE FLORIDA PROJECTS**

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## SECTION 1 – GENERAL REQUIREMENTS

### 1.1 Project Process Overview

The following overview describes in general the process used for design and construction of Space Florida projects. It also provides information pertaining to design consultants for Space Florida Projects (SPFLP) and their services.

#### 1.1.1 Project Types

Facilities designed, developed, or constructed by Space Florida shall be referred to as SPFLP. All other construction projects shall be referred to as Tenant Projects (TP). All Space Florida Projects shall be in accordance with Space Florida requirements and shall be subject to the Florida Consultant's Competitive Negotiations Act (FCNA) (Florida Statute (FS) 287.055).

The contract/delivery method for Space Florida projects will be determined on a case by case basis which may include:

- ❖ Design-Bid-Build (DBB)
- ❖ DBB with Construction Management (DBB with CM)
- ❖ Design-Build (DB)
- ❖ Design-Build-Operate-Maintain (DBOM)
- ❖ Build-Operate-Transfer (BOT)
- ❖ Integrated Project Delivery (IPD)
- ❖ Public Private Partnership (P3)

#### 1.1.2 Commissioning Policy and Procedures

Reference is made to the Space Florida Commissioning Policy and Procedures (CPP), which requires commissioning of all Space Florida construction projects, including development, maintenance and renovation, having a construction budget greater than \$500,000 or Space Florida building construction projects, including new construction and modifications, having a construction budget greater than \$50,000. For Space Florida construction projects subject to the CPP, the Space Florida Building Official shall not issue a construction permit until the Commissioning Authority has approved the Commissioning Plan. The Space Florida Building Official shall not issue a certificate of occupancy/use until all pre-occupancy commissioning activities identified in the Commissioning Plan have been successfully completed.

#### 1.1.3 Selection of Consultant(s)

All SPFLP shall be in accordance with State of Florida procurement requirements. All projects will be subject to Consultant's Competitive Negotiations Act (CCNA). Proposals are solicited for professional services through advertisements. A "short list" of candidates is selected after a careful review of the Statements of Qualifications (SOQ) that are submitted. These "short listed" firms are usually asked to make a presentation to a selection committee, which will make the recommendation for final selection.

#### **1.1.4 Consultant Contract**

After completion of the selection process, the first-rated consultant(s) enter into contract negotiations with Space Florida representatives. If negotiations with the first-rated firm(s) are unsuccessful, negotiations may be terminated, and the Space Florida representatives may begin negotiations with the next highest rated firm(s). Once an agreement is successfully negotiated, the final contract will be approved by Space Florida and a notice to proceed with design will be issued.

#### **1.1.5 Project Initiation**

At the beginning of every design project, a pre-design conference will be scheduled to be attended by the Project Manager (PM), Contract Administrator (CA), other Space Florida representatives and pertinent members of the design team. During this meeting, discussion will include the program for the design, the project budget and the project schedule.

#### **1.1.6 Design Milestones**

Design review submittals are required at the Schematic, Design Development and Construction Document levels of completion. Specific information on the requirements and level of detail required for each of these submittals is described in the following sections.

#### **1.1.7 Project Review**

Normally, two weeks should be allowed for Space Florida staff review of each submittal. However, additional time may be required under certain circumstances, particularly if there are interfaces with other projects, or if outside agency approvals are necessary.

#### **1.1.8 Review Comments**

The consultant must respond to all review comments. Copies of these responses shall be turned in to the PM with the next submittal. Review comments noted directly on the submitted drawings do not require written responses, but the consultant may be asked to return the previously reviewed plans temporarily to verify responses to specific review comments.

#### **1.1.9 Consultant Participation During Bid Phase**

In general, the following process is usually followed in the selection of contractors. Construction bids are solicited through general advertisements. A pre-bid conference is conducted prior to the opening of the bids to discuss the scope of the work and answer questions from bidders. The design consultant is expected to conduct or participate in this conference to provide answers to pertinent questions and to assist in preparing any resulting contract addenda. At the advertised time, the bids that have been received will be opened and read aloud. The consultant may be asked to assist in analyzing the bids to determine the responsive low bidder. A notice to proceed with construction will be issued after Space Florida approval of the final construction contract.

### **1.1.10 Consultant Participation During Construction Process**

Prior to the start of construction, a pre-construction conference is held to review contract requirements, operational and site restrictions, notification procedures and required inspections. Depending upon contract scope requirements, the consultant may be responsible for assisting in the review of shop drawings, submittals, change orders and other documents and may be required to attend periodic or regular construction progress meetings. On some projects, partnering sessions may be conducted. Space Florida representatives, the consultant, the contractor and/or the CM and the major sub-contractors will be included in the partnering sessions.

### **1.1.11 Consultant Participation at Completion of Construction**

Depending upon contract requirements, the consultant generally participates in a final project “walk-through” at the completion of construction and is usually responsible for reviewing the contractor’s certified as-built drawings and specifications submittal and for preparing the final record drawings.

## **1.2 Software Requirements and Project Design Delivery**

Production and maintenance of project documentation shall comply with the Space Florida Development Standards. The final deliverables shall consist of the construction Contract Documents which shall be complete and shall set forth in detail all work required for the architectural, civil, structural, mechanical, plumbing, electrical, fire protection and fire detection, communication, security and utility service systems, including transportation interfaces, site work, and all necessary bidding information.

## **1.3 Design Calculations**

Most design projects require that various engineering calculations be performed and/or design criteria/material cut sheets be assembled that provide the basis for information on the construction plans and specifications. These values and calculations shall be assembled in a “Basis of Design Manual” for each project. These documentation requirements will vary for each specific design discipline.

## **1.4 Required Submittals**

During the planning and design stages of project development, certain submittals are required in bound form for review and approval. The submittals described below should be considered as the minimum. Intermediate reviews may be required, only if the scope of the project has been changed or if an earlier review found the plans and specifications unacceptable, either as a whole or in part. The required stage of completion of the plans and specifications shall be as hereinafter outlined.

### **1.4.1 Schematic Design Phase (early-review)**

For all Space Florida projects the schematic plans and specifications shall include:

- a) A boundary survey and/or site topographic survey shall be made on the ground

- of the proposed building or construction site. All points shall be tied to the existing Survey Coordinate System. Ground survey verification of existing utility alignments and flow lines may be required.
- b) All existing buildings, facilities, contours, roadways, utilities, or signs in the immediate area of the project site or relevant to the proposed work should be shown on a preliminary site plan.
  - c) Layouts of the proposed roadways, access drives, parking areas, site utilities and building locations should be shown.

#### **1.4.2 Schematic Plans and Specifications for Airfield Projects**

- a) All existing facilities, runways, taxiways, taxi lanes, aprons, ground support equipment areas, emergency roads, buildings and structures, contours, underground utilities, or signs in the immediate area of the project site or relevant to the proposed work should be shown.
- b) All existing Navigational Aids (NAVAIDS), duct banks, guidance signs, lighting fixtures, electrical ducts, vaults, handholds, and circuit locations should be shown and identified.
- c) Layouts of proposed paving, drainage, and electrical improvements.
- d) Limits and dimensions of all object free areas, safety areas, exclusion zones, NAVAIDS, critical areas, and FAR part 77 airspace surfaces that affect project site.
- e) Locations of proposed buildings, signs, NAVAIDS, Security fences, and other site structures.

#### **1.4.3 Schematic Plans and Specifications for Buildings**

- a) Building code summary on cover sheet showing governing codes and requirements for building and site.
- b) Site plan showing building footprint, vehicle access / parking and landscaping.
- c) Floor plans and roof plan.
- d) Building elevations.
- e) Schedule of materials to be used.
- f) Building Design Data - The building program and any special studies which will affect the project design.
- g) Tower Line-of-Sight Studies (if required).
- h) Service entrances, trash locations.
- i) Design live loads.

#### **1.4.4 Schematic Plans and Specifications for HVAC**

- a) Mechanical rooms.
- b) Location of all chases required for air conditioning systems.
- c) Location of all air handling and refrigeration equipment.
- d) Narrative description of the proposed systems including a schematic diagram of air flow through the various system components (the general scheme outlined in the narrative must be previously discussed with the Space Florida Contact and agreed to at the Pre-design Conference).

#### **1.4.5 Schematic Plans and Specifications for Plumbing**

- a) A brochure defining all plumbing fixtures.
- b) Narrative description of plumbing systems proposed, including source of exterior services.
- c) Location of janitorial closets.

#### **1.4.6 Schematic Plans and Specifications for Electrical**

- a) Electrical rooms.
- b) Narrative description of the proposed systems including a schematic diagram of the distribution system (the general scheme outlined in the narrative must be previously discussed with the Space Florida Contact and agreed to at the Pre-Design Conference).
- c) Preliminary lighting layout showing general types of illumination to be used such as fluorescent, high-intensity discharge lamp, or others.
- d) Tabulation of lighting levels to be used for the design of the lighting system.
- e) A sample lighting calculation for a typical room or area (exterior lighting projects).

#### **1.4.7 Schematic Plans and Specifications for Fire Protection**

- a) Fire vehicle access.
- b) Narrative description of fire protection systems proposed, including source of exterior fire protection services such as water mains.
- c) Schematic fire protection drawings with identification of all sprinkled areas and areas protected by other automatic suppression systems.
- d) Drawings shall be drawn to a scale of 1/8"=1'-0".

#### **1.4.8 Schematic Plans and Specifications for Communications**

- a) Communication rooms.
- b) Narrative description of the proposed systems including a schematic diagram of the communication system (the general scheme outlined in the narrative must be previously discussed with the Space Florida Contact and agreed to at the Pre-design Conference).

#### **1.4.9 Schematic Plans and Specifications for Security**

- a) Site security.
- b) Closed Circuit TV (CCTV)/monitor and equipment rooms.
- c) Narrative description of the proposed systems including a schematic diagram of the security system (the general scheme outlined in the narrative must be previously discussed with the Space Florida Contact and agreed to at the Pre-design Conference).

#### **1.4.10 Number of Submittals**

Submit the number of sets of schematic plans required by the designer's contract to the Space Florida Contact for review and approval before proceeding to Design Development stage.

#### **1.4.11 Design Development Phase (mid-review)**

For all Space Florida projects the Design Development plans and specifications shall include all information in previous submittals plus all annotated comments from previous submittals and shall indicate:

- a) Proposed landscaping, exterior signing, exterior lighting, fencing or other site elements.
- b) Preliminary horizontal and vertical alignments for all roadways, drainage systems, and applicable exterior utilities tied into the coordinate system.
- c) Preliminary paving and parking layouts with horizontal and vertical ties to site survey and representative cross-sections.
- d) Preliminary Cost Estimates and Construction Schedule.
- e) Perspective Rendering - May be required if the project has visual impact on the Cape Canaveral Spaceport (CCS) development as a whole.
- f) Design data and analysis.
- g) Soil tests data and analysis.
- h) Outline Specifications.

#### **1.4.12 Design Development Plans and Specifications for Airfield Projects**

- a) Horizontal and vertical layouts for all proposed airfield paving, emergency roads, and drainage features.
- b) Layouts for proposed airfield electrical circuits, NAVAIDS, and underground utilities.
- c) Typical sections for each type of paving, including surface drainage.
- d) Site access points and haul routes.
- e) Typical details for all paving, jointing, sealing, drainage, electrical, utilities, etc.

#### **1.4.13 Design Development Plans and Specifications for Buildings**

- a) Floor plans.
- b) Framing plans.
- c) Ceiling plans.
- d) Roof plans.
- e) Sections and elevations.
- f) Details of typical conditions.

#### **1.4.14 Design Development Plans and Specifications for HVAC**

- a) Mechanical rooms with all equipment and required connecting ductwork drawn to scale (this requirement is mandatory to establish the space needs for mechanical equipment).
- b) Routing of major piping systems when space is a consideration; and ductwork for remainder of project in one-line form to indicate the breakdown of proposed zones.
- c) Report on design criteria and system loads.
- d) Specifications shall be in the form of an outline covering all Heating Ventilation & Air Conditioning (HVAC) equipment and materials to be used in the project.

#### **1.4.15 Design Development Plans and Specifications for Plumbing**

- a) All plumbing fixtures including those for disabled persons drawn to scale.
- b) Roof drains and route of storm drains to storm sewer.
- c) Sump pump and sewage ejector locations.
- d) One typical riser diagram for each type of system.
- e) Report on design criteria and system loads.
- f) Specifications shall be in the form of an outline covering all plumbing equipment and materials to be used in the project.

#### **1.4.16 Design Development (DD) Plans and Specifications for Electrical**

- a) Electrical rooms with all equipment drawn to scale (this requirement is mandatory to establish the space needs for electrical equipment).
- b) Routing of feeder and service conduit systems when space is a consideration.
- c) A one-line diagram of distribution system shall indicate approximate equipment and service size.
- d) Lighting layout for projects, including exterior systems, with tabulated loads.
- e) A brochure showing cut sheets on all lighting fixtures (and poles) proposed for project. Submit five (5) sets of DD electrical systems plans for review and approval before proceeding to final working drawings (Contract Bid Documents).
- f) Specifications shall be in the form of an outline covering all electrical equipment and materials to be used in the project.

#### **1.4.17 Design Development Plans and Specifications for Fire Protection**

- a) Fire protection plans shall indicate all underground water mains and their sizes.
- b) Fire hydrant locations.
- c) Proposed water supply connections to sprinkler systems.
- d) Control valve locations.
- e) Fire alarm panel locations.
- f) Smoke control/removal systems layout.
- g) Underground valve meter pit.
- h) Standpipe locations.
- i) Specifications shall be in the form of an outline covering all fire protection items, equipment and materials including manufacturers and model numbers to be used in the project (this shall include smoke/heat detectors and pressure, flow, and tamper switches).

#### **1.4.18 Design Development Plans and Specifications for Communications**

- a) Communication rooms with all equipment drawn to scale (this requirement is mandatory to establish the space needs for equipment).
- b) One-line diagram of communication system shall indicate intercom, speakers, equipment, terminal boards and cabinets.
- c) Specifications shall be in the form of an outline covering all communication equipment and materials to be used in the project.

#### **1.4.19 Design Development Plans and Specifications for Security**

- a) CCTV/monitor and equipment rooms with all equipment drawn to scale (this

- requirement is to establish the space needs for equipment). Provide adequate working clearance for monitors and operator console.
- b) One-line diagram of security system shall indicate control panels, sensors, cameras, monitors, telephone interface, and any other system devices critical to operation.
  - c) Specifications shall be in the form of an outline covering all security equipment and materials to be used in the project.

#### **1.4.20 Number of Submittals**

Submit the number of sets of Design Development plans required by the designer's contract, to the Space Florida Contact for review and approval before proceeding to Construction Documents stage.

#### **1.4.21 Construction Document Phase (Final Review)**

For all Space Florida projects the Construction Document plans and specifications shall include all information in previous submittals plus all annotated comments from previous submittals and shall include:

- a) Complete drawings with all plan, profile, detail, section, schedule, calculation and miscellaneous sheets included.
- b) Specifications complete in final typed form.
- c) Final Construction schedule.
- d) Final cost estimate.
- e) Storm water pollution prevention plan.

#### **1.4.22 Construction Document Plans and Specifications for Airfield Projects**

- a) All proposed paving and facilities.
- b) Proposed grading and surface contours.
- c) Final profiles and flow lines for all drainage systems.
- d) All required sections and details.

#### **1.4.23 Architectural Construction Document Plans and Specifications**

- a) Building code summary on cover sheet showing governing codes and requirements for building and site.
- b) Index, Symbols, Abbreviations, Key Plan Notes.
- c) Demolition, Site Plan, Temp Work.
- d) Site plan showing building footprint, vehicle access / parking and landscaping.
- e) Building elevations.
- f) Building Program Design Data.
- g) Design live loads.
- h) Material Schedule, Door Schedule, Key Drawing.
- i) Sections, Exterior Elevations.
- j) Detailed Floor Plans.
- k) Interior Elevations.
- l) Reflected Ceiling Plans.
- m) Vertical Circulation, Stairs, Elevators, Escalators.

- n) Exterior Details.
- o) Interior Details.

#### **1.4.24 Structural Construction Document Plans and Specifications**

- a) Index, Symbols, Abbreviations, Key Plan, Notes, Loading Criteria.
- b) Demolition Site Work.
- c) Foundation Plans and Details, Foundation Design Criteria.
- d) Framing Plans and Details.
- e) Elevations.
- f) Details.
- g) Schedules.
- h) Special Design.

#### **1.4.25 Construction Document Plans and Specifications for HVAC**

- a) All air conditioning systems drawn to scale, including all ductwork in two-lines with all fittings to scale.
- b) Sections through mechanical rooms to adequately describe the construction requirements.
- c) Schedule of all major items of equipment drawn on the plan sheets to indicate performance characteristics.
- d) All piping systems complete with necessary sections to clarify routing.
- e) Applicable details, including those included in the Design Criteria modified to suit project.
- f) Flow diagrams for each piping system except drains.
- g) A copy of the HVAC load calculations shall be furnished for future reference. Calculations shall clearly indicate all zoning requirements, etc.
- h) The type and contents of the Test and Balance Reports to be furnished shall coincide with the work scope of the system being designed.

#### **1.4.26 Construction Document Plans and Specifications for Plumbing**

- a) All plumbing fixtures shown and identified by a number.
- b) Riser diagrams in isometric form for all plumbing risers in the building.
- c) Flow diagrams for all pressure systems including hot and cold water, gas, oxygen, air vacuum, etc.
- d) Details such as lavatory connection, pump connection, hot water generator, water softener, sewer manholes, backflow prevention, water header, etc.
- e) Schedule all major equipment on drawings.
- f) Plumbing fixtures may be scheduled, but must also be described in detail in the specifications.

#### **1.4.27 Construction Document Plans and Specifications for Electrical**

- a) All electrical systems drawn to scale including light fixtures, distribution equipment and other miscellaneous system components.
- b) Schedule of all light fixtures, switchboards and motor control centers.
- c) Schedule of all panel boards which include connected loads and demand loads.
- d) One-line diagram of electrical distribution system including all equipment,

feeder, service ratings and available symmetrical three-phase fault current at each device.

- e) Applicable standard details from these guidelines modified to suit project.
- f) One-line diagrams for each system.
- g) Include all information in previous submittals plus annotated comments from last submission review.

#### **1.4.28 Construction Document Plans and Specifications for Fire Protection**

- a) All fire risers shown and identified by a number.
- b) Flow diagrams for fire protection pressure systems.
- c) Details such as fire hose cabinets, fire hydrants, fire pumps, fire department connections, backflow prevention, water header, connections, cathodic protection and riser insulation, etc.
- d) Schedule all major equipment on drawings; fire sprinkler drawings will include all piping sizes and locations, drawn to scale of no less than 1/8 inch equals one foot.

#### **1.4.29 Construction Document Plans and Specifications for Communications**

- a) All communication system equipment, cabinets, boards drawn to scale, telephone outlets, intercom stations, repeater stations, etc.; one-line diagram of communication systems.
- b) Applicable standard details from these guidelines modified to suit project.

#### **1.4.30 Construction Document Plans and Specifications for Security**

- a) All security system control and monitoring equipment drawn to scale, sensor locations and types.
- b) Applicable standard details from these guidelines modified to suit project.
- c) Security devices.
- d) Security signage.
- e) Individual zone location and designation, with all alarm device locations, including the security alarm and data panel, annunciators, and any other devices necessary for the operation of the system.

#### **1.4.31 Number of Submittals**

Submit the number of sets of Contract Bid Documents required by the Designer's Contract, for review and approval before printing for distribution to bidders.

The documents at this point should be ready to be signed and sealed pending approval by the Space Florida Contact. Once these documents are approved, signed and sealed, they can be provided to contractors for bidding purposes.

### **1.5 Specification Format**

Specifications shall be in accordance with the latest Construction Specification Institute (CSI) division standards. For all airfield construction projects, contract documents shall be prepared in accordance with the latest edition of FAA Advisory Circular 150/5370-10 Standards for

Specifying Construction of Airports. Division 0, including Notice to Bidders, Instructions to Bidders, Proposal Forms, Bid Schedule Forms, Bond Forms, General and Special Provisions of the contract documents shall be prepared based on guidance and direction from the Space Florida Building Official.

## **1.6 Coordination of Design**

Every effort shall be made to coordinate the design between disciplines.

### **1.6.1 HVAC**

The final HVAC drawings at a minimum shall be checked for the following:

- a) Electrical lighting fixtures shall be checked for conflict with air diffusers, ceiling grilles, sprinkler heads, ceiling type speakers, and other ceiling mounted devices.
- b) Ductwork shall be checked for clearance between ceiling construction and underside of beams, recessed lighting fixtures and other interferences where space is limited.
- c) Large mechanical system piping shall be coordinated with building structure to assure clearances and accessibility for maintenance. Piping and electrical switchgear locations are to be coordinated.
- d) Coordinate requirements for louvers, equipment supports and other devices serving mechanical systems, but furnished under the general construction section of the project.
- e) Coordinate special types of or Board furnished equipment for correct rough-in requirements.
- f) Plans and specifications shall be checked for conflicts.
- g) Plans shall be coordinated for size and location of all chases.

### **1.6.2 Plumbing**

The final Plumbing drawings at a minimum shall be checked for the following:

- a) Piping shall be coordinated with building construction, beams, etc., to assure clearances and accessibility for maintenance. Piping and electrical switchgear locations are to be coordinated.
- b) Piping shall be checked for clearance between ceiling construction and underside of beams, recessed lighting fixtures and other interferences where space is limited.
- c) Piping, ductwork, electrical conduits, etc. shall be checked for interferences that would prevent proper installation of each system.
- d) Coordinate special types of equipment for correct rough-in requirements.
- e) Plans shall be coordinated for size and location of all chases.

### **1.6.3 Electrical**

The final Electrical drawings at a minimum shall be checked for the following:

- a) Electrical lighting fixtures shall be checked for conflict with air diffusers, ceiling

- grilles, sprinkler heads, ceiling type speakers, etc.
- b) Large electrical system conduit and pull boxes shall be coordinated with building construction, beams, etc., to assure clearances and accessibility. Piping and electrical switchgear locations are to be coordinated.
  - c) Plans and specifications shall be checked for conflicts.
  - d) Plans shall be coordinated for size and location of all chases.

#### **1.6.4 Fire Protection**

The final Fire Protection drawings at a minimum shall be checked for the following:

- a) Piping shall be coordinated with building construction, beams, etc., to assure clearances and accessibility for maintenance. Piping and electrical switchgear locations are to be coordinated.
- b) Routing of sprinkler piping shall have minimum turns to avoid building construction, etc.
- c) No areas are to be left without fire protection/detection, such as wedges in terminals and utility closets when one project is subdivided into several phases.

#### **1.6.5 Communications**

The final Communications Drawings, shall at a minimum, be checked for the following:

- a) Ceiling type speakers shall be checked for conflict with light fixtures, air diffusers, ceiling grilles, sprinkler heads, etc.
- b) Large communication system conduit and pull boxes shall be coordinated with building construction, beams, etc., to assure clearances and accessibility.

#### **1.6.6 Security**

The final Security drawings at a minimum shall be checked for the following:

- a) Security system components and types and locations shall be coordinated through the Space Florida Contact to properly interface with existing system.
- b) Coordinate design to allow for uninterrupted operation of existing security systems. Security must be maintained during construction.
- c) Large security system conduit and pull boxes shall be coordinated with building construction, beams, etc., to assure clearances and accessibility.

#### **1.6.7 Exterior Utilities**

The final Exterior Utility drawings at a minimum shall be checked for the following:

- a) Electrical lighting poles, manholes, handholds and underground conduit shall be coordinated with existing utility locations as well as installation of other new utilities.
- b) Plans and specifications shall be checked for conflicts.

## **1.7 Project Solicitation**

Proposals shall be solicited in accordance with Florida Bidding Statutes. Space Florida will coordinate and be responsible for the contracting arrangements. Public Advertisement for Bids by the Space Florida will be run for two (2) consecutive Sundays in various local newspapers and listed in local plan rooms.

## **1.8 Sale and Issuance of Contract Documents to Contractors**

Beginning on Tuesday after the first Sunday advertisement, bid packages will be available to bidders from a local reproduction company. The designer should confirm this procedure with the Space Florida Contact.

## **1.9 Pre-Bid Conference**

Space Florida will conduct a Pre-Bid conference for the bidders. The designer will brief the bidders on the overall scope of the project, answer questions from bidders and arrange for and conduct a site tour.

## **1.10 Addenda**

If questions come up during the Pre-Bid Conference or if there are clarifications required, the designer will provide answers to the Space Florida Contact. Space Florida is responsible for issuing all Addenda.

## **1.11 Bid Opening**

Space Florida will conduct the bid opening at the designated location in the bid documents. After the bid opening, Space Florida will perform a bid analysis. Upon completion of the bid analysis a recommendation to award the contract to the lowest responsible bidder will be issued for approval.

## **1.12 Pre-Construction**

Upon approval of the project, the applicant, the design agents, and the contractor shall meet with Space Florida appointed representatives for a pre-construction conference. At such time, principal aspects of coordination will be established: project schedule, coordination, and inspections, as well as any other items of a timely nature to the project.

## **1.13 Site Clean-up**

The designer should specify that the Contractor will be responsible for maintaining an orderly and accommodative environment of the construction area and shall, prior to conclusion of the

work, remove all rubble, debris, and surplus material occasioned from the immediate site. In addition, the Contractor shall similarly render and restore all off-site areas disturbed during the construction of the facility.

VERSION 1.1



Orms, Mary <[REDACTED]>

**Fwd: [EXTERNAL] SpaceX removal of debris North of Hwy 4**

1 message

**Winton, Bryan** <[REDACTED]> Fri, Nov 29, 2019 at 9:32 AM  
To: Sonny Perez <[REDACTED]> Scot Edler <[REDACTED]> Imer Dela Garza <[REDACTED]>  
Chris Perez <[REDACTED]> Ernesto Reyes <[REDACTED]> Laura <[REDACTED]> Iriz  
Elizondo Navarro <[REDACTED]> Romeo Garcia <[REDACTED]> Gerardo Longoria  
<[REDACTED]> Ellissa Martinez <[REDACTED]> "Whitehead, Dawn" <[REDACTED]>  
"Orms, Mary" <[REDACTED]>

For your records. FAA has called for a Dec 5, 2019 meeting to revisit the EA and Biological Opinion that we worked on since April 2011, which did not turn out to accurately reflect what they (Space-X) have been doing. Their action differs significantly from what they proposed. The road closures and interruptions to the refuge/public beach is considerably more than was anticipated, and the action is now testing, rather than launches, which is inherently more inclined to result in a failure and thus damage to the refuge.

Hopefully their explosions will deter the LNG's from developing our area though. The air quality, viewshed impacts, and degradation of the Boca Chica area would be accelerated if one or more of these industrial energy projects ultimately proceeds.

bryan

----- Forwarded message -----

From: **Randy Rees** <[REDACTED]>  
Date: Sat, Nov 23, 2019 at 5:09 PM  
Subject: [EXTERNAL] SpaceX removal of debris North of Hwy 4  
To: Extranet Contact - bryan\_winton <[REDACTED]> <[REDACTED]>  
Cc: Extranet Contact - Stacey.Zee <[REDACTED]> Matthew Thompson <[REDACTED]> Katy Groom <[REDACTED]> Paul Sutter <[REDACTED]>

Hello Bryan,

**\*For Official Use Only\***

Per my discussion with Scot, I wanted to send some pictures from the removal operation. The team was able to pull the debris with 2 high capacity tow trucks, over to the ATV Barrier. There the debris was rigged and flown with a crane onto our Construction Dump truck for transport to our build area for inspections.

The ATV Barrier is all there, but one bollard needs to be reset/replaced, and then the cable re-tensioned. I can work with you next week on a plan to accomplish the necessary repair.

We have had crews on foot out yesterday and today using metal detectors to ensure any small pieces aren't missed.

No vehicles or ATVs of any type crossed the ATV barrier location during the operation.

PICTURES

Initial location of debris with arrows showing direction of removal.



After the drag began.



Largest piece almost pulled in.



Final location of the drag removal operation.



Due to the weight of the debris and load bearing limitations of the sand for the crane, they had to drag into the ATV barrier several feet. This is the unset bollard. The cable tension was released at a nearby cable clamp.



If you have any questions or concerns, please call anytime.

Thank You,

**Randy Rees**

Environmental Health and Safety Manager

Chief of Emergency Operations

Space Exploration Technologies (SpaceX)



[South Texas Physical](#)



☎ W: (956) [REDACTED] | 📞 M: (515) [REDACTED]

📧: [REDACTED] 🌐: [www.spacex.com](http://www.spacex.com)



**Contains Sensitive Proprietary and Confidential Information - Not for Further Distribution Without the Express Written Consent of Space Exploration Technologies.**

--  
Bryan R. Winton, Wildlife Refuge Manager  
Lower Rio Grande Valley National Wildlife Refuge

[REDACTED]  
[REDACTED] office; (956) [REDACTED] cell  
[REDACTED]

**From:** [Perez, Chris](#)  
**To:** [Perez, Sonny](#)  
**Cc:** [Winton, Bryan](#); [Gardiner, Dawn](#); [Orms, Mary](#); [deLaGarza, Laura](#)  
**Subject:** Re: FAA 4(f) determination - Assertion of no constructive use for SpaceX project  
**Date:** Wednesday, January 6, 2021 8:53:08 AM  
**Attachments:** [RefugeresponcetoFAA4F\\_14DEC20.pdf](#)  
[FINAL\\_RefugeresponcetoFAA4F\\_10.7.2020.pdf](#)

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Good morning Sonny:

I will try and work on our part of responding to the FAA's scoping request but I actually think our letters of October 7 and December 14th can simply be re-tooled towards a NEPA perspective...I will try and focus on that. Do you have a Word version of the Dec 14th letter? Of course, I must state this emphatically here that our response MUST be very clear that an EA is inappropriate to comply with the spirit and intent of NEPA, because we can see no path towards a FONSI! We need to recommend preparation of a new EIS to address the vastly different changes in purpose and the magnitude of impacts of the SpaceX activities, not to mention the lack of compliance with Section 4(f). Although the experimental aspects of their program were "causally" mentioned in the 2014 EIS, that document addressed the impacts of launches, not continual experimentation and construction going on out there. We must also address whether we intend to become a cooperating agency or not? Has this been decided from on high? I do not recommend that we do since it infers endorsement of their program that is not in the best interests nor consistent with the purposes of the refuge. Meanwhile, I'm hoping ES is working on this scoping request from their regulatory purview as well. At some point, we should circle back with Dawn and Mary on it. What do you think? Let me know.

Thanks!

Request for comment link:

[https://www.faa.gov/space/stakeholder\\_engagement/spacex\\_starship](https://www.faa.gov/space/stakeholder_engagement/spacex_starship)

*The FAA is in the beginning stages of conducting an environmental review of SpaceX's Starship/Super Heavy proposal. As part of this environmental review, SpaceX is working with the FAA to prepare a draft Environmental Assessment (EA). The FAA is holding a public scoping period to assist the FAA in determining the scope of issues for analysis in the draft EA. The FAA is considering the preparation of a Programmatic EA for this effort. The FAA requests public comments on potential alternatives and impacts, and identification of any relevant information, studies, or analyses of any kind concerning impacts affecting the quality of the human environment. Please include any comments on the preparation of a Programmatic EA. [Please submit comments by January 21, 2021.](#)*

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**From:** Perez, Sonny <[REDACTED]>  
**Sent:** Tuesday, January 5, 2021 12:30 PM  
**To:** Perez, Chris <[REDACTED]>  
**Subject:** Re: FAA 4(f) determination - Assertion of no constructive use for SpaceX project

Here you go, Chris.

---

**From:** Perez, Chris <[REDACTED]>  
**Sent:** Tuesday, January 5, 2021 10:01 AM  
**To:** Perez, Sonny <[REDACTED]>  
**Subject:** Re: FAA 4(f) determination - Assertion of no constructive use for SpaceX project

OK. Can you send me a copy of the Dec 14th letter? I don't recall seeing it and I recall the letter Justin reviewed was the October 7th letter?

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**From:** Perez, Sonny <[REDACTED]>  
**Sent:** Tuesday, January 5, 2021 9:56 AM  
**To:** Perez, Chris <[REDACTED]>  
**Subject:** Re: FAA 4(f) determination - Assertion of no constructive use for SpaceX project

Chris,

I know this is going to get confusing, but I sent a refuge response letter dated December 14 as a follow up to FAA's December 1 response. The December 14 letter includes a request for further consideration and for their appeal process. The December 14 letter is the letter that I coordinated through Justin Tade.

The December 14 letter is the one for which I am waiting to see a response. My thought is that if they once again disregard our concerns, then there is no point in choosing to be a cooperating agency on the "new" project.

Does this make sense?

Sonny

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**From:** Perez, Chris <[REDACTED]>  
**Sent:** Tuesday, January 5, 2021 9:07 AM  
**To:** Perez, Sonny <[REDACTED]>  
**Subject:** Fw: FAA 4(f) determination - Assertion of no constructive use for SpaceX project

Here's the SpaceX response to our last letter...

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**From:** Perez, Sonny <[REDACTED]>  
**Sent:** Tuesday, December 8, 2020 9:25 AM  
**To:** Gardiner, Dawn <[REDACTED]> Orms, Mary <[REDACTED]> Winton, Bryan <[REDACTED]> Perez, Chris <[REDACTED]>  
**Subject:** Fw: FAA 4(f) determination - Assertion of no constructive use for SpaceX project

All,

I wanted to share this email that I sent to Justin and Kelly late last week to begin a new dialogue after FAA's assertion of no constructive use. You will see that I have reviewed the issue and established the metrics for impact different than what I have heard discussed. I am setting up a Teams call with Justin for this afternoon if any of you are available to contribute. Main objective is to determine what recourse there is to appeal FAA's assertion.

Thank you,

Sonny

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**From:** Perez, Sonny  
**Sent:** Thursday, December 3, 2020 11:22 AM  
**To:** Tade, Justin S <[REDACTED]>

Cc: McDowell, Kelly <[REDACTED]>

**Subject:** FAA 4(f) determination - Assertion of no constructive use for SpaceX project

Justin,

Kelly McDowell suggested that I reach out to you regarding this Section 4f determination. Dawn Gardiner indicated that you have previously provided input on SpaceX coordination.

I have provided a few documents and some notes/thoughts that I have after my preliminary review of SpaceX's assertion of no constructive use. I will also make myself available to brief you when your schedule allows.

I hope to continue to work with both FAA and SpaceX in identifying ways to minimize impacts on the Refuge, however, I am still concerned at this time regarding their assertion of no constructive use and would like to discuss with them further after consulting with you.

Below are some definitions from FAA's 1050.1F Desk Reference that I selected based on terms FAA utilized in their exertion of no constructive use. This is the link address to the desk reference.

[https://www.faa.gov/about/office\\_org/headquarters\\_offices/apl/enviro\\_policy\\_guidance/policy/faq\\_nepa\\_order/desk\\_ref/](https://www.faa.gov/about/office_org/headquarters_offices/apl/enviro_policy_guidance/policy/faq_nepa_order/desk_ref/)

I have formulated two preliminary questions (in bold) based on their definitions. I intend to further my review but wanted to get this before you sooner than later.

#### Use

Generally, "use" occurs with a U.S. DOT approved project or program (1) when land from a Section 4(f) site is permanently incorporated into a transportation facility; (2) when there is a temporary occupancy of land that is adverse in terms of the statute's preservationist purposes, or (3) when the proximity impact of the transportation project on the Section 4(f) site, without acquisition of land, are so great that the purposes for which the Section 4(f) site exists are substantially impaired.

#### Temporary Occupancy

During the construction of a highway project, a temporary occupancy of a Section 4(f) property may be necessary for activities such as regrading slopes or to provide staging or access areas. Depending upon conditions, such activities – even though temporary in nature – may be considered adverse in terms of the Section 4(f) statute's preservation purpose, and therefore would be considered a Section 4(f) use. Once the easement is no longer needed, the Section 4(f) property must be restored to the condition in which it was originally found. This may involve re-grading or re-vegetating the area.

#### Unique Problems

Unique problems are present when there are unusual factors, or when the costs or community disruption reach extraordinary magnitude.

**Do the road closures result in a proximity impact?** Each closure requires the temporary occupancy by SpaceX officials only (no public).

*e.g. FAA frames their decision upon total number of closure hours (2.1 percent of a total 8,760 annual hours) which they determine 2.1 percent to be minimal. However, the Refuge has an estimated 110,000 visitors per year with 63 percent being Boca Chica tract visitors which is 69,300 visitors. Under this visitation figure and incorporating FAA's rationale, 69,300 visitor recreational hours (assuming each person only spent one hour at Boca Chica) X 180 closure hours = 12,474,000 recreational hours lost. The increase to 300 closure hours would be 20,790,000 recreational hours lost. That is 1,423 years and 2,373 years of recreational hours lost each calendar year, respectively.*

This is reasonable to suggest that the proximity impact of this transportation project is so great that the purposes of the refuge are substantially impaired even with the estimation of only one hour of visitation.

**Does the project by way of the road closure result in temporary occupancy or a unique problem?**

*e.g. Each closure requires the temporary occupancy by SpaceX officials only (no public). They are the only people allowed access to 8 refuge tracts totaling 22,500 acres which is 56% of the refuge's total public use acres. More importantly, it is 100% of the refuge's acres readily accessible to the City of Brownsville's 183,000 people (2018 data).*

This is reasonable to suggest that road closures albeit temporary in nature are adverse in that 100% of recreational acreage is lost for use by the public.

Thank you for your time to review and assist me further my coordination efforts.

Sonny Perez  
Acting Complex Refuge Manager  
South Texas Refuges Complex

**From:** [Stinebaugh, Jim](#)  
**To:** [Gardiner, Dawn](#)  
**Subject:** Re: Note to Coordinate SpaceX rocket landing failure in Boca Chica, TX  
**Date:** Thursday, December 10, 2020 5:20:05 PM

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Ok. Thanks Dawn. I plan to get down there soon for a site visit.

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**From:** Gardiner, Dawn <[REDACTED]>  
**Sent:** Thursday, December 10, 2020 4:23:29 PM  
**To:** Stinebaugh, Jim <[REDACTED]>  
**Subject:** Note to Coordinate SpaceX rocket landing failure in Boca Chica, TX

SpaceX is located down in Cameron County on their private inholding property in the middle of STX Refuge and TPWD and NPS lands. SpaceX blasted off an experimental rocket yesterday and the test flight was to go up a couple of miles and then roll over and come back and land on a landing pad beside the launch area. The vessel did the flip and came back but had an explosive landing. Someone filmed birds in the area reacting to the explosion. Refuge LE walked the site and no bird carcasses today.

The Refuge LE will be coordinating with you I think.

Also I'm having Mary draft a dear SpaceX letter with a copy to you reminding them about section 9 and piping plovers and that they dont have coverage for the activities right now that could look like harm and harass.....Our RD has engaged SpaceX so I will run it up our chain and check it with solicitor. We need FAA/SpaceX to update their current BO asap.

Dawn

## **PIPING PLOVER POPULATION ABUNDANCE, TREND AND SURVIVAL AT BOCA CHICA 2018-2021**

Report by Coastal Bend Bays & Estuaries Program – D. Newstead and B. Hill

22 October 2021

### **INTRODUCTION**

Piping Plovers are known to be highly faithful to wintering sites. Habitat used in winter consists mainly of Gulf beaches, and tidal flats (“mud flats,” “algal flats,” “sand flats” are commonly used descriptors). The species’ preference for one habitat or another is largely a function of habitat availability. High water levels that inundate the tidal flats reduce potential habitat there, at which time they are often found on the Gulf beach. While daily lunar-driven tides are relatively minor in the western Gulf of Mexico, seasonal tides are a more influential driver of habitat availability. Overall, tides tend to be highest in spring and fall periods, and lowest in summer and winter periods. Weather can have a strong overriding influence on this (e.g. storm surge from tropical systems, strong cold fronts), so plover habitat usage is not strictly a function of season.

The Boca Chica area is unique in that the inundation/exposure regimes of the flats north and south of the highway often alternate (Fig. 1). The north side becomes inundated when tides or strong northerly winds drive water through the pass into South Bay off the Brownsville Ship Channel. When this happens, water can be driven off the flats on the south side of the highway, “dewatering” those flats via a mangrove-lined connection to the Rio Grande near the rivermouth. When winds reverse, the opposite occurs. Flats that have recently become exposed after inundation provide preferred habitat for Piping Plovers and many other shorebirds, as prey items are still close to the surface. Blue-green algal mats are also an important foraging strata, where they forage on dipteran larvae that grow in cracks and crevices of the desiccated surface algal layer (Zonick 2000). Plovers are often found in groups when on the flats, and sometimes in groups exceeding 100 individuals. This would constitute an exceptionally large concentration in most parts of the species’ winter range, but in the past it has not been uncommon at Boca Chica to encounter groups of 200 or more (Zonick 2000, Maddock 2010). When flats are not available, they are more frequently found on the Gulf beach, where they are often quite territorial to a given linear stretch of beach. This mosaic of multiple habitat options – at least one of which is virtually always available to them – in a relatively confined area makes this site of unique importance for the species.

Piping Plovers depart their breeding grounds and arrive on the Texas coast as early as mid-July, and generally stay until at least March or April before returning north to breed. Based on previous radiotelemetry projects (Drake et al 2001, unpubl. data), most Piping Plovers are very territorial while on the beach and have small home range sizes throughout the full nonbreeding season. However, several birds captured in late September to mid-October (our study) on Padre Island National Seashore wintered further south in the Lower Laguna Madre including one that wintered in the flats at Boca Chica/South Bay.

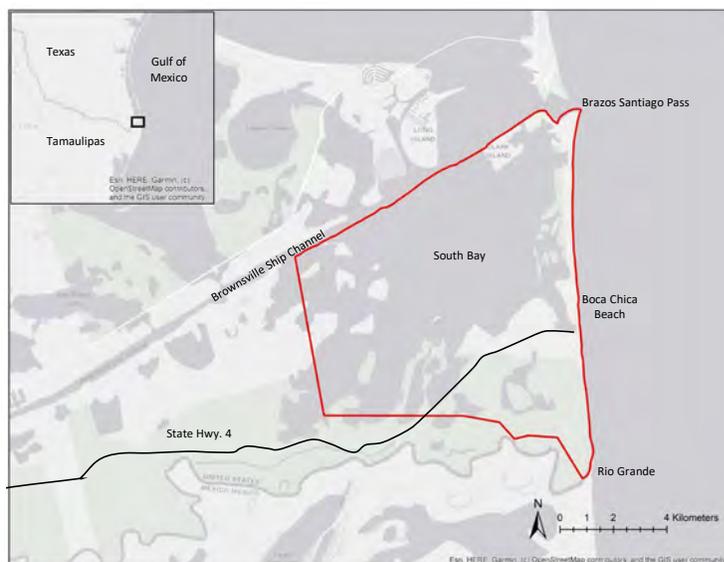


Figure 1. Study area including Piping Plover Critical Habitat Unit TX-1 outline in red.

Over the past 30 years there have been multiple banding programs on the species' breeding grounds. Most plovers that migrate to and winter in south Texas are from the Northern Great Plains (including Prairie Canada) and Great Lakes populations (Gratto-Trevor et al 2011). Birds captured for those projects were uniquely marked with a combination of color bands/flags and/or a leg flag with a unique alphanumeric code. Incorporating encounter histories of these birds – including the original marking and subsequent resightings – as well as proportions of marked and unmarked individuals into population models allows for estimation of important population parameters, including abundance and survival.

The objective of this analysis was to estimate population abundance, trend, and survival of Piping Plovers in the Boca Chica/South Bay area.

## METHODS

From late summer 2018 through fall 2021, we conducted surveys of Piping Plovers in the Boca Chica/South Bay area. The site is designated Critical Habitat Unit TX-1 for Piping Plover. Surveys were conducted along the Gulf beach, and in the tidal flats north and south of State Highway 4 (Fig.1).

Beach surveys were conducted as a linear transect covering the Gulf beach from the south jetty of Brazos Santiago Pass on the north end to the Rio Grande/Bravo rivermouth (international border) to the south. A skilled observer drove the beach slowly in order to detect Piping Plovers before they might be flushed. A GPS point was recorded for each individual observed. Each encountered plover was observed using binoculars and/or a spotting scope to determine if it was uniquely marked. If marked, the full band color/leg flag combination was recorded. If the observer was unable to read the full combination, it was recorded as “marked but unread.”

On the flats, a skilled observer familiar with habitats and behaviors of Piping Plovers used binoculars or a spotting scope to locate individuals or flocks from the highway or other access point, and then approached on foot. A GPS point was recorded in approximately the center of the flock. The whole flock was counted, and then the entire flock (or a sample in the case of a few very large flocks) were closely observed to determine how many marked and unmarked individuals were present. Once the ratio had

been recorded, the observer recorded the band combination of all uniquely marked plovers. In some cases, not all marks could be read.

In addition to records of individuals uniquely-marked on breeding grounds, we captured and marked four additional plovers at Boca Chica during the study (one in fall 2018, three in fall 2019) and these encounter histories were included in the analysis.

We used a Mark-Resight model in Program MARK to estimate abundance and other demographic parameters. Specifically, we used the Zero-Inflated Unidentified Marks Poisson Mark Resight Robust Design across Primaries model type (a type of zero-inflated Poisson log-normal estimator, hereafter, ZPNE). The ZPNE model allows for the estimation of the total population size by incorporating data describing temporal patterns in the number of both marked and unmarked individuals within a study system. This model assumes geographic closure within a single survey period (hereafter, primary period), but allows individuals to leave the population via mortality or permanent emigration (i.e., apparent survival;  $\varphi$ ) between primary periods.

Encounter histories were compiled for each individual for each of the primary periods of the time range. A primary period consisted of all surveys conducted within a nonbreeding period (“year”). The year began with surveys following the arrival of birds from breeding grounds (earliest survey date July 24) and continued until as late as February 20. Each survey is considered a secondary occasion, and were grouped into 4 primary periods, with a varying number of secondaries in each: 2018/19 (16); 2019/20 (12); fall 2020 (9); and fall 2021 (8). The numbers of “marked unidentified” and “unmarked” for each primary period were also incorporated into the data structure to allow for an unbiased estimate of the total overwinter population size. As the number of marked birds within the system on the initial time step was considered known, we constrained the presence parameters ( $w$  and  $g$ ) to 1.0 (McClintock 2021). Likewise, as zero banded birds were observed beyond the confines of the study system during the overwinter period, we fixed the temporary emigration parameters ( $\gamma'$ ,  $\gamma''$ ) to zero to allow for the apparent survival ( $\varphi$ ) and resight parameters to fully estimate. Models allowing the other parameters ( $\sigma^2$  – individual heterogeneity across primaries;  $\varphi$  – apparent survival between primary occasions) to vary among years or remain constant were tested to determine the most parsimonious fit.

To assess the potential for immigration or emigration of individuals to or from the study area between occasions, we searched other datasets of similar surveys in the Mustang and North Padre Island areas (near Corpus Christi) and South Padre Island (just north of Boca Chica) for records of the individuals encountered at Boca Chica. The Boca Chica area was considered the terminal wintering site.

## RESULTS

A total of 379 observations of 85 uniquely marked Piping Plovers were recorded in the surveys. With the exception of the four individuals captured at Boca Chica, all others were originally marked on breeding grounds in the Northern Great Plains.

The model allowing  $\alpha$ ,  $\sigma^2$ ,  $U$ , and  $\varphi$  to vary with time (with  $w$  and  $g$  fixed to 1.0 and  $\gamma'$  and  $\gamma''$  fixed to 0.0) was the only model that properly estimated all real and derived parameters.

The point estimates ( $\hat{N}$ ) indicate the wintering Piping Plover population at the site declined from approximately 308 to 142 over the course of three years, a 54% decline (Table 1, Fig. 1) since 2018 (= the 2018/19 nonbreeding season). The decline between the first and second years was over 38%, and the

trend continued downward in the following years. None of the confidence intervals in the last three years of the study overlap with the initial year. The fit of a linear trend through the point estimates over time was 0.82.

Apparent annual survival ( $\phi_a$ ) measured in this study ranged between 0.57-0.62 (Table 1). Since all marked birds in this study were breeding-age adults prior to entering the study area (or for those banded on site – were breeding-age adults at capture), these estimates reflect adult apparent annual survival.

Table 1: Population size ( $\hat{N}$ ), encounter probability ( $\hat{p}^*$ ) and annual survival estimates ( $\phi_a$ ) with lower/upper 95% confidence intervals for Piping Plovers at Boca Chica. “Year” is the calendar year of the beginning of the nonbreeding period (i.e. “2018” is fall and winter beginning 2018, ending 2019).

Year	$\hat{N}$	LCI (95%)	UCI (95%)	$\hat{p}^*$	LCI (95%)	UCI (95%)	$\phi_a$	LCI (95%)	UCI (95%)
<b>2018</b>	308.0	260.7	363.8	0.91	0.83	0.95	-	-	-
<b>2019</b>	189.0	146.1	244.4	0.83	0.72	0.91	0.57	0.43	0.69
<b>2020</b>	147.8	118.2	184.9	0.93	0.84	0.97	0.62	0.44	0.78
<b>2021</b>	141.8	86.6	232.3	0.81	0.49	0.95	0.61	0.30	0.85

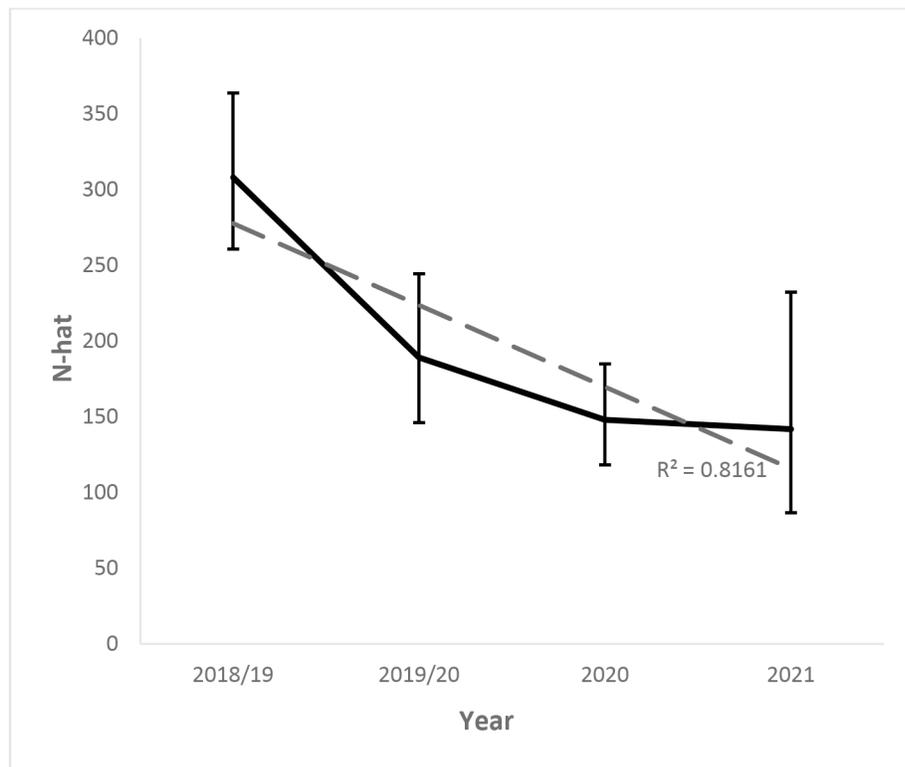


Fig. 1. Population estimate (including 95% confidence intervals) and trend of Piping Plovers at Boca Chica, 2018-2021.

## DISCUSSION

The overwhelming provenance of marked individuals from the Northern Great Plains (NGP) breeding population suggests plovers wintering at Boca Chica are almost entirely associated with that population (the two other breeding populations – the Great Lakes population of *C. m. circumcinctus* and the coastal Atlantic *C. m. melodus* population – had even more extensive banding programs during this timeframe but were not detected at the site during the study period), consistent with results of a range-wide connectivity analysis (Gratto-Trevor et al 2011). While birds from the far smaller Endangered Great Lakes population have been documented at the site in the past, none were detected at the site during this study.

The NGP breeding population is estimated at 4,700 individuals (Andres et al 2012). The population point estimate at Boca Chica in the first year of the study (~308) represents approximately 6.5% of that population while the point estimate in 2021 (~142 individuals) represents 3.0%. With no evidence that birds have changed wintering areas, this would suggest the NGP population experienced a ~3.5% decline over the period solely based on the trend at this specific site. Alternate hypotheses are that the entire NGP population has undergone a >50% decline in only four years, or that the population is in fact stable but greater numbers of unmarked individuals are now occupying other sites. The former hypothesis has no support, as such a catastrophic decline would not escape notice of many field-based projects on the species both in breeding and other wintering areas. While the latter hypothesis is plausible (it would require similar analysis of concurrent years at many other sites across the wintering range to test), wintering site fidelity is known to be very high with this species. If this hypothesis were correct, we would likely have detected at least some of these individuals at other wintering sites (none were).

Based on this model and data structure, the survival estimates represent the probability of an adult bird surviving from one nonbreeding season to the next. Since the nonbreeding season for Piping Plovers at the site is fairly long (~8 months), it cannot be definitively determined what part of the annual cycle is responsible for the highest component of the mortality (the inverse of survival). This model estimates “apparent” survival, assumed to be equal or lower than “true” survival which is the sum of apparent survival plus emigration from the site (a bird that survived but is no longer “available” to be seen at the site). However, none of the birds in this study were detected in other surveys in the most adjacent suitable habitat (Laguna Madre shoreline of South Padre Island), suggesting emigration is unlikely to have been a significant component of the inverse of apparent survival (i.e. the decline more likely reflects true mortality). The propensity for individuals to remain faithful to a wintering site despite high disturbance and/or degraded habitat quality can lead to lower site-level survival (Gibson et al 2018) as seen in this study.

Breeding-ground-based studies have yielded adult apparent annual survival estimates between 0.69-0.81 (Larson et al 2000; Roche et al 2010). Using a Barker model which approximates true survival (accounting for movement in/out of a site), Cohen and Gratto-Trevor (2011) estimated annual survival at 0.80 for adults for the studied Prairie Canada component of the NGP population. Similarly, a study incorporating both breeding and nonbreeding areas estimated apparent annual survival of the Texas population at 0.80 (Ellis et al, *in press*). Given the geographic scope of that study and very limited evidence of emigration, the authors suggest the apparent survival estimates closely approximate true survival.

Estimates from nonbreeding-ground-centric studies are more variable. Gibson et al (2018) estimated true survival at a range of sites across the southeast US Atlantic coast between 0.50-0.92, linking lower survival rates with sites experiencing higher levels of anthropogenic disturbance (a composite metric incorporating recreational beach usage and shoreline modification). The only sites in that study with lower survival estimates (0.50 and 0.55) than in our study were geographically proximate, not truly independent, and one was undergoing a significant natural loss of suitable habitat during the studied interval while the other had high levels of anthropogenic disturbance. Estimates of site fidelity in the Gibson et al (2017) study ranged from 0.73-0.91. While we did not explicitly measure site fidelity in this study, the fact that none of the uniquely-marked individuals detected in the study were ever detected in nearby sites in the winter suggests fidelity was very high. This would mean our apparent survival estimates are likely a close approximation to true survival.

A simulation study on the US NGP population of Piping Plovers (i.e., this study population, in part) demonstrated that variations in adult survival have the strongest potential to affect population trends compared to other demographic rates (McGowan and Ryan 2009). This means relatively minor decreases in adult survival across the population would likely accelerate population declines. A drastic decrease in survival at a key site such as this could have similar consequences.

The results of this study indicate a rapid and substantial loss of the population of Piping Plovers at the site (and to the NGP population), and that it may be functioning as a population sink.

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# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
South Texas Refuge Complex  
Lower Rio Grande Valley National Wildlife Refuge



[REDACTED]  
[REDACTED]  
January 15, 2021

Daniel P. Murray  
Manager, Safety Division  
Federal Aviation Administration (FAA)  
800 Independence Ave., SW  
Washington, D.C. 20591

Dear Mr. Murray:

It is our understanding that SpaceX is working with the FAA to prepare a draft Environmental Assessment (EA) for SpaceX's Starship/Super Heavy proposal. The FAA is holding a public scoping period to assist in determining the scope of issues for analysis in the draft EA. At this time, the FAA has decided not to prepare an Environmental Impact Statement (EIS) for the Starship/Super Heavy proposal. The following are U.S. Fish and Wildlife Service (FWS) comments for consideration in your analysis:

The spirit and intent of National Environmental Policy Act (NEPA) is to emphasize cooperative consultation among agencies. Section 1501.2(3) requires agencies to "...study, develop, and describe appropriate alternatives to recommend courses of action in any proposal which involves unresolved conflicts..." As stated in our previous correspondence in letters dated October 7, 2020, and December 14, 2020; the FWS does not concur with the FAA determination that the action will not result in a "constructive use" of the Boca Chica Tract of the Lower Rio Grande National Wildlife Refuge (Refuge).

The FAA is subject to Section 4(f) regulations which "require rigorous exploration and objective evaluation of alternative actions that would avoid all use of Section 4(f) properties...that would avoid some or all adverse effects" (OEPC Section 4(f) Handbook, per 23 CFR § 774). Furthermore, 23 U.S.C. § 138 precludes the Secretary of Transportation from approving a program or project unless "such program includes all possible planning to minimize harm" to wildlife refuges. It is the FWS's opinion that FAA has failed to comply with its own regulations in this regard. Based on the Section 4(f) definitions, a "constructive use" occurs when there is "a temporary occupancy of land that is adverse in terms of the statute's preservation purpose" or when "a project's proximity impacts are so severe that the protected activities, features, or attributes of a property are substantially impaired." The level, nature, and extent to which an area is constructively used is subject to the expertise and determination of the agency responsible for management and administration of the 4(f) lands impacted by the constructive use, in this case, the FWS. Frequent closures caused by SpaceX activities are already substantially impairing both the Refuge's ability to adequately manage the Refuge and the public's enjoyment of the Boca Chica Beach area for wildlife-dependent recreation. There

are both "*adverse*" and "*severe*" impacts to Refuge public use, management, wildlife, and habitat from the SpaceX activities. The protected public activities of the Refuge that are being substantially impaired include fishing, wildlife observation, photography, environmental education, and interpretation. Annually an estimated 110,000 visitors access the Refuge for these uses. The majority are beachgoers or fishers to the Boca Chica tract these activities occur throughout the year.

Since 2014, SpaceX has undertaken activities not covered in FAA's 2014 EIS which addressed only 12 launches per year, not continual experimentation related to the Starship/Super Heavy proposal as is currently being carried out. The activities not covered include a higher frequency of road closures extending well beyond 180 hours, large explosions from reported anomalies, the appearance of significantly large staffing, 24/7 operations, traffic, and construction activities not analyzed in the 2014 EIS. In addition, debris falling onto the Refuge can damage the sensitive wind tidal flats and the vehicles or machinery used to retrieve the debris can create ruts and other damage that interrupts sheet flow across these flats.

Due to operations by SpaceX, the FWS's ability to maintain the biological integrity, diversity and environmental health of Refuge resources, as well our ability in ensure the viability of the six wildlife-dependent recreational uses, has been significantly diminished at the Boca Chica tract. This occurs by preventing or constraining public access year-round, hampering biological and monitoring studies including sea turtle patrols, sea turtle cold-stunning responses, hampering refuge management and law enforcement patrol, increased observations of road mortality of wildlife at all hours of daytime and nighttime, damaging sensitive habitats such as the wind tidal flats and to the salt prairie from explosions and fires, as well as adversely impacting nesting habitat for sensitive species. According to the Coastal Bend Bays and Estuaries Program, Wilson's and Snowy Plovers, have essentially stopped nesting in that area in the last two years near the SpaceX site.

These issues have prompted concerns including the need to reinstate consultation with the FWS on the Endangered Species Act (ESA) Biological Opinion. Currently, the FAA is requesting to increase the number of Refuge closure hours from 180 to 300 per year. However, for the past six years, closures of the road to Boca Chica Beach have become increasingly frequent and may occur for one or more days at a time due to delays or problems occurring during testing. The Service believes the FAA/SpaceX closure reporting computation needs to be revised. It does not appear to take into account the extended closures occurring for anomalies or delays that are deterrents for public access to the Boca Chica tract and the beaches for the duration of all published closure timeframes. In 2019, the FWS conservatively quantified closure hours (over 1,000) and noted a significant disparity in accounting between SpaceX's reported total of 158 hours and number of hours tracked by FWS staff. When closures occur, all of these wildlife-dependent recreational uses are substantially impaired because they are not available to the public. Features and attributes of the Refuge that will be substantially impaired include the sensitive tidal flats, salt prairies, wildlife, dunes, migratory bird migrations, and sensitive bird nesting and wintering sites. These features and attributes will be substantially impaired by increased closures because explosions, debris, traffic, nighttime activities, tall building construction, and invasive plant species will continue to threaten the health and diversity of the Refuge's habitats and wildlife.

The FAA has previously stated the road closures comprise only 2.1 percent of the total annual closure hours they calculated, which would appear to be minimal. However, the FAA's decision omitted the recreational hours lost to Refuge visitors. The Refuge is visited by approximately 110,000 visitors annually with 50% or more visiting the Boca Chica tract. Therefore, approximately 55,000 people visit the Boca Chica tract each year. Assuming each visitor to the Boca Chica tract spends only one hour there, closing access to the tract for 180 hours per year (the current closure rate) will result in a loss of 9,900,000 recreational hours per year. Increasing the number of closure hours to 300 per year will result in 16,500,000 recreational hours lost per year. This loss of public recreational hours is significant. Therefore, we reiterate that the impacts of the increased road closures rise to the level of a substantial impairment and thus constitute a "*constructive use*," as defined under Section 4(f). We recommend FAA's NEPA analysis include adequate consideration of these unresolved issues.

NEPA's overall purpose is to foster excellent action and the process is intended to help public officials make decisions that are based on understanding of environmental consequences and to protect the quality of the human environment, that includes the effect on ecological systems. We believe that inadequate, misinterpreted, or lack of consideration regarding the proposed SpaceX activities may compromise the ability of decision makers to conduct a meaningful analysis consistent with the spirit and intent of NEPA. Adding to this is that SpaceX has already commenced the Starship/Super Heavy proposal which would further limit the availability of alternatives, also in contradiction with the spirit and intent of NEPA. Section 1501.5(a) of NEPA regulations state that an agency shall prepare an EA for an action that is "...*not likely to have significant effects or when the significance of the effects is unknown...*" Based on the level of unmitigated impacts to important fish and wildlife resources and the impacts to visitor use of Boca Chica Beach, we do not believe an EA is the appropriate level of NEPA analysis required for the proposed SpaceX Starship/Super Heavy activities now occurring onsite.

In conclusion the FWS believes, based on the significant level of adverse effects of Starship/Super Heavy activities already occurring there is no reasonable expectation adequate NEPA analysis would lead to a "finding of no significant impact." Therefore, the FWS recommends development of an EIS as the appropriate level of NEPA analysis required to address concerns. The FWS recommends adequate consideration and objective analysis of our concerns as per NEPA, and to bring the project into ESA compliance, as well as to conduct an alternative action analysis, as per Section 4(f) of the Transportation Act of 1966. To date, no adequate planning or environmental protection measures have been implemented by FAA or SpaceX as the Starship/Super Heavy proposal has already begun and damage to Refuge habitats and wildlife, including federally-listed species continues.

We appreciate your consideration of the above issues as you undertake your NEPA analysis and look forward to discussing these or other concerns as pertains to the SpaceX Boca Chica site. You may contact me via email at [REDACTED] or my direct line at [REDACTED]

Sincerely,

Manuel "Sonny" Perez III  
Complex Refuge Manager

cc:

Stacey Zee, Federal Aviation Administration, Washington, DC.

Bryan R. Winton, Refuge Manager, Lower Rio Grande Valley NWR

Kelly McDowell, Refuge Supervisor, OK/TX Refuges

Dawn Gardiner, Assistant Field Supervisor, Texas Coastal ES Field Office

EPA

DRAFT

# Laguna Atascosa National Wildlife Refuge

## *Comprehensive Conservation Plan*



*September 2010*



### **U. S. Fish and Wildlife Service Mission Statement**

*The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people.*



### **National Wildlife Refuge System Mission Statement**

*The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and, where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.*

—National Wildlife Refuge System Improvement Act of 1997

*Comprehensive conservation plans provide long-term guidance for management decisions and set forth goals, objectives and strategies needed to accomplish refuge purposes and identify the Service's best estimate of future needs. These plans detail program planning levels that are sometimes substantially above current budget allocations and, as such, are primarily for Service strategic planning and program prioritization purposes. The plans do not constitute a commitment for staffing increases, operational and maintenance increases, or funding for future land acquisition.*



# United States Department of the Interior



FISH AND WILDLIFE SERVICE



Dear Reader:

The U.S. Fish and Wildlife Service is pleased to provide you with a copy of the Final Comprehensive Conservation Plan (Plan) and Finding of No Significant Impact (FONSI) for Laguna Atascosa National Wildlife Refuge (NWR) in the State of Texas. This plan identifies the role that the Refuge will play in support of the mission of the U.S. Fish and Wildlife Service and National Wildlife Refuge System. It provides long-term guidance to the Refuge's management programs and activities.

The plan was developed by an interdisciplinary planning team which evaluated three management alternatives and chose Alternative B as the proposed action. The Service believes that this management action is a positive step in conserving and managing the Refuge's fish and wildlife resources.

The Service would like to thank you for participating in the planning process. Comments you submitted helped us prepare a better plan for the future of the Refuge.

Additional copies of this plan may be obtained by contacting: Sonny Perez, Refuge Manager, Laguna Atascosa NWR, 22817 Ocelot Road, Los Fresnos, TX 78566, phone (956) 748-3607, e-mail [sonny\\_perez@fws.gov](mailto:sonny_perez@fws.gov). The plan is also available on the Service's Internet website as follows: <http://www.fws.gov/southwest/refuges/Plan/completeplans.html>

Thank you for your continued support and interest in our fish and wildlife conservation efforts.

Sincerely,



Dr. Benjamin N. Tuggle, Regional Director  
U.S. Fish and Wildlife, Region 2

9/9/10  
Date

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# **Laguna Atascosa National Wildlife Refuge Comprehensive Conservation Plan**

**September 2010**

Prepared by  
U. S. Fish and Wildlife Service  
National Wildlife Refuge System, Southwest Region  
Division of Planning

[Redacted]

[Redacted]

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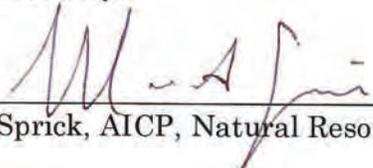
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**COMPREHENSIVE CONSERVATION PLAN APPROVAL**  
**For**  
**Laguna Atascosa National Wildlife Refuge, Los Fresnos, Texas**

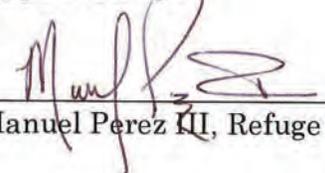
The attached Comprehensive Conservation Plan for the Laguna Atascosa National Wildlife Refuge has been prepared by Regional Office and Refuge Staff. The contents and format are found to be in compliance with Service policy on the preparation of Comprehensive Conservation Plans, and is hereby submitted for approval.

**Submitted by:**

  
\_\_\_\_\_  
Mark Sprick, AICP, Natural Resource Planner

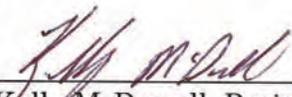
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**Approved by:**

  
\_\_\_\_\_  
Manuel Perez III, Refuge Manager

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\_\_\_\_\_  
Date

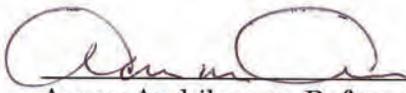
**Concurrence by:**

  
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Kelly McDowell, Project Leader  
South Texas Refuges Complex

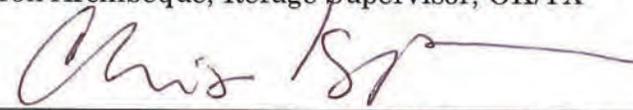
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Rob Campellone, Chief, Division of Planning

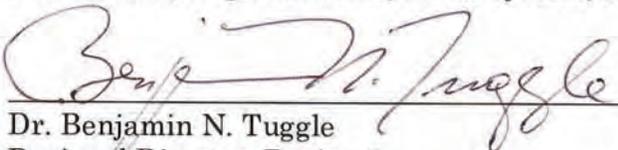
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Aaron Archibeque, Refuge Supervisor, OK/TX

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Chris Pease, Regional Chief, NWR System, Region 2

9-9-10  
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Date

  
\_\_\_\_\_  
Dr. Benjamin N. Tuggle  
Regional Director, Region 2  
U.S. Fish and Wildlife Service

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Date

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## *Refuge Vision*

Laguna Atascosa National Wildlife Refuge (Refuge) comprises a unique and rare assemblage of south Texas habitats that represent some of the last undeveloped coastal areas in the United States. The Refuge is a unique blend of temperate, subtropical, coastal and desert habitats. Several biotic communities exist on the Refuge, including brushlands, coastal prairies, freshwater and brackish pothole wetlands, estuarine wetlands, lomas (clay ridges), wind tidal flats, and barrier island beaches and dunes. Mexican plants and wildlife reach their northernmost limits here, while migratory birds stop to rest and feed during the spring and fall. This combination makes Laguna Atascosa world famous for its mix of birds and other wildlife found nowhere else. Historically, the Refuge was primarily managed for migratory waterfowl, principally redhead ducks. Today, there is an expanded emphasis that now includes shorebird management and endangered species conservation. The Refuge is a premiere bird-watching destination with 415 recorded bird species, more than any other national wildlife refuge. A total of nine federally-listed endangered or threatened species occur within the Refuge, including four species of sea turtles. The largest United States population of endangered ocelot cats is located on the Refuge, making it the center for ocelot conservation and recovery.

The importance of the Refuge's wildlands will increase for wildlife and people in the future as the Lower Rio Grande Valley area becomes more urbanized. Additional lands will be protected and restored to connect and enhance the management of existing Refuge lands. Wildlife and habitat conservation will improve through conducting and supporting research dedicated to solving important Refuge resource issues. Management facilities will be constructed or improved to meet future Refuge management needs and objectives. The refuge will serve as a resilient source of evolving habitats and ecosystem processes even as structure and composition are altered due to climate changes.



*Photo: Carlos Fiol*

Existing programs will be improved and new opportunities developed to connect people with nature through quality wildlife-dependent activities such as hunting, fishing, wildlife observation and photography, and environmental education and interpretation. The Refuge will improve outreach to diverse audiences, with an emphasis on local residents, to foster increased public appreciation and ownership of the Refuge and its role in the local community. Visitor service facilities and infrastructure will be improved or constructed to accommodate existing and new audiences. To meet future challenges, the Refuge will continue to build and maintain partnerships with governments, organizations, educational institutions, and public and private landowners.

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# 1. Introduction and Background

This Comprehensive Conservation Plan (CCP) for the 97,007-acre Laguna Atascosa National Wildlife Refuge (NWR, Refuge) will guide management decisions during the next 15 years and set forth goals, objectives, and strategies for achieving the Refuge's vision. The Refuge will help to conserve the natural biological diversity of the broader Texas Gulf Coast Ecosystem with emphasis on protection and enhancement of waterfowl, migratory birds, federally-listed wildlife, and their habitats. The Refuge will maintain and establish good working partnerships with stakeholders and provide the greatest opportunities for the public to learn about and enjoy the Refuge experience.

Laguna Atascosa NWR lies along the Gulf of Mexico at the southern tip of Texas, along the northeastern edge of Cameron County and the southeastern edge of Willacy County. The 97,007-acre Refuge consists of four main units:

- 1) Laguna Atascosa Unit, 45,187 acres
- 2) Bahia Grande Unit, 21,762 acres
- 3) South Padre Island Unit, 24,808 acres
- 4) Coastal Corridor Unit, 5,250 acres

Within these main units, 8,546 acres are part of the Lower Rio Grande Valley NWR, but they are administratively managed by the Refuge. The Laguna Atascosa Unit and main headquarters are located approximately 16 miles east of the town of Rio Hondo, Texas, on Farm-to-Market Road (FM) 106. The Bahia Grande Unit is sandwiched between State Highway (SH) 100 and SH 48, about one mile west of Port Isabel, Texas. The South Padre Island Unit, which consists of 21 separate tracts, is located on the north end of South Padre Island with the first Refuge tract location about 9.5 miles north of the Town of South Padre Island, Texas. The Coastal Corridor Unit currently includes five separate tracts located between the Laguna Atascosa Unit and the Bahia Grande Unit (Figure 1-1). Laguna Atascosa NWR is part of the South Texas Refuge Complex (STRC), which includes the Lower Rio Grande Valley NWR and Santa Ana NWR.

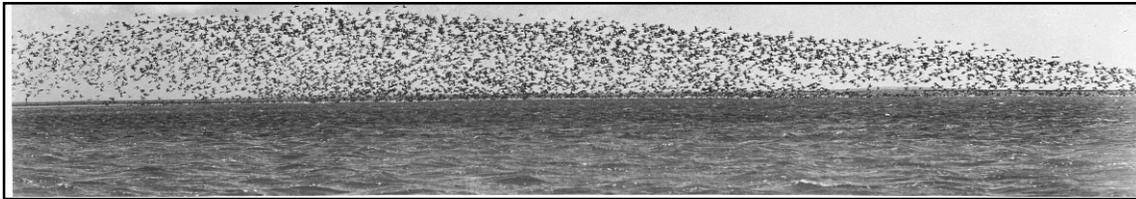
## 1.1 Refuge History and Purposes

### *Laguna Atascosa Unit*

During the late 1800s and early 1900s, the area of Laguna Atascosa had long been known to naturalists as a significant waterfowl wintering and resting area. During the 1930s, U.S. Fish and Wildlife Service (Service) biologists, who conducted several reconnaissance surveys, recommended that this area be given consideration as a refuge. In 1940–1941, the Service began the process of evaluating various land tracts for acquisition in the Laguna Atascosa Lake area. However, in late 1941, the War Department began acquiring some of these tracts (10,521 acres) on the mainland and some tracts on South Padre Island (24,363 acres) for use as an aerial gunnery and bombing range during World War II. Although some of these lands were used by the military during the 1940s, the Service continued to focus on the area's importance to wintering waterfowl and to coordinate with the War Department: *"We have been interested for some time in securing a considerable acreage in this section, including a portion of the lands now being acquired by your department, in order to give protection to the large rafts of wintering redhead ducks that frequent this section of Laguna Madre... We would*

*also like to suggest that when the present emergency comes to an end, the lands acquired by the War Department be placed under the administration of the Fish and Wildlife Service...” - Letter from Albert M. Day, Assistant to the Director of the U.S. Fish and Wildlife Service, to Colonel Robinson E. Duff of the War Department, September 6, 1941.*

During the war years, the Service continued plans to establish a refuge in areas surrounding Laguna Atascosa because lands were also being cleared for development, resulting in a reduction of woodland habitat that supported large numbers of nesting white-winged doves at that time. “...There was a good deal of activity in the clearing of this brush-grazing type for the purpose of putting the lands into citrus groves...” - Rudolph Dieffenbach, Chief, Division of Lands, Memorandum of May 2, 1944. The “...Atascosa refuge as proposed will include a variety of habitat extending from Redhead rafting and feeding grounds on Laguna Madre to inland lakes, ponds, resacas (creeks), and marshes utilized by many ducks, geese, herons, shorebirds, and other waterbirds. Coastal flats frequented by cranes, herons, and shorebirds, open woodland inhabited by deer, other mammals, and many species of migrant and resident land birds, and dense woodland populated by Chachalacas, White-winged Doves, White-fronted doves, and many other native species of birds and mammals.” -G.B. Saunders, Biologist, Migratory Bird Investigations, Division of Wildlife Research, Memorandum of February 11, 1944.



The great numbers of migratory waterfowl present on the Refuge, circa 1940s. Photo: USFWS

Following years of reconnaissance surveys and coordination with various interests, Laguna Atascosa NWR was formally established by the Migratory Bird Commission on October 31, 1945, as a unit of the National Wildlife Refuge System, and the first 11,275-acre tract forming the Refuge was acquired on March 29, 1946. On January 12, 1949, 8,486 acres of the Refuge were acquired by transfer from the War Assets Administration to the Secretary of Interior under Public Law 80-537. These and subsequent Refuge tracts were acquired under the authorities of the Migratory Bird Conservation Act of 1929, the Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948, and the Fish and Wildlife Act of 1956 (See Appendix E).

Long-time area residents commented on the value of the Refuge for the protection of wildlife as the area become increasingly developed: “...I have learned today...that the Fish and Wildlife Survey will take over the Laguna Gunnery Range in the eastern part of our county and want you to know that this is very gratifying news to me...I have lived down here since 1924 and for that time have seen the game slowly being wiped out and pushed back by the clearance of the native brush from land where the owner has desired to make more money farming or has sold out his land and the new owner cleared it for farming and of course we can not blame them as that is their business and their livelihood of making a living but not so long ago, and it really being after the close of deer season, I was up that way on the pavement running north and being directly west of the Gunnery Range and found that all of the native brush for a great distance west had been cleared out and the deer and javaline and quail dispersed and right in that particular vicinity there was no place for them to go except over in

*the northern part of the Gunnery Range which is still in native brush. Some of it was cleared out when the Gunnery Range was there but it is growing up again in second growth brush and with a few wet seasons it will all again be covered in brush and while I have absolutely no personal interest whatsoever, I would certainly like to see that whole Gunnery school taken over as a refuge for our wild fowl and also the remaining wild game.”* - Excerpted from a 1948 letter by W.B. Moothart to Luther C. Goldman, one of the first refuge managers for Laguna Atascosa NWR.

### ***Bahia Grande Unit***

Beginning in the late 1800s, the Bahia Grande area was well-known to early ornithologists (e.g., J.C. Merrill and G.B. Sennett) and naturalists for its abundant birdlife. On August 2, 1939, J. Clark Salyer, II, Chief of the Division of Wildlife Refuges, sent a 16-page report to Dr. Ira Gabrielson (first Director of the U.S. Fish and Wildlife Service), that summarized the findings of a three-year study of the Brownsville area. The purpose of the study was to locate suitable Refuge areas to protect “...*the great numbers of migratory waterfowl which annually winter in this region as well as the thousands of shore birds and a number of resident species of birds found only in the general Brownsville area of the United States.*” The report recommended three areas in South Texas to be acquired as national wildlife refuges:

- Santa Ana tract, 3,400 acres south of Alamo, Texas, in southern Hidalgo County
- Resaca de los Fresnos tract, 80 acres south of Harlingen, Texas
- San Martín Lake and Bahia Grande tract, 33,000 acres in southeastern Cameron County

The memorandum recommended the San Martín Lake and Bahia Grande area as a top priority for acquisition. However, only the Santa Ana tract was acquired as a result of the study, and it became Santa Ana NWR in 1943.

In the late 1990s, The Conservation Fund, a non-profit land conservation organization, led a complicated and time-consuming team effort to acquire the Bahia Grande and surrounding lands for the National Wildlife Refuge System (Refuge System, System). Negotiations were complex, as two of the landowner families had 30 to 40 stakeholders. The Natural Resources Conservation Service (NRCS) secured 30-year Wetland Reserve Program easements on two large tracts, totaling 17,060 acres, providing an important source of funding for the transaction. In 1999 and 2000, the Service purchased these two easement-protected tracts at a reduced price from The Conservation Fund. The Service directly purchased a little over 4,700 acres in smaller tracts from other landowners in the area, including a donated tract of 52.48 acres. The acquisition of land and easements totaled 21,762.5 acres. Because the Wetland Reserve Program easements were transferred from private ownership (i.e., The Conservation Fund) to Federal ownership (i.e., the Service), NRCS rescinded the two 30-year Wetland Reserve Program easements and transferred total management of the area to the Service in 2007.

### ***South Padre Island Unit***

In 2000, The Nature Conservancy (TNC) acquired 24,532 acres on the north end of South Padre Island to conserve the important barrier island ecosystem and the lower Laguna Madre. In May 2003, all of TNC’s land holdings on South Padre Island were transferred to the Service, except for a 1,548-acre parcel and three smaller land parcels, totaling 1,609 acres. It was the original intent of TNC to transfer all or part of the property to the Service for inclusion in the Refuge. However, the decision to retain the 1,609 acres was influenced by TNC's desire to establish a coastal preserve in the Laguna Madre region, which TNC called

the South Padre Island Preserve. In addition, Willacy County and the Willacy County Navigation District supported this decision and asked that TNC retain this land.

In November 2005, TNC's South Padre Island Preserve was the subject of a proposed condemnation effort by Willacy County, when the county announced plans to initiate proceedings to acquire the preserve using eminent domain to create a county park to provide public access to the barrier island from Port Mansfield via boat. However, condemnation proceedings did not commence, and TNC continued to negotiate with Willacy County regarding public access. In 2006, the Service entered into a management agreement with TNC to administer the South Padre Island Preserve as part of the Refuge, and, in June 2007, TNC donated the preserve in fee title to the Refuge.

### ***Coastal Corridor Unit***

The Coastal Corridor Unit is located in the area between the Laguna Atascosa Unit and the Bahia Grande Unit with the goal to provide a narrow link between these larger Refuge units. The Unit's purpose is to provide habitat and safe travel corridors for a variety of wildlife, particularly ocelots.

Most of the existing Coastal Corridor tracts were farmed in the past and are in various stages of habitat succession from fallow farm fields to mesquite-grass woodlands. The corridor is currently comprised of two Refuge tracts (the 22-acre Sendero del Gato and the 12-acre Escondido). Other tracts within the Coastal Corridor Unit include two Lower Rio Grande Valley NWR tracts (the 12-acre Resaca de la Gringa and the 400-acre Waller). The Resaca de la Gringa was the first tract acquired (1995), followed by the Waller (2002), Tocayo (2003), El Sendero del Gato (2006), and Escondido (2006) tracts (see Figure 1-1).

### **Purposes of Laguna Atascosa NWR:**

*"...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds..."* Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d), as amended;

*"...for wildlife conservation purposes if the real property has particular value in carrying out the national migratory bird management program..."* Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948 (16 U.S.C. 667b-667d), Public Law 80-537, as amended;

*"...for the development, advancement, management, conservation and protection of fish and wildlife resources..."* Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4), as amended, and

*"...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..."* Fish and Wildlife Act of 1956 (16 U.S.C. 742(b)(1), as amended.

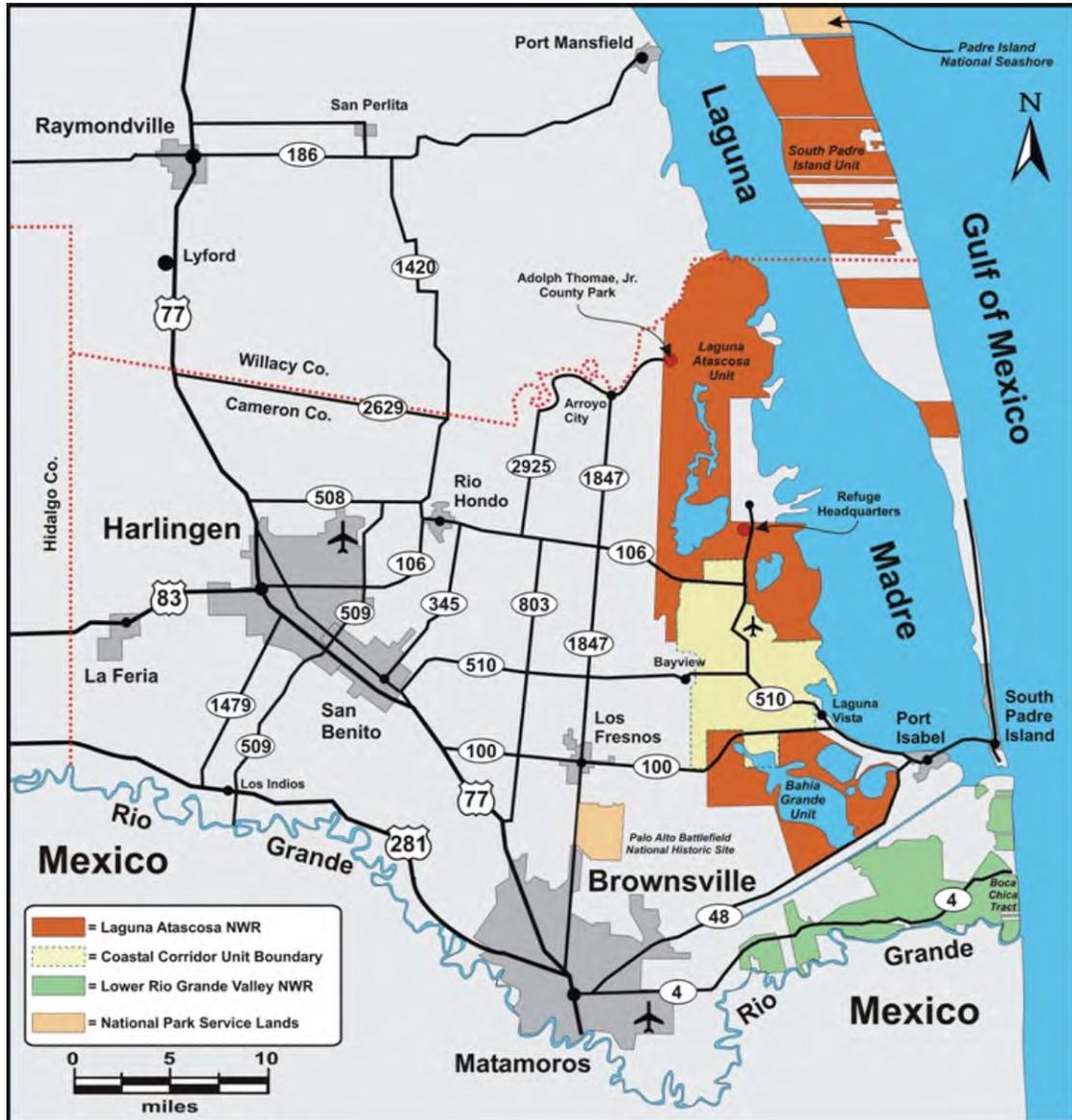


Figure 1-1. Laguna Atascosa NWR and Vicinity

## 1.2 Purpose and Need for the Plan

The purpose of comprehensive conservation planning is to “...provide long range guidance for the management of national wildlife refuges.” As such, all lands of the National Wildlife Refuge System are to be managed in accordance with an approved CCP that will guide management decisions and set forth strategies for achieving Refuge purposes. The Refuge Improvement Act of 1997 requires all refuges to have a CCP and provides the following legislative mandates to guide the development of the CCP:

- Wildlife has first priority in the management of refuges.

- Wildlife-dependent recreation activities such as hunting, fishing, wildlife observation and photography, and environmental education and interpretation are priority public uses of refuges. We will facilitate these activities when they do not interfere with our ability to fulfill the Refuge's purpose or the mission of the Refuge System.
- Other uses will only be allowed when they are determined appropriate and compatible with the purposes of the Refuge and the Refuge System mission.

This CCP provides long-term direction for present and future Refuge managers for the next 15 years. It describes management activities, important fish and wildlife resources that occur on the Refuge, wildlife-dependent recreational and educational opportunities, and provides goals, objectives, and specific strategies designed to fulfill the Refuge's vision for the future.

### 1.3 U.S. Fish and Wildlife Service Mission

The U.S. Fish and Wildlife Service is the principal Federal agency responsible for conserving, protecting, and enhancing fish and wildlife and their habitats for the continuing benefit of the American people. The Service has a primary responsibility to manage and protect Federal trust species, which includes migratory birds, threatened species, endangered species, interjurisdictional fish, marine mammals, and other species of concern. Specific responsibilities include enforcing Federal wildlife laws, managing migratory bird populations, restoring nationally significant fisheries, administering the Endangered Species Act, conserving and restoring wildlife habitat such as wetlands, and helping Native American tribal governments and foreign governments with their conservation efforts. It also oversees the Federal Assistance Program, which distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to State fish and wildlife agencies. The Service also manages the National Wildlife Refuge System. The mission of the U.S. Fish and Wildlife Service is:

*“Working with others to conserve, protect and enhance fish, wildlife and plants and their habitats for the continuing benefit of the American people.”*

### 1.4 National Wildlife Refuge System Mission and Goals

Managing the National Wildlife Refuge System has evolved into a significant role for the Service. Founded in 1903 by President Theodore Roosevelt with the designation of Pelican Island as a refuge for nesting pelicans, the Refuge System is the world's largest collection of lands and waters specifically managed for fish and wildlife. The Service manages the 97-million-acre Refuge System, which encompasses 548 national wildlife refuges, thousands of small wetlands, and other special management areas (see Figure 1-2). Refuges provide habitat for more than 5,000 species of birds, mammals, fish, and invertebrates.

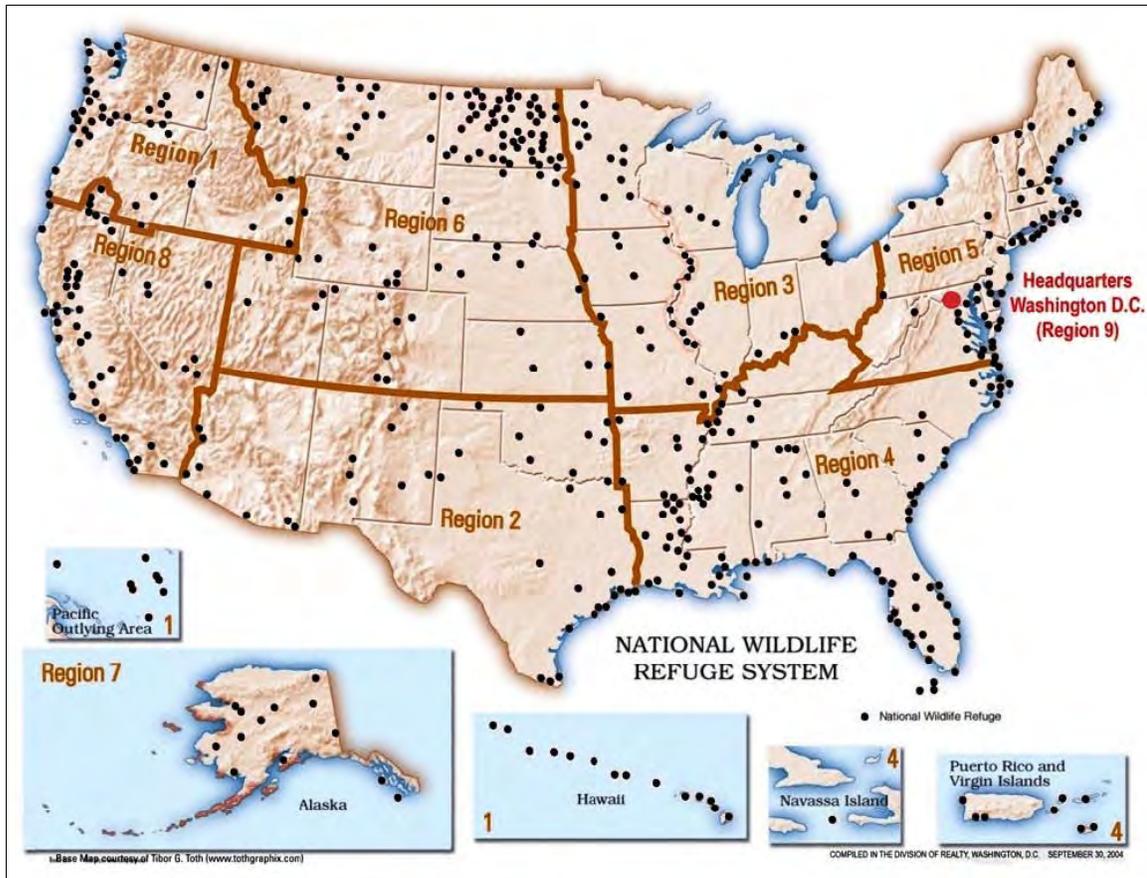


Figure 1-2. National Wildlife Refuge System

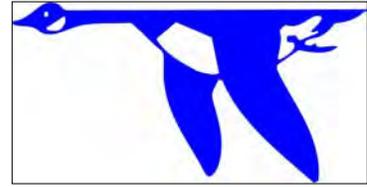
Many early national wildlife refuges, such as Pelican Island NWR, were created for herons, egrets, and other waterbirds or for the specific requirements of trust resources such as elk or bison. However, most refuges have been created to protect migratory birds, primarily waterfowl. This is a result of the United States' responsibilities under international treaties for migratory bird conservation and other legislation, such as the Migratory Bird Conservation Act of 1929.

National wildlife refuges also play a vital role in preserving endangered and threatened species. Among the refuges that are well-known for endangered species is Laguna Atascosa NWR, which provides important habitat for the endangered ocelot. Other well-known refuges include the Florida Panther NWR, protecting one of the nation's most endangered mammals, and the Aransas NWR, providing critical wintering habitat for whooping cranes.

Refuges also provide unique opportunities for people. When it is compatible with refuge purposes, refuges can be used for wildlife-dependent activities such as hunting, fishing, wildlife observation and photography, and environmental education and interpretation. Many refuges have visitor centers, wildlife trails, auto tour routes, and environmental education programs. Nationwide, approximately 35 million people visit national wildlife refuges annually.

The mission of the Refuge System is:

*“To administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.”*



The Blue Goose: Symbol of the National Wildlife Refuge System.  
Photo: USFWS

The goals of the Refuge System are to:

- a) Conserve a diversity of fish, wildlife, and plants and their habitats, including species that are endangered or threatened with becoming endangered;
- b) Develop and maintain a network of habitats for migratory birds, anadromous and interjurisdictional fish, and marine mammal populations that is strategically distributed and carefully managed to meet important life history needs of these species across their ranges;
- c) Conserve those ecosystems, plant communities, wetlands of national or international significance, and landscapes and seascapes that are unique, rare, declining, or underrepresented in existing protection efforts;
- d) Provide and enhance opportunities to participate in compatible wildlife-dependent recreation (hunting, fishing, wildlife observation and photography, and environmental education and interpretation); and
- e) Foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats.

## **1.5 Legal and Policy Guidance**

Administration of national wildlife refuges is guided by refuge purposes, the mission and goals of the National Wildlife Refuge System, Federal law, Presidential executive orders, and international treaties. Refuge management is further refined by Service policy, as provided in the Service Manual, director's orders, and memorandums. Most recently, the National Wildlife Refuge System Improvement Act of 1997, which amended the Refuge System Administration Act of 1966, includes a unifying mission for the Refuge System, a new process for determining compatible uses on refuges, and a requirement that each refuge will be managed under a CCP. It also requires the Secretary of the Interior (Interior) to maintain the biological integrity, diversity, and environmental health of the Refuge System (Biological Integrity Policy; Service Manual 601 FW 3). For a more complete listing of relevant legal mandates and policies guiding refuge management, see Appendix F.

### **1.5.1 Coordination with the State of Texas (Texas Parks and Wildlife Department)**

In administering the Refuge System, the Service will ensure that the CCP complements State efforts to conserve fish and wildlife and their habitats and to increase support for the Refuge System and participation from conservation partners and the public. During the development of the CCP, the Service is required to consult and coordinate with affected State conservation agencies, as well as adjoining Federal, local, and private landowners. The Service is required to ensure effective coordination, interaction, and cooperation in a timely and effective manner with the State during the course of acquiring and managing refuges. Under the Refuge Administration Act of 1966 and 43 CFR 24, the Secretary of the Interior, acting through the director of the

Service, is required to ensure the Refuge System regulations and management plans are, to the extent practicable, consistent with State laws, regulations, and management plans.

## 1.6 Existing Partnerships

Laguna Atascosa NWR staff work with a variety of individuals and organizations to accomplish habitat management, outreach, and environmental education projects. Some current partners include the Friends of Laguna Atascosa NWR; NRCS (U.S. Department of Agriculture); irrigation and drainage districts; the chambers of commerce of Harlingen, Brownsville, and South Padre Island; private non-profit conservation groups; and private landowners. The Cameron County Parks Department has a 25-year Cooperative Management Agreement with the Service to manage a 57-acre area on the Refuge just east of Arroyo City known as the Adolph Thomae Jr. County Park. This agreement has provided an excellent opportunity to provide additional opportunities for quality, wildlife-dependent activities such as fishing, wildlife observation, photography, and hiking. Refuge law enforcement (LE) has established partnerships with the Cameron County Sheriff's Office and Texas Parks and Wildlife Department (TPWD) to assist with LE operations on the Refuge. Refuge law enforcement also has a "Local Interagency Agreement" (2005) with the Willacy County Sheriff's Office to provide LE assistance in the northernmost portions of the Refuge (South Padre Island).

The Bahia Grande Restoration Partnership, which includes more than 65 partners, works with the Refuge to help restore the Bahia Grande wetland system. Some of the Bahia Grande partners include the University of Texas-Brownsville/Texas Southmost College, Brownsville Navigation District, Texas Department of Transportation (TXDOT), and local businesses and groups. Some of the endangered ocelot program partners include the Friends of Laguna Atascosa NWR, Gladys Porter Zoo-Brownsville, TPWD, Environmental Defense, TNC, The Conservation Fund, Marine Military Academy, TXDOT, Dallas Zoo, Comisión Nacional de Áreas Naturales Protegidas (CONANP), Caesar Kleberg Wildlife Research Institute (CKWRI), Immigration and Customs Enforcement-Bayview Detention Facility, irrigation and drainage districts in Cameron and Willacy counties, and private landowners. Some of the biological program partners include Ducks Unlimited, The Peregrine Fund, Inc., Sea Turtle, Inc., the Town of South Padre Island, The National Audubon Society, National Marine Fisheries Service, Padre Island National Seashore (National Park Service), UT-Pan American Coastal Studies Lab, Cameron County Parks Division, Arroyo Colorado Watershed Partnership, and CKWRI. Far less would be accomplished within and beyond the Refuge boundaries without these important partnerships.



Bahia Grande Partner. Photo: UTB-TSC



Pelicans and Plovers. Illustration: Ram Papish

## 2. Planning Process: Issues, Considerations, and Perspectives

The development of this CCP has incorporated the directives, policies, and regulations of the Service, the Refuge System, and Refuge purposes to assist in providing guidance to the Refuge for long-range management decisions. In addition, this CCP incorporates important goals and objectives of other applicable plans, approaches, or initiatives, such as those described in the following sections.

### 2.1 Strategic Habitat Conservation

An important overall force guiding the biological and habitat goals and objectives of the CCP includes a focus on fish and wildlife conservation, not just on the Refuge, but on a landscape level, which is the Service's ecosystem approach to management. In 2006, the National Ecological Assessment Team released the Strategic Habitat Conservation (SHC) report. SHC is defined as a structured, science-driven approach for making efficient, transparent decisions. SHC is a means to achieve the goals and principles of the Service's ecosystem management approach. The 2006 SHC report outlines a decision-making process for conservation actions on a landscape level containing four key elements:

- Biological planning
- Conservation design
- Delivery of conservation actions
- Monitoring and research, which are implemented in an adaptive management loop (USFWS/USGS 2006)

Using the SHC approach, we improve our abilities to protect and enhance wildlife populations and their ecology through more efficient uses of resources that are focused on key priority species (i.e., focal species) representative of larger guilds of species or groups that use habitats similarly. The guiding principles of SHC involve defining measurable population objectives; using the best scientific information available; implementing management actions that are defensible; incorporating an “adaptive management” approach; and working with partners. The goal of strategic habitat conservation is the conservation of populations and the ecological functions that sustain them (USFWS/USGS 2006).

### 2.2 The Ecosystem Approach to Management

The Service has adopted an ecosystem approach to more effectively achieve its mission of fish and wildlife conservation for future generations (Service Manual 052 FW1, Planning and Management). The ecosystem approach is defined as “...*protecting or restoring the natural function, structure, and species composition of an ecosystem while recognizing that all components are interrelated.*” Ecosystem management includes preservation and enhancement of ecological integrity and sustainable levels of economic and recreational activity. Central to the successful implementation of the ecosystem management approach is involvement of partners from Federal, State, and local governments and the private sector,



especially landowners. The Service has identified 52 ecosystems within the United States based on watershed designations. Laguna Atascosa NWR occurs within two major ecosystems: 1) the Lower Rio Grande Ecosystem, as described in the Lower Rio Grande/Rio Bravo Bi-National Ecosystem Management Plan, and 2) the Texas Gulf Coast Ecosystem. Important elements of the Lower Rio Grande Ecosystem are considered in this CCP; however, since the Refuge primarily occurs within the Texas Gulf Coast Ecosystem, that ecosystem will guide in the development of goals, objectives, and strategies of this CCP.

## 2.3 The Texas Gulf Coast Ecosystem

The Texas Gulf Coast Ecosystem lies between the Sabine River and the mouth of the Rio Grande and inland to include the historical coastal prairie. This is also similar to the area described in the Service’s 1981 Ecological Characterization of the Texas Barrier Islands Region and the area covered under the Gulf Coast Joint Venture (Laguna Madre Initiative Area) of the North American Waterfowl Management Plan. The Texas Gulf Coast Ecosystem area corresponds to the Gulf Prairies and Marshes

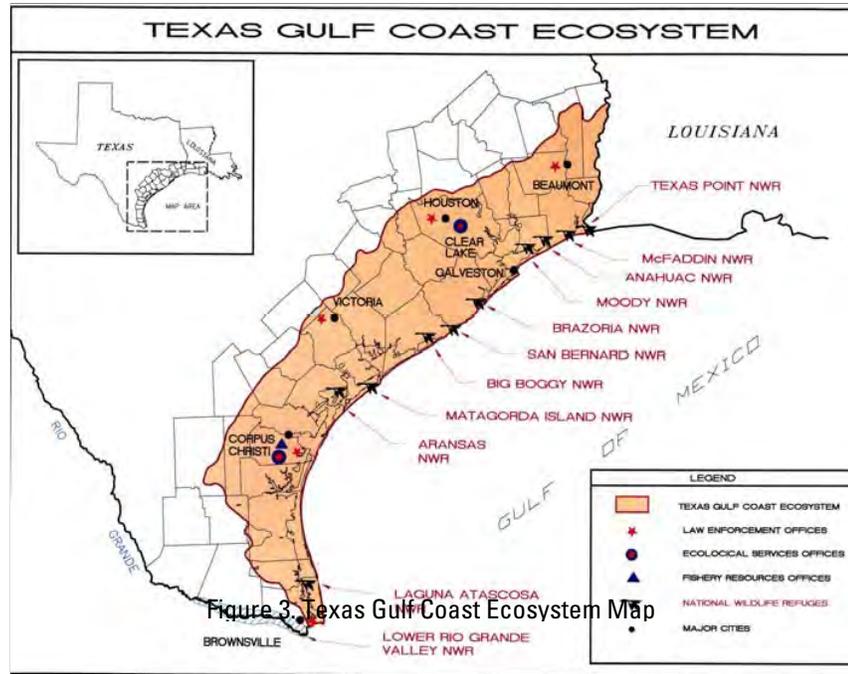


Figure 2-1. Texas Gulf Coast Ecosystem Map

ecological area delineated by Gould *et al.*, 1960 (Figure 2-1). The Service’s goal for the Texas Gulf Coast Ecosystem is to help restore, maintain, and enhance the level of natural species diversity (floral and faunal communities) native to this ecosystem in close cooperation with resource management agencies, other government and non-governmental entities, industries, private landowners, and other citizenry.

The prominent features of this ecosystem include the coastal prairies, which in many places contain small depressional wetlands that are now largely fragmented by agricultural and urban development; coastal marshes, which are mostly tidal but also include both isolated and transitional fresh and intermediate marshes; bays and lagunas, which support extensive seagrass beds; tidal flats and reef complexes; barrier islands; and forested riparian corridors, mottes, and dense brushy habitat. Natural forces that shape the system include prevailing southeast winds, tropical weather systems, and a substantial gradient in rainfall from more than 60 inches per year on the upper coast to less than 20 inches per year on the lower coast. Other key systemic processes include flooding and freshwater inflows that create estuaries and add nutrients and sediments.

### *Biotic Communities within the Lower Rio Grande Valley of Texas*

This CCP will focus on lands managed by the Service within the Texas Gulf Coast Ecosystem within the Lower Rio Grande Valley of Texas (LRGV or the Valley). According to Jahrsdoerfer and Leslie (1988), there are 11 distinct biotic communities occurring in the LRGV. Several of these biotic communities that occur on Laguna Atascosa NWR include clay loma/wind tidal flats, wooded potholes and basins, and coastal brushland potholes (Figure 2-2). Clay loma/wind tidal flats are miniature ecosystems of wooded islands in tidal flats that are periodically inundated by water from South Bay and the Gulf of Mexico. Lomas are formed from wind-blown silt or clay particles originally deposited in tidal flats by periodic flooding of the Rio Grande (Jahrsdoerfer and Leslie 1988). Wooded potholes and basins are freshwater and saline wetlands or potholes surrounded by brushlands, which become islands of wildlife habitat or “greentree reservoirs” for wintering waterfowl amidst an agrarian landscape (Jahrsdoerfer and Leslie 1988). Coastal brushland potholes are coastally-influenced wooded wetlands that vary in salinity from freshwater to saline estuaries. This biotic community is influenced by moving sand dunes (Jahrsdoerfer and Leslie 1988). Since the early 1900s, approximately 95 percent of the native brushland habitat of the LRGV was cleared for agriculture and urban development (Collins 1984). The remaining five percent, which includes Laguna Atascosa NWR, still supports many unique and rare species, some found nowhere else in the world. In Cameron County alone, approximately 91 percent of the original native woodland cover has been lost between the mid-1930s and 1983, from 202,128 acres down to 19,274 (Tremblay *et al.* 2005). Currently, urban expansion is the primary threat to the natural environment in the LRGV (Tremblay *et al.* 2005 after Paull *et al.* 2002). This is also true of the lands surrounding Laguna Atascosa NWR as the area is experiencing resort-type development and other associated development along the Laguna Madre and just inland.

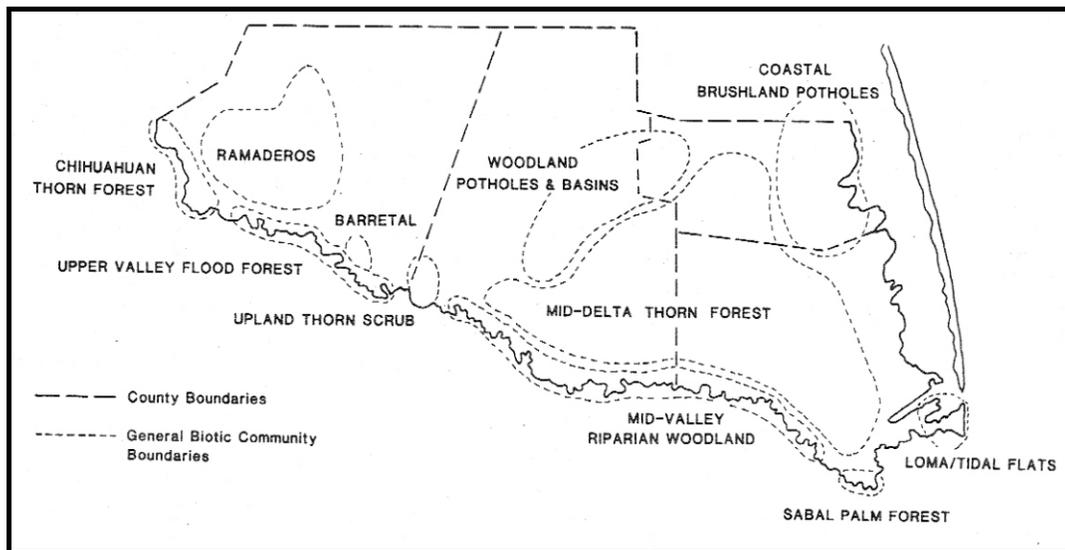


Figure 2-2. Biotic Communities of the LRGV

## 2.4 Other Plans and Initiatives Relevant to CCP Planning

### *Refuge-Specific Plans*

#### *Laguna Atascosa NWR Master Plan (1989)*

The Refuge's master plan was last revised to address two circumstances. In addition to preserving and managing resting and feeding habitats for migrating and wintering waterfowl, it became necessary to 1) address the decline in diving ducks, particularly redhead ducks and 2) manage for endangered species (ocelot and jaguarundi) (USFWS 1989). This plan, which provided a more balanced management program for these important fish and wildlife resources and provided updated public uses, is the current guiding document and will be replaced by this CCP.

#### *Laguna Atascosa NWR Refuge Expansion and Conceptual Management Plan (1999)*

This plan outlines several alternatives regarding Refuge expansion and includes a Conceptual Management Plan for any lands acquired after 1999. The alternative adopted by the Service outlines a plan to buy additional lands or conservation easements from willing sellers—up to 108,127 acres of land adjacent to or near the existing 45,187-acre Laguna Atascosa NWR, bringing the Refuge's acquisition goal to 153,314 acres. The acquisition area is limited to eastern Cameron County (around the Laguna Atascosa Unit and on South Padre Island north of Park Road 100) and Willacy County (South Padre Island). (See Refuge Boundary Map).

The reasons for the Refuge expansion are to:

- Provide additional riparian and thicket habitats for the endangered ocelot, which is currently limited to fewer than 30 animals
- Protect and enhance migratory bird habitats such as those of San Martín Lake and Bahía Grande, Resaca de los Cuates, and other water bodies in the project area
- Protect habitats on South Padre Island for species such as endangered sea turtles, peregrine falcons, piping plovers, other shorebirds, wading birds, waterfowl, and Neotropical migrants
- Protect fishing, hunting, and other wildlife-dependent public recreational opportunities for future generations

The preferred actions and outline described in the Conceptual Management Plan have been incorporated into the objectives and strategies of this CCP.

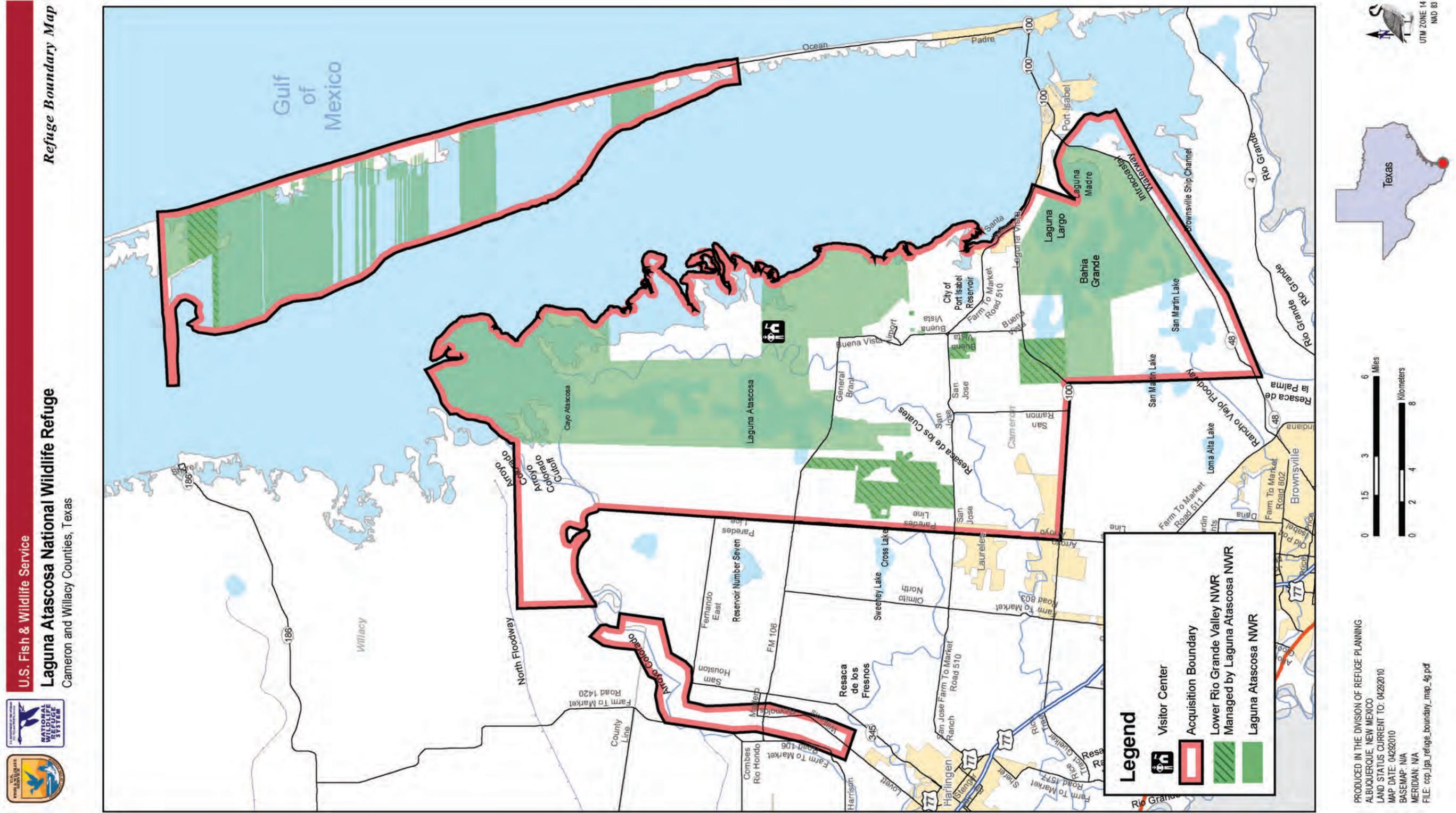


Figure 2-3. Refuge Boundary Map

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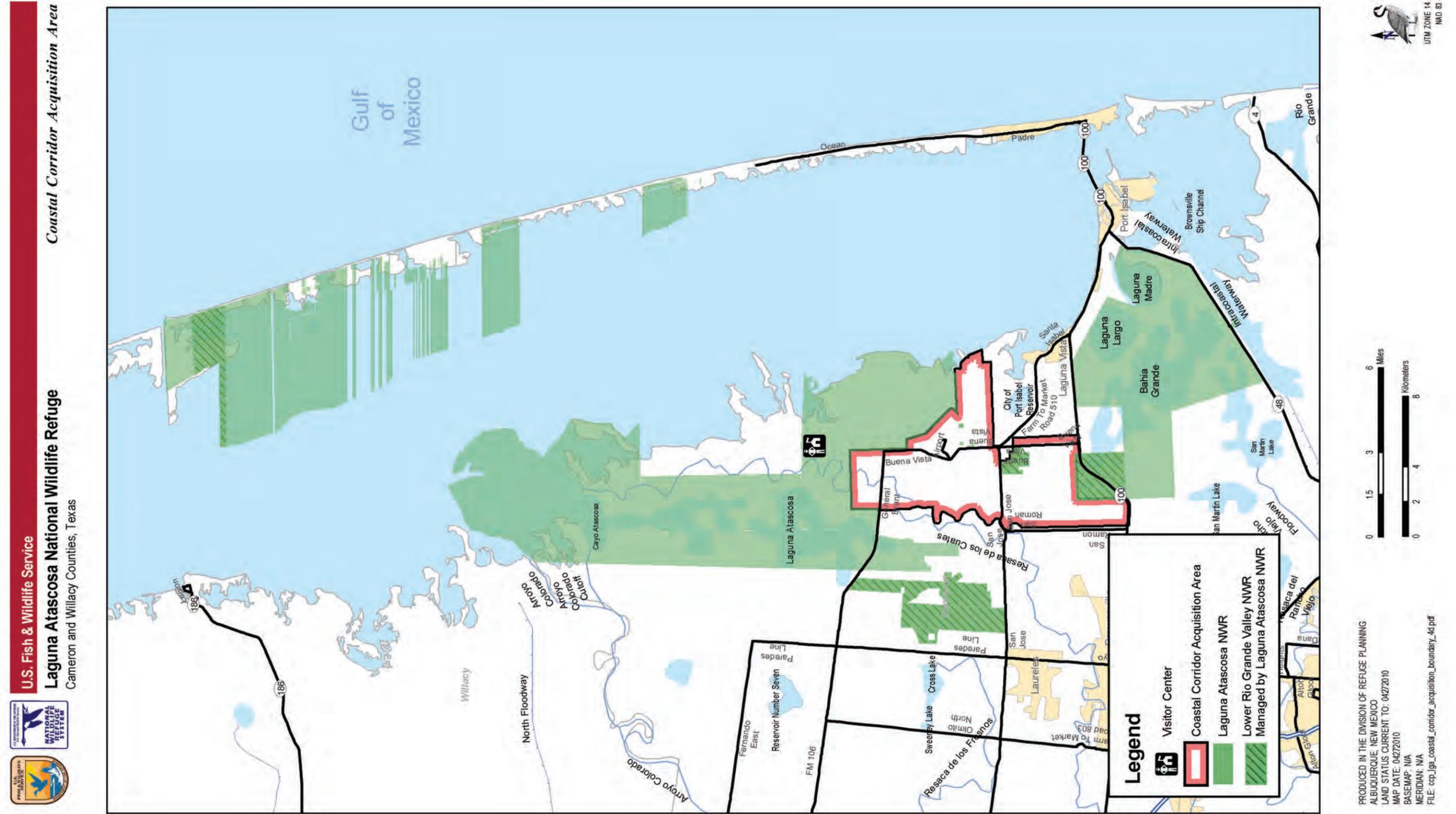


Figure 2-4. Coastal Corridor Acquisition Area

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Lower Rio Grande Valley NWR Land Protection Plan (1983)

The LRGV has long been recognized as a unique wildlife area containing extremely rare wildlife and habitats. During the 1930s, Service biologists conducted several surveys in the LRGV to establish wildlife refuges. They recommended the acquisition of several tracts of land, including Santa Ana NWR, Laguna Atascosa NWR, and the Bahia Grande Unit. By the 1980s, over 95 percent of the native Tamaulipan brushland in the Valley had been cleared for agriculture, urban development, and recreation, and 99 percent of the native brush in riparian areas had been destroyed (Jahrsdoerfer and Leslie 1988). The Lower Rio Grande Valley NWR was established in 1979 to protect important biotic communities in the LRGV, but primarily focused on the establishment and protection of a wildlife corridor along the Rio Grande. The Service's 1983 land protection plan for the Lower Rio Grande Valley NWR identifies that, "...the best preservation alternative appears to be a combination fee and easement purchase program to establish a wildlife easement corridor along the river between fee management units and utilization of the same approach connecting the La Sal Vieja area." According to the 1983 plan, "The primary objective of the Lower Rio Grande Valley NWR is the maintenance of the existing wildlife populations...and the preservation of existing remnants of important wildlife habitat in the LRGV of Texas without extirpation or extinction of any of a longer list of vertebrate species." Collins (1984) identified riparian and scrub forest associated with the Rio Grande as a major habitat type and stated that "...the FWS brush protection and acquisition program revolves around the maintenance and protection of the north bank of the Rio Grande as a wildlife corridor. The terraces and associated vegetation immediate to the river are of prime importance as travel lanes for wildlife, allowing genetic exchange between the refuges and existing natural cover."

Lower Rio Grande Valley NWR Comprehensive Conservation Plan (1997)

The CCP for the Lower Rio Grande Valley NWR outlines a vision that this Refuge "...will someday be 132,500 acres of mostly contiguous tracts of natural brush, reforested farmlands and wetlands." A major goal for the Lower Rio Grande Valley NWR is "to restore, enhance, and protect the natural diversity of the LRGV including threatened and endangered species on and off refuge lands, through (1) land acquisition when appropriate, (2) the management of habitat and wildlife resources on refuge lands; and, (3) by strengthening existing, and establishing new cooperative efforts with public and private conservation agencies, and other government jurisdictions including Mexico."

Major land acquisition objectives are to "Continue to pursue acquisition goal of 132,500 acres for the Lower Rio Grande Valley NWR by purchasing fee title lands or conservation easements within the river corridor and other lands within the four-county area that will contribute to the preservation and enhancement of any of the 11 biotic communities..." and to "...acquire lands (tracts) that will: (1) Provide for the protection of endangered species; (2) Assist in the achievement of a contiguous river wildlife corridor; (3) Enlarge established brush tracts or create corridors connecting tracts of native habitat; (4) Enhance or connect existing refuge tracts not on or near the river; and, (5) Protect isolated tracts of desirable habitat."

**Wildlife Corridors** - There are two important land units (Laguna Atascosa Unit and Bahia Grande Unit) that make up part of the Laguna Atascosa NWR and should be linked to the Lower Rio Grande Valley NWR's wildlife corridor. Given the pace of development in the LRGV and the number of isolated refuge tracts Valley-wide, wildlife corridors are a key conservation tool to address not only the long-term protection of native biotic communities, but also to help address the recovery of endangered species such as the ocelot and jaguarundi.

To help implement ocelot recovery in the LRGV, there is a need to establish at least five corridors:

- A “Ranchito Corridor” from the Refuge to the Ranchito Tract (Lower Rio Grande Valley NWR);
- A “Coastal Corridor” from the Laguna Atascosa Unit to the Bahia Grande Unit (i.e., Coastal Corridor Unit);
- A “Boca Chica Corridor” from the Bahia Grande Unit to the Boca Chica Tract (Lower Rio Grande Valley NWR);
- A “Ranchland Corridor” from the Laguna Atascosa Unit to the Lower Rio Grande Valley NWR tracts (i.e., Willamar, El Jardin, and San Perlita), and ranch country to the north (e.g., Yturria); and
- A “North Valley Corridor” running east-west from the Ranchland Corridor Refuge tracts and ranch country along the coast to the Lower Rio Grande Valley NWR tracts in northern Willacy and Hidalgo Counties (e.g., East Lake, Teniente, La Sal del Rey).

This would help achieve important ocelot recovery goals, as well as protection of the Valley’s unique wildlife and habitat. Some of these corridors are outside Laguna’s approved acquisition boundary; however, they are within Lower Rio Grande Valley NWR’s approved acquisition boundary (see Figure 2-5). Therefore, there is a need to coordinate land acquisition strategies within the STRC, which includes the Lower Rio Grande Valley NWR. These protected corridors will enable movement of terrestrial wildlife between protected areas, connect isolated populations, increase resilience of wildlife to catastrophic events (e.g., hurricanes, droughts, and disease outbreaks), and ensure the existence of important wildlife in perpetuity as development in the LRGV continues.

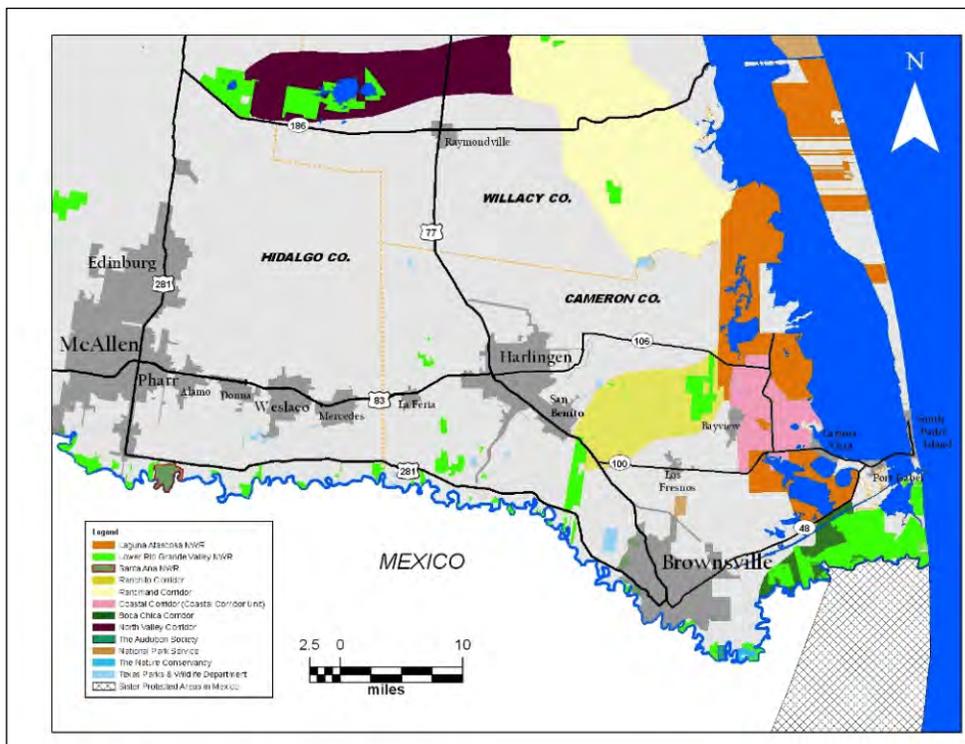


Figure 2-5. Wildlife Conservation Corridors

### *National Plans and Initiatives*

#### Lower Rio Grande/Rio Bravo Bi-National Ecosystem Management Plan (2003)

The Lower Rio Grande/Rio Bravo Bi-National Ecosystem Management Plan established a vision, objectives, strategies, and activities for the protection and restoration of native plants and animals of the Lower Rio Grande Valley area of Texas on both sides of the international border. This plan defines the ecosystem as Tamaulipan brushland from Falcon Dam to Boca Chica, 65 miles on either side of the Rio Grande within the Tamaulipan Biotic Province as described in Blair (1950; Dice 1943). Tamaulipan brushland is characteristically dense and thorny, dominated by such species as Texas ebony, retama, granjeño, huisache, prickly pear cactus, and mesquite. However, because of the variety of Tamaulipan brushland types owing to differences in soil, geology, and elevation, it is further classified into 11 biotic communities as described in Jahrsdoerfer and Leslie (1988).

The plan's vision is to foster joint bi-national participation in the ecosystem management of natural areas in the Lower Rio Grande/Rio Bravo Ecosystem for sustainable resource management. Plan objectives have been divided into three main conservation categories:

- Water,
- Species and habitats, and
- Education

Objectives include maintaining and improving water quality and quantity, managing invasive species, prioritizing recovery and management of federally-listed species (*See Section 3.2.6*), and increasing public awareness of the value of these natural resources through such means as ecotourism. Laguna Atascosa's CCP incorporates many of the elements to facilitate implementation of this ecosystem plan.

#### U.S. Fish and Wildlife Service Migratory Bird Program Strategic Plan 2004–2014 “A Blueprint for the Future of Migratory Birds”

Developed by the Service's Migratory Bird Program, this plan's main goal is “...to increase the percent of species of migratory birds that are at healthy and sustainable levels.” The plan identifies “focal species” that are considered to be of a priority emphasis in the overall context of landscape-scale integrated bird conservation. These species all share a high conservation need and are representative of larger groups of birds that share similar, or the same, conservation needs. The plan also calls for partnerships inside and outside the Service essential to the implementation of action plans. About 30 of these Migratory Bird Program focal species frequently occur on the Refuge (*See Sections 3.2.7 and 3.2.8*).

#### North American Waterfowl Management Plan - Gulf Coast Joint Venture: Laguna Madre Initiative Area (2002)

The North American Waterfowl Management Plan (NAWMP) was launched in 1986 in response to record low waterfowl numbers observed in the early 1980s. Recognizing the importance of waterfowl and wetlands to North Americans and the need for international cooperation to help in the recovery of shared resources, the Canadian and United States governments, and later the Mexican government, developed a strategy to restore waterfowl populations to levels seen in the 1970s. The purpose of the NAWMP is to achieve waterfowl conservation (through habitat protection, restoration, and enhancement) while maintaining or enhancing the associated ecological values in harmony with human needs (Esslinger and Wilson 2002). Regional

partnerships, called joint ventures, are the implementing mechanisms of the NAWMP. Within the Gulf Coast Joint Venture are six initiative areas. Laguna Atascosa NWR occurs in the Laguna Madre Initiative Area. This initiative area comprises five counties along the extreme lower coastal plain of Texas, from Corpus Christi Bay to the mouth of the Rio Grande. The goal of the Laguna Madre Initiative is to provide wintering and migration habitat for significant numbers of redhead ducks, greater and lesser scaup, northern pintails and other dabbling ducks, as well as year-round habitat for mottled ducks (Esslinger and Wilson 2002).

According to the plan, habitat conservation is imperative for meeting the waterfowl population objectives, especially on coastal marshes, and for improving the waterfowl value of agricultural lands. The two major waterfowl habitats in the initiative area are hypersaline lagoons, with associated seagrasses, and freshwater wetlands. To sustain the plan's waterfowl population objectives, an estimated 2,225 acres of seasonal wetlands from late August through October, and an additional 10,133 acres from November through March, are needed within the initiative area. In addition, the plan recommends restoring or creating 2- to 12-acre freshwater wetlands adjacent to the Laguna Madre. Planning objectives for Laguna Atascosa NWR in support of the NAWMP include maintenance of existing habitat, wetland restoration activities such as those at Bahia Grande, acquisition of additional lands as described in the 1999 Refuge Expansion Plan, and specific habitat activities in support of CCP focal waterfowl species (*See Section 3.2.8*).

#### Partners in Flight (1990)

Partners in Flight (PIF) was launched in response to growing concerns about declines in the populations of several land bird species and to emphasize the conservation of birds not covered by existing conservation initiatives. The PIF vision is: "*Populations of native birds will occur in their natural numbers, natural habitats, and natural geographic ranges, through coordinated efforts by scientists, government, and private citizens.*" The initial focus was on species that breed in North America and winter in Central and South America, but the focus has since expanded to include most other birds requiring terrestrial habitats. PIF is a cooperative effort involving partnerships of Federal, State, and local government agencies, philanthropic organizations, professional organizations, conservation groups, industry, the academic community, and private individuals.

According to PIF, habitat loss (including fragmentation) remains the paramount factor behind population declines of most bird species, such as those of native prairies. Many of the species described in the North American Landbird Conservation Plan by PIF (Rich *et al.* 2004) migrate through or winter at Laguna Atascosa NWR and depend on quality upland habitats such as brush-covered lomas, riparian, resaca (ox-bow lake) vegetation, and coastal prairies found on the Refuge. Specific recommended actions pertaining to the Bird Conservation Region in which the Refuge occurs, include continuing community-growth planning in high development areas such as in the Brownsville and Port Isabel area; maintaining many patches of high quality grasslands; and developing community-involved, well planned fire management strategies in woodlands and grasslands.

#### U.S. Shorebird Conservation Plan (2001)

The U.S. Shorebird Conservation Plan is a partnership involving organizations throughout the United States committed to the conservation of shorebirds. The organizations and individuals working on the plan have developed conservation goals for each region of the country, identified critical habitat conservation needs and key research needs, and proposed education and outreach programs to increase awareness of shorebirds and the threats they face. Major goals of the plan are to ensure that an adequate quantity and quality of habitats are identified and

maintained locally and to maintain or restore shorebird populations at the continental and hemispheric levels. Laguna Atascosa NWR occurs in the Central Flyway migratory corridor and the Laguna Madre Region, as identified in the plan.

According to the Shorebird Conservation Plan, increased development, recreation, and infrastructure resulting from expanding human populations pose the greatest disturbance to shorebird habitat. Indirect impacts to shorebird habitat (beach, washover flats, tidal flats, spoil islands, and shallow water areas) include:

- Changes in hydrology adjacent to roads,
- Cumulative impacts of induced development along new road routes,
- Non-point source pollution associated with run-off and accidental spills of hazardous materials, and
- Increased access to shorebird habitats from off-road vehicles (ORVs), or illegal dumping (USFWS 2001)

This plan recognizes Laguna Atascosa NWR as an important shorebird area with the highest numbers of shorebirds (21 percent) detected during aerial surveys along the Texas coast from 1997–1998. The plan lists 39 priority shorebird species—such as the snowy plover, piping plover, long-billed curlew, red knot, and the buff-breasted sandpiper—that are considered “highly imperiled” as of 2004. Consistent with this plan, the CCP will incorporate conservation measures for shorebirds such as protecting the dune system, washover passes, wind tidal flats, algal flats, and mangrove lagoons, as well as monitoring populations and use areas for potential disturbance. Per the 1999 Refuge Expansion Plan, additional lands may be added to the Refuge to help protect existing natural habitats that shorebirds depend on such as wind tidal flats, barrier island mudflats, and other habitats.

#### Western Hemisphere Shorebird Reserve Network

The Western Hemisphere Shorebird Reserve Network (WHSRN) is a voluntary non-regulatory coalition that identifies and promotes conservation of crucial breeding, wintering, or migratory stopover sites for shorebirds. The mission of the WHSRN is “...to conserve shorebird species and their habitats across the Americas through a network of key sites.” According to the WHSRN, more than 25 percent of all of North America’s shorebirds—such as piping plovers, snowy plovers, and Wilson’s plovers—are in serious decline.

In 2001, Laguna Atascosa NWR was officially designated a WHSRN International Site, along with Rancho Rincón de Anacahuítas in Mexico. These sites (out of 63 current sites in eight countries) make up the first bi-national site within the WHSRN. Both Laguna Atascosa and Rancho Rincón de Anacahuítas in Mexico sites host at least 100,000 shorebirds during migration and during the winter. “Members” of each site agree to make shorebird conservation a priority, protect and manage shorebird habitat, and keep WHSRN informed of any status changes to the site. This CCP incorporates strategies that attempt to meet these items.

#### U.S. Ocean Action Plan (2004)

As part of Oceans Act of 2000 and the U.S. Commission on Ocean Policy, the U.S. Ocean Action Plan recognizes the importance of oceans, coasts, and Great Lakes of the United States and promotes responsible use and stewardship of ocean and coastal resources for the benefit of all Americans. The intent of the plan is to identify immediate, short-term actions that provide direction for ocean policy and to outline additional long-term actions that provide

direction for the future. The Service has established guiding principles (June 21, 2007, memo) to implement relevant aspects of this plan through an ecosystem-based management approach. Some of the guiding principles include focusing on the Service mission, executing statutory responsibilities, integrating goals and activities across programs and agencies, providing technical assistance to partners, and managing marine and coastal national wildlife refuges for “wildlife first,” along with compatible public uses. This CCP complements these efforts by incorporating relevant priorities, including but not limited to conserving and restoring coastal habitat, enhancing the conservation of marine mammals and sea turtles, strengthening coordination with other agencies, establishing and maintaining excellent partnerships, and monitoring coastal resources within the management area.

### Marine Protected Areas (2000)

Marine Protected Areas or MPAs are defined as any area of the marine environment reserved by Federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein. As such, portions of Laguna Atascosa NWR qualify as an MPA. Executive Order 13158 (65 FR 34909-11) directs Federal agencies to work together with states, territories, tribes, and non-governmental partners to maintain the MPA system and to accomplish a variety of related tasks working with public and private partners. The mission statement of the MPA Center’s Strategic Plan (2007) is: “*To facilitate the effective use of science, technology, training, and information in the planning, management, and evaluation of the nation’s system of MPAs.*” The main focus is to ensure that MPAs are coordinated in a larger ecosystem framework to comprehensively protect these natural and cultural resources; through the national system, these sites and programs will benefit by working together to accomplish priorities that could not be achieved alone. Relevant aspects of this plan and executive order (EO) directives are considered in this CCP.

U.S. Department of Agriculture (USDA) - Conservation Reserve Program: Lower Rio Grande Valley Thornscrub Restoration Project; State Areas for Wildlife Enhancement (SAFE) (2008)

This USDA Farm Service Agency initiative is specifically geared toward creating and restoring endangered ocelot habitat in Cameron, Willacy, Hidalgo, and Kenedy counties in Southern Texas. Recognizing that over 90 percent of the original thornscrub habitat in the LRGV has been lost by conversion to row crop, orchard agriculture, and urban encroachment, this initiative introduces a conservation practice for private landowners intended to create 5,000 acres of native grasses and thornscrub habitat. Although this is for ocelots, it will also benefit other wildlife such as bobwhite quail, white-tailed deer, and numerous grassland birds. Under this initiative, eligible landowners receive financial incentives to plant native species of grasses and woody shrubs in areas with the greatest potential to restore ocelot habitat and connect known ocelot habitats via wildlife corridors. Partners include the Service, NRCS, TPWD, and non-governmental organizations (NGOs) such as Environmental Defense, TNC, and Valley Nature Center.

### Draft Climate Change Strategic Plan and Five-Year Action Plan (2008)

Secretarial Order No. 3226 directs the U.S. Department of the Interior to consider and analyze potential climate change impacts when undertaking long-range planning activities and decision-making for public lands. Recognizing that climate change is one of the greatest environmental and conservation challenges, the Service began development on a Climate Change Strategic Plan and associated Five-Year Action Plan to consider and address the impacts of climate change on fish and wildlife resources. The Strategic Plan envisions efforts in adaptation, mitigation, and education, and provides flexibility for the Service to respond to

evolving science, technology, and implementation experience. Coastal refuges, such as Laguna Atascosa NWR, may be most affected by global environmental trends such as climate change and sea level rise.

### ***State Plans and Initiatives***

#### ***Texas Comprehensive Wildlife Conservation Strategy (2005)***

As part of the State Wildlife Grant Program, the Texas Wildlife Conservation Strategy (Texas Wildlife Action Plan) was completed by the TPWD to assist the agency and its conservation partners with the development of non-game initiatives and goals to address the needs of wildlife and habitats. This plan provides detailed species and habitat information on 10 major ecoregions in Texas. Laguna Atascosa NWR occurs within the Gulf Coast Prairies and Marshes Ecoregion. This ecoregion runs along the Texas Gulf Coast and extends inland approximately 60 miles. The Gulf Coast Prairies and Marshes Ecoregion is ranked as a high conservation priority and is considered to be among the most threatened of the 10 ecoregions (TPWD 2005). The plan identified that inland prairies, coastal woodlands, and beach habitats are specifically threatened by increased population growth and associated development. The plan also identifies 297 priority species within this ecoregion. Ninety-seven species are invertebrates; 33 species are State-listed threatened or endangered (*See Appendix C*), and 14 of the State-listed species are also federally-listed as threatened or endangered (*See Appendix B*). Seventy-nine State priority species identified in the Texas Action Plan commonly occur or nest on Laguna Atascosa NWR (*See Appendix A*).

A major focus of the action plan is to provide species and habitat assessments along with conservation strategies. The plan indicates that since Texas is more than 94 percent privately owned, “a strong education program” is also needed to “gain support for general conservation as well as specific projects.” High priority conservation actions include vegetation and habitat mapping, biological inventories, data collection and database management, land protection, support of bird joint ventures, land and water monitoring, developing conservation partnerships, and education and outreach activities. Species-specific conservation actions are also included in the plan. Relevant strategies of this CCP and associated step-down management plans will take into account many of the specific conservation actions in the State’s plan.

#### ***Seagrass Conservation Plan for Texas (1999)***

Status and trend information on Texas seagrasses, as documented by Pulich and Roberts (1996) and Quammen and Onuf (1993), indicate significant declines and major conservation and environmental problems affecting the remaining 235,000 acres of Texas seagrasses. Seagrass meadows are unique subtropical habitats of bays and estuaries that play critical ecological roles in the Gulf Coast Ecosystem. Seagrass meadows provide a major organic source that drives coastal food webs, help stabilize coastal erosion and sedimentation, and provide important nursery habitat for fish and other marine life; seagrasses play a natural role in nutrient cycling and water quality processes. Having State management authority or jurisdiction where seagrasses occur, TPWD, Texas General Land Office, and the Texas Natural Resource Conservation Commission (now the Texas Commission on Environmental Quality) have taken the lead in the development and implementation of this plan. The plan focuses on three separate issue categories: Seagrass Research, Management/Policy, and Education/Outreach, including cross-agency coordination and cooperation with Federal agencies. Relevant strategies of this CCP and associated step-down management plans take into account the major issues identified in this plan.

### Land and Water Resources Conservation and Recreation Plan (2005)

The Land and Water Resources Conservation and Recreation Plan was written to guide TPWD in conserving the State's natural and historic heritage and in providing public access to the outdoors. Major goals of this plan include:

- Improving access to the outdoors;
- Conserving, managing, operating, and promoting agency sites for recreational opportunities, biodiversity, and the cultural heritage of Texas;
- Assisting landowners in managing their lands for sustainable wildlife habitat consistent with their goals;
- Increasing participation in hunting, fishing, boating, and outdoor recreation;
- Enhancing the quality of hunting, fishing, boating, and outdoor recreation;
- Improving science, data collection, and information dissemination to make informed management decisions;
- Maintaining or improving water quality and quantity to support the needs of fish, wildlife, and recreation; and
- Continuously improving TPWD business management systems, business practices, and work culture

According to the Plan, "...the high population growth and associated development along the coast have fragmented land, converted prairies, changed river flows, decreased water quality and increased sediment loads and pollutants on marshes and estuaries. Projections indicate continued high growth and increasing fragmentation in most parts of this ecoregion..." The Plan recommends that "...many beach areas and mud flats need additional protection." This CCP incorporates many relevant strategies, both in land and water conservation (e.g., monitoring species status and trends, creating and restoring coastal prairie, public outreach, cultural and historical resource protection, maintaining and developing new partnerships, and managing invasive species); and in recreation (e.g., providing quality hunting, fishing, and other wildlife-dependent recreational opportunities).

State plans closely linked to this plan include the Coastal Erosion Planning and Response Act and the State Water Plan-Region M (2007), which include strategies regarding natural resource issues and management considerations applicable to the Refuge.

### Arroyo Colorado Watershed Protection Plan (2007)

The Arroyo Colorado Watershed (ACW) Protection Plan was developed by a coalition of public and private organizations to improve water quality and aquatic and riparian habitat in the Arroyo Colorado. This plan takes into account current uses of the Arroyo such as flood control, navigation, conveyance of municipal and industrial wastewater discharges and irrigation return flows, as well as recreation and environmental uses, and provides actions to restore and protect these uses. The goal of the ACW Protection Plan is "...to reduce the addition (i.e., loading) of pollutants such as oxygen-demanding substances, nitrogen, phosphorus, and sediment to the Arroyo Colorado and to improve natural habitat to the degree necessary to meet the uses designated by the State of Texas and specified in the State's Water Quality Standards..." The Refuge participates as a cooperating stakeholder in the ACW Protection

Plan as the Arroyo Colorado, originally a distributary of the Rio Grande, flows across the Refuge and into the Laguna Madre.

***Federally-listed Species Recovery Plans***

*Listed Cats of Texas and Arizona Recovery Plan (with emphasis on the Ocelot) - (1990)*

The recovery plan for the federally-endangered ocelot emphasizes maintaining, protecting, and increasing ocelot populations and distribution in Texas (USFWS 1990a). This includes surveying for ocelots; identifying, protecting, and managing ocelot habitat; developing translocation techniques; and developing an education and information program. Laguna Atascosa NWR is the lead recovery station for the ocelot and is, therefore, primarily responsible for the implementation of recovery actions. As such, Refuge staff are actively surveying the resident ocelot population; radio tagging and tracking ocelot; conducting serological studies to monitor for disease, contaminants, and genetic health; taking actions to minimize human disturbance to ocelot habitats; encouraging protection of the ocelot and the federally-endangered jaguarundi on private lands; educating the public on the conservation of these rare species; increasing ocelot habitat through restoration; identifying potential habitat sites (for acquisition or protection of blocks of habitat and corridors); and investigating and following up on sighting and mortality reports. The Refuge is also involved in partnerships with local landowners, NGOs, and Federal, State, and local agencies to monitor and protect ocelots and their habitat. In addition, the Refuge is working with other agencies such as TXDOT to help design “cat crossings” to reduce the risk of road kills and also to facilitate habitat connectivity across the roads. The Refuge provides technical assistance with Endangered Species Act consultations and with updating or revising the recovery plan. The Refuge is working with NGOs such as Environmental Defense and TNC to assist in the implementation of recovery actions on private lands.



Radio-collared ocelot on the Refuge.  
Photo: USFWS



Ocelot being fitted with a radio collar and checked for diseases. Photo: USFWS

Top recovery priorities for the Refuge in the coming years will focus on:

- Addressing the potentially deleterious effects of small population size, population isolation, and loss of genetic diversity in the Cameron County ocelot population;
- Protecting existing ocelot habitat and minimizing habitat loss on and in the vicinity of the Refuge;
- Restoring, connecting, and increasing the availability of ocelot habitat;
- Continuing the long-term monitoring and research of ocelots;
- Increasing water availability during times of drought; and
- Reducing the risk of ocelot road mortalities



Aplomado Falcon (1990)

The Aplomado Falcon Recovery Plan (USFWS 1990b) states that “...suitable habitat in the United States and Mexico should be identified and protected, especially in areas close to reintroduction sites.” Additionally, “Particular attention should be directed toward suitable habitat on public lands.” Other elements of the recovery plan emphasize a reintroduction program to establish populations in the United States. The criteria for downlisting the aplomado to threatened is when “...a minimum self-sustaining population of 60 breeding pairs has been established in the United States.”

In partnership with the Peregrine Fund, a non-profit conservation group based in Boise, Idaho, the first major aplomado falcon releases began in 1993 on the Refuge. The Refuge contains some of the best coastal prairie and savannah habitat for this species, particularly the Bahia Grande Unit. As of 2004, over 900 falcons have been released in the LRGV, and 25 nesting pairs were documented in 2006. The current recovery objectives for a sustainable population of aplomado falcons in the LRGV are estimated to be between 30-35 pairs (Peregrine Fund, 2010). Monitoring of aplomado falcons continues on the Refuge in order to document nesting and fledgling success and to monitor contaminant levels. Prescribed fire is used to manage for healthy grassland habitat that would benefit the aplomado falcon.

Sea Turtles

Major actions needed to achieve recovery involve providing long-term protection to important nesting beaches, ensuring hatching success, determining distribution and seasonal movements for all life stages, minimizing mortality from commercial fisheries, and reducing the threat from marine pollution. On the Refuge, the Kemp’s ridley, the loggerhead, and green sea turtles nest on the beach. These sea turtles and the hawksbill sea turtle may occur within the bays, beaches, and Gulf of Mexico. The endangered leatherback sea turtle (*Dermochelys coriacea*) was last documented on the Texas coast on Padre Island in the 1930s, but a nest has been recently confirmed near the Refuge on the Padre Island National Seashore in June 2008.



Kemp’s ridley sea turtle coming ashore to nest. Photo: USFWS

The Refuge contributes to recovery plan tasks for sea turtles primarily through monitoring nesting and stranding, patrolling beaches, protecting nest areas, participating in recovery work groups, and partnering with sister agencies such as the National Park Service’s Padre Island National Seashore and private groups such as Sea Turtle, Inc. Nest monitoring includes daily, all-terrain vehicle (ATV) beach patrols on Boca Chica Beach and South Padre Island from early April through mid-July, which corresponds with the nesting season of the Kemp’s ridley. Monitoring on the Refuge also contributes to recovery plan actions that call for

determining the distribution, abundance, and status in the marine environment and in nearshore habitats. The Refuge participates in the Sea Turtle Stranding and Salvage Network, as recommended in these recovery plans. This CCP incorporates, as objectives and strategies, those action items of the sea turtle recovery plans (Kemp’s ridley, loggerhead, green, hawksbill, and leatherback sea turtles) as they apply to Laguna Atascosa NWR.

### *Piping Plover*

Because of declines in numbers and breeding sites, piping plover populations became federally-listed in 1986 (50 FR 50726-34). Piping plovers on the Great Lakes were listed as endangered and Atlantic and northern Great Plains populations were listed as threatened. Piping plovers on migration and in wintering areas (such as at Laguna Atascosa NWR) are classified as a threatened species. Critical habitat has recently been proposed along the Texas coast and includes South Padre Island (73 FR 29294-29321; May 20, 2008). Piping plovers winter primarily along beaches, sandflats, and algal flats on the Gulf of Mexico. Dredging and recreational development are cited in the recovery plan as serious threats for the species. Some of the actions needed to recover the species include determining current distribution and population trends; protecting, preserving, enhancing piping plover habitat; and implementing public education programs to enhance piping plover conservation. Relevant strategies to help implement these recovery actions for the piping plover are included in this CCP. For Laguna Atascosa NWR, these include protecting their wintering habitat from undue disturbance and impacts resulting from ORV use along the beach, washover passes, and algal flats, primarily in the South Padre Island Unit.

## 2.5 Planning Perspectives

This comprehensive planning effort will integrate the following perspectives so that management direction during the next 15 years will produce holistic management approaches for Laguna Atascosa NWR.

- Environmental issues affecting the Refuge such as ecological and wildlife trends, water supply and quality, contaminants issues, invasive species, and alternative energy developments (e.g., wind farms, biofuels).
- Service policies, mandates, and legal requirements such as appropriate Refuge uses decisions, compatibility determinations, threatened and endangered species considerations, migratory bird conservation, wildlife and habitat management, and staffing.
- Refuge public use and trends, public involvement in the planning process, environmental education and outreach, interjurisdictional and interagency cooperation, strategic habitat conservation approaches, partnerships, and research needs.

## 2.6 Planning Issues

The following is a list of major issues and challenges, not necessarily in priority order, associated with current Refuge management. While not an exhaustive list, the questions listed for each issue are some of the major concerns identified during the scoping process. These concerns are addressed in *Section 4.0 - Management Direction*.

### ***Issue 1. Threatened and Endangered Species Management***

Laguna Atascosa NWR provides habitat for the endangered ocelot, jaguarundi, and northern aplomado falcon as well as threatened and endangered sea turtles and shorebirds. Issues include:

- What are the additional actions that need to be taken to benefit threatened and endangered species?

- Which areas should become priorities for potential acquisition or for the development of conservation agreements, particularly where there are inholdings within or between Refuge tracts for endangered species conservation and protection?
- What are future research needs for listed species?

***Issue 2. Wildlife Management***

Additional inventory and monitoring efforts are needed for more comprehensive population assessments of priority and focal species (*See Sections 3.2.7 and 3.2.8*), particularly at the Bahia Grande and South Padre Island units. The additional inventory and monitoring will help integrate and better direct wildlife and habitat management activities to benefit priority and focal species.

- What are the wildlife populations, distribution trends, and potentially adverse impacts on wildlife at the Bahia Grande, Coastal Corridor, and South Padre Island units and other tracts?
- What surveys and monitoring projects are top priorities on the Laguna Atascosa Unit, Bahia Grande Unit, Coastal Corridor Unit, and South Padre Island Unit?
- What other species and/or communities are priorities for management on the Laguna Atascosa Unit?
- What are future research needs for Federal trust species and other priority or focal species?
- What are the potential impacts of wind farms offshore of the South Padre Island Unit?

***Issue 3. Habitat Management and Restoration***

Habitat management programs on the Refuge are geared toward enhancement of the ecological integrity of biotic communities within the larger Texas Gulf Coast Ecosystem. These efforts are also consistent with Refuge purposes and the conservation of important fish and wildlife resources such as Federal trust species and priority and focal species.

- What are the primary management and restoration needs on the Laguna Atascosa Unit? Bahia Grande Unit? Coastal Corridor Unit? South Padre Island Unit?
- What invasive plant species occur on the Refuge, and what are the top priorities for management?
- What are the habitat management research priorities on the Refuge?

***Issue 4. Wetland Management and Restoration***

The quality and quantity of wetlands on the Refuge are extremely important to a variety of wildlife, particularly waterfowl and other migratory birds. The numerous impoundments, resacas, ponds, potholes, and drainages have the capability of incorporating an integrated water management regime. Freshwater is usually in short supply and the Refuge is almost completely dependent on rainfall. Issues include:

- What are the primary wetland and water management and restoration priorities?
- How can the Refuge maximize the available freshwater and increase the freshwater supply for wildlife use, including adding more tanks, ponds, and obtaining water from the irrigation districts?

- Given the high evaporation and distribution costs of river water, what mechanisms are available to make it feasible for the Refuge to purchase water?
- What are the long-term wetland management and restoration goals on the Bahia Grande Unit for the large estuarine basins and freshwater wetlands?

#### **Issue 5. Land Protection and Acquisition**

One of the key elements of wildlife and habitat conservation in the LRGV involves acquiring or otherwise protecting important land tracts that either contain natural vegetation representative of the Valley's native biotic communities or that can be used to connect important habitat units. Many of these lands are found along the river or resacas, or they exist as old pastures or agricultural fields that can be revegetated or restored for wildlife. In addition, working in partnership with non-governmental agencies (e.g., TNC, The Conservation Fund, National Audubon Society [Audubon], private landowners, or other agencies such as irrigation districts), can also help accomplish land protection objectives. To meet important long-term recovery goals for the ocelot, wildlife corridors and large land tracts are needed to allow for genetic exchange between ocelots at Laguna Atascosa NWR with ocelots along the river, in Mexico, and in the ranch country of Willacy and adjacent counties. The approved acquisition boundary for Laguna Atascosa NWR, which is the lead recovery station for ocelots, is limited to small portions of eastern Cameron County. This limits the Refuge's ability to create the wildlife corridors necessary for the recovery of the ocelot. However, the approved acquisition boundary for the Lower Rio Grande Valley NWR encompasses the four-county area of the Valley, and a primary objective of the Lower Rio Grande Valley NWR is to create wildlife corridors (*See Section 2.4*). Therefore, a coordinated land acquisition effort between the Refuge and Lower Rio Grande Valley NWR would help meet important recovery plan goals for the ocelot, as well as to connect refuge tracts for the mutual benefit of the fish, wildlife, plants, and their habitats on each refuge.

- What lands should be priorities for acquisition that can provide additional habitat for Refuge focal species and/or provide important connecting links between disjunct tracts, such as connecting the Bahia Grande Unit to the Laguna Atascosa Unit?
- For the Refuge to meet important recovery goals for the ocelot, should the Lower Rio Grande Valley NWR's current and future land acquisition goals include priorities for completing wildlife corridors that would connect LRGV NWR tracts with Laguna Atascosa NWR tracts, which would be complementary to each refuge's vision?
- What should the priorities and strategies be for acquiring inholdings at the South Padre Island Unit?

#### **Issue 6. Cultural Resources Management**

The area surrounding Laguna Atascosa NWR has a rich history of Native American use and Spanish exploration, as well as historic involvement in the Mexican War, the Civil War, and World War II. Interpreting the area's history and protecting important archaeological sites and cultural resources on the Refuge will allow the public to learn more about this history and the connection between people and the land.

- What actions should be taken to better understand and protect cultural and historical resources on the Refuge?
- What is the most effective way to interpret the Refuge's cultural resources?

***Issue 7. Interagency Coordination and Partnerships***

Strengthening existing partnerships while developing additional partnerships is a vital part of improving the quality of the Refuge experience and appreciation for the Refuge's natural resources and achieving the Refuge's vision. Issues include:

- How can interagency coordination be improved at the Federal, State, and local levels, particularly regarding management and law enforcement on the Bahia Grande and South Padre Island units?
- What additional partnerships should be established to benefit wildlife, increase support for the Refuge, and improve the quality of the visitor's experience?
- How can current partnerships be improved for the benefit of the Refuge, its wildlife, and visitor enjoyment?
- How can the Friends of Laguna Atascosa NWR group provide additional support to accomplish CCP goals?

***Issue 8. Visitor Services, Environmental Education, and Outreach***

The Refuge is nationally recognized as a significant birding hotspot and is becoming well-known as a significant butterfly watching area to observe rare and uncommon butterflies. Laguna Atascosa NWR has a locally-popular hunting program for white-tailed deer and exotics (e.g., feral hog). Birding, photography, hunting, and fishing currently attract between 210,000 and 250,000 visitors annually on the Laguna Atascosa Unit where visitor service facilities exist. These numbers do not reflect visitation to the other Refuge units where visitor service facilities do not exist. Protecting natural resources, while allowing for anticipated increases in public visitation, will be a major challenge. Issues include:

- What types of environmental education and interpretation should be implemented, especially on the Bahia Grande and South Padre Island units?
- What types of visitor service facilities should be developed on the Bahia Grande and South Padre Island units?
- Should the Refuge provide signage, brochures, and other outreach materials for Spanish-speaking visitors?
- How do we make our visitor services facilities and programs more accessible?
- What types of recreational, wildlife-dependent activities (priority public uses) would be appropriate for each Refuge unit?
- What types of new facilities and improvements to existing facilities are needed to improve the visitor experience and public safety during the next 15 years?
- What types of permanent signage or boundary markers are needed to ensure each Refuge tract is adequately marked to identify boundaries and authorized uses? Additionally, how can Refuge tracts on the South Padre Island Unit be properly marked to identify areas open to the public, since most Refuge tracts on this unit are poorly marked or not marked at all?

***Issue 9. Regional Transportation Issues Affecting the Refuge***

Due to the rapid pace of development in the LRGV, many existing highways and roads in the vicinity of the Refuge have been improved and expanded. New transportation routes have also

been proposed to address increasing population demands of the area. As the Refuge expands and roads and highways are continually improved and built to meet regional transportation needs, many of these would affect Refuge resources. In general, roadways pose significant barriers to wildlife movement (i.e., wildlife corridors) and promote further land development in and around the Refuge.

- How can the Refuge better coordinate with State and county road planners to address important Refuge concerns such as the condition of the roads leading to the Refuge?
- How will the undeveloped Park Road 100 right-of-way that bisects tracts on the South Padre Island Unit affect this unit?
- How will a proposed South Padre Island Second Access Project by the Cameron County Regional Mobility Authority affect the Refuge, and—more specifically—the Coastal Corridor Unit?
- Over the long term, how effective will the 11 wildlife crossings be in reducing the risk of ocelot road mortality and other collisions between wildlife and automobiles along the expanded FM 106 roadway?
- How can the Service work with partners, FHWA, and TXDOT to construct viable wildlife crossings at U.S. 77/83 to facilitate the Ranchito Corridor, North Valley Corridor, Ranchland Corridor, and Boca Chica Corridor connections for wildlife connectivity between tracts of the Lower Rio Grande Valley and Laguna Atascosa NWRs?
- How will the proposed Interstate 69 transportation corridor (currently U.S. Highway 77) affect connecting wildlife corridors (e.g., the North Valley Corridor) between tracts of the Lower Rio Grande Valley NWR and Laguna Atascosa NWR?
- Is there a need for additional wildlife crossings on existing major highways such as SH 100?

#### ***Issue 10. Staffing and Funding Needs***

Additional staff and funding will be needed to implement new or expanded programs to accomplish CCP goals for the Refuge, especially on the Bahia Grande and South Padre Island units.

- What level of staffing and funding is required to achieve the goals and objectives of this plan?
- Is current staffing and funding adequate to meet the long-term goals of the CCP?
- How can the Refuge expand its volunteer and intern programs to help meet staffing and funding shortages?

## **2.7 Expected Planning Outcomes**

The following outcomes should result from this comprehensive conservation planning effort:

- Ensure that management of Laguna Atascosa NWR reflects the policies and goals of the Refuge System and the purposes for which the Refuge was established.
- Identify the types and locations of compatible Refuge uses.
- Ensure that Laguna Atascosa NWR contributes to the goals of the Texas Gulf Coast Ecosystem and incorporates applicable elements of the relevant plans or initiatives, as outlined in *Section 2.4*.

- Provide a “vision” of desired future conditions for Laguna Atascosa NWR and goals, objectives, and strategies needed to achieve those conditions.
- Cooperate with other agencies, organizations, stakeholders, and partners on current and future projects that may affect the biological resources of Laguna Atascosa NWR.
- Provide an effective approach for budget requests for operational, maintenance, and capital development programs on the Refuge. This CCP can help in obtaining funding for Refuge projects and programs by clearly outlining long-term Refuge needs in advance.
- Provide timelines and priorities for plan implementation on Laguna Atascosa NWR.
- Provide long-term management direction of the Refuge, despite staff changes.
- Inform the public of the long-term plans of the Refuge, and seek public and State participation in the planning process.

## **2.8 Planning Process and Public Involvement**

The CCP planning process consists of the following eight steps. Some of the steps may be repeated, and/or more than one step can occur at the same time.

- Preplanning - form a core team and identify needs
- Identify issues and develop vision - public input is gathered on issues
- Develop goals and objectives - compiled from issues, resource partnerships, legal responsibilities
- Develop and analyze alternatives, including the proposed action
- Prepare draft plan and National Environmental Policy Act (NEPA) document - assess environmental effects and public comments
- Prepare and adopt final plan
- Review and revise plan

To begin the CCP process, a comment period notification was published in the *Federal Register* on July 19, 2004 (69 FR 43010-11). Draft documents and other relevant information for public review was made available at the Refuge headquarters. Internal pre-planning meetings were held at the Refuge in February and June, 2004, to discuss concerns, issues, and opportunities for the future of the Refuge. Four “open house” public scoping meetings were held between February 28 and March 8, 2005, at Raymondville, Brownsville, Harlingen, and South Padre Island to solicit initial public input and involvement during the early stages of CCP development. The TPWD was also invited to participate as a partner in the planning process on April 12, 2004. All comments received from the public were reviewed and considered throughout the CCP process. These comments will be addressed in the final CCP.

The CCP would guide management of the Refuge during the next 15 years. Plans are signed by the regional director, Region 2, thus providing regional direction to the Refuge manager and staff. Copies of the CCP would be provided to all interested parties when requested. Whenever there is a significant need, or at least every 5 years, the Refuge manager will review the plan and decide if a revision is necessary.

### 3. Refuge Resources

Laguna Atascosa NWR is a unique blend of temperate, subtropical, coastal, and Chihuahuan desert habitats. Mexican plants and wildlife reach their northernmost limits here, while migratory birds stop to rest and feed during the spring and fall. This combination makes Laguna Atascosa NWR world famous for its mix of birds and other wildlife. Eight federally-listed endangered or threatened species (ocelot, jaguarundi, northern aplomado falcon, piping plover, and the green, hawksbill, loggerhead, and Kemp’s ridley sea turtles) are known to occur on the Refuge. Approximately 450 plant, 415 bird, 42 mammal, and 44 reptile and amphibian species have been recorded on the Refuge.



View of the lower Laguna Madre along Bayshore Drive.  
Photo: USFWS

Refuge topography is typical of the Texas Coastal Plain, which is basically flat with a slope toward the Laguna Madre at about 17 inches per mile. The highest elevations at Laguna Atascosa occur on “lomas” (natural silty clay mounds), reaching heights from 20 to 36 feet, yet the majority of the Refuge is less than 10 feet above mean sea level. The landscape of the Refuge consists of an irregular pattern of meandering resacas, brushy lomas, coastal salt prairie, tidal flats, sand dunes, freshwater and estuarine wetlands, and impoundments.

#### 3.1 Habitats

The following contains a summary of the typical vegetation types, associated species, and habitat acreage. See Appendix A for a complete list of plants and corresponding scientific names and Appendix I (vegetation map).

##### 3.1.1 Wetlands

The Refuge has almost 55,000 acres of wetland habitats, ranging from freshwater to mostly brackish or salty. With the exception of the open waters of the Gulf of Mexico, three wetland types make up Laguna Atascosa NWR:

- Estuarine wetlands are tidally-influenced and semi-enclosed by land, but have partly obstructed or sporadic access to the ocean and are occasionally diluted by freshwater runoff;



Bahia Grande Wetlands. Photo: USFWS

- Lacustrine wetlands are generally deep, open water habitats situated in topographic depressions or dammed river channels, greater than 20 acres in size, and lacking trees, shrubs, or persistent emergent vegetation; and
- Palustrine wetlands are non-tidal wetlands dominated by trees, shrubs, and other persistent emergent vegetation. It also includes wetlands lacking such vegetation, but having less than 20 acres, lacking a wave-formed shoreline, a water depth less than 6.6 feet, and low salinity (Cowardin *et al.* 1979)

The largest wetland feature on the Refuge is the expansive estuarine system along the lower Laguna Madre boundaries. Water regimes are affected by tides, rainfall, freshwater runoff, evaporation, and wind, which create the unique hypersaline conditions found in the Laguna Madre. These conditions have created a rich resource of fish, shellfish, algal mats, bird colonies, migratory bird wintering and staging areas, and seagrass beds. Thus, it is one of the most productive estuarine systems in the United States (Jones 1999). A recent addition of estuarine habitat to the Refuge was the flooding of the Bahia Grande in 2005. Historically, a productive shrimp, oyster, fish, and crab nursery, with bird nesting islands, the Bahia Grande wetland system (about 10,000 acres), was cut off from the Laguna Madre in the mid-1930s with the construction of the Brownsville Ship Channel. About 22,600 acres of shallow, tidally-influenced wetlands occur on the Refuge. Common vegetation found in or on the margins of these wetlands are shoregrass (*Monanthochloe littoralis*), saltwort (*Batis maritima*), glasswort (*Salicornia bigelovii*), shoalgrass (*Halodule beaudettei*), and manateegrass (*Syringodium filiforme*).



Laguna Atascosa Lake. Photo: USFWS

The landscape of the Laguna Unit has many lacustrine wetlands. A main lacustrine wetland feature is the 5,000-acre impoundment system known as Laguna Atascosa (which means “muddy lagoon”) and includes the Upper Cayo Atascosa and the Laguna del Cayo. This wetland system contains fresh to brackish permanent water with a maximum depth of about four feet. Inflows to this system are from agricultural runoff and rainfall. Another large lacustrine wetland, Pelican Lake, does not contain permanent water. However, following heavy rains, it may hold up to 1,000 surface acre-feet of water. The Resaca de los Cuates

normally contains about 500 acres of impounded water. Depths vary considerably, from a few inches to six feet. Water in the resaca system may be obtained through an irrigation district, but is normally filled through rainfall and surface water runoff. Other wetlands included in the lacustrine systems are large ponds or impoundments, such as Laguna de los Patos, Bayside Lake, Morancho Blanco Impoundment, Pintail Pond, and Horseshoe Lake, which collectively account for approximately 500 acres of seasonally flooded wetlands.



Alligator Pond on the Laguna Atascosa Unit.  
Photo: USFWS

Many palustrine wetlands are scattered throughout Laguna Atascosa NWR. These consist of the pothole wetlands, ephemeral ponds, resacas, inter-dunal ponds, coastal prairie wetlands, old stock tanks, small impoundments, and coastal marshes. These wetlands are extremely important to wildlife, as they are the only source of freshwater on the Bahia Grande and South Padre Island units. Common vegetation found in or on the margins of these wetlands are saltwort, glasswort, sea ox-eye daisy, Gulf cordgrass, and cattails.

### 3.1.2 Beaches, Dunes, and Tidal Flats



Inter-dunal zone on the Refuge.  
Photo: USFWS

There are over eight miles of beachfront on the South Padre Island Unit. Padre Island has been cited as the longest barrier island in the world (Britton and Morton 1989) and is continually being reshaped by wind, wave, and current action. The barrier island habitats transition from sandy beaches along the Gulf shore, moving inland to the sharp rises of the Gulf dune lines, progressing onto the inter-dunal area (deflation plain), and terminating with broad mudflats or wind tidal flats bordering the Laguna Madre. In some places, Gulf dune lines can reach over 30 feet high. The inter-dunal area and mudflats make up about 80–90 percent of the area behind the Gulf

dune lines and is mixed with grassy cover, smaller dunes, slightly larger back island dunes, brackish marshes, and ephemeral freshwater ponds. Typical vegetation includes cattails, sea oats (*Uniola paniculata*), cordgrass (*Spartina spp.*), bulrushes (*Scirpus spp.*), sedges (*Cyperus spp.*), spikerushes (*Eleocharis spp.*), and railroad vine (*Ipomoea pes-caprae var. emarginata*). Soils on the higher elevations contain pure sand, which gradually mixes with clay in the lower elevations toward the Laguna Madre.



Sea oats on the dunes. Photo: USFWS

### 3.1.3 Coastal Prairie and Savannah

Laguna Atascosa NWR contains about 19,800 acres of coastal prairie and savannah habitat, which is the second most prevalent habitat type on the Refuge. The Refuge's prairies are



Coastal Prairie on the Refuge.  
Photo: USFWS

dominated by Gulf cordgrass (*Spartina spartinae*). Generally, two grassland habitat types are delimited by soil salinity and elevation. The first type is the “salt-prairie,” which is at or near sea level, and includes salt-tolerant plants such as leatherleaf (*Maytenus phyllanthoides*), seepweed (*Sueda linearis*), glasswort, saltwort, shoregrass, sea ox-eye daisy (*Borrichia frutescens*), and sea lavender (*Limonium nashii*). On slightly higher elevations, the second type contains Gulf cordgrass (*Spartina spartinae*), which may be interspersed with woody vegetation such as trecul yucca (*Yucca treculeana*), honey mesquite (*Prosopis glandulosa*), and pricklypear cactus (*Opuntia*

*engelmannii* var. *lindheimeri*) to form a savannah. Mixed stands of huisache (*Acacia farnesiana*), retama, and mesquite often extend into the grassland or brushland margins. These higher elevation grasslands, from 6 to 10 feet above sea level, may also contain a prevalence of grasses such as seashore paspalum (*Paspalum vaginatum*), seashore dropseed (*Sporobolus virginicus*), and various bluestem species. However, many of these native grasslands have been dominated by invasive species such as Bermuda grass (*Cynodon dactylon*), guineagrass (*Panicum maximum*) and buffelgrass (*Pennisetum ciliare*). In South Texas, the coastal prairie and savannah provides essential foraging and nesting habitats for the endangered northern aplomado falcon.

### 3.1.4 Brushlands and Lomas

Although many early writers alleged widespread brush encroachment into the southern Texas coastal grasslands (e.g., Cook 1908); this notion has since been challenged by later, more comprehensive studies, as seen in Johnston (1955, 1963). Johnston (1963) stated that the “...plains and low hills of extreme southern Texas and Tamaulipas were covered by more or less dense growths of shrubs and low trees...” According to Inglis (1964), native brush habitat once extended as far as 30 miles on either side of the Rio Grande. Brushlands are the upland forested habitats represented at



Laguna Atascosa’s brushland habitat. Photo: USFWS

Laguna Atascosa NWR. Brushland occupies about 11,400 acres of the Refuge, which are generally well drained soils and not normally flooded. These areas are dominated by woody vegetation with 50 percent or more canopy cover. A unique brushland habitat type occurs on the Refuge’s lomas because of their higher elevations and variations in soil salinity, which results in differing vegetational zones on the same loma. Clover (1937) describes the brushland vegetation of the lomas of eastern Cameron County as “islands” of chaparral and mesquite. Common brushland vegetation includes granjeño or spiny hackberry (*Celtis pallida*), brasil (*Condalia hookeri* var. *hookeri*), coyotillo (*Karwinskia humboldtiana*), retama (*Parkinsonia aculeata*), Texas ebony (*Pithecellobium flexicaule*), huisache, yucca, prickly pear cactus, and colima (*Zanthoxylum fagara*). The understory includes brush such as whitebrush (*Aloysia gratissima*), snake eyes (*Phaulothamnus spinescens*), cenizo (*Leucophyllum frutescens*), and Texas lantana (*Lantana horrida*). The understory of some brushland habitats (e.g., mesquite woodlands) are dominated by invasive grasses due to past disturbance. On the open, grassy portions of the lomas, two rare plants found only on the lomas are lila de las lomas (*Echeandia texensis*) and lila de los llanos (*Echeandia chandleri*). In 1999, *E. texensis* was recognized as a distinct species known only from historic collections from the Refuge and nearby Green Island (Cruden 1999). However, the spread of invasive grasses, such as buffelgrass and guineagrass, threaten these rare plant communities. The brushlands on the lomas are essential to the survival of the endangered ocelot, as well as providing protective roosting habitat for aplomado falcons.

See Appendix A for a complete list of plants and corresponding scientific names.

### 3.1.5 Invasive Plant Species

Buffelgrass, guineagrass, Brazilian peppertree (*Schinus terebinthifolius*), and saltcedar (*Tamarix aphylla*) are of particular concern on Laguna Atascosa NWR. The Refuge has conducted limited control of buffelgrass and other invasive plants along roads and trails. Saltcedar has been mechanically controlled on Refuge levees and dikes, and cattails (*Typha domingensis*) have been controlled with prescribed fire. The spread of these invasive species and potential exacerbation by management activities like prescribed fire will need to be monitored to assess future threats and control measures.

See Appendix A for a listing of invasive plants that occur or may occur on the Refuge.

## 3.2 Fish and Wildlife

The unique combination of temperate, subtropical, desert, and coastal habitats that converge at the Refuge makes it one of the best areas in the United States to see a variety of wildlife. Over 450 identified plants, 415 recorded bird species (more than any other national wildlife refuge), 45 types of mammals, 44 reptile and amphibian species, and about 40 fish species are known to occur on the Refuge. See Appendices A–C.

### 3.2.1 Mammals

There are 45 resident mammal species known to inhabit the Refuge. Mammals commonly seen on the Refuge include white-tailed deer, coyote, bobcat, collared peccary (javelina), and eastern cottontail rabbits. Other rarer or less obvious mammals include ocelot, raccoon, grey fox, long-tailed weasel, Mexican ground squirrel, nine-banded armadillo, bats, and various rodent species. The Refuge population of white-tailed deer is healthy and stable, and good deer habitat is abundant, primarily on the Laguna Atascosa Unit. Deer can often be seen in the coastal prairies, along wooded or brushy areas of the auto tour routes, and along the access roads near the Refuge headquarters. Feral hogs (*Sus scrofa*) and exotic nilgai antelope (*Boselaphus tragocamelus*) also occur on the Refuge and are considered pest species.

See Appendix A for a complete list of mammals and corresponding scientific names.

### 3.2.2 Birds

Birds are the most varied wildlife group on the Refuge, with 415 recorded species and 95 nesting species. This is the highest number of birds recorded on any national wildlife refuge, which makes Laguna Atascosa one of the top ten birding “hotspots” in the nation. Laguna Atascosa NWR thrives with migratory, wintering, and nesting waterfowl, shorebirds, and songbirds each year.



Great Kiskadee. Photo: Carlos Fiol

The Refuge is strategically located on the southern end of the Central Flyway and is a major stopover point on the lower Texas coast for waterfowl going to and from Mexico. More waterfowl winter here than any other place on the lower Texas coast. From September through March, thousands of ducks can be found on the Refuge. In November alone, when peak use occurs, over 250,000 ducks are on the Refuge and thousands more are on the Laguna Madre adjacent to the Refuge. Commonly seen waterfowl include redheads, pintails, greater white-fronted geese, and snow geese. In fact, the majority of redhead ducks in the United States winter at or near Laguna Atascosa NWR. The Refuge’s cordgrass habitat provides important nesting areas for mottled



Roseate spoonbills. Photo: Carlos Fiol

ducks. Mottled duck populations have been declining in Texas over the past several decades and are a focal waterfowl species on the Refuge.

In 2001, Laguna Atascosa NWR was officially designated a Western Hemisphere Shorebird Reserve Network (WHSRN) site, along with Rancho Rincón de Anacahuatas in Mexico. These sites make up the first bi-national sites within the WHSRN that, together, host at least 100,000 shorebirds annually. Five species of shorebirds are known to nest here: snowy plover, Wilson's plover, kildeer, black-necked stilt, and American avocet. With the exception of the Laguna Madre shoreline, more than 38,000 acres (about 40 percent) of Laguna Atascosa NWR are comprised of

wetlands and mudflats, making it a significant wintering and migratory stopover and a major shorebird and waterbird breeding area. The South Padre Island Unit supports the highest numbers of breeding pairs for snowy and Wilson's plovers in the lower Laguna Madre region (Zdravkovic and Hecker 2004).

In 1993, the aplomado falcon re-introduction program began with the first large-scale releases occurring on the Laguna Atascosa Unit. The Refuge's coastal prairie, savannah, and marshes offer some of the best aplomado falcon habitat. The re-introduction in South Texas has been deemed a success, and pairs of released birds and their offspring regularly nest and reside on the Bahia Grande and Laguna Atascosa units. Padre Island is also well-known for hosting large concentrations of fall and spring migrating peregrine falcons (Hunt *et al.* 1975, Earthspan 2003). It is an internationally important staging area for these falcons.

In addition to waterfowl, shorebirds, and raptors, the Refuge is a vital migratory stopover for Neotropical songbirds, particularly during spring migration when these birds are more concentrated on the Refuge. The Laguna Atascosa and South Padre Island units are important "fallout" areas for Neotropical passerine birds moving northward in the spring. Typical Neotropical passerines include indigo bunting, painted bunting, blue grosbeak, orchard oriole, Bullock's oriole, various warblers, vireos, tanagers, flycatchers, kingbirds, and hummingbirds. The passage of strong cold fronts during the spring migration can cause thousands of Neotropical songbirds to fallout on the Refuge to seek shelter from the strong winds and food to fuel their northward journey. These events make excellent opportunities to see thousands of songbirds concentrated in a small area.

### ***Migrating and Wintering Birds***

The Flyway System was initiated in 1948 to allow for differing regulations relating to individual waterfowl populations migrating through each "flyway." The term "flyway" has long been used to designate the migration routes of birds. For management purposes, four flyways (Pacific, Central, Mississippi, and Atlantic), were established in the United States (see Figure 3-1). The Refuge is located within the southern end of the Central Flyway, which in totality forms an extensive geographical area that reaches from Alaska and central arctic Canada to South America. Being along the coastline, some migrating birds are "funneled" through Laguna Atascosa NWR from the Mississippi Flyway as well.

The management objectives of Laguna Atascosa NWR contribute to those of the Central Flyway Management Program. The Refuge fulfills the purpose of its establishment by

providing quality winter habitat to sustain high numbers of migratory bird populations, particularly waterfowl and shorebirds, as well as raptors such as peregrine falcons. South Padre Island is a significant staging area for migrating peregrine falcons, as the majority of these falcons pass through the island on their way from arctic nests to Mexico, the Caribbean, and Central and South America each year. Although there are many outside factors influencing the bird use of the Refuge, maintaining the health and condition of important stopover and winter habitat positively affects their migrational and reproductive successes each year.

See Appendix A for a complete listing of birds and corresponding scientific names found on the Refuge.

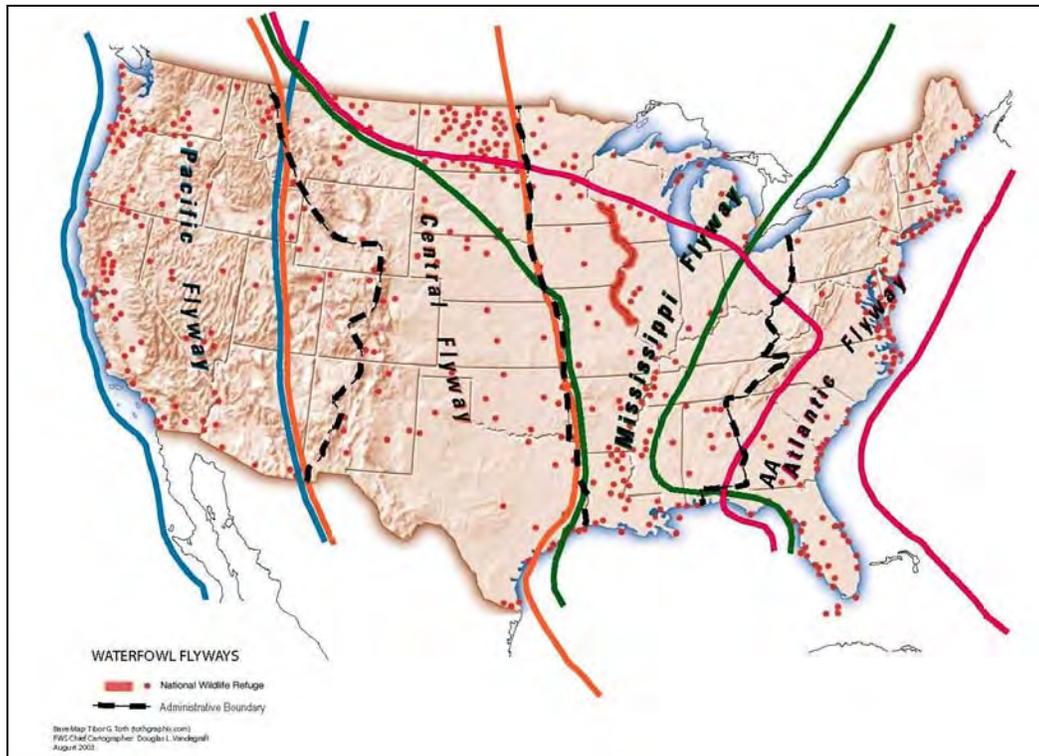


Figure 3-1. Waterfowl Flyways and National Wildlife Refuges

### 3.2.3 Reptiles and Amphibians

At least 44 species of reptiles and amphibians are known to inhabit Laguna Atascosa NWR. Being in a semi-tropical area, the Refuge hosts a variety of interesting herpetofauna. Typical species that may be seen on the Refuge include Texas tortoise, six-lined racerunner lizard, bullsnake, and red-eared slider turtles. Rarer species include the sea turtle, American alligator, coral snake, Texas indigo snake, Texas horned lizard, Rio Grande leopard frog, Texas spiny softshell turtle, Rio Grande lesser siren, and black-spotted newt.



American alligator. Photo: USFWS

See Appendix A for a complete listing of reptiles and amphibians and corresponding scientific names found on the Refuge.

### 3.2.4 Fishery Resources

About 40 species of fish occur on Laguna Atascosa NWR, ranging from freshwater and brackish water species to saltwater species. The predominant fish species found on the Laguna Atascosa and Bahia Grande units either in upland freshwaters or in the tidal areas of the Laguna Madre are alligator gar (*Atractosteus spatula*), gizzard shad (*Dorosoma cepedianum*), blue catfish (*Ictalurus furcatus*), Gulf killifish (*Fundulus grandis*), and sheepshead minnow (*Cyprinodon variegatus*). Other fish species include spotted gar (*Lepisosteus oculatus*), carp (*Cyprinus carpio*), striped mullet (*Mugil cephalis*), red drum (*Sciaenops ocellatus*), black drum (*Pogonias cromis*), spotted seatrout (*Cynoscion nebulosus*), silverside minnow (*Menidia beryllina*), and sheepshead minnow (*Cyprinodon variegatus*).

See Appendix A for a complete listing of fishery resources and corresponding scientific names found on the Refuge.

### 3.2.5 Invertebrates

Invertebrates, particularly insects, have the highest known numbers of species of any animal group at well over 900,000 (Barnes 1987). Invertebrates are a critical part of the food web and play important ecological roles such as in nutrient cycling, energy transfer, and plant reproduction. Snails, crustaceans, and insects are the most important invertebrate groups for breeding ducks. Worm-like midge larvae are especially important to waterfowl and occur in aquatic vegetation and in all types of wetlands (Eldridge 1990). Snails (Gastropoda) can be good indicators of overall ecosystem health, since they usually require relatively uncontaminated wet environments. Shorebirds are highly dependent on invertebrate food items (copepods, midges, worms, and mollusks) during their migration, feeding on small invertebrates found in mudflats, on Gulf beaches, and on the shorelines and in shallow waters of other wetlands. Common aquatic invertebrates on the Refuge include water bugs (Hemiptera), crayfish, and fiddler crabs. Terrestrial invertebrates such as damselflies and dragonflies (Odonata) are common on the Refuge, as well as mosquitoes and midges (Diptera), beetles (Coleoptera), and moths and butterflies (Lepidoptera). Some migratory and resident birds, including songbirds and Neotropical migrants, are highly dependent on insects as their primary food source. On the Refuge, these birds include loggerhead shrikes, woodpeckers, paraques, nighthawks, kingbirds, and orioles.



Blue metalmark. Photo: Ellie Thompson

The Refuge visitor center has on display a butterfly garden containing important butterfly host plants such as cenizo, croton, and milkweed, and nectar plants such as lantana, eupatorium, and white plumbago (*Plumbago scandens*). Some uncommon or rare butterfly species on the Refuge include the Blue metalmark, Xami hairstreak, Clytie ministreak, and Theona checkerspot. An extremely rare species, Xami hairstreak (*Callophrys xami*) has recently been found on the Bahia Grande Unit (2007), and in prior years on the Laguna

Atascosa Unit. This rare butterfly depends on a single host plant, coastal stonecrop (*Sedum texana*), which is found only in a few isolated areas of the Refuge. Other notables seen throughout the year are great southern whites, giant swallowtails, and whirlabouts. To date, over 128 species of butterflies have been documented on the Refuge, most of them at the visitor center's butterfly gardens.

See Appendix A for a complete listing of butterflies and corresponding scientific names found on the Refuge.

### 3.2.6 Federally-listed Species

A major purpose of the Endangered Species Act (ESA) is to “...conserve the ecosystems upon which endangered and threatened species depend...” and to provide a program for the conservation and recovery of listed species. Under the law, species may be listed as either “endangered” or “threatened.” Endangered means a species is in danger of extinction throughout all or a significant portion of its range. Threatened means a species is likely to become endangered within the foreseeable future. All species of plants and animals, except pests, are eligible for listing as endangered or threatened. Proposed species means any species of fish, wildlife, or plant that is proposed in the *Federal Register* to be listed under the ESA. *See also: Appendix B.*

Species declines resulting in their additions to the threatened and endangered species lists are often related to habitat loss and fragmentation. Approximately 95 percent of the native habitat in the LRGV has been converted for agricultural or urban development. Ranching and farming, oil and gas development, beach development, road building, housing and other urbanization, irrigation and drainage systems, and/or land clearing contribute to habitat loss or alteration. Laguna Atascosa NWR provides essential habitat for some of the most endangered species in the United States. Eight federally-listed species (ocelot, jaguarundi, northern aplomado falcon, piping plover, and the Kemp's ridley, loggerhead, green, and hawksbill sea turtles) depend on the Refuge on a regular or seasonal basis. There are no federally-listed plants currently known to occur on Laguna Atascosa NWR.

**Ocelot (*Leopardus pardalis*)** - The ocelot is a medium-size spotted cat that ranges from southern Texas to northern Argentina in humid, tropical and subtropical forests, coastal mangroves, swampy savannas, and semi-arid thornscrub (USFWS 1990a). The ocelot was listed as endangered (without critical habitat) in 1972 due primarily to over-collection for the fur trade and habitat loss (37 FR 2589). These primarily nocturnal cats usually feed on small mammals and birds and require large home ranges. The ocelot prefers dense thornscrub or brush occurring along riparian areas, drainages, lomas, and other uplands, but it has also been found in other dense habitats such as live oak forest with brushy understory. Optimal habitat consists of dense thornscrub with 95 percent or more canopy cover (USFWS 1990a), although they also use less dense habitats for foraging and dispersal. Laguna Atascosa NWR supports the largest known United States population of these rare and endangered cats, and there is approximately 9,000 to 11,000 acres of suitable habitat on the Laguna Atascosa Unit. Current estimates indicate fewer than 50 ocelots remain



Ocelot. Photo: Carlos Fiol

in the United States (all in southernmost Texas), and about 10–25 occur on and adjacent to the Laguna Atascosa Unit of the Refuge (Jody Mays, personal communication 2009).

Road kills are the primary cause of direct mortality to the remaining ocelot population as urbanization, road construction, and other development in the LRGV area has recently increased. Habitat loss and fragmentation was and still is a major reason for their endangered status. Long-term survival of this species depends not only on the protection of large, densely-vegetated brushlands or other suitable habitats and safe wildlife corridors between them, but also on addressing the small population sizes, population isolation, and loss of genetic diversity. According to Haines *et al.* (2006), a population viability analysis shows there is a 33 percent probability that ocelots in southern Texas would become extinct within 50 years under current conditions. Genetic analysis (Janecka 2006) indicates that the only two known breeding populations remaining in the United States are isolated from populations in Mexico and from each other. With respect to the Refuge's ocelot population, since 1990, ocelots on or near Laguna Atascosa NWR have lost nearly all of their genetic diversity (Janecka *et al.* 2007). Currently, the effective population size of ocelots on the Refuge is estimated to range from 8 to 13.9 breeders (Janecka *et al.* 2007). The ocelot population in Cameron County has suffered severe declines and loss of genetic diversity. Genetic heterozygosity has decreased 23 percent since 1986 (Janecka *et al.* 2007). Further adding to the genetic dilemma is recent legislation authorizing the construction of a border fence between the United States and Mexico that may be waived of all Federal environmental laws or wildlife considerations, as per the REAL ID Act of 2005 (Bies 2007).

**Gulf Coast Jaguarundi (*Herpailurus yagouaroundi cacomitli*)** - The jaguarundi is a small, exceedingly rare wildcat in the United States, weighing between 8 and 16 pounds with a relatively long tail and short legs. Coloration is widely variable, ranging from blackish to brownish-gray or reddish-yellow to chestnut (Hall 1981). The last known record of a jaguarundi in the United States was along State Highway 4, just east of Brownsville, Texas, when one was found road-killed in 1986 in an area where the road intersects an old resaca. There have been several reported sightings on the Laguna Atascosa NWR in recent years, and historically, jaguarundis have been documented on the Laguna Atascosa Unit. However, despite recent efforts to document the existence of these cats on the Refuge and in the vicinity, researchers have been unable to photograph or trap one. It is now estimated that less than 15 cats may exist in South Texas (Klepper 2005). Just like the ocelot, brush clearing activities in the LRGV have eliminated much of their habitat, leading to their endangered status. Efforts aimed at preserving and restoring native brush are necessary to support any remaining cats, particularly in eastern Cameron and Willacy counties.

**Northern Aplomado Falcon (*Falco femoralis septentrionalis*)** - The aplomado falcon is a rare, non-migratory, medium-sized Neotropical falcon of the open grasslands ranging from the southwestern United States and Mexico through Central and South America. The aplomado falcon is approximately 12–15 inches long and has a wingspan of about three feet. In South Texas, the aplomado falcon inhabits coastal prairie and savannahs with prominent scattered woody vegetation, typically a flat open area with low growing vegetation containing



Aplomado falcon. Photo: Larry Ditto

yuccas or mesquite trees. The species feeds primarily on small birds, but a variety of insects, crustaceans, small reptiles, and mammals are also prey items (C. Perez, personal observation 1993 and 1994). Aplomado falcons are generally year-round residents within the LRGV.

The northern subspecies of aplomado falcon (*F. f. septentrionalis*) was listed as endangered in 1986 due to its extirpation in the United States and evidence of pesticide contamination and population declines in eastern Mexico (51 FR: 6686-6690). Hector (1987) states that the aplomado falcon may have begun its decline in the United States as early as 1905, but became exceedingly rare after 1930. The majority of aplomado falcon egg and skin collections in the United States between 1890 and 1910 were from South Texas (USFWS 1990b). Egg collection cards and other historical records (Oberholser 1974) indicate that the species was apparently concentrated in the “salt prairie” between Brownsville and Port Isabel (Bahia Grande Unit area), as this is where major collecting activities occurred in the late 1800s to the early 1900s. It is, therefore, plausible that the original decline of the aplomado falcon in the LRGV was most likely due to over-collection than from habitat degradation that occurred in other parts of its United States range (Chihuahuan desert grasslands of western Texas, southern New Mexico, and southeastern Arizona).

Today, the aplomado falcon has made a comeback in South Texas due to an aggressive recovery program involving captive breeding and re-introduction efforts. In 1993, releases began on the Laguna Atascosa Unit in partnership with The Peregrine Fund, a non-profit conservation group based in Boise, Idaho. In 1995, the first known United States nest of an aplomado falcon since 1952 was documented near Old Port Isabel Road and Loma Alta, a few miles southwest of the Bahia Grande Unit. As of 2004, over 900 falcons have been released in the LRGV, and 25 nesting pairs were documented in 2006. The release program in the LRGV was deemed a success, and efforts have now shifted to West Texas and New Mexico. Established territories and nesting have been annually documented in recent years on both the Bahia Grande and Laguna Atascosa units, and monitoring of aplomado falcons continues on the Refuge to document nesting and fledgling success and to monitor contaminant levels. Prescribed fire is used to manage for healthy grassland habitat that would benefit the aplomado falcon. The Refuge currently has 19,800 acres of coastal prairie and savannah suitable for aplomado falcons.

Continued development within suitable habitat is another major problem, and contaminant problems for the aplomado falcon are most likely because the falcons are foraging territories adjacent to farm fields (e.g., cotton fields) treated with pesticides. Data from recent aplomado falcon nests examined in South Texas have detected levels of PCBs, DDE, and mercury concentrations in the eggshells (Mora *et al.* 1997). Mora concluded that potentially high DDE levels in certain prey species could result in negative effects on reproduction and survival of aplomado falcons. Other agricultural chemicals, such as carbamates, could cause direct mortality.

**Piping Plover (*Charadrius melodus*)** - The federally-threatened piping plover has undergone serious declines related to direct and inadvertent harassment of birds and nests by people, dogs, and off-road vehicles (ORVs); destruction of beach habitat for development projects; increased predation due to human presence in formerly pristine beach areas; and water level regulation activities that endanger nesting sites along the Missouri, Platte, and Niobrara rivers (Haig 1992). The piping plover winters along beaches and in sandflats and mudflats from Florida to northern Mexico (Haig and Oring 1988). Some of the largest known wintering populations of the piping plover and snowy plover occur along the lower Laguna Madre of South Texas (Brush 1995). During the winter months, they occur mainly on high mudflats and algal flats free of

vegetation encroachment (Brush 1995). They are also noted on the beach areas along the Gulf. The piping plover is not known to breed on Laguna Atascosa NWR.

**Kemp's Ridley Sea Turtle (*Lepidochelys kempii*)** - The federally-endangered Kemp's ridley sea turtle is one of the smallest sea turtles, measuring about 23 to 27 inches long and weighing about 100 pounds (*Source: NPS-Padre Island National Seashore Web article 2006*). The Kemp's ridley is found mainly in the Gulf of Mexico, but also occurs in the northwestern Atlantic Ocean. The species prefers the shallow Gulf coastal waters where it feeds mainly on crabs (NMFS and USFWS 1992). The Kemp's ridley has one of the most restricted ranges of any sea turtle, and its major nesting concentration is along the northeastern Mexican coast. Around 1947, populations were at their highest known point; in one day, an estimated 40,000 females were recorded during an "arribada" or mass nesting emergence at the beach along Rancho Nuevo, Mexico (NMFS and USFWS 1992). Since then, populations have sharply declined due, originally, to the ongoing exploitation of their eggs and later due to mortality of juveniles and adults as by-catch in shrimp trawler nets. By 1985, only about 700 nests were documented in the same area. Shrimping operations have now incorporated the use of turtle excluder devices or TEDs, which have significantly reduced the incidences of sea turtles getting caught in trawler nets. Escalating threats include beach development, ORVs, non-native dune vegetation, beach renourishment, and mechanized beach cleaning activities. In 1978, the governments of Mexico and the United States joined to help establish another nesting colony at Padre Island National Seashore. Currently, due to bi-national efforts and an aggressive turtle nest protection, relocation, and monitoring program, Kemp's ridley sea turtle populations are stable or increasing. The number of Kemp's ridley nesting in the United States has steadily increased from six nests in 1996 to 102 in 2006 (*Source: NPS-Padre Island National Seashore*). Thirteen of these nests occurred on the South Padre Island Unit and at other sites on South Padre Island.



Kemp's Ridley Sea Turtle hatchlings returning to the sea. Photo: USFWS

**Loggerhead Sea Turtle (*Caretta caretta*)** -The loggerhead is a fairly large sea turtle, measuring up to 45 inches long and weighing over 350 pounds. This turtle inhabits the temperate and tropical waters of both hemispheres that include the continental shelves and estuarine environments along the margins of the Atlantic, Pacific, and Indian Oceans (NMFS and USFWS 1991b). This is the most commonly found sea turtle in the southeastern United States, particularly noted around wrecks, underwater structures, and reefs, where they feed on crabs, jellyfish, and mollusks. In the United States, the species nests from Texas to as far as the Virginia coast, but the majority of nesting occurs in southeastern Florida. Along the Texas coast, there are one to five documented nests per year (*Source: NPS-Padre Island National Seashore Web article 2006*). This species was listed as threatened in 1978 due to population declines stemming from egg collection and mortality from commercial fishing. The species still faces a variety of threats such as the loss of nesting habitat from coastal development; placement of erosion control structures and other barriers to nesting; lighting; vehicular and pedestrian traffic; beach nourishment; commercial fisheries; and pollution of the marine environment (NMFS and USFWS 1991b, NMFS and USFWS 2007). Currently, the

species is declining in the U.S., based on the most recent nesting surveys (NMFS and USFWS 2007). These turtles have nested on the South Padre Island Unit.

**Green Sea Turtle (*Chelonia mydas*)** - The green sea turtle is the largest shelled or “thecate” sea turtle, growing up to 48 inches long and weighing up to 450 pounds. The green sea turtle occurs throughout the world in tropical and subtropical waters, feeding on pastures of seagrasses and algae. In the United States, this species nests primarily along the eastern coast of Florida, but in Texas, one to five nests are found per year on the Padre Island National Seashore. During recent years, nesting has increased both on the east coast of Florida and in Tamaulipas, Mexico (*Source: NPS-Padre Island National Seashore Web article 2006*). On the Refuge, green sea turtles can be found within the bays and along the Gulf Coast. Young green sea turtles are commonly seen in the Port Mansfield cut, on the north end of the South Padre Island Unit, feeding on the algae on the jetty rocks. In 1978, the green sea turtle was listed as threatened except for the breeding populations in Florida and the Pacific Coast of Mexico, which are listed as endangered (NMFS and USFWS 1991a). Green sea turtles have been historically exploited by people as food items; coupled with over-fishing and their exceptionally long reproductive cycle, populations have been seriously depleted. Currently, they continue to be exploited, and degradation of nesting and foraging habitats are serious problems (NMFS and USFWS 1991a).

**Hawksbill Sea Turtle (*Eretmochelys imbricata*)** - The hawksbill sea turtle is one of the smaller sea turtles occurring worldwide in tropical to subtropical waters. They typically weigh 95–165 pounds and reach a shell length of about 34 inches. They can be found in shallow coastal areas, lagoons, and coral reefs where—although they are omnivorous—they mainly feed on sponges. Within the continental United States, hawksbills occur in southern Florida, such as the Florida Keys, and along the Texas coast. Within the Refuge, this species may occur in the bays and inlets to the Gulf of Mexico. Observations in Texas are usually post-hatchling or juvenile turtles believed to have originated from nesting beaches in Mexico (NMFS and USFWS 1993). However, one nest was recorded in 1998 on Padre Island National Seashore. The species was listed as endangered in 1970 due to numerous threats, but the main reason for their decline is the taking of these turtles for their shell. Their colorful ornate shell is used to make “tortoise shell” jewelry and many other items (*Source: NPS-Padre Island National Seashore Web article 2006*).

### 3.2.7 Refuge Priority Species

These wildlife or plant species include Federal trust species such as migratory birds, threatened species, endangered species, inter-jurisdictional fish, marine mammals, and other species of concern. Priority species also include rare or declining species, or species of management concern that are on lists maintained by natural heritage programs, State wildlife agencies, other Federal agencies, or professional, academic, and scientific societies; and those mentioned in landscape-level or other conservation plans. The following priority species are known to occur, or the species’ potential habitat occurs, on the Refuge.

**Redhead (*Aythya americana*)** - Redheads are medium-size diving ducks that commonly winter in the coastal bays and lagoons along the Laguna Madre. They breed in the western United States and Canada and arrive on Laguna Atascosa NWR from mid-October through the end of November. About 80 percent of the redhead population winters in the Laguna Madre, and this species accounts for over 60 percent of the duck use on the Refuge. Redheads feed in the Laguna Madre on seagrasses such as shoalgrass (*Halodule wrightii*) and use the fresh and brackish water lagoons and lakes for drinking water and for loafing.

The Laguna Madre is the chief wintering habitat for redheads because of the abundance of seagrasses, the relatively undisturbed nature of the area, and the availability of freshwater sources in the adjacent mainland. Industrial, urban, and recreational developments along this area influence waterfowl use of the Laguna Madre. Because of this, the value of Laguna Atascosa NWR will become even more important to this species as development, use, and pollution of the Laguna Madre increases. In dry years, there is a shortage of freshwater wetlands along the Laguna Madre, and lakes such as Laguna Atascosa Lake and the Laguna del Cayo become increasingly important to this species.

Historically, redheads have used the lacustrine wetlands on Laguna Atascosa NWR as a source of freshwater and as a loafing area when disturbed by people or high winds on the Laguna Madre. Redheads primarily use Laguna Atascosa Lake, Upper Cayo Atascosa, Laguna del Cayo, and Pelican Lake.

**Mottled Duck (*Anas fulvigula*)** - The mottled duck is a medium-size dabbling duck found only along the Gulf of Mexico's coastline. The mottled duck, similar in appearance, but paler than the American black duck, lives a sedentary life in the fresh and brackish coastal wetlands. They are non-migratory and usually begin breeding by January, and the young fledge around August (Audubon 2002). The mottled duck has suffered severe declines due to the loss of coastal wetlands and hybridization with introduced populations of mallard (Audubon 2002). This is particularly prevalent in Florida, as much of that State's wetlands have been drained for urban development. Along the Texas coast, the Refuge has one of the largest breeding populations of mottled ducks, but the continued loss of wetlands is still a significant threat for the mottled duck along the entire Gulf Coast.

**Northern Pintail (*Anas acuta*)** - The northern pintail, a popular duck for waterfowl hunters, is a large dabbling duck widely distributed across the world. Northern pintail populations have declined sharply due to avian disease and losses of freshwater potholes, conversion of agricultural fields, and conversion of grasslands. On Laguna Atascosa NWR, the northern pintail is the second most common wintering duck, after the redhead, and is found primarily on the Laguna Atascosa Unit on Pelican Lake, Laguna de los Patos, Laguna Atascosa Lake, and numerous freshwater impoundments such as Pintail Pond. They spend a majority of their time feeding in the freshwater impoundments on the Refuge before moving over to feed in the Laguna Madre and in agricultural fields near the Refuge.

**Wilson's Plover (*Charadrius wilsonia*)** - Wilson's plover is a small shorebird found along the sandy beaches and tidal mudflats of the Gulf Coast and southern Atlantic coast (Audubon 2002). This plover is strictly a coastal species, where it eats mostly fiddler crabs, mollusks, marine worms, and insects (Audubon 2002). This species nests on dry portions of the beach, usually near a piece of driftwood or other object, which makes them highly vulnerable to dog predation and disturbance or to trampling by people or ORVs. This species is considered by many as a "species of high concern" because of the threats facing it and its low population estimates: about 6,000 individual birds (Audubon 2002). Because these birds are only found along the coast, Wilson's plovers are threatened by increased development and the recreational uses of the beach. Their population status needs to be monitored and breeding areas protected. The Wilson's plover breeds in large numbers on South Padre Island, but unfortunately, many of these birds, eggs, and their young are crushed by the unrestricted use of ORVs by the public (Zdravkovic and Hecker 2004).

**Snowy Plover (*Charadrius alexandrinus*)** - The snowy plover is a small cosmopolitan shorebird of the sand flats. In North America, the species breeds in Saskatchewan, Canada,

and ranges from the United States' Pacific Coast and Gulf Coast to the Mexican coasts. Along the United States Pacific and Gulf coasts, the population is shrinking due to habitat degradation and expanding recreational use of beaches (Page *et al.* 1995). In response to these declines and threats to the species, the western population (*Charadrius alexandrinus nivosus*) occurring in California, Oregon, and Washington within 50 miles of the Pacific coast were listed as threatened on March 5, 1993 (USFWS 1993). Snowy plovers forage on invertebrates in the wet salt pans, on spoil sites, and along the edges of salt marshes and salt ponds. South Padre Island supports 28 percent of the nesting snowy plovers in the State of Texas (Zdravkovic and Hecker 2004). In fact, South Padre Island is the most important site for snowy plovers in the State because it has the largest amount of suitable habitat (Zdravkovic and Hecker 2004). Much of this habitat occurs on the South Padre Island Unit of the Refuge.

**Reddish Egret (*Egretta rufescens*)** - The reddish egret is a Texas-threatened, rare, medium-size wading bird best known for its active feeding behavior in tidal flats, salt marshes, and lagoons. The reddish egret occurs along the Gulf Coast, in the Caribbean and West Indies, and along the northern coast in South America. In Texas, the species breeds and is a permanent resident, primarily along the central to lower coast. They feed by holding their wings apart while running and lurching after prey or by holding their wings apart and providing shade, which can attract prey. They feed on small fish, frogs, and crustaceans. Historically, the species experienced severe declines due to over-harvesting for its plumes, but it now faces threats from habitat degradation and destruction. The species is uniquely associated with salt water habitats, which have been heavily developed and affected by changes in hydrology. The protected habitats of the Refuge provide prime feeding habitat, such as the extensive mudflats and estuarine wetlands on all units. Islands in the Bahia Grande and spoil islands in the Laguna Madre provide important nesting habitat.

**Arctic Peregrine Falcon (*Falco peregrinus tundrius*)** - The arctic peregrine falcon is a medium-size raptor that breeds in the arctic tundra and winters in South America. South Padre Island is a major staging area for arctic peregrines moving southward and northward along the Texas coast. Peregrines may be seen on the South Padre Island Unit in early October through November and again in April through May. Although this species (formerly endangered) was de-listed in 1994 (59 FR 50796), the Refuge will continue to protect important habitats for this species. According to Hunt and Ward (1988), the majority of spring migrant peregrine falcons were found in the dune areas and wind-tidal flat portions of South Padre Island.

**Black-spotted Newt (*Notophthalmus meridionalis*)** - The black-spotted newt is a rare, Texas-threatened species associated with ephemeral freshwater wetlands in South Texas. The species depends on relatively uncontaminated freshwater ponds and brushland habitat for breeding and cover sites. They have been found in the same ponds as Rio Grande lesser sirens, so management efforts for newts would benefit sirens. The Laguna Atascosa Unit of the Refuge contains a major population of black-spotted newts, and management efforts should continue to focus on protecting, restoring, or enhancing freshwater wetland habitats and brushlands.

**Texas Botteri's Sparrow (*Aimophila botterii texana*)** - The Texas Botteri's sparrow is a Texas-threatened species of subtropical grasslands whose breeding range is limited to South Texas. Preferred nesting habitat includes tall bunchgrasses with scattered bushes or fenceposts for perching. The Refuge provides important coastal grassland habitat for this

species and other grassland-dependent species. Although they are secretive, like many grassland species, the Botteri's sparrow has experienced significant declines due to the conversion of grassland habitats to farm fields and urban developments.

**Audubon's Oriole (*Icterus graduacauda audubonii*)** - Audubon's orioles are exceedingly rare, with a low population size and extremely limited range in the United States (i.e., common in the Valley, but found in other South Texas areas). The species prefers dense brush and riparian thickets of the Tamaulipan brushlands. Dense native brushland in the Valley is extremely limited, which makes the Refuge's brushland habitat very important to this species. Efforts focused on restoring and protecting large tracts of native brushland are needed to protect and enhance this species and other priority brushland and riparian species (e.g., yellow-billed cuckoo and painted bunting).

### ***Other Refuge Priority Species***

Other priority species on the Refuge include *white-faced ibis*, *burrowing owl*, *Texas olive sparrow*, *Texas indigo snake*, *Texas horned lizard*, *Rio Grande lesser siren*, *Texas tortoise*, *keeled earless lizard*, *Xami hairstreak*, *lila de las lomas*, and *Lila de los llanos*. These species are either rare, declining, or species of management concern on lists maintained by natural heritage programs, State wildlife agencies, other Federal agencies, or professional, academic, and scientific societies (See *Appendices A and C*).

### ***Partners in Flight - Birds of Special Management Concern***

The Refuge occurs within the South Texas Brushlands physiographic area, as identified by the Partners in Flight Program (PIF). Several bird species have been identified as Priority Bird Populations within this area (Ruth 2006). Therefore, their populations have been emphasized as a monitoring priority. The Texas Gulf Coast comprises a mosaic of biotic communities, including dense brush, brush corridors, and coastal habitats. Much of South Texas has been cleared for agriculture and urban development, and many remaining habitats are degraded. According to the PIF document, birds that have declined the most are those that inhabit riparian forests and native grasslands. PIF points out that continued protection and addition of remaining native lands into the Refuge System would offer the best opportunity to protect and restore these habitats. For the South Texas Brushlands physiographic area, PIF has identified the following birds: *Brownsville common yellowthroat*, *Texas Botteri's sparrow*, *Audubon's oriole*, *buff-bellied hummingbird*, *mountain plover*, *aplomado falcon*, *ferruginous pygmy owl*, *Bell's vireo*, *long-billed thrasher*, *painted bunting*, *Altamira oriole*, *red-billed pigeon*, *chachalaca*, *scaled quail*, *golden-fronted woodpecker*, *northern beardless tyrannulet*, *olive sparrow*, *Cassin's sparrow*, *hooded oriole*, *elf owl*, *Couch's kingbird*, *cave swallow*, *green jay*, *curve-billed thrasher*, and *pyrrhuloxia*.

### ***U.S. Fish and Wildlife Service - Migratory Bird Program Focal Species***

The Migratory Bird Program Strategic Plan 2004–2014 identified 139 focal species or populations to increase the percent of migratory birds that are at healthy and sustainable levels. The target for the percent increase is equivalent to five species by fiscal year 2007, and another five species by fiscal year 2012 (five species per five-year increment). The *long-billed curlew*, *snowy plover*, and *painted bunting* were among those species that regularly occur on the Refuge and were identified as the highest priority focal species to be addressed first (beginning in fiscal year 2005). Other focal species identified in this plan that frequently occur on the Refuge include *Canada goose*, *American wigeon*, *mallard*, *mottled duck*, *northern pintail*, *brown pelican*, *double-crested cormorant*, *reddish egret*, *peregrine falcon*, *clapper*

*rail, king rail, sandhill crane, Wilson's plover, piping plover, gull-billed tern, Caspian tern, yellow-billed cuckoo, short-eared owl, yellow-bellied sapsucker, loggerhead shrike, wood thrush, prothonotary warbler, grasshopper sparrow, seaside sparrow, eastern meadowlark, and Audubon's oriole.*

### 3.2.8 Focal Species

Focal species are a subset of priority species and represent larger guilds of species that use habitats in a similar fashion. Focal species are selected based on the knowledge that factors limiting their populations are sensitive to landscape scale characteristics and that by addressing the needs of these focal species, other priority species within a guild are expected to benefit. In addition, an appropriate set of focal species includes consideration for the specifics of the respective ecoregion, availability of data and information, and programmatic obligations, as defined in the Strategic Habitat Conservation Report (USFWS 2006). Therefore, focal species are those species and their associated habitats included in CCP objectives and strategies for which protection, management, research, and monitoring efforts will be focused and for which management and protection efforts to sustain them are necessary.



Ocelot. Photo: USFWS

For this CCP, focal species are grouped into three categories, each meeting specific criteria. The first group includes listed species that meet the following criteria:

- Federal or State-listed species that are known to (or may) reproduce or nest on the Refuge;
- Are representative of particular habitats at risk; and
- Are included in State or Federal landscape-level or conservation plans (*See Section 2.4*)

The second group includes priority bird species that meet the following criteria:

- Are known to nest on the Refuge;
- Are rare or uncommon on the Refuge during any season; and
- Are included in State or Federal landscape-level or conservation plans (*See Section 2.4*)

The third group includes priority waterfowl species that meet the following criteria:

- Occupies important wintering habitat or nesting habitat associated with Laguna Atascosa NWR; and
- Are representative of freshwater wetlands at risk in the lower Laguna Madre area; and
- Are included in State or Federal landscape-level or conservation plans (*See Section 2.4*)

Table 3-1. Laguna Atascosa NWR Focal Species

<b>Focal Listed Species</b>	<b>Focal Bird Species</b>	<b>Focal Waterfowl Species</b>
Ocelot	Wilson’s plover	Redhead
Jaguarundi	Snowy plover	Mottled duck
Northern aplomado falcon	Audubon’s oriole	Northern pintail
Reddish egret	Texas Botteri’s sparrow	
Kemp’s ridley sea turtle		
Black-spotted newt		

**3.2.9 Exotic and Invasive Wildlife Species**

Several exotic and invasive wildlife species occur on Laguna Atascosa NWR that damage native habitats or compete with native wildlife for resources. Nilgai antelope, a native of India and Pakistan, are an exotic species on the Refuge. Their populations have increased recently, and they compete with native species such as white-tailed deer for food. Feral hogs are an invasive species found on the Refuge that damage fragile wetland resources and are predators to native wildlife. Both of these species require aggressive and continuing control efforts. However, other invasive or exotic wildlife species such as Norway rats, roof rats, and Africanized honey bees may compete with native wildlife for food or affect native habitats.

**3.3 Climate**

The local climate on the Refuge is semi-arid and subtropical, generally warm and humid with prevailing winds from the southeast. The climate in the LRGV is largely dominated by maritime tropical air from the Gulf of Mexico (Orton *et al.* 1967). Typical of the subtropics, the LRGV is characterized by short, mild winters and long, hot summers (Orton *et al.* 1967). The persistent southeasterly winds from March through November give way to about 15–20 short-lived but strong northerly cold fronts each year from about December through January. These year-round winds also create a moisture deficit in the area (Farmer 1992) through high evaporation rates. Temperatures tend to be moderate; the average winter temperature is 63 degrees Fahrenheit, and the average summer temperature is 84 degrees Fahrenheit on Laguna Atascosa NWR. The normal growing season is about 336 days from January 23 to December 25. Killing frosts occur, but are rare. Annual precipitation averages 27 inches, with the heaviest rainfall occurring in May through June and from mid-August through mid-October (NOAA climatological data; Brownsville, Texas). Extremes from 13–60 inches of annual rainfall have been recorded on Laguna Atascosa NWR (USFWS 1989). Most of the rainfall occurs as thunderstorms that are unevenly distributed both geographically and seasonally (Orton *et al.* 1967). Occasional hurricanes or tropical storms in the late summer can produce heavy rains and can cause monthly rainfall averages to peak in September (Orton *et al.* 1967). Significant prolonged droughts have also occurred.

**3.4 Geology**

The Lower Rio Grande Valley of Texas is a broad deltaic plain of the Rio Grande. Approximately 30,000 years ago, as sea levels receded, the Rio Grande formed a deep valley that was re-filled by deltaic and estuarine deposits 7,000–18,000 years ago following the Pleistocene glacial melts (Farmer 1992). Since that time, the Rio Grande has shifted its course several times creating the resacas that occur throughout the lower Valley. In fact, the Rio Grande has been the dominant

active force in the LRGV since the Pleistocene (Farmer 1992). The Refuge lies in an ancient delta that formed the resacas. Today, the region is generally inactive due to drier climates broken only by hurricanes, which bring new deposits (Farmer 1992).

### 3.5 Soils

Soil types occurring on or near the Refuge include alluvial clays and silty clay loams. The majority of the Refuge's topsoils are shallow with underlying, dense, impervious soils resulting in slow percolation. Thus, many ponds and potholes retain water for several weeks, and sometimes months, after a period of heavy rains. The soils are also highly saline due to marine influence (USFWS 1989). Only a few inches in elevation can change plant distributions and types. Brushy species such as mesquite, granjeño (*Celtis pallida*), and prickly pear are found on the higher elevations, while the lower elevations contain salt tolerant vegetation such as Gulf cordgrass and sea ox-eye daisy.

Most of Laguna Atascosa NWR occurs in the Sejita-Lomalta-Barrada soils association and the Laredo-Lomalta association (USDA 1977). The soils of the former association are saline, loamy, and clayey at or near sea level, and broad areas of barren clay are inundated by high tides and rains (USDA 1977). The flat topography is interspersed by "clay dunes" or "lomas" rising 10–40 feet above the surrounding soils. These lomas range in size from less than one acre to over 100 acres in size. The Laredo-Lomalta soils association is characterized by nearly level to gently sloping silty clay loam, most of which is located within old meander channels (USDA 1977). Bahia Grande is entirely comprised of the Sejita-Lomalta-Barrada soils association. South Padre Island is comprised of the Mustang-Coastal dunes association, which is nearly level to steep, poorly drained fine sands and sand dunes.

### 3.6 Water Management: Quality and Quantity

One of the primary purposes of the Refuge is to provide habitat for wintering waterfowl and other migratory birds. Some 415 species of birds have been recorded on Laguna Atascosa NWR, and many of these birds depend on the quality and quantity of the freshwater and saltwater wetland habitats. Focal species such as redheads, mottled ducks, snowy plovers, reddish egrets, Wilson's plover, Rio Grande lesser siren, and black-spotted newts also depend on quality fresh and saline wetlands. The Refuge manipulates seasonal water levels to provide for the greatest variety of uses for such bird groups as dabbling ducks, wading birds, shorebirds, and larger waterbirds such as pelicans. Restoring tidal flows is one important water management focus, as well as the need to provide more freshwater sources.

The Refuge occurs within the Arroyo Colorado Watershed (ACW), which has been degraded over time through chemical pollution and other contaminants. The Refuge is a participant in the Arroyo Colorado Watershed Protection Plan, which aims to protect and restore the water quality in the watershed. The Cayo Atascosa, also part of the Arroyo Colorado watershed, is a natural freshwater drainage that flows into Laguna Atascosa Lake, where it eventually becomes more brackish, before emptying into the Harlingen Ship Channel. Two major water control structures are used to seasonally manipulate water levels in this system to provide varying water levels for migrating birds and resident wildlife. The Resaca de los Cuates and Pelican Lake are also important freshwater sources upon which waterfowl and resident wildlife depend. Keeping water in these systems is a year-round high priority. Freshwater is usually in low supply, and the Refuge is completely dependent upon rainwater, irrigation drainage, and surface runoff. Because the Refuge receives farmland and residential runoff

water, water quality is an issue in some of the Refuge's major wetlands such as Laguna Atascosa Lake (Wells *et al.* 1988). Therefore, a major objective of water management on the Refuge is to provide a quality, year-round abundance of freshwater for resident and migratory wildlife. This includes working with partners within the ACW to improve the overall quality and abundance of water for wildlife and people.

### **3.7 Fire Management**

Current Interagency Wildland Fire Policy (2009) allows for the use of both prescribed fire and wildfires to achieve resource management objectives. Fire management on Laguna Atascosa NWR is guided by the South Texas Refuge Complex (STRC) Fire Management Plan (FMP) was written to help achieve multiple resource management objectives by integrating the historical and ecological role of fire and a full range of fire management response options in consideration of fire threats to firefighter safety, the public, communities and structures, and natural resource values. These include full to limited wildfire suppression (e.g., confine, contain, or control strategies), mechanical fuel treatments, and prescribed fire. According to the STRC Fire Management Plan, approximately 99 percent of wildfires occurring on the Refuge are human-caused. Naturally occurring wildfires are not common, but have occurred historically, in the LRGV (Jahrsdoerfer and Leslie 1988). Wildfires that occur on or near the Refuge typically require response by trained Refuge fire personnel. Initial attacks on wildfires off the Refuge are usually made by local fire departments with assistance by Refuge fire personnel, most commonly when Refuge lands are potentially threatened.

Historically, fire in the LRGV was employed as a means to clear brush for farming, grazing, and settlement. Although most of the vegetative associations now present in the LRGV are not fire-dependent and would not be considered fire-adapted, some brush and native grass communities exhibit some adaptations to fire. Many desirable native grass communities likely evolved with adaptations to some frequency of repeated fire (Scifres 1980a). However, some exotic grasses are even more fire-adapted, and wildfires can potentially enhance their spread to the detriment of native vegetation. Responsible fire management and monitoring is imperative to lessen the threat of exotic invasive grasses. Prescribed fire is used as a tool to reduce hazardous fuels, control exotic and invasive species, and to maintain or restore important habitats such as the coastal prairie and savannah (e.g., Gulf cordgrass). Wildfire and prescribed fire effects on southern prairie grasslands and marshlands (e.g., Gulf cordgrass) has been shown to revitalize these biotic communities by removing the dead vegetation and accumulated mulch (McAtee *et al.* 1979).

#### ***Wildland Urban Interface (WUI)***

In 2000, a U.S. government report, "Managing the Impacts of Wildfires on Communities and the Environment," was released that provides an overall framework for fire management in the nation's forests and rangelands (66 FR: 751-770). The report requires Federal agencies to increase investments in projects to reduce fire risk and to work with local communities to reduce fire hazards close to homes and communities. A wildland urban interface (WUI) is defined as a community where humans and their development "...meet or intermix with wildland fuel..." such as when a colonia or subdivision is located next to Refuge property. According to the National Fire Plan Operations and Reporting System, the following are "affected communities" associated with Laguna Atascosa NWR: Arroyo City, the Laguna Atascosa Headquarters Complex, San Roman Road residences, the Cameron County Airport, the Bayview Immigration Detention Facility, and the Marine Science Center. Under the

National Fire Plan of 2002, funding for WUI can help the Refuge reduce the impacts of wildfires on communities by reducing the fuel loads and by establishing fire breaks to reduce fire threats to affected communities.

### ***Prescribed Fire***

Most research suggests the southern prairies of Texas have been severely reduced and degraded due to historical overgrazing, agriculture, fire suppression, and related woodland encroachment (Bray 1901, Scifres 1980a, Johnston 1963). Bray (1901) describes vegetation changes in the southern prairies of Texas in the following way:

*Apparently under the open prairie regime, the equilibrium was maintained by more or less regular recurrence of prairie fires. This, of course, is by no means a new idea, but the strength of it lies in the fact that the grass vegetation was tolerant of fires and the woody vegetation was not. It was only after weakening the grass floor by heavy pasturing and ceasing to ward off the encroaching species by fire that the latter invaded the grass lands.*

Prescribed fire is a management tool used to emulate natural ecological processes, to reduce hazardous fuels, and to maintain and restore fire-adapted ecosystems. Prescribed fire is used at Laguna Atascosa to reduce hazardous fuel loads and fire risk, and to maintain and restore native functioning prairie and marshland ecosystems.

On Laguna Atascosa NWR, prescribed fire is a viable habitat management strategy to reduce brush encroachment and to improve habitat for mottled ducks, aplomado falcons, and wintering waterfowl. Burning coastal prairie creates more open, diverse grassland habitat and controls encroaching brush. Burning Gulf cordgrass results in increased habitat, density, and viability and a decrease in the density of invasive species (McAtee *et al.* 1979, Oefinger and Scifres 1977, Scifres 1980b).

## **3.8 Refuge Law Enforcement**

The Refuge Law Enforcement Program is administered from the STRC office. The STRC Law Enforcement Program is comprised of five Refuge law enforcement officers (LEOs) and one supervisory LEO that focus on three main areas in the LRGV:

- All Refuge tracts, including Lower Rio Grande Valley NWR tracts in Cameron and eastern Willacy counties;
- All Refuge tracts in Hidalgo and western Willacy counties; and
- All Refuge tracts in Starr County, Texas.

In Cameron and eastern Willacy counties, where Laguna Atascosa NWR units and tracts are located, three Refuge officers are currently assigned.

Refuge officers provide visitor assistance and safety, emergency medical response, and crime investigation and prevention. Visitor assistance and safety involves finding lost persons that have wandered off the trails; assisting with vehicle lock-outs, pet issues, disabled vehicles, or nuisance animals; and providing advisories on safety awareness and relevant information. Regular law enforcement presence and visitor contacts work well as preventative law enforcement tools. Perhaps one the most vital functions of the LE program is being a medical "first responder." Portions of the Refuge are very remote, with nearest medical facilities over 40 miles away in Brownsville or Harlingen. Refuge officers provide life-saving CPR, First Aid, and

emergency communication and coordination for transportation of injured persons. Crime investigation on the Refuge typically involves hunting and fishing violations, plant and animal poaching, illegal dumping, and vandalism. Refuge officers also enforce vehicle traffic laws, fee compliance, and road closures, and they perform initial accident investigations. Refuge officers conduct routine patrols of Refuge tracts to maintain a visible presence on the Refuge to help detect and deter violations.

The STRC Law Enforcement Program has established partnerships with Federal, State, and local law enforcement agencies such as with the TPWD and county sheriff's offices through a Memoranda of Understanding (MOU) and interagency agreements. Partnerships with other law enforcement agencies are essential for effective law enforcement coverage, since some Refuge tracts (e.g., South Padre Island Unit), are remote and cross-jurisdictional.

### 3.9 Archaeological, Cultural, and Historical Resources

The LRGV area has a rich heritage of Native Americans and Spanish and European colonists.

The earliest records of human occupation are described as big-game “Paleo-Indian” cultures, which were in the area between 9500 B.C. and 7000 B.C. From 5000 B.C. through 700 A.D. (Archaic), many of the cultural and subsistence patterns of early people remained essentially unchanged until the arrival of Spanish explorers (USFWS 1989). The Archaic hunting and gathering bands that occupied the area exhibited the seashore adaptation of the later coastal cultures (USFWS 1989). This consisted of seasonal movements between the shore and various inland locales. Beginning about 700 A.D., pottery and the use of the bow and arrow appeared (USFWS 1989). Spanish records indicate that at least 34 recognizable Native American groups were found in the Rio Grande delta region, and north and south of the river. The people spoke various dialects of a language spoken in Coahuila, hence the name “Coahuiltecan.”

Coahuiltecan inhabited coastal Cameron County when the first Spanish explorers (i.e., Alonso Alvarez de Piñeda Expedition) arrived in 1519. The Coahuiltecan foraged on the land, seeking edible roots, prickly pear cactus fruit, and small animals. Their villages were described as clustered bell-shaped huts made of arched reeds and covered with animal skins, usually situated near freshwater sources (Scurlock *et al.* 1974). Laguna Atascosa NWR contains several Coahuiltecan archaeological sites, such as the Unland Site, which was discovered in 1976 during the construction of a Refuge service road. This site contained stone and shell artifacts and human skeletal remains. Another site discovered on Horse Island contained the skeletal remains of a female buried some 1,200 years ago.

Although Spanish explorers first visited South Texas in the early 1500s, it wasn't until the mid-1700s—following the Spanish land grants—that Europeans began to settle in the area. By 1755, 23 settlements and 15 missions had been established in the region, which became known as the Nuevo Santander (USFWS 1989). Some of the earliest colonists, such as Doña Rosa Maria Hinojosa and her son Padre Nicholas Balli, inherited several land grants and established some of the earliest ranching operations. The Santa Isabella Land Grant included the area known today as Padre Island



Old Railroad pilings at Bahia Grande.

Photo: USFWS

(Source: Cameron County Historical Commission). During the 1830s, coastal Cameron County was settled by ranchers and by pirates who were sailing contraband between the Rio Grande and Corpus Christi. In 1846, General Zachary Taylor moved his army southward and established Fort Brown (Brownsville) during the Mexican War of 1846–1848 (Source: *Handbook of Texas Online*). Major supply routes were established between Corpus Christi and Point Isabel, and travel between these points began the time of major settlement of the area. One important crossing, the Paso Real ferry along the Arroyo Colorado just west of the Refuge (near Arroyo City), was an important thoroughfare for settlers, traders, and soldiers. During, and in the years following, the Mexican War and the Civil War (1861–1865), cattle ranching became the major enterprise in South Texas, and the area comprising the Refuge was mostly used for cattle ranching. By the mid-1800s, practically all of the Native American groups along the Texas Gulf Coast had disappeared. Although a number of factors were involved, epidemics of diseases such as smallpox and measles played a major role in the decline of native peoples of the area (Salinas 1990).

On the Bahia Grande Unit, an important historical resource is the abandoned railroad bed that crosses the Bahia Grande basin. Some of the cypress pilings are still visible today. The railroad was originally constructed in the mid-1870s to move goods and people between Point Isabel (Port Isabel) and Brownsville. The railroad was abandoned by the early 1920s. During World War II, parts of the Laguna Atascosa Unit (Management Unit 7) were used as a gunnery training range. Remnants of World War II structures still exist on the unit. Old storage bunkers, target tracks, and spent bullets can be found near Bayside Drive.

Up until the early 1900s, the LRGV saw mostly cattle grazing and some small cleared patches for crops. Many of the original tracts of the Refuge comprised several ranches, such as the El Granjeño Ranch, Jones Ranch, and Chapin Ranch. On the Refuge, located near Mesquite Trail, an old cemetery can be found from the early settlement days. Soon after, the LRGV was drastically changed with the advent of mechanized agricultural practices. Attracted by the rich topsoils and the moderate climate, vast blocks of land were cleared and major irrigation systems installed, first for sugar cane and then for cotton, citrus, sorghum, and vegetables. The LRGV, on both sides of the Rio Grande, was converted to intensively managed cropland and pasture with only small pockets of natural vegetation remaining (USFWS 1969). Today, the LRGV is rapidly becoming more urbanized due to industrial expansion, retirement and resort development, and other population demands. Approximately five percent of the native brushland in the LRGV now remains (Jahrsdoerfer and Leslie 1988).

### 3.10 Public Access and Wildlife-Dependent Recreational Uses

The National Wildlife Refuge System Improvement Act of 1997 recognizes six wildlife-dependent public uses on refuges (hunting, fishing, wildlife observation and photography, and environmental education and interpretation) to be given priority when determined to be compatible. Except where otherwise mandated by law, the Service must determine whether a particular use is compatible with Refuge purposes before permitting it. Compatibility determinations are normally made by the Refuge manager in accordance with guidelines developed by the Service (*See Appendix D*). Under these guidelines, a compatible use is defined as one that, “...in the sound professional judgment of the refuge manager, will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge.” Before making a final determination, the Refuge manager, using sound professional judgment, must consider refuge resources, Service policy, availability of staffing and funding, other applicable laws, and public opinion. Compatible uses are

reviewed every 10–15 years (*See Appendix D*). The National Wildlife Refuge System Improvement Act of 1997 states that "*compatible wildlife-dependent recreation is a legitimate and appropriate general public use of the System.*"

The overarching goal of the Refuge System's wildlife-dependent recreation policy is to enhance wildlife-dependent recreational opportunities and access to quality visitor experiences on refuges while primarily managing refuges to conserve fish, wildlife, plants, and their habitats. This "*wildlife first*" approach will be used in this plan when evaluating and developing "*wildlife-dependent*" recreational opportunities, programs, and facilities on the Refuge. Wildlife-dependent recreational uses and wildlife-dependent recreation are defined as "*...hunting, fishing, wildlife observation and photography, or environmental education and interpretation.*" Compatible, wildlife-dependent recreational uses are the priority general public uses of the Refuge System, but other recreational uses may be allowed if they are both appropriate and compatible with the purposes of the Refuge and the Refuge System.

New and ongoing recreational uses would help visitors focus on wildlife and other natural resources. These uses would provide an opportunity to make visitors aware of resource issues, management plans, and how the Refuge contributes to the Refuge System and Service mission. Thus, only wildlife-dependent recreation will be allowed on a refuge after it is determined that it is compatible. Refuge managers work with state fish and wildlife agencies to develop and implement quality wildlife-dependent recreation programs on refuges to ensure that the refuge's hunting and fishing regulations and step-down plans are consistent with state laws, regulations (but may be more restrictive), and management plans. Any new proposed wildlife-dependent recreational uses, such as those proposed for the Bahia Grande Unit, will require the development and approval of a separate Visitor Services Plan (VSP). The wildlife-dependent recreational opportunities identified in this CCP and step-down plans (e.g., a VSP) will take into account legal commitments and, to the extent practicable, visitor interest, community traditions and viewpoints, constraints of the location, and Refuge resources, while recognizing that wildlife conservation is the first priority ("*wildlife first*") of the Refuge System.

To ensure continued visitor satisfaction with the Refuge's wildlife-dependent recreation programs, public input will be incorporated, using visitor satisfaction surveys or other instruments, including input during the development of this CCP or subsequent VSP that would help define and evaluate wildlife-dependent recreation programs at the Refuge. Wildlife-dependent recreation programs will be developed in consultation with State fish and wildlife agencies, and stakeholder and public input based on the following "quality criteria" to help ensure quality wildlife-dependent recreational experiences:

- Promotes safety of participants, other visitors, and facilities;
- Promotes compliance with applicable laws and regulations and responsible behavior;
- Minimizes or eliminates conflict with fish and wildlife population or habitat goals or objectives in an approved plan;
- Minimizes or eliminates conflicts with other compatible wildlife-dependent recreation;
- Minimizes conflicts with neighboring landowners;
- Promotes accessibility and availability to a broad spectrum of the American people;
- Promotes resource stewardship and conservation;

- Promotes public understanding and increases public appreciation of America's natural resources and our role in managing and conserving these resources;
- Provides reliable/reasonable opportunities to experience wildlife;
- Uses facilities that are accessible to people and blend into the natural setting; and
- Uses visitor satisfaction to help define and evaluate programs.

The following general guidelines apply to wildlife-dependent recreation throughout the Refuge System and are used in this CCP (Service Manual 605 FW1, General Guidelines for Wildlife-dependent Recreation) (*See Appendix F*):

- **Supportive Recreational Uses:** other activities, such as kayaking, bicycling, and camping, may be allowed only if they directly facilitate a compatible wildlife-dependent recreational use.
- **Hours of Use:** refuges are generally open during daylight hours and closed to the public at night. However, on occasion, night-time activities may be allowed if they are appropriate and compatible with refuge purposes and the Refuge System mission. Other factors that will be considered before allowing after-hours or night-time uses include the need for increased management, law enforcement capability, or public safety.
- **Accessibility:** when necessary and when compatible with resource management objectives, exceptions to general access restrictions will be made for visitors with disabilities to facilitate their experience. For example, hunters with certain disabilities will be allowed special access to hunt blinds, or accessible trails and boardwalks will be provided for mobility-impaired visitors.
- **Safety:** visitor safety is a key issue and a high priority when providing and developing quality, compatible wildlife-dependent recreation programs. Adequate law enforcement for basic visitor protection will be provided, and visitors will be alerted to specific safety hazards through signs, visitor education, and interpretive programs.
- **Partners:** partnerships with other Federal and State agencies, Friends groups, tribes, organizations, industry, local communities, schools, and others can produce significant contributions to the Refuge's wildlife-dependent recreational programs. The Refuge will work with partners to share expertise, personnel, materials, or programs to foster a sense of ownership and stewardship of natural resources among a variety of stakeholder groups.

### ***Transportation Management and Public Access***

Access on refuges is provided primarily to facilitate the six priority public uses of the Refuge System (hunting, fishing, wildlife observation and photography, and environmental education and interpretation) when compatible with refuge purposes and the Refuge System mission. Public access is normally only allowed in designated areas and along designated routes of travel (e.g., roads, trails, waterways, and other routes). Designated routes of travel can be either public roadways (e.g., State or county roads) and waterways or refuge roads, trails, and waterways. Refuge routes of travel and access are maintained, improved, or added through various funding sources, with one of the main sources being the Refuge Roads Program (RRP).

The RRP was established in June 1998 as part of the Transportation Equity Act for the 21st Century (TEA-21) and reauthorized in August 2005 under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). This makes Federal highway funds available to pay the cost of maintenance and improvement of refuge

roads, parking areas, rest areas, pedestrian and bicycle trails, and related facilities. This also includes administrative costs associated with such maintenance and improvements. Refuge roads are generally any road open to public travel that provides access to or within a unit of the Refuge System, and for which title and maintenance responsibility are vested in the United States Government.

All projects funded under the RRP must be consistent with the goals and objectives outlined in CCPs and step-down management plans. The Service's refuge planning policy requires that transportation issues be considered in the development of a CCP, including public use roads and trails, passenger vehicles, and pedestrian and bicycle needs as appropriate for the refuge. Refuge transportation infrastructure and related issues will be coordinated with the respective State or county transportation agencies and metropolitan and rural road planning organizations to assure that, among other considerations, there are no negative impacts to traffic congestion or air quality on the Refuge.

### *Laguna Atascosa Unit*

The Refuge provides two auto tour routes (Lakeside Wildlife Drive, 1 1/2 miles; Bayside Wildlife Drive, 15 miles) and six walking trails (Kiskadee, 1/8 mile; Mesquite, 1 1/2 miles; Paisano, 1 mile; Lakeside, 1/2 mile; Moranco Blanco, 3 1/10 miles; and Alligator Pond, 1/4 mile) on the Laguna Atascosa Unit. In addition, bicycles are allowed on designated Refuge tour and service roads. These hike-and-bike trails range from 4 to 20 miles in length. In 2001, the Federal Highway Administration (FHWA) evaluated the road and trail infrastructure on the Refuge. They re-paved 13 miles of the Bayside Wildlife Drive and improved 12 small parking areas amounting to 13,102 square feet. Main access to the Refuge headquarters and visitor center is via General Brant County Road and Buena Vista County Road. These paved county roads are the only public access routes to the Refuge headquarters and visitor center, but the poor condition of these roads currently limits public access due to concerns over vehicle damage (see Figure 3-2).

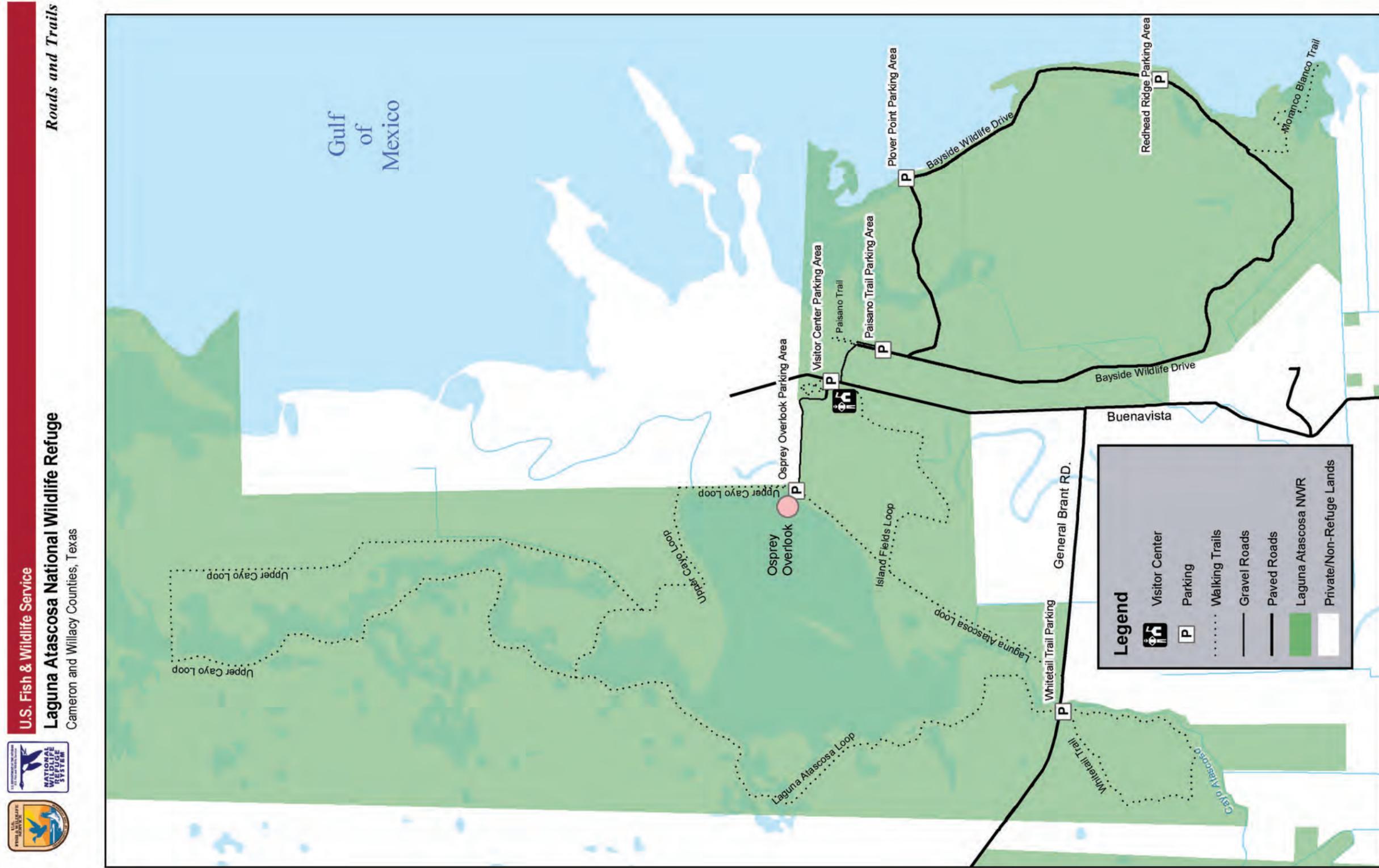
### *Bahia Grande Unit*

Bahia Grande Unit is bounded on the north by SH 100 and on the south by SH 48. These are major, four-lane highways that connect the Town of South Padre Island to the City of Brownsville (SH 48) and to U.S. Highway 77/83 (SH 100), near the City of San Benito. Except for a public boat ramp located off SH 48 at San Martín Lake, there are currently no developed public access points to this unit from these highways.

### *South Padre Island Unit*

Road access to this unit is by Park Road 100 and county beach access points north of the Town of South Padre Island. The paved portion of Park Road 100 ends approximately three miles south of the first Refuge tract, but TXDOT has fee-title right-of-way that extends north through Refuge parcels for approximately 14 miles and terminates approximately 8.5 miles south of the Port Mansfield Channel. This unit can also be accessed by small watercraft from the Gulf of Mexico, the Port Mansfield Channel, and the lower Laguna Madre.

Under the Texas Open Beaches Act (1973), as amended, the public has legal access to and from the state-owned beaches and to privately-owned land (i.e., the beach area extending from the line of mean low tide to the line of vegetation bordering on the Gulf of Mexico), for which the public has acquired a right of use or easement (*Texas Natural Resources Code, Subtitle E. Beaches and Dunes, Chapter 61. Use and maintenance of public beaches, Subchapter B. Access to Public Beaches, Subsection 61.011*).



PRODUCED IN THE DIVISION OF REFUGE PLANNING  
 ALBUQUERQUE, NEW MEXICO  
 LAND STATUS CURRENT TO: 5/3/09  
 MAP DATE:  
 BASEMAP: N/A  
 MERIDIAN: N/A  
 FILE: il\_mapfile

Figure 3-2. Roads and Trails

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In the 1999 Laguna Atascosa NWR Refuge Expansion Plan, the U.S. Fish and Wildlife Service stated that it would support and cooperate with the Texas Open Beaches Act, which provides for public access on all Texas Gulf beaches. This will ensure the continued enjoyment by the public of traditional beach recreational activities such as beachcombing, swimming, fishing, overnight camping, horseback riding, and other legal public uses. These activities will continue to be allowed on the “open beaches” of the South Padre Island Unit, as defined by the Texas Open Beaches Act, and as stated in the 1999 Refuge Expansion Plan. Sensitive wildlife habitat, such as the dunes and tidal flats located inland, are not open to these activities. However, random access with motorized vehicles in washover, dune, and tidal flat areas west of the public beach area of the South Padre Island Unit is currently restricted to prevent dune erosion and to secure undisturbed habitat for wildlife that use the dunes and tidal flats. The washover, dune, and tidal flat areas are not within public access described under the Texas Open Beaches Act. In addition, the Refuge supports and cooperates with the Texas Dune Protection Act (1977), as amended, to restrict motorized recreational vehicles within the protected dune areas. Only pedestrian access is currently allowed to the dune and tidal flat areas from the beachfront for compatible wildlife-dependent recreational activities, unless seasonally closed to protect sensitive areas (e.g., nesting birds) or coastal habitats.

### 3.10.1 Hunting

In 1966 and again in 1997 (National Wildlife Refuge System Improvement Act), Congress recognized the legitimacy of hunting on the Refuge. The Service is dedicated to providing opportunities for hunting and other compatible wildlife-dependent recreation. Hunting is an important wildlife management tool to control populations of some species that might otherwise exceed the carrying capacity of their habitat, threaten the well-being of other wildlife species, and—in some instances— threaten human health and safety. The guiding principles that the Refuge System use to manage quality hunting on refuges are:

1. To manage wildlife populations consistent with approved management plans;
2. To promote visitor understanding of and increase visitor appreciation for America’s natural resources;
3. To provide opportunities for quality recreational and educational experiences; and
4. To minimize conflicts with visitors participating in other compatible wildlife-dependent recreational activities.

Primary objectives of the hunting program on Laguna Atascosa NWR are to provide a quality recreational and educational experience for a diverse audience and to control exotic wildlife. The Refuge hunting program provides affordable and accessible public hunting opportunities that are very limited in South Texas. Therefore, white-tailed deer hunting on Laguna Atascosa NWR is one of the most popular public deer hunts in the Valley, especially for local hunters. Archery hunts have been held annually since 1970, and firearm hunts have been held annually since 1979. Special youth hunts and exotic-only hunts (e.g., feral hog and nilgai antelope) have recently been established. All regular hunts are by Refuge permit only and are conducted during specific periods within the State’s hunting season. Special hunts are by Refuge permit only and may occur at any time during the year. Approximately 20,000 acres of the Laguna Atascosa Unit are currently open to hunting (*See Appendix D*). Hunting is not currently allowed on the Bahia Grande, Coastal Corridor, and South Padre Island Units. Other local hunting opportunities include public hunts on the Lower Rio Grande Valley NWR and TPWD wildlife management areas. They provide migratory bird hunting opportunities (e.g., dove hunts) that are not

currently offered by the Refuge. TPWD also provides upland game hunting (e.g., quail) and javelina hunting on some of its wildlife management units in the Valley.

### **3.10.2 Fishing**

Saltwater fishing is the most popular wildlife-dependent recreational activity, particularly by local residents in the LRGV. Freshwater fishing areas are limited in the Valley, and those areas open to public fishing (e.g., irrigation canals, water settling ponds) have water quality issues that may limit human consumption of fish caught in these areas. Surf-fishing, wade-fishing, bank-fishing, and fishing from boats are popular methods of fishing in the Valley. Common saltwater species pursued are red drum (redfish), sea trout, and flounder.



Fishing at Bahia Grande. Photo: USFWS

Fishing opportunities on the Refuge are currently available at Adolph Thomae Jr. County Park (Laguna Atascosa Unit), along the Gulf beaches (South Padre Island Unit), and at San Martín Lake (Bahia Grande Unit). Boating and fishing is available along the Harlingen Ship Channel at Adolph Thomae Jr. County Park and at San Martín Lake, which are both situated within the Refuge boundary. The rest of the Refuge is not currently open to boating or fishing.

On November 12, 1986, a 25-year lease was granted to the Cameron County Parks Department for the development of a 57-acre county park on the Laguna Atascosa Unit for fishing, camping, and boating. The Adolph Thomae Jr. County Park provides quality fishing opportunities for families that include fishing piers, picnic sites, a boat ramp, parking areas, and recreational vehicle and tent camping and cooking sites. About 70 percent of the park's annual visitation participates in saltwater fishing, as the county park provides an important public access point to the lower Laguna Madre. The nearest public boat ramps from the county park are located 25 miles to the south and 20 miles to the north. Visitation to the county park is 130,000–150,000 people per year. The majority of visitation to the park is for fishing or boating access. Fishing is also permitted along State Highway 48, at San Martín Lake on the Bahia Grande Unit. There is a public boat ramp located near this popular fishing spot. Fishing also occurs on the South Padre Island Unit, where anglers either surf-fish or drive along the beachfront to the Mansfield Channel to fish on the jetties. Freshwater fishing on the Laguna Atascosa Unit is not allowed due to contaminants found in the fishery resources (USFWS 2002, Wells *et al.* 1988) and to avoid potential wildlife disturbance.

### **3.10.3 Wildlife Observation and Photography**

As one of the 10 best birding areas in the nation, with 415 documented bird species (the most species of any national wildlife refuge), the Laguna Atascosa Unit of the Refuge is a major destination for wildlife observation and photography. Nationwide, butterfly watching is growing in popularity. Consequently, Refuge visitation specifically to observe and photograph butterflies has also been increasing because of the rare, tropical butterflies that can be found in the LRGV. Seasonally, the Refuge



Bayside Drive boardwalk.  
Photo: USFWS



Ozzy the Ocelot and Friends.  
Photo: USFWS

conducts guided birding, butterfly, and other wildlife observation tours (e.g., night-time tours, school groups). Near the visitor center is a butterfly garden, wildlife viewing area, photo blind, three self-guided trails, and an amphitheater, providing easily accessible opportunities for visitors to enjoy and learn about the Refuge's wildlife and plants. There are two auto tour routes (1.5-mile Lakeside Drive and 15-mile Bayside Wildlife Drive) and six walking trails on the Laguna Atascosa Unit. This unit also has a variety of wildlife observation structures (e.g., boardwalks, viewing decks, elevated observation platform), with associated parking, to facilitate the visitor's wildlife experience. To increase wildlife observation and photography opportunities, four back-country hiking and bicycling trails, with associated trailheads, have been designated along service roads. These trails range from 4 to 20 miles in length. Bicycling, as a means to enjoy nature and observe wildlife continues to be popular each year, particularly on the more accessible, paved Bayside Wildlife

Drive. There are currently no developed wildlife observation and photography facilities on the Bahia Grande and South Padre Island units.

#### 3.10.4 Environmental Education and Interpretation

Refuge programs and events such as birding and nature festivals, school or youth group tours, the annual Ocelot Conservation Festival, and youth scouting programs, conducted both on- and off-site, are an essential part of ongoing environmental education (EE) efforts provided by the Refuge. A fully staffed visitor center, open year-round, serves as a focal point for EE and interpretation programs (e.g., school group programs). Other interpretation and education features on the Laguna Atascosa Unit include interpretive signs, exhibits, and an auto tour route with associated interpretive signs. Interpretive programs currently offered include birding tours, nature walks, guided van tours, sunset wildlife tours, and butterfly identification walks. As part of the EE program, the Refuge has a designated camping area for local youth scouting groups. Environmental education programs, such as mangrove restoration and wetland sampling, have been conducted on the Bahia Grande Unit for local schools. In partnership with Sea Turtle, Inc., the public is given opportunities to witness sea turtle hatchling releases from June through August on South Padre Island. The hatchling releases include a presentation on the importance of barrier islands to endangered sea turtles. As the center for endangered ocelot recovery, the Refuge, Friends of Laguna Atascosa NWR, Marine Military Academy, and *The Valley Morning Star* newspaper annually host the Ocelot Conservation Festival to promote ocelot conservation and to provide educational opportunities on a variety of wildlife topics and Refuge programs (e.g., ocelot recovery, bird conservation, and wetland management) in a family-oriented setting. The Ocelot Conservation Festival is a special event that is gaining in popularity each year and is a major EE and outreach event of Laguna Atascosa NWR.

### 3.11 Socioeconomic Environment

The Lower Rio Grande Valley of Texas (LRGV) is characterized by agricultural and urban development, scattered small farming communities, and the seasonal influx of summer visitors and winter residents (i.e., Winter Texans). There are three major metropolitan areas in the Valley. The City of Brownsville, with a population of 139,722 (*Source: 2000 U.S. Census*

*Bureau*), is located about 30 miles south of the Refuge headquarters, along the Rio Grande. Harlingen, located about 25 miles west of the Refuge, has a population of 57,564 (*Source: 2000 U.S. Census Bureau*). The third major metropolitan area is McAllen, located about 58 miles west of the Refuge, with a population of 106,414 (*2000 U.S. Census Bureau*). Overall, the population of the LRGV, which is comprised of Cameron, Hidalgo, Starr, and Willacy counties, has grown from 701,888 in 1990 to 978,369 in 2000, a 39.4 percent increase (Sethi and Arriola 2002). Cameron County grew by 28.9 percent and Willacy County grew by 13.4 percent during the same 10-year period (Sethi and Arriola 2002). In fact, the LRGV metropolitan area is one of the top 30 fastest growing regions in the nation (Sethi and Arriola 2002). Population in the LRGV is expected to continue to grow at a rate of 4 percent per year in the coming years (Sethi and Arriola 2002). Despite this growth, the LRGV ranks as one of the highest unemployment areas in the United States and also has high poverty rates (Mathis and Matisoff 2004). Over 85 percent of the population in the LRGV is Hispanic, and over 30 percent of LRGV families live below the poverty level (*Source: 2000 U.S. Census Bureau*).

Agriculture has always been the staple of the Valley's economy. The LRGV produces more than 40 crops, primarily cotton, citrus, grain sorghum, sugar cane, vegetables, and melons (*Source: Rio Grande Valley Chamber of Commerce*). The longer growing season and subtropical climate has long attracted farmers to the area, as they can produce two crops each year on the same land. Today, Valley farms and ranches produce cash receipts of \$500 million per year on average (*Source: Rio Grande Valley Chamber of Commerce*). Aside from agriculture, some of the largest employers in the LRGV include public schools, hospitals, health care agencies, restaurants, food stores, and social service agencies. The service industry represents 36 percent of the total LRGV economy, followed by local government (20 percent) and trade (17 percent) (Sethi and Arriola 2002). One of the largest and fastest growing industries is tourism, particularly nature-based or ecotourism (Mathis and Matisoff 2004). During the winter months, retired people leave their northern homes to spend the winter in the more favorable climate of the Valley. Winter Texans are an important economic factor in the LRGV since they provide a substantial source of revenue for the local economy. In the LRGV, ecotourism generates \$100–\$170 million annually, and creates several thousand jobs (Mathis and Matisoff 2004, after Chapa 2004). Laguna Atascosa, Santa Ana, and the Lower Rio Grande Valley NWRs are some of the main tourist attractions in the LRGV.

The Refuge's contribution to the local economy includes the local benefits of attracting approximately 350,000 visitors annually. For example, in 2002, non-residents spent almost \$2.4 million related to their visits to Laguna Atascosa NWR, which resulted in \$2.2 million in new economic activity, as well as 46 new jobs and \$873,400 in payroll (Caudill and Henderson 2002). Additionally, there is the direct expenditure of Refuge resources, such as salaries to local employees and the purchase of equipment, services, and supplies from local vendors. For example, Refuge spending in fiscal year 2002 was \$844,500, the net economic value visitors derived from their use of the Refuge was \$2.7 million, and almost \$6.3 million in benefits was derived from maintaining public use of this Refuge (Caudill and Henderson 2002). In the past five years, annual Refuge budget expenditures averaged \$972,800, much of which makes its way into the local economy as stated previously. Refuge Revenue Sharing Act payments from the Department of the Interior are designed to offset the burden that counties feel when Refuge properties are removed from the tax rolls. Laguna Atascosa NWR's tax payments to Cameron and Willacy counties from 2003 to 2005 averaged \$87,273 and \$16,330 respectively (*Source: U.S. Fish and Wildlife Service Realty Division*).

### 3.11.1 Other Economic Uses and Reserved Mineral Rights

#### *Other Economic Uses*

Economic uses, either public or private, may be authorized on a wildlife refuge when it is determined that the use contributes to the achievement of the refuge purposes or the mission of the Refuge System, and the use is determined to be compatible. Economic uses include, but are not limited to, grazing livestock, harvesting hay or timber, removing sand or gravel, and cultivating crops. The only economic use currently on the Refuge is a cooperative farming program in the Coastal Corridor Unit. This program supports brush restoration on the Refuge.

#### *Cooperative Farming Program*

The Cooperative Farming Program is not only an economic use on the Refuge, but also an important habitat management tool. In many cooperative farming programs on refuges, crops are typically grown as supplemental food sources for wildlife such as migratory waterfowl. On Laguna Atascosa NWR, the program is located South of Management Unit 1 (approx. 400 acres) and focuses on brush restoration, where the cooperative farmer provides the Refuge native plant seedlings, site preparation, and personnel for planting the seedlings in return for their share of agricultural crops planted on Refuge lands.

#### *Oil and Gas Activities*

Oil and gas activities are allowed to take place on refuges for a number of reasons. On the majority of refuges, oil or gas activities occur where private entities, states, or native corporations, rather than the Federal government, own the mineral rights. Owners of these mineral rights have the right to develop, produce, and transport the oil and gas resources located within a refuge (USGAO 2001). However, the Department of the Interior's regulations requires mineral owners "*...to the greatest extent practicable,*" ensure that "*...all exploration, development and production operations...*" be conducted in such a manner as to "*...prevent damage, erosion, pollution, or contamination to the lands, waters, facilities, and vegetation of the area.*" Further, "*...so far as practicable, such operations must also be conducted without interference with the operation of the refuge or disturbance to the wildlife thereon*" (50 CFR Part 29.32). Exploring for oil and gas usually involves seismic mapping of the subsurface topography. Regardless of the technology employed, seismic surveys typically involve surface disturbance. Oil and gas drilling and production often require construction of access roads, pipelines, electrical poles, gravel pads, storage tanks, separating facilities, and compressor stations.

Under the National Wildlife Refuge System Improvement Act of 1997, the Service is responsible for regulating all activities on refuges. The Act requires the Service to determine the compatibility of activities with the purposes of the particular refuge or the mission of the Refuge System and not allow those activities deemed incompatible. However, the Service does not apply the compatibility requirements to the exercise of private mineral rights on refuges. Department of the Interior regulations also prohibit leasing Federal minerals underlying refuges outside of Alaska, except in cases where Federal minerals are being obtained by operations on property adjacent to the refuge. Nevertheless, the activities of private mineral owners on refuges are subject to a variety of legal restrictions, including Service regulations. A variety of Federal laws affect how private mineral rights owners conduct their activities. Also, Service regulations require that oil and gas activities be performed in a way that minimizes the risk of damage to the land and wildlife and the

disturbance to the operation of a refuge. The regulations also require that land affected be reclaimed after operations have ceased. The Refuge reviews proposals for oil and gas activities on the Refuge and special conditions are included in a letter of agreement. Special conditions normally include seasonal restrictions to protect nesting birds, mitigation for habitat destruction, drilling fluids removal from the drilling site, and returning the site to as natural a condition as possible. Refuge personnel (an oil and gas officer assigned to the STRC) have established good working relationships with local oil and gas companies, resulting in compliance of Refuge rules and regulations.

On the Laguna Atascosa Unit, the Federal government owns all of the subsurface mineral rights. Mineral rights on the Bahia Grande, Coastal Corridor, and South Padre Island units are primarily owned by private persons or third parties. The Federal government and the State of Texas have limited mineral right ownership on the Bahia Grande Unit. Currently, the only oil and gas infrastructure on the Refuge are natural gas pipeline rights-of-way. The Refuge receives numerous requests for oil and gas exploration for privately-owned mineral interests. A major seismic survey was recently conducted on the Bahia Grande Unit as part of a larger survey of southeastern Cameron County. Established procedures at the STRC level address all oil and gas activities (e.g., exploration, production, and transportation) on the Refuge.

## **3.12 Special Designations**

### ***Designated Wilderness Areas***

There are no designated Wilderness Areas on Laguna Atascosa NWR, as defined by the Wilderness Act of 1964. In 1970 (35 FR 12785; August 12, 1970), North Island on the Laguna Atascosa Unit, consisting of about 9,440 acres north of the Harlingen Ship Channel, was studied for potential wilderness status, but was not designated due to waterfowl management needs (*April 2, 1971, memorandum*).

### ***Research Natural Areas***

Research natural areas (RNAs) are part of a national network of ecological areas for research, education, and biological diversity. Although RNAs are for non-manipulative research, observation, and study, they may also assist in implementing provisions of the Endangered Species Act. Two RNAs totaling 175 acres have been established on the Refuge. The Granjeño RNA represents 125 acres of mesquite-savannah located along the eastern boundary of the Laguna Atascosa Unit (Management Unit 7). The endangered ocelot breeds and occurs within this RNA. The second RNA is the 50-acre South Texas Cordgrass Prairie RNA, also located within the Laguna Atascosa Unit (Management Unit 7). This site is important for many species such as the endangered northern aplomado falcon and mottled duck.

### ***National Natural Landmarks Program***

As set forth in 36 CFR, Part 62, National Natural Landmarks are management areas having national significance as sites that exemplify one of a natural region's characteristic biotic or geologic features. Sites must be one of the best-known examples of a unique feature and must be located in the United States or on the Continental Shelf. There are 587 designated natural landmarks throughout the United States, with 43 on units of the National Wildlife Refuge System, including a site on Laguna Atascosa NWR. A 3,794-acre area surrounding the Bayside Tour Loop has been designated as the Bayside Resaca National Natural Landmark.

This site exemplifies the unique resaca systems (old meander channels of the Rio Grande) that occur in eastern Cameron County, Texas.

### ***Western Hemisphere Shorebird Reserve Network Sites***

In 2001, Laguna Atascosa NWR was officially designated a Western Hemisphere Shorebird Reserve Network International Site (WHSRN), along with Rancho Rincón de Anacahuítas in Mexico. The WHSRN is a voluntary, non-regulatory coalition that identifies and promotes conservation of crucial breeding, wintering, or migratory stopover sites for shorebirds. The mission of the WHSRN is “...to conserve shorebird species and their habitats across the Americas through a network of key sites.”

### ***Globally Important Bird Areas***

The American Bird Conservancy launched the Important Bird Areas program in 1995 to identify and document the top sites in the United States that are essential for bird conservation on a global level. For a site to be included, it must contain, at some part of the year, “critical habitat” supporting a significant population of an endangered or threatened species such as the piping plover. Another criterion is that the site must support a significantly large population of breeding, migrating, or wintering birds, including waterfowl, seabirds, wading birds, raptors, or landbirds. Laguna Atascosa NWR meets these two criteria, and thus, is designated by the American Bird Conservancy as a “globally important bird area.”

### ***Marine Protected Areas***

In 2000, EO 13158 directed that Federal agencies work together with states, territories, tribes, and non-governmental partners to develop and maintain an effective national system of Marine Protected Areas or MPAs. An MPA is “...any area of the marine environment that has been reserved by Federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein.” As such, portions of Laguna Atascosa NWR qualify as an MPA. These include areas such as Bahia Grande basin, San Martín Lake, and the intertidal mudflats on the Laguna Atascosa and South Padre Island units.

### ***Sister Protected Areas***

The 2005 Resolution of the Ecosystem Conservation Working Table, under the auspices of the Canada-Mexico-United States Trilateral Commission, established Sister Protected Areas for wildlife and ecosystem conservation and management. A "Sister Protected Area" is defined as two or more nationally designated protected areas from different countries, endorsed by the Trilateral Committee, with similar resources or shared management interests, that agree to cooperate on projects and programs for the conservation and management of wildlife, plants, biological diversity, and/or ecosystems of mutual interest. Laguna Atascosa National Wildlife Refuge and the Laguna Madre and Delta del Rio Bravo Flora and Fauna Protected Area have been identified as a Sister Protected Area under this Resolution.

## **3.13 Environmental Contaminants**

Laguna Atascosa NWR occurs in a major agricultural area that is heavily urbanized and includes an intricate web of irrigation and drainage canals, roads and highways, and commercial waterways (e.g., ship channels, intracoastal waterway). Contaminants are distributed throughout the Valley by existing irrigation and drainage systems (Jahrsdoerfer and Leslie 1988, after Black and Veatch 1981). The Arroyo Colorado, originally a distributary

of the Rio Grande, flows across the Refuge and into the Laguna Madre. It receives much of the municipal, agricultural, and industrial wastes of the Valley (Jahrsdoerfer and Leslie 1988). The Arroyo Colorado, which extends 90 miles from Mission, Texas, to the Laguna Madre, passes through the Laguna Atascosa Unit as the Harlingen Ship Channel. The Cayo Atascosa is another primary freshwater drainage that flows through the Laguna Atascosa Unit. This drainage carries agricultural and residential (i.e., colonias) runoff and flows directly into Laguna Atascosa Lake. Freshwater fishing on the Cayo Atascosa and Laguna Atascosa Lake, within the Laguna Atascosa Unit, is not allowed due to contaminants found in the fishery resources (USFWS 2002, Wells *et al.* 1988). Pesticides, herbicides, and other contaminants carried into the Laguna Madre from the Arroyo Colorado and Cayo Atascosa negatively affect fish and wildlife habitats (e.g., seagrass beds) by changing nutrient levels, acidity, and oxygen levels. Agricultural pesticides are used year-round in the LRGV, and drift and overspray from aerial applications occur periodically on NWR lands (Jahrsdoerfer and Leslie 1988). The Laguna Atascosa and Coastal Corridor Units are surrounded by croplands such as cotton and sorghum that are seasonally treated with pesticides. The Refuge supports the continuation of the Agricultural Co-existence Committee, regarding the creation of buffer zones adjacent to the Refuge for pesticide spraying, both ground and aerial. Large, commercial shrimp farms are located adjacent to the Laguna Atascosa Unit, one on the south boundary and two near Arroyo City, Texas. These farms may be converted into other types of aquaculture (e.g., algae, menhaden) for the production of biofuels. Potential contaminants from these operations are currently unknown, but may adversely affect water quality of Refuge wetlands and in the lower Laguna Madre.

During the early 1940s, parts of the Laguna Atascosa Unit (Management Unit 7) were used as a gunnery training range (Laguna Madre Gunnery Range). Aerial gunners for B-17 and B-29 military aircraft trained here, and the Refuge was affected by millions of .30 and .50 caliber machine gun rounds. In 1950, contractors removed 60,380 pounds of machine gun rounds and 3,555 pounds of skeet shot from the area, but many of these bullets still remain and may pose a copper, lead, and other contaminants risk to soil, water, migratory birds, and aquatic organisms. The area is classified by the U.S. Army Corps of Engineers (Corps) as a “Formerly Used Defense Site” or FUDS (Property No: K06TX0780) and is listed as containing a hazards potential.

Other existing or potential contaminants and water quality issues identified on the Refuge include the following:

- An uncapped gas well on the Bahia Grande Unit in the Laguna Larga basin is contaminating the wetland with heavy metals and salts, which may affect fish, aquatic organisms, migratory birds, water quality, and connected wetlands;
- A desalination plant upstream of San Martín Lake on the Bahia Grande Unit may be affecting water quality and contaminating aquatic organisms and migratory birds;
- Marine debris such as crude oil, medical waste, trash, and other contaminants may be affecting soils, water quality, marine organisms, and migratory birds on the South Padre Island Unit;
- Airborne salty clay dust from dredge spoil sites south of the Brownsville Ship Channel may affect air quality and wildlife-dependent recreational activities on the Bahia Grande Unit;

- Airborne contaminants (e.g., heavy metals, solvents, lead paint, asbestos) from industrial operations, such as ship salvage and oil platform construction, may affect air and water quality on the Bahia Grande Unit;
- Several illegal dump sites containing a variety of household and residential construction debris, garbage, and chemicals are found on the Bahia Grande Unit; and
- Accidental spills (e.g., oil and chemical spills, pipeline ruptures, oil and gas facilities) would cause soil and water contamination and direct fish and wildlife die-offs on all Refuge units.

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## 4. Management Direction

The following goals, objectives, and strategies reflect the issues and concerns expressed by the planning team and the public. They also reflect important conservation approaches and incorporate important aspects of applicable plans and initiatives described herein. The main priorities for the Refuge include: protecting and restoring native habitats such as brushlands, grasslands, and wetlands; conserving and managing important fish and wildlife resources such as waterfowl, migratory birds, and federally-listed species; and providing quality opportunities for public use, environmental education, and interpretation. Unless otherwise noted in the text, the following items are expected to be implemented throughout the 15-year term of this plan.

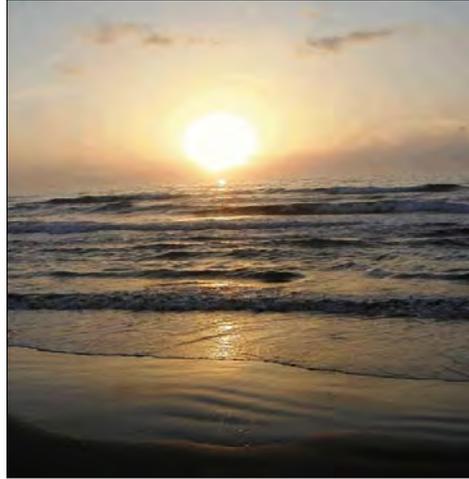


Photo: USFWS

Common objectives and strategies applicable to all Refuge units will be denoted with an “**All.**” Specific objectives or strategies will be coded as “**L**” for the Laguna Atascosa Unit; “**B**” for the Bahia Grande Unit; “**S**” for the South Padre Island Unit; and “**C**” for the Coastal Corridor Unit, which includes all smaller managed tracts located between or near the Laguna Atascosa Unit and the Bahia Grande Unit (e.g., La Selva Verde, Waller, and Resaca de la Gringa tracts).

### 4.1 Goal 1

**Wildlife:** Protect, conserve, and manage for native wildlife such as endangered species, other Federal trust species, and priority species with an emphasis on Refuge focal species.

**Wildlife Objective 1:** Annually implement the six priority recovery actions (shown in the following text) to increase the Cameron County ocelot population to at least 75 ocelots and ensure their continued survival.

**Discussion:** On and near the Refuge, there is estimated to be approximately 10–25 ocelots, one of only two remaining breeding populations known to occur in the United States. The six priority recovery actions for the Refuge are defined as:

- Addressing the potentially deleterious effects of small population size, population isolation, and loss of genetic diversity in the Cameron County ocelot population;
- Protecting existing ocelot habitat and minimizing habitat loss on and in the vicinity of the Refuge;
- Restoring, connecting, and increasing the availability of ocelot habitat;
- Continuing the long-term monitoring and research of ocelots;
- Increasing water availability during times of drought; and
- Reducing the risk of ocelot road mortalities

Continued close monitoring and the protection of this critically endangered species is necessary to ensure its continued survival in the United States. This includes consistency with other Service recovery activities or plans (e.g., Spotlight Species Action Plan developed by the Ecological Services Division), and the development and implementation of management plans, appropriate strategies, public education and outreach, and partnerships.

- Strategy 1: Continue monitoring of the Cameron County ocelot population area to include a minimum of 750 live-trapping nights and a minimum of 2,500 camera-trapping nights per year. This includes monitoring population trends, collecting information on the condition of the animals, monitoring captured ocelots through radiotelemetry, and collecting blood samples for genetics studies and disease monitoring. **Ongoing; Units: L, B, and C.**
- Strategy 2: Develop contingency plan or protocols for any ocelots that have been injured or require veterinary care in partnership with Gladys Porter Zoo in Brownsville, Texas, and others.
- Strategy 3: Continue to monitor and investigate ocelot road mortalities, and follow up on credible ocelot sighting reports within 48 hours on and near the Refuge. **Ongoing; Units: L, B, and C.**
- Strategy 4: Maintain existing supplemental freshwater sources (e.g., guzzlers and stock tanks) for ocelots during periods of drought. Consult with Ecological Services to determine optimal location and number of any new artificial water sources to sustain population viability. Conduct environmental assessment of any new artificial water sources. **Units: L, B, and C.**
- Strategy 5: Monitor ocelot use of habitat restoration areas, freshwater guzzlers, public road crossings and culverts, and potential wildlife corridors on private property (e.g., irrigation district canals). **Ongoing; Units: L, B, and C.**
- Strategy 6: Monitor the effectiveness of 11 ocelot crossings (culvert-type) across FM 106 (Laguna Atascosa Unit) and one crossing (elevated underpass) on State Highway 48 (Bahia Grande Unit). Monitoring will commence at the conclusion of short-term, post-construction monitoring conducted by consultants. This is to determine ocelot use and to identify any potential modifications required to ensure they function as intended, per the Service's Biological Opinion dated January 2005 (Consultation #2-11-00-F-9003), for the FM 106 road project. **Units: L, B, and C.**
- Strategy 7: Conduct monthly roadside mortality surveys along FM 106, FM 510, State Highway 100, and State Highway 48 to document ocelot and prey species mortality. **Ongoing; Units: L, B, and C.**
- Strategy 8: Coordinate with TXDOT, utility companies, and Cameron, Hidalgo, and Willacy counties to inform the Refuge of any suspected ocelot road mortalities for timely response and documentation. **Ongoing**
- Strategy 9: Partner with TXDOT and Cameron, Hidalgo, and Willacy counties to install road crossings, fencing, and warning signs at locations where ocelot road mortalities have been documented to help reduce the risk of mortality. **Ongoing**

- Strategy 10: Monitor ocelots and bobcats in and around the Refuge for occurrence of diseases. **Ongoing; Units: L, B, and C.**
- Strategy 11: Coordinate with the Mexican government to translocate ocelots (or genetic material) from the State of Tamaulipas to address the small population size, population isolation, and genetic diversity issues of the Laguna Atascosa ocelot population. **Ongoing; Units: L, B, and C.**
- Strategy 12: Partner with CONANP (Comisión Nacional de Áreas Naturales Protegidas, Secretaría de Medio Ambiente y Recursos Naturales) to establish wildlife corridors to link Refuge and Tamaulipas (Mexico) ocelot populations. This includes restoring Matorral Espinoso Tamaulipeco (Tamaulipan thornscrub) in key areas. **Ongoing; Units: L, B, and C.**
- Strategy 13: Prepare an annual report of all ocelot monitoring, status, mortality, and other research results for the Refuge's ocelot population. This includes creating and maintaining a photo-identification database for the Refuge's ocelot population. **Ongoing; Units: L, B, and C.**
- Strategy 14: Develop or participate in cooperative conservation projects (such as USDA's SAFE initiative, *See Section 2.4*) and develop or participate in partnerships with willing landowners to monitor, conduct research, and help implement recovery actions on lands near or adjacent to the Refuge. **Ongoing; Units: L, B, and C.**
- Strategy 15: Develop a public outreach program to garner local community support for ocelot recovery actions and to encourage local communities and governments to consider zoning regulations that could benefit ocelot recovery. **Ongoing; Units: L, B, and C.**

**Wildlife Objective 2:** Annually implement actions, as the lead recovery station, needed to support downlisting the ocelot from endangered to threatened status.

**Discussion:** It is currently estimated that less than 50 ocelots (in two known separate populations) are remaining in the United States; all are in southernmost Texas, and one of these populations is on and in the vicinity of Laguna Atascosa NWR in Cameron County. The other population is on and in the vicinity of private property in Willacy County with existing conservation easements. Establishing and protecting vegetated wildlife corridors have been identified as necessary to restore habitat connectivity to allow ocelots to disperse and to promote genetic exchange. In the LRGV, this means acquiring lands that connect major blocks of suitable ocelot habitat that occurs both on and off Refuge lands.

This would help achieve important ocelot recovery goals and protect the Valley's unique wildlife and habitat. Some of these wildlife corridors are outside Laguna's approved acquisition boundary; however, they are within Lower Rio Grande Valley NWR's approved acquisition boundary. Therefore, there is a need to coordinate land acquisition strategies within the STRC, which includes the Lower Rio Grande Valley NWR.

- Strategy 1: Coordinate land acquisition activities with the Lower Rio Grande Valley NWR to establish several wildlife corridors (Ranchito Corridor, Coastal Corridor, Boca Chica Corridor, Ranchland Corridor, and North Valley Corridor) to establish connectivity between ocelot populations (*See Section 2.4*). **Ongoing**

- Strategy 2: Develop or participate in cooperative conservation projects (such as USDA’s SAFE initiative, *See Section 2.4*) with private landowners to help establish wildlife corridors on lands near, adjacent to, and between important tracts of the Refuge that can contribute toward ocelot recovery objectives. **Ongoing; Units: L, B, and C.**
- Strategy 3: Work with Mexican researchers and academia in Tamaulipas to map density, distribution, genetic diversity, and other parameters in ocelot populations in Mexico to help implement priority task items.
- Strategy 4: Establish baseline feline disease information in ocelot and bobcat populations in Texas and Tamaulipas.
- Strategy 5: Partner with CONANP (Comisión Nacional de Áreas Naturales Protegidas, Secretaría de Medio Ambiente y Recursos Naturales) to identify, map, and begin creation of one or more wildlife corridors to link Mexican and U.S. ocelot populations. This includes mapping existing protected areas, identifying wildlife corridor gaps, and restoring Matorral Espinoso Tamaulipeco (Tamaulipan thornscrub) in key areas. **Ongoing**
- Strategy 6: Coordinate, provide technical support, participate in routine ocelot conservation workshops (every three to five years), share information, and collaborate with research partners and colleagues to support or conduct research related to radio telemetry, automatic camera stations, hair snares, genetic monitoring, disease monitoring, and other research on ocelot populations in northeastern Mexico. **Ongoing**
- Strategy 7: Develop and maintain a database and repository of literature and information on ocelots. **Ongoing**
- Strategy 8: Continue to monitor and investigate ocelot road mortalities and follow up on credible ocelot sighting reports within 48 hours in Texas. **Ongoing**
- Strategy 9: Partner with non-governmental organizations and private landowners to provide technical assistance or support for providing supplemental freshwater sources for ocelots during periods of drought off Refuge. **Ongoing**
- Strategy 10: Partner with universities, non-governmental organizations, consultants, private landowners, and others to survey and monitor ocelots and their use of habitat restoration areas, potential wildlife corridors, other areas of potential occurrence, supplemental freshwater sources, and public road crossings and culverts. **Ongoing**
- Strategy 11: Coordinate with TXDOT, county road departments, and utility companies in South Texas to inform the Refuge of any suspected ocelot road mortalities for timely response and documentation. **Ongoing**
- Strategy 12: Partner with State and county governments in South Texas to install road crossings, fencing, and warning signs at locations where ocelot road mortalities have been documented. **Ongoing**
- Strategy 13: Coordinate with the Mexican government to translocate ocelots (or genetic material) from the State of Tamaulipas to address the genetic diversity issues of ocelot populations in the U.S. Establish a translocation working group by

2010 to include partners such as CKWRI, Dallas Zoo, Gladys Porter Zoo, CONANP, and others to develop and implement a translocation plan.

- Strategy 14: Coordinate, provide technical support, and share information with research partners and colleagues working in the Arizona area to support implementation of recovery actions in that area. **Ongoing**
- Strategy 15: Coordinate, provide technical support, and share information with research partners and colleagues throughout the remainder of areas of ocelot occurrence (e.g., southern Mexico, Central and South America) to support ocelot recovery efforts. **Ongoing**
- Strategy 16: Provide technical assistance and information to the Service's Corpus Christi Ecological Services Field Office and other agencies on projects, actions, permits, and grant proposals that involve or may affect ocelots. **Ongoing**
- Strategy 17: Develop and present educational and outreach materials (e.g., brochures, landowner incentives) and programs (e.g., awareness training) to partners in ocelot recovery, including U.S. Border Patrol, TXDOT, USDA-Wildlife Services, landowners, hunters, utility companies, and others that may encounter ocelots or impact their habitat. **Ongoing**

**Wildlife Objective 3:** Determine the status of the endangered jaguarundi in Cameron and Willacy counties. The status involves determining presence or absence, and if present, determining if there is a breeding population, and habitat use and size of the occupied range(s).

**Discussion:** The status of the jaguarundi is currently unknown in the United States. The last jaguarundi documented in South Texas was in 1986, near Brownsville. Each year, there are several credible sightings on or near the Refuge, so there is a need to verify and document this species' occurrence on or near the Refuge by implementation of appropriate trapping, surveillance, or other investigative techniques.

- Strategy 1: Train staff biologists on established trapping or surveillance techniques used by our counterparts in Tamaulipas, Mexico, and study the habitat types being used by jaguarundis in Mexico.
- Strategy 2: Conduct trapping and surveillance on the Refuge specifically for jaguarundi based on information gained in Mexico. Conduct intensive trapping operations in areas on the Refuge where jaguarundi sightings have been confirmed (e.g., remote trip camera). **Ongoing**
- Strategy 3: Conduct radio-telemetry and monitoring of trapped jaguarundis to determine habitat use, movements, and reproduction. **Ongoing**
- Strategy 4: Investigate all credible reports of jaguarundi sightings or road kills, and document findings within 48 hours of the report. **Ongoing**
- Strategy 5: Develop and maintain a database and repository of literature and information on jaguarundis. **Ongoing**
- Strategy 6: Provide technical assistance and information to the Corpus Christi Ecological Services Field Office and other agencies on projects, actions, recovery permits, and grant proposals that involve or may affect jaguarundis. **Ongoing**

Strategy 7: Seek partnerships to investigate potential jaguarundi occurrence on off-Refuge lands. **Ongoing**

**Wildlife Objective 4:** Annually conduct seasonal sea turtle nest patrols on the South Padre Island Unit to locate a minimum of 5–10 nests during the season; relocate nests to protected “corrals” to improve hatching success to a minimum of 70 percent. Nest patrols will focus primarily on the endangered Kemp’s ridley, the most commonly nesting sea turtle on the Refuge. Annually monitor the nesting status of the Kemp’s ridley, loggerhead, green, and hawksbill sea turtles and implement important recovery task items as they apply to South Padre Island Unit. Conduct outreach efforts and provide information to increase public awareness, participation, and support for sea turtle conservation.

**Discussion:** Heavy human use of South Padre Island, particularly vehicles, is an ongoing threat to the successful nesting of sea turtles. Kemp’s ridley sea turtles are more vulnerable to becoming injured by vehicle traffic since they nest during the day and are more vulnerable to predation than other sea turtles. The Texas Open Beaches Act allows access to the beach area, which precludes the ability to close the area for the protection of sea turtle nests. Nest patrols and protection are necessary to ensure their recovery in the United States. Public information and outreach is also an important element in helping protect sea turtles and their nests.

Strategy 1: Continue protection of nesting sea turtles through patrols and moving eggs to a protective corral. Use sea turtle hatchling releases as public outreach events to raise awareness of sea turtle conservation efforts and the importance of the Refuge to these efforts. **Ongoing; Unit: S.**

Strategy 2: Investigate and identify sea turtle nesting “hotspots” during sea turtle monitoring to designate these areas for special protection. Protect these areas through seasonal closures, if feasible, with posted signs; increased patrols of these areas; and by posting public informational signs to encourage reporting of nesting sea turtles in these areas. **Ongoing; Unit: S.**

Strategy 3: Increase the Refuge partnership with Sea Turtle, Inc., and form new partnerships with Federal, State, and local government, Mexico, and private entities to promote the conservation of sea turtles. **Unit: S.**

Strategy 4: Provide technical assistance and information to the Corpus Christi Ecological Services Field Office and other agencies on projects, actions, and recovery permits that involve or may affect sea turtles. **Ongoing**

Strategy 5: Develop and present educational and outreach materials to partners in sea turtle recovery, including Cameron and Willacy counties, resorts, private landowners, Border Patrol, and other entities that may encounter sea turtles or impact their habitat. **Ongoing**

**Wildlife Objective 5:** Annually, follow-up on any reported sea turtle strandings within 48-hours and implement necessary actions, as per the Stranding and Salvage Network.

**Discussion:** The Refuge participates in the Sea Turtle Stranding and Salvage Network, as recommended in sea turtle recovery plans. Each year, approximately 20 to 30 sea turtles are found stranded on South Padre Island and Boca Chica area. The Refuge investigates reported strandings and complies with the protocols established by the Stranding and Salvage Network.

- Strategy 1: Search for and document any live or dead stranded sea turtles when nesting patrols are conducted. Collect information such as species, size, and other data, as set forth by the Stranding and Salvage Network. **Ongoing**
- Strategy 2: Provide information and coordinate with the local and State Sea Turtle Stranding Coordinators. **Ongoing**
- Strategy 3: Provide technical assistance and support, such as transporting cold-stunned or injured sea turtles, in partnership with Sea Turtle, Inc., and other entities. **Ongoing**

**Wildlife Objective 6:** Maintain a minimum of 12 breeding territories and corresponding wintering areas for aplomado falcons and, through land protection efforts, protect an additional 6 breeding territories. Annually monitor the status of the aplomado falcon population and implement other important recovery task items as they apply to Laguna Atascosa NWR.

**Discussion:** Historically, the endangered northern aplomado falcon only occurred in deep South Texas, in portions of West Texas, and in southern New Mexico and Arizona. In South Texas, the northern aplomado falcon was extirpated, primarily through over-collecting during the late 1800s and early 1900s (Hector 1987). Efforts to re-establish this falcon within its historical South Texas range began with the first major releases of captive-bred falcons on Laguna Atascosa NWR in 1993 in partnership with The Peregrine Fund. As of 2004, over 900 falcons had been released in the LRGV, and in 2006, 25 nesting pairs were documented. The current recovery objectives for a sustainable population of aplomado falcons in the LRGV are estimated to be between 30-35 pairs (Peregrine Fund, 2010). Contaminants, prey abundance, predation, and the availability of suitable nesting sites are important concerns that may affect this species. Therefore, aplomado falcon populations in the LRGV should continue to be monitored to determine the factors limiting their reproduction and survival. Efforts to restore and enhance coastal prairie grasslands would benefit this species, as well as other priority grassland species that occur on the Refuge, such as the Texas Botteri's sparrow. Peregrine Fund field data show that aplomado falcons are at least 50 percent more successful in producing young in tree yuccas than in mesquite and hackberry. According to the 1990 recovery plan, northern aplomado falcons may be considered for downlisting to threatened status when there are a minimum of 60 breeding pairs in the United States.

- Strategy 1: Conduct a pre-nesting season examination of all known nest sites (especially artificial nest structures) and make any needed repairs or replacements of old stick nests in cooperation with The Peregrine Fund. Check for potential occupancy by caracaras and white-tailed hawks. **Ongoing; Units: L, B, and C.**
- Strategy 2: Partner with The Peregrine Fund and others to monitor the status of the population on the Refuge. Annually count all breeding falcons on the Refuge. This includes monitoring nesting success from April through August and identifying any factors that may adversely affect nesting. **Ongoing; Units: L, B, and C.**
- Strategy 3: Monitor the aplomado falcon population when The Peregrine Fund ceases their monitoring program, including nesting activity and locations each year from April through August, consistent with recovery plan objectives. **Ongoing; Units: L, B, and C.**

- Strategy 4: Partner with The Peregrine Fund and others to collect and analyze eggshell fragments for potential pesticide contamination in the falcon population, particularly nesting territories within or near farm fields, at least every 2-3 years. **Ongoing; Units: L, B, and C.**
- Strategy 5: Partner with The Peregrine Fund and others to investigate the local use of pesticides that may cause direct mortality of aplomado falcons (e.g., carbamates). **Ongoing; Units: L, B, and C.**
- Strategy 6: Continue coordination and outreach with the local agricultural community, the Texas Department of Agriculture, and the USDA regarding pesticide applications and farming trends in areas near the Refuge that may affect aplomado falcons to ensure compliance with the 1990 National Pesticide Application Biological Opinion.
- Strategy 7: Implement applicable recovery plan task items such as construction of artificial nest structures, to ensure continued success of the Refuge's aplomado falcon population based on monitoring results. **Ongoing; Units: L, B, and C.**
- Strategy 8: Protect all known aplomado falcon and other raptor nest sites (including tree yuccas) from damage by fire during controlled burns (or natural fires as much as possible), by mowing, plowing, and back-firing when necessary. This includes natural nests as well as artificial structures. **Ongoing; Units: L, B, and C.**
- Strategy 9: Plant tree yuccas where they are otherwise absent in open grassland to improve nesting opportunities. **Units: L, B, and C.**
- Strategy 10: Identify and rank potential habitat and land protection specific to aplomado falcons to provide additional protected habitat (e.g., coastal prairie and savannah).

**Wildlife Objective 7:** Monitor the status of focal species and other Federal trust and priority species to identify the presence, population levels, and distribution of these species, as determined by Service policy and according to national, regional, and Refuge management plans and initiatives.

**Discussion:** Wildlife populations are dynamic and can be affected by factors such as weather, pollution, global climate change, and human-related disturbances. There is a need to increase our knowledge of wildlife needs and to continue to assess wildlife trends and populations, particularly at the newly acquired Bahia Grande, Coastal Corridor, and South Padre Island units. Focal species monitoring (e.g., mottled ducks, redheads, northern aplomado falcons, snowy plovers, and State-listed species), as well as monitoring land changes, is necessary in order to direct appropriate management responses (i.e., adaptive management).

- Strategy 1: Revise the Refuge Inventory and Monitoring Plan to include needed baseline studies, per Service Manual 701 FW2 (e.g., Update the Wildlife Inventory Monitoring step-down plan) to include all focal species (*as listed in Sections 3.2.8*). **Units: All.**
- Strategy 2: Identify and monitor snowy and Wilson's plover breeding sites for off-road vehicle (ORV) or human disturbance and establish seasonal closures on priority nesting areas. **Ongoing; Units: B, S.**

- Strategy 3: Identify and monitor colonial waterbird (e.g., reddish egret, gull-billed tern, black skimmer, and heron) nesting sites and establish seasonal closures, as needed. **Ongoing; Units: L, B, and S.**
- Strategy 4: Determine the population size and distribution of black-spotted newts and lesser Rio Grande sirens. Consider these species in conjunction with projects intended to benefit other wetland-dependent species. **Ongoing; Units: L, B, and C.**
- Strategy 5: Conduct a baseline inventory and determine winter use by burrowing owls, and monitor this species in conjunction with projects that might affect this species. **Units: All.**
- Strategy 6: Monitor mottled duck populations annually to determine population parameters such as distribution, numbers, nesting success, and survivorship. **Ongoing; Units: L, B, and C.**
- Strategy 7: Conduct annual winter surveys of waterfowl (e.g., mottled ducks, redheads, northern pintails), geese, and sandhill cranes. Evaluate survey frequency (e.g., weekly, bi-weekly, monthly) on each unit. **Ongoing; Units: L, B, and C.**
- Strategy 8: Conduct shorebird surveys and participate in the International Shorebird Census and the Piping Plover Census in support of the Shorebird Conservation Plan and the WHSRN. **Ongoing; Units: All.**
- Strategy 9: Conduct surveys of non-priority species (e.g., white-tailed deer and alligators) at least every five years to determine population status. **Ongoing; Units: All.**
- Strategy 10: Conduct surveys, as needed, for exotic or invasive wildlife species such as feral hogs, nilgai antelope, and cactus moth (*Cactoblastis cactorum*). **Units: All.**
- Strategy 11: Incorporate relevant strategies from the proposed Climate Change Strategic Plan and the associated five-year Action Plan by updating appropriate wildlife management step-down plans, as discussed in Section 5.2 of this CCP. **Units: All.**

**Wildlife Objective 8:** Achieve a minimum of an 80 percent level of protection on each Refuge unit for Federal trust species and their habitats on the Refuge.

**Discussion:** Consistent with the purposes of the Refuge, management efforts will continue to focus on protecting the trust species such as waterfowl, migratory birds, and endangered and threatened species and habitats of the Refuge. As is the case with many endangered and threatened species, these important species need areas for feeding, sheltering, and reproducing without undue disturbance of these major behavioral patterns. Refuge management actions involving federally-listed species will adhere to the ESA, compatibility standards, Service policy and regulations, and NEPA to protect and enhance endangered species and other important fish and wildlife resources. The Refuge will provide technical assistance on endangered species management to private landowners or the public whenever it is requested. Protection may be accomplished through a variety of methods such as signage, fencing, environmental education, outreach, community partnerships, and law enforcement.

- Strategy 1: Consult with the Corpus Christi Ecological Services Field Office on any activities or permitted uses on the Refuge that may affect federally-listed

endangered or threatened species, as per the Endangered Species Act.  
**Ongoing; Units: All.**

- Strategy 2: Coordinate with Federal, State, and local law enforcement agencies regarding the mission of the Refuge System and the protection of federally-listed species, as well as the importance of protecting fish and wildlife resources, including the development of MOUs or interagency agreements with these agencies. Primary coordination will be conducted by the regional zone officer and the supervisor of the STRC Law Enforcement Program. **Ongoing; Units: All.**
- Strategy 3: Inspect and maintain Refuge boundary signs and markers, and replace them when stolen or damaged. Boundary signs and markers will be in both Spanish and English. **Ongoing; Units: All.**
- Strategy 4: Identify and close sensitive wildlife areas by posting signs and markers that explain the closure (e.g., bird nesting area), including working with adjacent private landowners to develop cooperative agreements for protecting these areas that may cross onto private property. Closures may be seasonal, temporary, or permanent, depending on the area. **Ongoing; Units: All.**
- Strategy 5: Develop a leaflet to be handed out at county Beach Access Points 4, 5, and 6. This leaflet would include a Refuge map, and rules, regulations, and information that describe the importance of protecting barrier island resources, including federally-listed species such as sea turtles and piping plovers. **Unit: S.**
- Strategy 6: Identify and mark beach-to-bay access routes for ORV use to protect important wildlife such as nesting birds and piping plovers. Access routes are intended only to support wildlife-dependent recreational uses. **Ongoing; Unit: S.**
- Strategy 7: Reduce human disturbance and adverse impacts to tidal mudflats through increased law enforcement patrols, additional signage, educational outreach, and partnerships. **Ongoing; Units: L, S.**
- Strategy 8: Reduce human disturbance and adverse impacts to dunes and the inter-dunal habitat through increased law enforcement patrols, additional signage, educational outreach, and partnerships. **Ongoing; Unit: S.**
- Strategy 9: Reduce human disturbance and adverse impacts to beachfront habitat through increased law enforcement patrols, additional signage, educational outreach, and partnerships consistent with the Texas Open Beaches Act. **Ongoing; Unit: S.**
- Strategy 10: Reduce wildlife disturbance and habitat damage on the north end of the island during periods of high public use (e.g., holiday weekends) or address specific resource impacts (e.g., impacts to nesting sea turtles) through the deployment of a Special Operations Response Team (SORT). The deployment of Regional SORT teams helps supplement local Refuge law enforcement operations. **Ongoing; Unit: S.**
- Strategy 11: Acquire TXDOT's fee title rights-of-way that go through Refuge tracts. **Unit: S.**

**Wildlife Objective 9:** Achieve a minimum of an 80 percent level of protection on each Refuge unit for focal species and their habitats on the Refuge.

**Discussion:** As development of the surrounding area continues, there is a greater need for protecting and managing focal species (*See Section 3.2.8*). Associated with this protection is the need to identify potential impacts and disturbances to focal species, as well as to educate the public on wildlife protections and considerations.

Strategy 1: Incorporate relevant Gulf Coast Ecosystem plan items, Texas Wildlife Conservation Strategy items, and task items of other applicable plans into the Refuge's habitat and wildlife management programs, as listed in *Section 2.4* of this plan. **Units: All.**

Strategy 2: Monitor bird populations and adjust management strategies, as needed, to optimize bird populations consistent with the goals of relevant plans such as those found in *Section 2.4* (e.g., NAWMP, PIF, Shorebird Conservation Plan, WHSRN). **Ongoing; Units: All.**

**Wildlife Objective 10:** Annually establish at least three research projects in partnership with universities, other institutions, and other agencies (e.g., U.S. Geological Survey) that will contribute to species protection and management of Federal trust species, priority, and focal species (*Sections 3.2.7 and 8*).

**Discussion:** Research would primarily focus on the conservation of Federal Trust and focal species such as the ocelot, aplomado falcon, Kemp's ridley sea turtle, waterfowl, and shorebirds. There are many research needs at Laguna Atascosa NWR that, if undertaken, would support Refuge conservation and management efforts and meet the objectives found in various plans and Federal mandates. Priority will be given to research projects that can be applied to current wildlife management or conservation issues. Research activities will be reviewed periodically by the Service and other representatives to evaluate results. This objective would also provide opportunities for students to study unique South Texas species, while at the same time help increase the pool of prospective wildlife managers and biologists that can specialize in the unique wildlife of the area.

Strategy 1: Develop research partnerships with academia such as the University of Texas-Pan American, UT-Brownsville, Texas Southmost College, and Texas A&M University Kingsville. Examples include marine or fishery surveys in response to seagrass restoration and wildlife species diversity changes in response to loma restoration in the Bahia Grande Unit. **Ongoing; Units: All.**

Strategy 2: Develop a partnership with the U.S. Geological Survey (USGS), Biological Research Division, to assist in the development and implementation of monitoring plans, GIS-based maps, population-habitat models, and research proposals. **Ongoing; Units: All.**

Strategy 3: Work with the regional biologist to address region-wide issues and priorities relevant to or potentially affecting Laguna's wildlife management activities such as research needs, overall conservation issues, and regional mandates or policies related to wildlife management. An example includes assessing the relative benefits of the use of wildlife guzzlers to terrestrial species during prolonged drought conditions on the Refuge. **Ongoing; Units: All.**

Strategy 4: Partner with others, as needed, to identify and address information gaps such as species occurrence, distribution, status, and limiting factors. Examples include black-spotted and Rio Grande lesser siren status surveys in freshwater wetlands on the mainland, and herpetological and mammal baseline surveys on the South Padre Island Unit. **Ongoing; Units: All.**

Strategy 5: Study mottled duck population ecology including nesting, brood rearing, wintering habitat needs, recruitment, mortality factors, and movement along the coast in conjunction with any habitat restoration and maintenance projects for this species, including prescribed fire. **Ongoing; Units: L, B, and C.**

## **4.2 Goal 2**

**Habitat:** Protect, restore, enhance, and maintain the ecological integrity and diversity of native habitats with an emphasis on wetlands, brushlands, coastal prairies, and barrier island habitats.

**Habitat Objective 1:** Conduct brush restoration efforts on appropriate sites annually to increase the amount of ocelot habitat on and near the Laguna Atascosa Unit of the Refuge by 3,000 to 4,500 acres.

**Discussion:** The ultimate goal is to eventually provide approximately 19,000 acres of new ocelot habitat to have enough habitat on and in the vicinity of the Refuge to support up to 75 ocelots. Three habitat priorities for the Refuge’s endangered ocelot program are:

- Habitat restoration and techniques to increase ocelot habitat availability and connectivity,
- Habitat protection through land acquisition, and
- Minimizing habitat losses on and in the vicinity of the Refuge.

This objective addresses the first priority. The estimated normal carrying capacity on and in the vicinity of the Refuge is 30–40 ocelots. Haines *et al.* (2006) determined average ocelot home range sizes of 2,595 acres for males and 1,606 acres for females and determined this area currently has 18,533 acres of existing habitat. Biologists have recommended a minimum population size of 75 ocelots on and in the vicinity of the Refuge to ensure long-term survival of the species in the United States. Consequently, based on these calculations, approximately 19,000 acres of new ocelot habitat must be established to help meet conservation goals, assuming no existing ocelot habitat is lost.

Strategy 1: Identify and prioritize areas for brush restoration through an evaluation process, including researching of historical records and soil types and using GIS to select the appropriate sites best capable of establishing prime ocelot habitat. **Ongoing**

Strategy 2: Identify and prioritize areas for brush restoration on newly acquired lands. **Ongoing**

Strategy 3: Monitor brushland restoration and maintenance annually in areas that have been re-planted or enhanced and adjust management techniques, as necessary, consistent with an approved Habitat Management Plan (HMP). **Ongoing; Units: L, B, and C.**

- Strategy 4: Restore brushland habitat in the Laguna Unit to increase available habitat for ocelots and other brush-dependent species. The first priority for brushland restoration is the old farm fields along the north side of Management Unit 6 (e.g., Scum Pond area). Second priority is the old farm fields along the south and east side of Management Unit 8 (e.g., Eva Thompson Point area). The third priority is the Island Fields area of Management Unit 6. Following restoration of these areas, new areas identified in Strategy 1 will be selected and restored. **Ongoing; Unit: L.**
- Strategy 5: Restore brushland habitat on wildlife corridor tracts. Many of these tracts have the potential to support additional populations of ocelots and are important to providing connections between adjacent habitat patches and adjacent Refuge tracts. Currently, some of the tracts contain marginal habitat or farmland from prior land uses. **Ongoing; Unit: C.**
- Strategy 6: Experiment with different techniques to improve or increase brush restoration success (e.g., intensively-planted small blocks of brush habitat, herbicide applications to control invasive plants, prescribed fire) to see if usable ocelot habitat can be created in a shorter time period. **Ongoing; Units: L, C.**
- Strategy 7: Stabilize deteriorated lomas and uplands on the Bahia Grande Unit once the tidal wetlands are permanently re-flooded. Stabilizing the bare lomas with native grasses will prevent erosion—the first step in eventually restoring these areas to brushland suitable for ocelots. **Ongoing; Unit: B.**
- Strategy 8: Restore brush on the lomas at Bahia Grande after initial stabilization and soil evaluations are complete. The Bahia Grande has substantial potential for dense brush on the lomas suitable for ocelot use. This area could also serve as a connecting wildlife corridor for dispersing ocelots between Laguna Atascosa NWR, tracts of the Lower Rio Grande Valley NWR, and Mexico. **Unit: B.**
- Strategy 9: Work with private landowners adjacent to or near the Refuge and others to protect and restore brush habitat suitable for ocelots (*See also: Wildlife Objective 2, Strategy 2*). **Ongoing; Units: L, B, and C.**

**Habitat Objective 2:** Continually monitor the effects of habitat management practices as determined by Service policy and according to national, regional, and Refuge management plans.

**Discussion:** Staff biologists will continually monitor changes to the overall quality of the Refuge's habitats and the effects of habitat management activities outlined in the appropriate step-down plans, such as the Wetlands Management Plan, to adjust and adapt habitat management strategies to achieve the desired results.

- Strategy 1: Monitor vegetation response to water level management activities annually in all water impoundment systems and adjust management techniques, as necessary, consistent with an approved HMP. **Ongoing; Units: L, B, and C.**
- Strategy 2: Monitor grassland restoration and maintenance annually in areas treated with prescribed fire or other practices and adjust management techniques, as necessary, consistent with an approved HMP. **Ongoing; Units: L, B, and C.**
- Strategy 3: Conduct hydrologic monitoring of tidal flows in the Bahia Grande wetland system to determine effectiveness of the channel design and placement to

ensure optimal tidal exchange and circulation within the system (*See also, Habitat Objective 3, Strategy 10*). **Ongoing; Unit: B.**

Strategy 4: Monitor water quality in Laguna Atascosa Lake, Laguna del Cayo, Pelican Lake, San Martín Lake, Laguna Larga, Little Laguna Madre, and Bahía Grande. This involves looking for contaminants and coordinating with the Ecological Services contaminants biologists, Cameron County, and agricultural groups. **Units: L, B, and C.**

**Habitat Objective 3:** Maintain, improve, or increase wetlands, tidal mudflats, and seagrass habitats for the benefit of Federal trust species such as migratory birds and focal species.

**Discussion:** One of the primary purposes of the Refuge is for Federal trust species such as migratory birds. Millions of birds funnel along the lower Texas coast during spring and fall migrations. Many of these birds stop at the Refuge for short periods to feed and rest, while others winter here. From September through March, the Refuge hosts thousands of migrating and wintering ducks, geese, and sandhill cranes. About 80 percent of North America's redhead duck population winters on or near the Refuge because of the seagrass beds, primarily shoalgrass (*Halodule wrightii*) found in the lower Laguna Madre. Consistent with the Gulf Coast Joint Venture (Laguna Madre Initiative Area) plan, future management activities for redheads need to include ensuring that an abundance of freshwater wetlands exist during the fall, especially during periods of prolonged drought; facilitating the growth and maintenance of food sources such as seagrasses and other wetland plants; and ensuring wintering areas remain relatively undisturbed. Within the Laguna Madre's bay systems, efforts are needed to protect and restore the seagrass beds and improve water quality (e.g., to reduce turbidity and other pollution) for the benefit of redhead ducks (as well as other trust species such as the green sea turtle).

About 38 species of shorebirds migrate and winter on the Refuge. To date, 415 species of birds have been recorded on Laguna Atascosa, and many of these birds depend on the quality and quantity of the saltwater and freshwater wetland habitats on the Refuge. Focal species such as mottled ducks, snowy plovers, reddish egrets, Wilson's plovers, Rio Grande lesser sirens, and black-spotted newts also depend on quality fresh, saline, or tidal mudflat wetlands. In particular, the lack of freshwater wetlands in the Laguna Madre area has been cited as a significant issue, and efforts are needed to protect and enhance these wetland types for the benefit of species such as redhead and mottled ducks. Freshwater wetlands are usually ephemeral or altered by drainage systems, and the Refuge is completely dependent on rainwater, irrigation drainage, and surface runoff to fill Refuge freshwater wetlands. Therefore, those projects that restore tidal flows, provide additional freshwater, or convey water more efficiently, are high priorities.

Strategy 1: Implement specific wetland habitat management activities, as described in the Habitat Management Plan (2008), a step-down plan to the CCP. **Ongoing; Units: All.**

Strategy 2: Support and participate in the implementation of action items of the Arroyo Colorado Watershed Protection Plan (2007). **Ongoing; Units: L and C.**

Strategy 3: Remove silt plugs in Laguna Atascosa Lake to enhance water flow to and from the lake. The major plugs include one area near Eva Thompson Point and another on the southern end of the lake where cattails choke the water flow. **Unit: L.**

- Strategy 4: Replace water control structure (Crossing #2) on the 800-acre Lower Cayo Atascosa to control water levels in this wetland for migratory waterbirds and waterfowl benefits. **Unit: L.**
- Strategy 5: Restore and maintain 180 acres of freshwater wetlands (Resaca de los Fresnos) on La Selva Verde Tract by replacing old and dilapidated water control structures, replacing the electric water pump, and constructing channels and ponds to restore and maintain natural flow to this wetland system. **Unit: C.**
- Strategy 6: Restore the 180-acre Resaca de los Cuates wetland system by modifying and maintaining a 1,500-foot ditch leading into this system, and replacing water control structures in this system for water level manipulation. Continue to pursue opportunities for acquiring water through local irrigation districts to fill this wetland system. **Ongoing; Unit: L.**
- Strategy 7: Enhance Laguna de los Patos Lake by increasing the capacity and contouring its shape to provide a variety of waterfowl uses. **Unit: L.**
- Strategy 8: Modify and maintain the entrance to Bayside Lake to restore tidal flows from the Laguna Madre. **Unit: L.**
- Strategy 9: Improve tidal flows in the 1,550-acre Horse Island mudflat area. Wind and lunar tidal flows into this area are currently blocked by an 800-foot earthen causeway on the south end and spoil areas from the Harlingen Ship Channel on the north end. Work with partners such as Ducks Unlimited and the Corps through the Continuing Authorities Program, to open tidal blockages with channels and water control structures to restore this mudflat area. **Unit: L.**
- Strategy 10: Construct or enhance connections between the Brownsville Ship Channel and the Bahia Grande wetland system by working with partners to expand the pilot channel, which connects the Bahia Grande basin to the Brownsville Ship Channel, to final design specifications to increase tidal exchange within the wetland system. **Unit: B.**
- Strategy 11: Complete construction of channels and associated structures (e.g., water control structures, bridges) interconnecting Laguna Larga, Little Laguna Madre, and Bahia Grande basins to improve water circulation and tidal exchange. **Unit: B.**
- Strategy 12: Conduct a feasibility study to reconnect San Martín Lake to the Bahia Grande Wetland system to improve estuarine conditions. If feasible, restore the hydrological and wetland functions of San Martín Lake to include its historical connection to the Bahia Grande wetland system. **Unit: B.**
- Strategy 13: Connect the El Tular Lake freshwater system to the Laguna Larga basin to enhance estuarine conditions, in partnership with Cameron County, TXDOT, and the NRCS. **Unit: B.**
- Strategy 14: Restore tidal flow into Moranco Blanco Lake by establishing a channel into the Laguna Madre and modifying the existing water control structure and dike. **Unit: L.**

- Strategy 15: Restore the South Boundary Drain System, bordering Management Unit 7, by maintaining the water delivery ditch, modifying the existing dike, and replacing the water control structure. **Unit: L.**
- Strategy 16: Maintain and enhance natural and artificial freshwater ponds (e.g., old stock tanks) for Federal trust species (e.g., migratory birds) and other priority or focal species. **Ongoing; Units L, B, and C.**
- Strategy 17: Maintain and enhance West Lake Road freshwater impoundment system for migratory waterfowl, waterbirds, and other priority or focal species. **Unit: L.**
- Strategy 18: Maintain, enhance, or modify the existing drainage system of ditches on the Refuge to restore and manage freshwater wetlands. **Units: L, B.**
- Strategy 19: Maintain and enhance Pelican Lake and associated drainage ditches for wintering waterfowl, waterbirds, and other priority or focal species. **Unit: L.**
- Strategy 20: Restore the West Cayo Mudflat system by maintaining, enhancing, or constructing dikes, channels, and water control structures that would allow flow from the Harlingen Ship Channel and the Arroyo City shrimp farms. **Unit: L.**
- Strategy 21: Assess potential lead and copper contamination of Pelican Lake and nearby areas in the Laguna Atascosa Unit, Management Unit 7, from leftover spent bullets in the Formerly Used Defense Site (FUDS). **Unit: L.**
- Strategy 22: Protect the inter-dunal freshwater wetlands and mudflat habitats from ORV use and other activities (e.g., oil and gas exploration). **Ongoing; Unit: S.**
- Strategy 23: Restore seagrass beds in the Bahia Grande tidal wetland system upon completion of the main channel that connects it to Brownsville Ship Channel. **Unit: B.**
- Strategy 24: Implement management and protection measures to protect and enhance seagrass habitats per the Seagrass Conservation Plan for Texas as they apply to Laguna Atascosa NWR. **Units: L, B, and S.**
- Strategy 25: Update and expand the existing Water Management Plan to assess the adequacy and reliability of existing freshwater resources and supplies.

**Habitat Objective 4:** Maintain, improve, or restore native upland habitats to meet the needs of Federal trust species (e.g., endangered species) and priority or focal species.

**Discussion:** The Refuge contains several unique habitat types, such as Tamaulipan thornscrub, which support endangered species and numerous other priority wildlife. The Refuge's diverse assemblage of brushy and grassy uplands is home to the endangered ocelot, jaguarundi, and aplomado falcon. The ocelot is an area-sensitive species requiring large, dense brush tracts. In addition, priority species such as the Texas tortoise and focal species such as the Texas horned lizard and Botteri's sparrow depend on native upland habitats. As the area surrounding the Refuge continues to be rapidly developed, there is a continuing need to maintain and enhance uplands such as native brushland for the recovery of endangered species; to maintain and enhance migratory bird habitats; and to provide public opportunities for the enjoyment of coastal South Texas wildlife for generations to come. Strategies for this objective also take into consideration the important recommendations of landscape level plans such as the PIF-North American Landbird Conservation Plan (*See Section 2.4*).

- Strategy 1: Develop a vegetative type cover map using GIS. 2011; **Units: All.**
- Strategy 2: Identify locations with appropriate soil types to determine the best approach for brushland restoration. **Ongoing; Units: L, B, and C.**
- Strategy 3: Manage Gulf cordgrass habitat with a fire management program that utilizes both prescribed fire and wildlife to enhance mottled duck nesting habitat and to create green forage for migratory waterfowl and sandhill cranes. **Ongoing; Units: L, B.**
- Strategy 4: Provide supplemental freshwater sources for ocelots and other wildlife during periods of drought. Increased ocelot mortality and lack of reproduction have been attributed to the lack of available water during droughts. One way to provide supplemental water is to install artificial “wildlife guzzlers.” They are designed to collect and store dew and rainwater and then direct it into concrete water holes accessible to wildlife. Also, determine location and number of guzzlers that may be needed on other Refuge units. **Ongoing; Units: L, B, and C.**
- Strategy 5: Use prescribed fire, or other treatments, to reduce brush encroachment into grassland areas and to help manage grassland habitat to increase population densities of rodents and other prey to benefit species such as the aplomado falcon, white-tailed kite, and other avian predators (*See also: Habitat Objective 5, Strategy 8*). **Ongoing; Units: L, B.**
- Strategy 6: Enhance “edge” habitat adjacent to prime brush habitat to optimize the prey base for the ocelot by prescribed fire or other treatments. **Ongoing; Units: L, B.**

**Habitat Objective 5:** Reduce by more than 50 percent all invasive species on the Refuge.

**Discussion:** The spread or introduction of invasive species is an ongoing and serious threat to native habitats. Executive Order 13112 requires, among other things, that Federal agencies use relevant programs, authorities, and funds to monitor for, prevent, and control the spread of invasive species. The spread of invasive grasses threatens the biodiversity of rare plant communities on the Refuge’s lomas (e.g., lila de las lomas and Lila de los llanos populations).

- Strategy 1: Develop and implement an integrated pest management plan to address Refuge habitat needs as well as comply with Federal mandates. The Integrated Pest Management Plan includes strategies for surveying, mapping, monitoring, and controlling invasive species as per existing budgets and staff. **Units: All.**
- Strategy 2: Improve the control of exotic nilgai antelope and feral hogs by developing and implementing specific control plans for these species. **Units: L, B, and C.**
- Strategy 3: Control Brazilian peppertree stands on the Refuge through mechanical and chemical treatments. **Ongoing; Units: L, C.**
- Strategy 4: Remove saltcedar and replant wildlife corridor with native brush used by ocelots on the Sendero del Gato Tract (formerly known as the Schatz Tract). This project should be done in segments to ensure protected wildlife corridor habitat is available at all times of the year. **Ongoing; Unit: C.**
- Strategy 5: Control saltcedar stands through mechanical and chemical treatments on the Refuge. **Ongoing; Units: L, C.**

- Strategy 6: Control guinea grass, buffelgrass, and other exotic grasses on the Refuge with particular focus on the lila de las lomas and Lila de los llanos plant communities on the lomas. **Ongoing; Units: L, B, and C.**
- Strategy 7: Monitor for and map other invasive and/or exotic species as indicated by an integrated pest management plan. **Units: All.**
- Strategy 8: Use prescribed and wildland fire to maintain and restore coastal prairie communities at four- to seven-year fire frequencies to enhance native species abundance and landscape diversity, and to reduce non-native invasive species. **Ongoing; Units: L, B, and C.**

**Habitat Objective 6:** Encourage research with universities and other research partners that will contribute to the biological database of the Refuge or contribute to habitat restoration or management of Federal trust species and priority species. The research activities will be reviewed periodically by the Service and other representatives to evaluate research results. Research will focus on Federal trust species and priority species (e.g., ocelots, sea turtles, migratory birds, and State-listed species) monitoring and habitat management activities.

**Discussion:** There are many informational gaps regarding wildlife and habitat on the Refuge. This significantly limits management efforts in supporting the purposes of the Refuge and in meeting the goals and objectives of various conservation plans and Federal mandates. Appropriate research is needed to fill these informational gaps. This objective would also provide opportunities for students to study unique South Texas coastal environments while helping increase the pool of prospective wildlife managers and biologists that can specialize in the ecology of the area.

- Strategy 1: Develop research partnerships with academia such as UT-Pan American, UT-Brownsville, and Texas A&M University-Kingsville to accomplish high priority research needs. **Ongoing; Units: All.**
- Strategy 2: Work with the regional office Refuge biologist to prioritize research needs based upon biological resources, wildlife trends, and corresponding management activities. **Ongoing; Units: All.**
- Strategy 3: Identify information gaps regarding distribution and abundance of flora and fauna, particularly on Bahia Grande and South Padre Island Units. **Ongoing; Units: All.**
- Strategy 4: Develop a field research station at Bahia Grande through partnerships (e.g., local universities). **Unit: B.**

**Habitat Objective 7:** Protect and conserve wildlife habitat, particularly tracts that provide connecting links between adjacent Refuge tracts and tracts containing unique or declining habitat, through working closely with the Lower Rio Grande Valley NWR and through partnerships, land protection, and land acquisition.

**Discussion:** By working with partners, the Service can more fully ensure that healthy wildlife populations and habitat are here for future generations. A concerted effort with those entities interested in the long-term health of coastal South Texas biotic communities is essential. Additionally, land acquisition is the main tool to ensure protection of wildlife habitats in perpetuity. Laguna's current acquisition boundary is limited to eastern Cameron County and may not include additional lands that could serve as important wildlife corridors or connecting links between adjacent Refuge tracts or other key conservation lands. Top acquisition

priorities are connecting the Bahia Grande and Laguna units (e.g., via the Coastal Corridor Unit); acquiring inholdings within the larger Refuge parcels, especially on the South Padre Island Unit in the Coastal Barrier Resources Act (CBRA) area; and establishing wildlife corridors between Refuge tracts and other protected areas north of the Laguna Unit.

- Strategy 1: Pursue wildlife habitat land acquisition. Seek to acquire from willing sellers, and contingent upon Congressional funding, lands that contain high quality or restorable habitats. **Ongoing; Units: All.**
- Strategy 2: Transfer all Lower Rio Grande Valley NWR tracts within Laguna Atascosa NWR's approved acquisition boundary to Laguna Atascosa NWR (i.e., an administrative land transfer between refuges). **Units: B, C.**
- Strategy 3: Work closely with the Lower Rio Grande Valley NWR to establish wildlife corridors to connect Refuge tracts with those of the Lower Rio Grande Valley NWR. Identified potential wildlife corridors include: Ranchito Corridor, Ranchland Corridor, Boca Chica Corridor, and North Valley Corridor (*See also: Wildlife Objective 2, Strategy 1*). **Ongoing; Units: L, B, and C.**
- Strategy 4: Work closely with Cameron County Drainage Districts 3 and 4 to minimize brushland habitat loss and disposal impacts during ditch maintenance activities on La Selva Verde tract and the Laguna Unit. This includes continuing existing management agreements with these Districts. **Ongoing; Units: L, C.**
- Strategy 5: Develop management agreements with irrigation and drainage districts to minimize brushland habitat loss during ditch and canal maintenance activities. These agreements will help create or improve wildlife corridors connecting Refuge tracts. **Ongoing; Units: L, B, and C.**
- Strategy 6: Coordinate with the Corpus Christi Ecological Services Field Office and non-governmental organizations (NGOs) such as Environmental Defense, to promote or encourage private landowners to participate in Safe Harbor agreements and other landowner incentive programs. Emphasis will be placed on establishing or protecting wildlife corridors between Refuge tracts and other protected areas for the benefit of ocelots and other listed species, as necessary. **Ongoing; Units: All.**
- Strategy 7: Continue to develop partnerships for habitat conservation and protection with other Federal agencies, private landowners, communities, and NGOs, such as Environmental Defense, The Nature Conservancy, and The Conservation Fund. Examples include USDA's SAFE Initiative (*See also: Wildlife Objective 2, Strategy 2 and Section 2.4*). **Ongoing; Units: All.**
- Strategy 8: Incorporate relevant strategies from the proposed Climate Change Strategic Plan



Green Jays. Illustration: Ram Papish

and the associated five-year Action Plan by updating the Refuge's Habitat Management Plan (HMP). *Units: All.*

Strategy 9: Coordinate with agencies such as the USGS, NOAA, and others regarding global climate change or sea level rise and its potential effects at Laguna Atascosa NWR for consideration in Refuge management activities. **Annually.**

### 4.3 Goal 3

**Public Use:** Connect people with nature by providing compatible wildlife-dependent recreation, interpretation, and environmental education to a diverse audience by offering quality visitor services and facilities. Provide outreach programs with an emphasis on reaching local residents.

The National Wildlife Refuge System Improvement Act of 1997, as amended, emphasizes that wildlife-dependent recreation uses are appropriate, priority uses and should be facilitated when compatible with Refuge purposes and the mission of the Refuge System. Priority wildlife-dependent uses include hunting, fishing, wildlife observation and photography, and environmental education and interpretation. Other recreational uses may be allowed if appropriate and compatible with the purposes of the Refuge and the Refuge System mission. The guidelines used for developing the following objectives and strategies are described in this CCP in Section 3.10: *Public Access and Wildlife-Dependent Recreational Uses.*

**Public Use Objective 1:** Annually evaluate the hunting program on the Laguna Atascosa Unit to enhance hunting access and opportunities for a safe, quality hunting experience for diverse audiences, and develop hunting opportunities, as compatible, for other Refuge units.

**Discussion:** Hunting is an important wildlife management tool that the Refuge System recognizes as a healthy, traditional outdoor pastime, deeply rooted in the American heritage. Hunting is an appropriate use of the Refuge System; however, the Refuge manager must still determine if and where hunting is compatible on the Refuge. It is also considered a priority general public use of the Refuge System and will receive enhanced consideration over non-priority uses. Hunting programs can promote understanding and appreciation of natural resources and their management on lands and waters in the Refuge System. The Refuge's hunting program relies on close cooperation and coordination with TPWD in developing and managing hunting opportunities and in setting Refuge population management goals and objectives. Refuge hunting regulations are consistent with State fish and wildlife laws, regulations (but may be more restrictive), and management plans.

The Laguna Atascosa Unit offers the largest public hunt in the LRGV, an area known for limited public hunting opportunities. Recreational hunts are provided at the Refuge for white-tailed deer during the State season. In addition, feral hogs and nilgai antelope, with no bag limits, are hunted during the white-tailed deer hunts. The current hunt program on the Laguna Atascosa Unit is directed by the 1994 Hunt Plan with 2004 revisions, which provides thorough documentation for population ceilings, bag limits, and objectives for the program.

Currently, no public hunting has been developed for the South Padre Island Unit and the Bahia Grande Unit. As stated in the Refuge's 1999 Refuge Expansion Plan, the Refuge decided not to allow public hunting on the South Padre Island Unit. This decision was made, in part, due to the lack of huntable populations of big game, upland game, and migratory birds sufficient to have quality hunts. Additionally, the non-contiguous Refuge tracts on the South Padre Island Unit, interspersed with private property and public beachfront (i.e., Texas Open

Beaches Act), do not facilitate safe public hunts. However, the Bahia Grande Unit could offer several public hunting opportunities because it is a large, singular unit and has huntable game populations. This unit may offer waterfowl, big game, upland game, and exotic wildlife (e.g., feral hogs and nilgai antelope) hunting opportunities.

- Strategy 1: Revise the hunting plan. **Units: All.**
- Strategy 2: Determine the feasibility of developing a migratory bird hunting program (e.g., waterfowl and doves) on the Bahia Grande Unit. **Unit: B.**
- Strategy 3: Determine the feasibility of developing an upland game bird hunting program (e.g., quail) on the Bahia Grande Unit. **Unit: B.**
- Strategy 4: Determine the feasibility of developing a big game hunting program (e.g., nilgai antelope and feral hogs) on the Bahia Grande Unit. **Unit: B.**
- Strategy 5: Determine the feasibility of developing a migratory bird hunting program (i.e., doves only) and an upland game bird hunting program (e.g., quail) on the Laguna Atascosa Unit. **Unit: L.**
- Strategy 6: Determine the feasibility of opening Management Unit 4 (area north of the Harlingen Ship Channel) to big game hunting and to waterfowl hunting on the Laguna Atascosa Unit. **Unit: L.**
- Strategy 7: Determine the feasibility of having quality, special public hunts directed toward youths (e.g., family hunts), individuals with disabilities, underrepresented groups. **Units: L, B.**
- Strategy 8: Update the Refuge Web site to provide bilingual public hunting information, such as application forms and Refuge hunting regulations. **Units: All.**
- Strategy 9: Increase Refuge LE presence on the South Padre Island Unit during the general Texas hunting season to prevent poaching and illegal hunting in partnership with the LE Division of TPWD. **Unit: S.**

**Public Use Objective 2:** Annually evaluate the fishing program on the Refuge to enhance fishing access and opportunities for a safe, quality fishing experience for diverse audiences and to expand fishing opportunities over current levels when compatible.

**Discussion:** Fishing is one of the top recreational activities enjoyed by local residents and is, therefore, an important wildlife-dependent activity on the Refuge. Fishing is an appropriate use of the Refuge System; however, the Refuge manager must still determine if and where fishing is compatible on the Refuge. It is also considered a priority general public use of the Refuge System and will receive enhanced consideration over non-priority uses. Fishing programs can promote understanding and appreciation of natural resources and their management on lands and waters in the Refuge System. The Refuge fishing program relies on close cooperation and coordination with TPWD in developing and managing fishing opportunities. Fishing access and opportunities on the Refuge will be high quality, conducted in a safe and cost-effective manner, and carried out in accordance with State regulations (*See Section 3.10.2 for a description of current fishing opportunities*).

- Strategy 1: Develop a fishing plan. **Units: All.**
- Strategy 2: Evaluate the Adolph Thomae Jr. County Park Cooperative Management Agreement, which is set to expire in 2011, if requested by Cameron County for

the continuation of public fishing and boating access at the park. An appropriate use finding and compatibility determination will be conducted at that time. **Unit: L.**

- Strategy 3: Determine the feasibility of allowing seasonal wade-fishing access (e.g., Memorial Day to Labor Day) to the Laguna Madre from the Bayside Wildlife Drive in Management Unit 7, including any additional infrastructure (e.g., parking areas and access points). **Unit: L.**
- Strategy 4: Determine the feasibility of allowing wade-fishing and non-motorized watercraft (e.g., canoe and kayak) on the Bahia Grande off SH 48, including the addition of parking areas and a fishing and boat access pier. **Unit: B.**
- Strategy 5: Enhance fishing access opportunities at San Martín Lake along SH 48 in partnership with TXDOT and TPWD to provide better parking and other infrastructure. **Unit: B.**
- Strategy 6: Conduct periodic water testing and fish sampling at San Martín Lake, Bahia Grande, and Laguna Larga to monitor water quality and identify any potential contaminants in fish and other marine life in partnership with the Texas Commission on Environmental Quality. **Ongoing; Unit: B.**
- Strategy 7: Conduct a minimum of two youth and family-oriented fishing events annually (e.g., Junior Angler program) in partnership with TPWD and Valley recreational fishing organizations. **Ongoing; Units: L, B.**
- Strategy 8: Identify and post designated access routes for motorized vehicles at traditional access locations (e.g., washovers) from the public beach side on South Padre Island to designated sites along the shore of the Laguna Madre to allow boating and fishing access. **Unit: S.**
- Strategy 9: Increase LE presence on the Refuge to prevent poaching and illegal fishing in partnership with the LE Division of TPWD. **Ongoing; Units: All.**
- Strategy 10: Update the Refuge Web site to include bilingual public fishing information. **Units: All.**

**Public Use Objective 3:** Improve the quality of wildlife observation opportunities for diverse audiences, and increase participation by 10 percent over current levels on the Laguna Atascosa Unit by updating existing programs, facilities, or infrastructure; on the Bahia Grande Unit by adding a minimum of 10 new programs, facilities, or infrastructure; and on the South Padre Island Unit by increasing public awareness of these opportunities.

**Discussion:** The majority of Refuge visitation is for both wildlife observation and photography. Because the Refuge recently added the Bahia Grande and South Padre Island units, there are additional opportunities to further enhance these important public uses. Additional facilities and services are needed to deal with the ever-increasing demand for this type of wildlife-related ecotourism in the LRGV. Visitor safety is a top priority for the Refuge in the design, integrity, and maintenance of visitor service facilities and programs.

Laguna Atascosa NWR is recognized as one of the best refuges for the popular activity of bird watching, and it is one of the best butterfly watching locations in the nation. To date, 415 species of birds have been recorded on the Refuge, more than any other national wildlife

refuge. The Refuge is a popular destination for wildlife viewing, attracting more than 85,000 visitors annually to engage in this and other activities.

- Strategy 1: Write and implement a Visitor Services Plan. **Units: All.**
- Strategy 2: Revise and update Refuge species lists, such as the Watchable Wildlife List, and create a butterfly checklist and a plant brochure. **Units: All.**
- Strategy 3: Inspect annually, all visitor service facilities and areas such as boardwalks, trails, roads, parking, and observation areas for potential safety hazards. Repair facilities, as needed, to eliminate safety hazards. **Ongoing; Units: All.**
- Strategy 4: Pave Lakeside Wildlife Drive to improve motorized vehicle and bicycle access to the Osprey Overlook trailhead area. **Unit: L.**
- Strategy 5: Pave the parking lot and renovate the observation deck at the Osprey Overlook trailhead area and an accessible pathway to the trailhead of Lakeside Trail South (Alligator Pond Trail). **Unit: L.**
- Strategy 6: Complete the back-country hike-and-bike trail system to include informational kiosks along the trails and a leaflet describing wildlife observation opportunities. **Unit: L.**
- Strategy 7: Improve (e.g., re-pave) and maintain the Buena Vista access road (i.e., the three-mile section from the FM 106 intersection north to the Refuge visitor center) by working with Cameron County and TXDOT to improve public access to the Refuge visitor center and wildlife drives. **Unit: L.**
- Strategy 8: Improve or create wildlife observation opportunities by constructing additional observation platforms or installing webcams at locations of representative Refuge habitat types. **Units: L, B.**
- Strategy 9: Provide a bicycle rental program in partnership with the Friends of Laguna Atascosa NWR to improve access to more remote wildlife viewing locations (e.g., Kidney Pond) not accessible by motorized vehicles. **Units: L, B.**
- Strategy 10: Develop an informational kiosk, boardwalk, observation deck and tower, and canoe and/or kayak launch site adjacent to the TXDOT parking area along SH 48, bordering the Bahia Grande Unit in partnership with TXDOT and others. **Unit: B.**
- Strategy 11: Establish a visitor contact station and wildlife drive on the Bahia Grande Unit. **Unit: B.**
- Strategy 12: Establish on existing roads a minimum of four hike-and-bike trails, including paved parking lot and informational kiosk, at select access points off of SH 48 and SH 100 on the Bahia Grande Unit. **Unit: B.**
- Strategy 13: Establish a Refuge informational exhibit and seasonal staff presence at the South Padre Island World Birding Center (SPI-WBC) in partnership with the South Padre Island Economic Development Corp. **Unit: S.**
- Strategy 14: Develop a video, in partnership with the SPI-WBC or other partners, to enhance wildlife observation opportunities. **Unit: S.**

- Strategy 15: Establish “eBird Trail Tracker” kiosk or equivalent computer system at the SPI-WBC and at the Laguna Atascosa Unit visitor center to report bird observations. **Units: L, S.**
- Strategy 16: Develop videos describing wildlife observation opportunities on the Laguna Atascosa and Bahia Grande Units. **Units: L, B.**
- Strategy 17: Update the Refuge Web site to include bilingual wildlife observation information, such as unique Valley specialty species (e.g., butterflies, birds). **Units: All.**
- Strategy 18: Evaluate visitor service facilities (e.g., trails, boardwalks, observation decks) and programs to update, improve, replace, or eliminate, as needed. **Ongoing; Units: All.**
- Strategy 19: Evaluate the need to change recreational fee program on the Laguna Atascosa Unit and evaluate the need to initiate public entrance fee collection on the Bahia Grande Unit. No public entrance fees will be required on the South Padre Island Unit per the 1999 Refuge Expansion Plan.
- Strategy 20: Develop a minimum of four new programs (e.g., beginning butterfly watching and bird sound identification). **Units: All.**
- Strategy 21: Evaluate virtual geocaching as a method of encouraging Refuge visitation for wildlife observation. If appropriate and compatible, establish online virtual geocaching links on the Refuge Web site and provide Refuge geocaching links to recognized, reputable geocaching Web sites. **Units: All.**

**Public Use Objective 4:** Improve the quality of wildlife photography opportunities for diverse audiences, and increase participation by 10 percent over current levels on the Laguna Atascosa Unit by updating existing programs, facilities, or infrastructure; on the Bahia Grande Unit by adding a minimum of 10 new programs, facilities, or infrastructure; and on the South Padre Island Unit by increasing public awareness of these opportunities.

**Discussion:** The majority of Refuge visitation is for both wildlife observation and photography. Because the Refuge recently added the Bahia Grande and South Padre Island units, there are additional opportunities to further enhance these important public uses. Additional facilities and services are needed to deal with the ever-increasing demand for this type of wildlife-related ecotourism in the LRGV. Visitor safety is a top priority for the Refuge in the design, integrity, and maintenance of visitor service facilities and programs.

Laguna Atascosa NWR is recognized as one of the best refuges for the popular activity of bird and butterfly photography. To date, 415 species of birds have been recorded on the Refuge, more than any other national wildlife refuge. The Refuge is a popular destination for wildlife photography, attracting more than 85,000 visitors annually to engage in this and other activities.

- Strategy 1: Write and implement a Visitor Services Plan. **Units: All.**
- Strategy 2: Inspect annually, all visitor service facilities and areas such as boardwalks, trails, roads, photo blinds, and parking for potential safety hazards. Repair facilities, as needed, to eliminate safety hazards. **Ongoing; Units: All.**
- Strategy 3: Pave Lakeside Wildlife Drive to improve motorized vehicle and bicycle access to the Osprey Overlook trailhead area. **Unit: L.**

- Strategy 4: Pave the parking lot and renovate the observation deck at the Osprey Overlook trailhead area and an accessible pathway to the trailhead of Lakeside Trail South (Alligator Pond Trail). **Unit: L.**
- Strategy 5: Improve or create wildlife photography opportunities by constructing additional photo blinds and observation platforms. **Units: L, B.**
- Strategy 6: Develop a boardwalk and observation deck and tower adjacent to the TXDOT parking area along SH 48, bordering the Bahia Grande Unit in partnership with TXDOT and others. **Unit: B.**
- Strategy 7: Establish a visitor contact station and wildlife drive on the Bahia Grande Unit. **Unit: B.**
- Strategy 8: Update the Refuge Web site to include bilingual wildlife photography information, such as unique Valley specialty species (e.g., butterflies, birds). **Units: All.**
- Strategy 9: Evaluate visitor service facilities (e.g., trails, boardwalks, observation decks) and programs to update, improve, replace, or eliminate, as needed. **Ongoing; Units: All.**
- Strategy 10: Develop a minimum of four new programs (e.g., beginner digital nature photography). **Units: All.**

**Public Use Objective 5:** Increase curriculum-specific EE program attendance by 15–20 percent over current levels, with an emphasis on reaching diverse student audiences, which will lead to a greater understanding and appreciation for the fish, wildlife, plants, and their habitats within coastal South Texas.

**Discussion:** Environmental education (EE) programs are offered year-round serving diverse student populations, from pre-K through university level, and the general public. Interest in Refuge environmental education programs from school districts in Cameron and Willacy counties and from local universities is high as the Refuge is part of the curriculum of many of these institutions. Based on national or State educational standards, the Refuge will offer curriculum-based environmental education programs to advance public awareness and knowledge of key issues and resources of the Refuge. There are nine school districts in the vicinity of the Laguna Atascosa Unit; however, relatively few educators bring classes to Laguna Atascosa or request classroom programs. One reason is a lack of information about what kinds of programs the Refuge offers and another is that existing programs do not always conform to science testing standards. Developing and implementing educational programs that may be used with or without Refuge staff assistance may encourage more teachers to use the Refuge for science and environmental based curricula. In addition, there are opportunities to provide improved outdoor classroom activities on the Laguna Atascosa Unit and new opportunities on the Bahia Grande and South Padre Island Units, focusing on the Brownsville and Point Isabel Independent School District (ISD) and the University of Texas at Brownsville.

- Strategy 1: Write and implement a Visitor Services Plan. **Units: All.**
- Strategy 2: Identify a multipurpose room to be used for educational programs (e.g., school groups), public meetings, and other presentations. **Unit: L.**

- Strategy 3: Develop sea turtle, endangered species, bird adaptation, and wetland EE programs, in accordance with State curriculum standards, for elementary and high schools in partnership with local ISDs. **Units: All.**
- Strategy 4: Conduct at least one “Project Wild,” or equivalent, session or teacher workshop annually to prepare educators to incorporate the Refuge as an outdoor classroom for their students. **Ongoing; Units: L, B.**
- Strategy 5: Develop educational packets and lesson plans, in accordance with State curriculum standards, about Refuge habitats that can be used by educators on Refuge field trips with minimal staff assistance. **Ongoing; Units: L, B.**
- Strategy 6: Apply for grants to fund Refuge field trips and obtain EE supplies in partnership with Friends of Laguna Atascosa, local ISDs, and other partners. **Ongoing; Units: L, B.**
- Strategy 7: Establish a visitor contact station and a research field station (in partnership with local universities and ISDs) as a facility for conducting outdoor classroom activities at Bahia Grande (*See also: Public Use Objective 3; Strategy 11*). **Unit: B.**
- Strategy 8: Provide restroom facilities at two locations on the Bahia Grande Unit for school groups engaged in outdoor classroom activities. **Unit: B.**

**Public Use Objective 6:** Increase interpretive program attendance by 10 percent over current levels, improve or update more than 50 percent of existing written interpretive materials, and add at least 20 interpretive materials, facilities, specialty vehicles, or infrastructure over the life of this plan to better inform and accommodate visitors of all ages and abilities—leading to a greater understanding and appreciation of the unique resources of the Refuge.

**Discussion:** Interpretation programs promote a better understanding and appreciation for the natural and cultural resources and their management on Refuge lands and waters. A primary goal of the Refuge System is connecting people with nature. Many of the interpretive facilities, programs, signs, brochures, exhibits, and kiosks are 10–20 years old. The material, in some cases, is out-of-date or inaccurate, some of the facilities and programs do not meet ADA (Americans with Disabilities Act) guidelines and regulations, and many signs and observation structures need to be updated to present a better image of the Service to the public and enhance their visit to the Refuge. Signage will be bilingual (i.e., English and Spanish) and/or include international symbols, and interpretive materials (e.g., brochures, leaflets) will have bilingual components.

- Strategy 1: Develop an interpretive plan as part of the Visitor Services Plan. **Units: All.**
- Strategy 2: Renovate existing visitor center restrooms to be ADA-compliant or construct new restroom facilities. **Unit: L.**
- Strategy 3: Acquire tour vehicle (e.g., tram or 4x4 van). **Unit: L.**
- Strategy 4: Add or update interpretive panels focusing on wetlands habitats at popular visitor locations, including Alligator Pond, Osprey Overlook, Pelican Lake, Bahia Grande, and SH 100 pullout area west of Laguna Vista. **Units: L, B.**
- Strategy 5: Update or replace existing interpretive panels along Bayside Wildlife Drive. **Unit: L.**

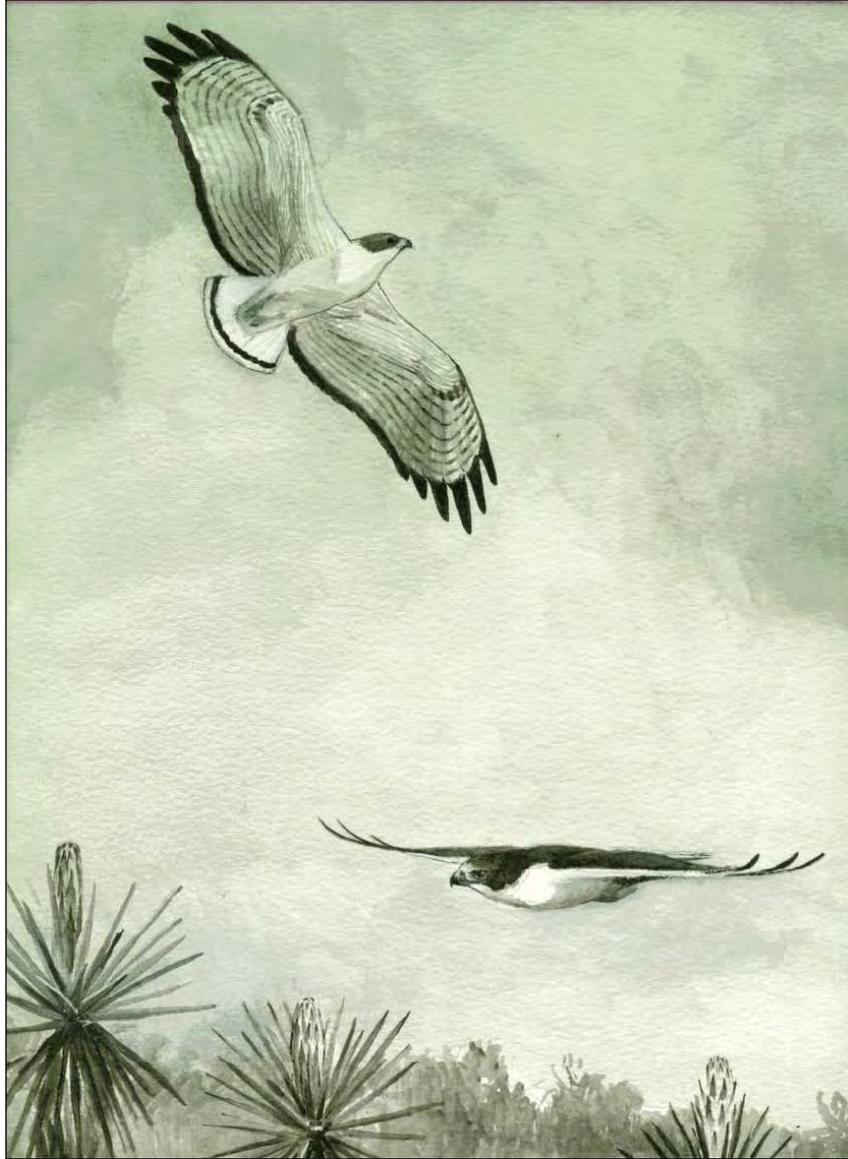
- Strategy 6: Install directional signs and install an informational kiosk for Whitetail Trail (Management Unit 1). **Unit: L.**
- Strategy 7: Develop an interpretive brochure, flyer, or audio/visual material that describes the wildlife resources and habitats on the South Padre Island Unit, in partnership with Cameron County Parks Division and others. **Unit: S.**
- Strategy 8: Update or add entrance and informational signage at appropriate Refuge entrance locations. **Units: All.**
- Strategy 9: Complete map and/or fact sheet for new hike-and-bike trail system (*See also: Public Use Objective 3, Strategy 6*). **Unit: L.**
- Strategy 10: Review and update all current interpretive programs to include basic principles of interpretation, to incorporate principles of universal design (e.g., accessibility), and to reflect Service themes and messages. **Ongoing; Unit: L.**
- Strategy 11: Create new guided bird tours, walks, and interpretive programs for the Bahia Grande and South Padre Island units to include basic principles of interpretation, incorporate principles of universal design (e.g., accessibility), and to reflect Service themes and messages. **Units: B, S.**
- Strategy 12: Provide guided canoe and/or kayak tours and tram tours in partnership with the Friends of Laguna Atascosa NWR. **Ongoing; Units: L, B.**
- Strategy 13: Evaluate the feasibility of establishing at least one self-guided interpretive canoe and/or kayak paddling trail. **Units: L, B.**
- Strategy 14: Interpret Refuge-specific historical or cultural resources through interpretive panels, brochures, or other media. **Units: All.**
- Strategy 15: Develop interpretive programs in a digital format (e.g., CD/DVD, MP3, etc.) for use on the Refuge (e.g., podcasts, geocaching, Web site checklists). The programs will be available in hard copy at the Visitor Center or downloadable online on the Refuge Web site. **Units: All.**
- Strategy 16: Construct new visitor center to new Service standard, including land acquisition of a suitable site (e.g., 35 or more acres). **Unit: L.**

**Public Use Objective 7:** Present a minimum of five special public outreach events annually and a minimum of 12 annual presentations, monthly news releases, or Web-based outreach articles, with an emphasis on reaching local residents, to foster increased public appreciation and ownership of the Refuge and its role in the local community.

**Discussion:** To achieve many of the Refuge's objectives, community support and public involvement are needed. Community involvement and visitation on the Refuge by local residents has primarily consisted of very specific user groups (e.g., hunters and anglers). Encouraging local communities and more diverse user groups to become involved in Refuge programs and wildlife-dependent activities promotes an open exchange of ideas and instills a sense of local pride and ownership toward the Refuge. Currently, the Refuge is best known in the local area for its Ocelot Conservation Festival, held annually in February. Refuge staff organize an annual Christmas Bird Count and participate in National Wildlife Refuge Week activities. Presenting additional large-scale events; making monthly informational presentations to community, civic, and special interest groups; and improving the Refuge's

Web site will enhance the outreach program, leading to greater awareness of Refuge wildlife resources, programs, and visitor use opportunities among local residents and nature tourists.

- Strategy 1: Develop and implement at least five special annual events (or partner with existing events) such as Ocelot Conservation Festival, Christmas Bird Count, National Fishing Day, National Wildlife Refuge Week, International Migratory Bird Day, and Teacher Appreciation Weekend. **Ongoing; Units: All.**
- Strategy 2: Involve tourist boards and Chambers of Commerce in program development and promotion; develop and supply Refuge informational brochures and flyers to Chambers of Commerce, hotels, and visitor information centers. **Ongoing; Units: All.**
- Strategy 3: Update current Refuge Web site to include appropriate links to the Friends group and partners. **Ongoing; Units: All.**
- Strategy 4: Train and involve all staff to present programs for a combination of government, civic, sporting, and interest groups on a variety of Refuge-related topics and issues; include information about the economic and wildlife-dependent recreational benefits that the Refuge provides. **Ongoing; Units: All.**
- Strategy 5: Continue developing partnerships with hotels, businesses, media outlets, and Cameron County Parks and Recreation Department to educate residents, tourists, and recreational anglers about sea turtle nesting on local beaches. **Ongoing; Unit: S.**
- Strategy 6: Develop and purchase supplies and obtain an interchangeable, portable exhibit, representing all units of the Refuge and its varied management programs, goals, and recreational opportunities. **Units: All.**
- Strategy 7: Develop news releases for local and State newspapers, magazines, and other media outlets, as needed. **Ongoing; Units: All.**



White-tailed hawks. Illustration: Ram Papish

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## 5. Implementation and Monitoring

Refuge objectives in this CCP are intended to be accomplished during the next 15 years. Many of the specific management activities for Laguna Atascosa NWR will require the development of step-down management plans. Implementation of new management activities and major resource projects will be phased in as described within the step-down plans and will be contingent upon funding, staffing, regional and national Service directives. This section identifies staffing and funding needs, step-down management plans, partnership opportunities, and plan monitoring, evaluation, amendment, and revision.

### 5.1 Funding and Personnel

The following staffing lists show current and proposed additional staff needed to fully implement the CCP. If all proposed positions are filled, the Refuge could carry out all aspects of the CCP. If some positions are not filled, some aspects of the CCP cannot be completed or will take longer to complete, delaying the accomplishment of the objectives and strategies of this CCP.

#### *Current Staff*

The Refuge has a current staff of 17 permanent full-time employees assigned or stationed at the Refuge:

Table 5-1. Current staff

Title	Grade	Program
Wildlife Refuge Manager	GS-13	Management
Supervisory Wildlife Refuge	GS-11/12	Management
Wildlife Refuge Specialist	GS-09	Management
Administrative Technician	GS-07	Administration
Office Assistant	GS-05	Administration
Wildlife Biologist	GS-09/11	Biology
Wildlife Biologist	GS-09/11	Biology
Maintenance Mechanic	WG-09	Maintenance
Maintenance Worker	WG-08	Maintenance
Maintenance Worker	WG-08	Maintenance
Supervisory Park Ranger	GS-11	Law Enforcement
Park Ranger (LE/Refuge)†	GS-09	Law Enforcement
Park Ranger (LE/Refuge)†	GS-09	Law Enforcement
Park Ranger (Interpretation)†	GS-05/07	Visitor Services
Forestry Technician (Engine	GS-06/07	Fire
Forestry Technician	GS-03/04/05	Fire
Forestry Technician	GS-03/04/05	Fire

† South Texas Refuge Complex (STRC) positions stationed at Laguna Atascosa NWR.

***Proposed additional staff needed to fully implement the CCP***

The staffing requirements identified in this CCP would increase staff levels as shown. If all positions are filled, the Refuge could carry out all aspects of the CCP. If some positions are not filled, all aspects may not be completed or those completed may be done over a longer time. Staffing and funding are expected to be accomplished over the 15-year life of the plan. Proposed positions are as follows:

Table 5-2. Proposed staffing positions

<b>Title</b>	<b>Grade</b>	<b>Program</b>
Wildlife Refuge Specialist	GS-09/11	Management
Wildlife Refuge Specialist	GS-05/07/09	Management
Clerk Typist/Receptionist	GS-04/05	Administration
Biologist (Wildlife)	GS-05/07	Biology
Biologist (Wildlife)	GS-05/07	Biology
Engineering Equipment Operator	WG-09/10	Maintenance
Maintenance Mechanic	WG-09	Maintenance
Work Leader/Supervisor	WL-07/08 or WS-07/08	Maintenance
Tractor Operator	WG-05/06	Maintenance
Laborer	WG-04/05	Maintenance
Laborer (Custodial)	WG-03	Maintenance
Park Ranger (Interpretation)†	GS-09/11	Visitor Services
Park Ranger (Interpretation)†	GS-05/7/9	Visitor Services
Supervisory Park Ranger (LE/Refuge)†	GS-12	Law Enforcement*
Park Ranger (LE/Refuge)†	GS-11	Law Enforcement*
Park Ranger (LE/Refuge)†	GS-11	Law Enforcement*
Park Ranger (LE/Refuge)†	GS-11	Law Enforcement*
Park Ranger (LE/Refuge)†	GS-11	Law Enforcement*
Park Ranger (LE/Refuge)†	GS-05/07/09	Law Enforcement*
Park Ranger (LE/Refuge)†	GS-05/07/09	Law Enforcement*
<b>Additional Seasonal employees (0.5 time FTEs):</b>		
Park Ranger (Interpretation)†	GS-05	Visitor Services
Park Ranger (LE/Refuge)†	GS-05	Law Enforcement
Forestry Technician (Firefighter) †	GS-05	Fire
Forestry Technician (Firefighter)†	GS-05	Fire

† South Texas Refuge Complex (STRC) positions stationed at Laguna Atascosa NWR.

\* The International Association of Chiefs of Police Deployment Model for Refuge Law Enforcement calls for 18 Refuge Law Enforcement Officers (LEOs) and 3 supervisory LEOs in the STRC. For Laguna Atascosa NWR, to meet these recommendations and to address future staffing needs, at least five additional LEO positions are needed. Supervisory LEOs should be GS-0025-12 series, LEO positions should be GS-0025-11 series, and all positions should have 25 percent Administratively Uncontrollable Overtime (AUO) authorized and funded.

### ***Funding***

Total annual budget (k) for the Refuge varies depending on the Service priorities for the resource projects each year and the national and regional allocation of funds. These figures do not include fire, law enforcement, or visitor services positions. The following is a general breakdown of the current annual operation budget of the Refuge:

Table 5-3. Funding Categories and Average Annual Funding (Fiscal Years 2003–2007)

<b>Fund Category</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
O&M - 1261 (General)	703.7	702.5	594.0	340.2	451.9
O&M - 1263 (Visitor Services)				108.4	141.9
MMS - 1262 (Base Funds)				203.8	260.3
MMS - 1262 (Annual Maintenance)	510.1	460.0	94.7	104.9	152.7
Duck Banding - 1231			5.0	10.0	10.0
Volunteer Program				5.0	5.0
Fire - 9252					
Total:	1213.8	1162.5	693.7	772.3	1021.8
					<b>average*</b> <b>972.8</b>

### ***Description of fund categories:***

- 1261 funds include Refuge operations and personnel salaries (Operations include annual fixed costs; salaries, mandatory training and/or travel, as well as annual operations of Refuge programs). 1261 funding, once distributed, may be used at the discretion of management to accomplish the Refuge mission. In fiscal year 2006, this category was divided into sub-categories representative of each major program area.
- 1262 funds include annual maintenance, salaries, and deferred maintenance, and some fixed costs such as utilities, gasoline, diesel, and equipment repair.
- 1263 funds are for Visitor Services costs and salaries.
- 9252 funds are fire management funding for prescribed fire operations. Funds for fighting wildfires are in a special account and distributed on an “as needed” basis.

\* *Funding does not include those positions stationed at the Refuge from STRC-level staffing and programs such as Law Enforcement, Fire, or Visitor Services.*

In fiscal years 2003–2007, Laguna Atascosa NWR had an average annual operation budget of \$972,800 to fund all operating expenses, including salaries, benefits, maintenance, and fixed costs. This CCP proposes to accomplish more resource protection, habitat management, and significant expansion of visitor services opportunities, which can only be realized through the following additional estimated funding:

Table 5-4. Annual Operation Budget (k) needed for full implementation of the CCP

<b>Annual Funding, Including all Staffing and Operational Costs**</b>	<b>Current Average</b>	<b>Additional</b>	<b>Total Estimated</b>
	972.8	719.0	1,691.8

\*\* Operational costs include: salaries, benefits, annual maintenance, and fixed costs.

† Additional estimated costs include new staff assigned to the Refuge and funded out of the Refuge budget (11 positions). Other new staff (11 positions) are not included in these estimated costs since they are funded by the STRC but stationed at the Refuge. Salaries, benefits (+35 percent), and overhead costs (+25 percent) apply to each position. This estimate is based on starting salary pay grades for each pay series (GS-General Schedule, LE Law Enforcement, WG-wage grade) using the 2007–2008 OPM (Office of Personnel Management) Salary Tables. This estimate does not include the one-time startup costs of \$30–50k associated with each new permanent employee (\$330–550k for 11 new staff). This estimate does not include any funding for specifically targeted projects.

‡ This estimate does not take into account future grade and step increases, cost of living increases, and general inflation, which may increase the level of funding needed in future years.

## 5.2 Step-down Plans

The CCP is intended as a broad umbrella plan, providing a general framework for the future management of Refuge resources and visitor services, such as wildlife and habitat management, threatened and endangered species protection and recovery, wildlife-dependent recreational opportunities, law enforcement, visitor safety, and maintaining and building partnerships. Step-down plans provide specific guidance and strategies to the Refuge manager to implement the overall goals and objectives in the CCP. The following list outlines the relevant step-down plans for Laguna Atascosa NWR.

### ***Habitat Management Plan***

The Habitat Management Plan (HMP) was developed in 2008 to prioritize species habitat management activities and provide specific guidance and decision-making processes toward implementing appropriate strategies to achieve stated habitat objectives in support of the Refuge’s vision. Although this CCP provides fairly specific objectives and strategies, the HMP further defines and expands the level of specificity for accomplishing important habitat management tasks. This plan incorporates several earlier habitat management plans (1988).

### ***Visitor Services Plan (VSP)***

The VSP, a step-down plan of the CCP, addresses visitor services management goals. The plan contains chapters on hunting, fishing, interpretation goals, informational signs, outreach, traffic management, volunteer coordination, Friends group coordination, and environmental education goals and objectives. The VSP is anticipated to be completed within one year after completion of the CCP. Separate step-down plans may be necessary to further address specific topics. Anticipated completion is 2011.

### ***Inventory and Monitoring Plan***

The Inventory and Monitoring Plan (Wildlife Inventory Management Plan) was developed in 1988 in conjunction with the Refuge’s Master Plan. This plan details inventory policy, describes habitat and survey unit needs, and establishes specific inventory procedures for various wildlife and species groups. This plan is expected to be revised as a result of CCP implementation and to be updated accordingly by 2012.

### ***Waterfowl and Migratory Bird Disease Contingency Plan***

This plan was last updated in 1996 and describes protocols for disease surveillance, disease response, appropriate contacts, logistical considerations, biological considerations, and other guidance. This plan is anticipated to be revised by 2011.

### ***Fire Management Plan***

The South Texas Refuge Complex (STRC) FMP, which includes Laguna Atascosa NWR, provides fire management policy, guidance, options, activities, and specific strategies for the use of prescribed fire and wildfire in accomplishing the goals and objectives of the STRC Plan. The goals of the STRC Fire Plan are to ensure that firefighter and public safety is the priority goal of the program and that all fire management activities reflect this commitment; protect life, property, and other resources from unplanned fire; use fire as a tool, where applicable, to accomplish resource management objectives; and to develop and implement a process to ensure the collection, analysis, and application of fire management information needed to make sound management decisions.

Fire management objectives include efforts to protect from fire all important scientific, cultural, historic, and prehistoric sites, visitor facilities, administrative sites, and Refuge housing; restore and perpetuate habitat important to migratory and native wildlife species by maintaining a diversity of plant communities; prevent human-caused wildfires; and educate the public regarding the role of prescribed fire within the STRC. The STRC FMP was completed in 2009 and incorporates elements of Laguna's FMP, completed in 1988.

### ***Hunting Plan***

This plan, which is a chapter of the Visitor Services Plan, addresses specific aspects of the Refuge hunting program, defining the species to be hunted, season structure, hunting methods, and applicable Refuge-specific hunting regulations. The Refuge currently conducts an annual recreational and management firearms and archery hunt for white-tailed deer and feral hogs. This plan was completed in 1986 and was revised in 2004 to include exotic nilgai antelope. Nilgai were imported into Texas as game animals, readily reproduced, and established free-ranging populations. The hunting plan is anticipated to be revised by 2011 to improve hunting opportunities on the Refuge.

Recent guidance (*Service Memorandum of December 22, 2006*) provides for addressing the cumulative impacts of proposed hunting. Five elements to be addressed are:

- The anticipated direct and indirect impacts of proposed hunt on wildlife species;
- Anticipated direct and indirect impacts of proposed action on Refuge programs, facilities, and cultural resources;
- Anticipated impacts of proposed hunt on Refuge environment and community;
- Other past, present, proposed, and reasonably foreseeable hunts and anticipated impacts; and
- Anticipated impacts if individual hunts are allowed to accumulate.

In addition to these five elements, a cumulative impacts analysis must consider the impacts of a proposed action within a geographic context.

***Environmental Management Plan***

The Environmental Management Plan for the South Texas Refuge Complex (which includes Laguna Atascosa NWR) was completed in 2005. The plan provides guidance on pollution prevention, hazardous materials management, emergency response and coordination with State and other Federal agencies regarding spill responses, general environmental compliance, recycling, environmental management, and environmental education.

***Integrated Pest Management Plan***

This plan describes biological, mechanical, or chemical methods for the most effective eradication and control of invasive weeds and woody vegetation and specific pests, including those damaging crops without affecting the natural resources of the area. The Integrated Pest Management Plan will provide complete and specific methods and timelines for preventing introductions, prioritizing (including rapid response), surveying, mapping, monitoring, and treating or controlling invasive plants, feral animals, or other non-native species. Treatment methods may include mechanical clearing, chemical applications, prescribed burning, biological control, or combinations of these, depending on the particular pest species. This plan will dovetail with the national management plan (EO 13112) and comply with State mandates requiring prevention, monitoring, and control or eradication of invasives. The Integrated Pest Management Plan for Laguna Atascosa is anticipated to be completed by 2011.

***Oil Spill Contingency Plan***

The Oil Spill Contingency Plan for Laguna Atascosa was developed in collaboration with the Texas General Land Office. The plan was revised in 2003 and details specific procedures and scenarios for dealing with oil spills and oiled wildlife, particularly birds. Potential oil spill issues at Laguna Atascosa may involve pipeline ruptures or barges in the Harlingen Ship Channel, which run across the Laguna Unit and in the Gulf Intracoastal Waterway. The plan also provides details on the containment, logistical contacts, clean-up, and priorities for Service response in the event of an oil spill.

***Safety Management Plan***

This plan delineates station responsibilities, procedures, and preventative actions necessary to make station facilities and operations comply with Federal occupational health and safety standards and other applicable regulations for the public and employees. Consistent with the policies of the Service, the main purpose of the plan is to ensure a safe and healthful work environment for each employee and to provide for general employee welfare in terms of providing training, awareness, and adequate provisions for prompt assistance should any employee(s) be injured on the job. Laguna's Safety Management Plan was completed in 1990 and is anticipated to be updated in 2009.

***Partnership Opportunities***

There are many opportunities to collaborate with Federal, State, and local governmental agencies and NGOs, private landowners, and other groups for the benefit to the area's natural resources. One example of an ongoing, mutually beneficial partnership is the Bahia Grande Wetland Restoration Partnership. About 75 partners, such as the Brownsville Navigation District, University of Texas-Brownsville, Ocean Trust, and the Natural Resources Conservation Service, have donated money and in-kind services for one of the largest wetland restoration projects in the United States.

Other partnership opportunities include:

- Establishing partnerships with private landowners and conservation organizations could result in the development of conservation agreements or other options for land protection, habitat enhancement, restoration, and opportunities for continuity of management.
- Strengthening partnerships with the TPWD, GLO, and Cameron and Willacy counties.
- Strengthening partnerships with academic institutions such as The University of Texas at Brownsville to coordinate research needs and activities.

Maintenance of existing programs and facilities has been the full-time endeavor of the existing staff. To enhance current programs and initiate new activities, additional staff positions will be required. In the future, establishing agreements with private landowners, conservation organizations, educational institutions, and other government agencies through MOUs is expected to result in the development of conservation agreements or other options for land protection, habitat enhancement and restoration, and opportunities for wildlife research.

### **5.3 Monitoring and Evaluation**

Where possible, the CCP identifies and incorporates monitoring and evaluation activities as objectives or strategies. Specific guidelines for monitoring and evaluation will vary by program and will be included in the appropriate step-down plan. As new information becomes available through baseline data, research, or outcomes of management projects, the appropriate Refuge program would be adjusted accordingly. Step-down plans, including the monitoring and evaluation sections, would require periodic review, program evaluation, and adjustments as necessary.

This CCP will be a useful working document for present and future managers. Periodic review and evaluation, and the addition of information, will be required to achieve effective implementation of the CCP, as Refuge programs change over time.

### **5.4 Plan Amendment and Revision**

The Laguna Atascosa NWR Refuge manager will refer to the CCP annually to ensure station priorities and work guidance is on track with the CCP. Appropriate staff members will be assigned tasks and projects identified in the CCP to accomplish the objectives stated in the plan. The Refuge manager will review the CCP at least every five years to determine if it needs revision. Any necessary revisions will be incorporated into the plan, with proper public participation. The CCP will be revised no later than 2022.

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## Glossary

**Appropriate Use:** A proposed or existing use on a refuge that is a wildlife-dependent recreational use as identified in the 1997 Refuge System Improvement Act (hunting, fishing, wildlife observation and photography, and environmental education and interpretation) or a use that contributes to the fulfillment of refuge purpose(s), the Refuge System mission, or goals or objectives described in a refuge management plan approved after October 9, 1997.

**Bilingual:** Refers to standard, Latin-American Spanish. Because of the Refuge's close proximity to Mexico and Latin America, in the LRGV, the population is over 85 percent Hispanic (*2000 U.S. Census Bureau*).

**Biological Diversity:** The variety of life and its processes, including the variety of living organisms, the genetic differences among them, and communities and ecosystems in which they occur.

**Biological Integrity:** Biotic composition, structure, and functioning at genetic, organism, and community levels comparable with historic conditions, including the natural biological processes that shape genomes, organisms, and communities.

**Biotic Community:** A set of plants, animals, and microorganisms occupying an area interacting directly or indirectly with each other and their physical environment.

**Colonia:** A residential area along the Texas-Mexico border that may lack some of the most basic living necessities, such as potable water and sewer systems, electricity, paved roads, and safe and sanitary housing -*Texas Secretary of State*.

**Compatible Use:** A wildlife-dependent recreational use or any other proposed or existing use on a refuge that will not materially interfere with or detract from the purposes of the refuge or the National Wildlife Refuge System mission.

**Comprehensive Conservation Plan:** A document that describes the desired future conditions of a refuge or planning unit and provides long-range guidance and management direction to achieve the purposes of the refuge; helps fulfill the mission of the Refuge System; maintains and, where appropriate, restores the ecological integrity of each refuge and the Refuge System; helps achieve the goals of the National Wilderness Preservation System; and meets other mandates.

**Cultural Resources:** The remains of sites, structures, or objects used by people in the past.

**DDE (dichlorodiphenyldichloroethylene):** A by-product of DDT that may persist in the environment for many years. The main sources of DDE on Laguna Atascosa NWR come from irrigation drainwater and floodwater inflows.

**DDT (dichlorodiphenyltrichloroethane):** A pesticide used to control insects in agriculture that remains in the environment for many years. Its use was banned in the United States in 1972 because of damage to wildlife, but is still used in some countries (e.g., Mexico). DDT collects in the fatty tissues of birds, fish, and other animals and may affect

the nervous system and cause cancer. Exposure to humans can occur through the consumption of fish, wildlife, and leafy vegetables, and by breathing or swallowing contaminated soil, such as near landfills. The main sources of DDT on the Refuge come from irrigation drainwater and floodwater inflows.

**Ecological Integrity:** The relative intactness of biotic and abiotic components and their interrelated structure and function within a given ecosystem.

**Ecosystem:** Dynamic and interrelating complex of plant and animal communities and their associated non-living environment.

**Ecosystem Approach:** A strategy or plan to protect and/or restore the natural function, structure, and species composition of an ecosystem, recognizing that all components are interrelated.

**Ecosystem Management:** Management of an ecosystem that includes all ecological, social, and economic components that make up and/or affect the whole of the system.

**Ecotourism:** Nature-based tourism or “responsible travel to natural areas that conserves the environment and improves the welfare of local people.” - *As defined by Conservation International.*

**Endangered Species:** A plant or animal species listed under the Endangered Species Act that is in danger of extinction throughout all or a significant portion of its range.

**Environmental Assessment:** A systematic analysis to determine if proposed Federal actions would result in a “significant effect on the quality of the human environment,” thereby requiring either the preparation of an environmental impact statement (EIS) or a determination of a “Finding of No Significant Impact” (FONSI).

**Exotic:** A non-native plant or animal species to the ecosystem under consideration that is introduced intentionally or unintentionally.

**Fallout:** An ornithological term that refers to an event when birds, during migration over or near large expanses of water (e.g., Gulf of Mexico), become exhausted and drop down onto land to find shelter from strong winds (e.g., storm or cold fronts) and food before continuing their migratory journey.

**Federal Trust Species:** Important fish and wildlife resources that the U.S. Fish and Wildlife Service is specifically mandated to protect, including migratory birds, threatened species, endangered species, interjurisdictional fish, marine mammals, and other species of concern (16 U.S.C. 3772; PL-109-294).

**Focal Species:** Wildlife species that are a subset of priority species and that represent larger guilds of species that use habitats in a similar way.

**Geocaching:** An outdoor recreational activity consisting of finding locations or objects using GPS (global positioning system) technology such as a handheld GPS unit. The coordinates are programmed into the device, which leads to the location or object.

Geocaching can be a tool to improve wildlife observation and photography opportunities on refuges. There are many types of geocaching, but only “virtual caching” and “mystery caching,” or similar types of geocaching, may be appropriate on refuges. These types of geocaching usually do not impact natural or cultural resources, as they involve simply visiting the GPS locations on the refuge to observe wildlife, take photographs, or view an interesting site (e.g., cultural, historical, or natural).

**Guild (or Species Guild):** An aggregation or group of species that tend to use the same kinds of resources for feeding or reproduction (e.g., feeding sites, nesting sites) in a similar manner. Species guilds are useful in helping to focus wildlife and habitat management efforts or in environmental impact studies.

**Invasive Plant Species:** A non-native plant to the ecosystem under consideration that lacks natural controls and tends to aggressively dominate the plant community, often forming extensive monocultures. Invasive species generally reduce the diversity and health of ecosystems when they become dominant.

**Loma:** Spanish word meaning hill. This term refers to the clay dunes of the Rio Grande delta within eastern Cameron County, Texas. Lomas range in size from less than one acre to over 100 acres in size. They occur within coastal “salt prairie” and because they are higher in elevation than the surrounding flats, contain islands of native habitats, including dense brush.

**National Wildlife Refuge:** A designated area of land or water or an interest in land or water within the Refuge System, such as refuges, wildlife management areas, waterfowl production areas, and other areas under Service jurisdiction for the protection and conservation of fish and wildlife and plant resources. A complete listing of all units of the Refuge System may be found in the current “Annual Report of Lands under Control of the U.S. Fish and Wildlife Service.”

**National Wildlife Refuge System:** All lands, waters, and interests therein administered by the U.S. Fish and Wildlife Service as wildlife refuges, wildlife ranges, wildlife management areas, waterfowl production areas, and other areas for the protection and conservation of fish, wildlife, and plant resources.

**PCBs (Polychlorinated biphenyls):** PCBs are a mixture of chemicals that are no longer produced in the United States, but still occur in the environment. PCBs are either oily liquids or solids that are used as coolants and lubricants in transformers, capacitors, and other electrical equipment. PCBs were banned in the United States in 1977 because of their harmful health effects and persistence in the environment. PCBs bind in soils, bottom sediments, and organic particles and are taken up by small organisms and fish in water. PCBs accumulate in fish and marine mammals and can become highly concentrated in their tissues. The main dietary sources of PCBs are fish (e.g., sport fish caught in contaminated lakes or rivers), meat, and dairy products. PCBs are also carcinogenic. The main sources of PCBs on Laguna Atascosa NWR come from irrigation drainwater and floodwater inflows.

**Priority Public Use:** Wildlife-dependent recreational uses involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation are the

priority general public uses of the Refuge System and shall receive priority consideration in Refuge planning and management.

**Priority Species:** Wildlife or plant species that include Federal trust species such as migratory birds, threatened species, endangered species, inter-jurisdictional fish, marine mammals, and other species of concern. Priority species also include rare, declining, or species of management concern that are on lists maintained by natural heritage programs, State wildlife agencies, other Federal agencies, or professional, academic, and scientific societies, and those mentioned in landscape-level or other conservation plans.

**Public Use:** Any use of the Refuge System by the public, including but not limited to wildlife-dependent recreation and other appropriate uses.

**Recreational Use - Other:** A recreational use of the Refuge System that is not one of the six wildlife-dependent recreational uses and that may only be allowed if it is both appropriate and compatible.

**Resaca:** A local term describing the unique natural meander belts or old channels of the Rio Grande (ox-bow lakes), usually filled by rainwater or used as water delivery systems in Cameron County, Texas. They were formed as the Rio Grande shifted course within its delta. The word “resaca” is believed to come from a conjunction of two words “rio” and “seco,” which means “dry river.”

**Riparian:** Of or relating to land lying immediately adjacent to a water body and having specific characteristics of that area, such as riparian vegetation. A stream bank is an example of a riparian area.

**Scoping:** A process for identifying the “scope of issues” to be addressed by a CCP. Involved in the scoping process are Federal, State, local agencies, private organizations, and individuals.

**Stakeholders:** Those agencies, organizations, groups, and individuals of the public, having an interest or stake in an organization’s program and that may be affected by its implementation.

**Threatened Species:** A plant or animal species listed under the Endangered Species Act that is likely to become endangered within the foreseeable future.

**Trust Species:** (*See Federal Trust Species*).

**Visitor Services:** Any program provided by the Service that is specifically or predominately designed for the participation or benefit of visitors.

**Visitor Services Plan (VSP):** A step-down management plan containing specific strategies formulated to meet the visitor services goals and objectives of the refuge’s CCP that integrates wildlife-dependent and other recreational uses on a refuge or group of refuges.

**Watershed:** The entire land area that collects and drains water into a stream or stream system.

**Wetland:** Areas such as lakes, marshes, ponds, swamps, or streams that are inundated by surface or groundwater that is enough to support plants and animals that require saturated or seasonally saturated soils.

**Wildlife:** The terms "fish," "wildlife," and "fish and wildlife" mean any wild member of the animal kingdom, whether alive or dead, regardless of whether it was bred, hatched, or born in captivity, including its parts, products, eggs, or offspring.

**Wildlife-dependent Recreational Use:** A use of a refuge that involves hunting, fishing, wildlife observation and photography, and environmental education and interpretation, as identified in the National Wildlife Refuge System Improvement Act of 1997.

**Winter Texan:** Travelers who migrate to Texas for the winter, usually for several months at a time. For some, Texas is an established winter home. The Lower Rio Grande Valley is the top destination for Winter Texans (*Source: Texas Department of Economic Development and Tourism Division*).

## Abbreviations and Acronyms

ACW	Arroyo Colorado Watershed
ADA	Americans with Disabilities Act
ARPA	Archaeological Resources Protection Act
ATV	All-terrain vehicle
CBRA	Coastal Barrier Resources Act
CCP	Comprehensive Conservation Plan
CKWRI	Caesar Kleberg Wildlife Research Institute
CONANP	Comisión Nacional de Áreas Naturales Protegidas, Secretaría de Medio Ambiente y Recursos Naturales
CORPS	U.S. Army Corps of Engineers
DDE	Dichlorodiphenyldichloroethylene ( <i>pesticide by-product</i> )
DDT	Dichlorodiphenyltrichloroethane ( <i>pesticide</i> )
EA	Environmental Assessment
EE	Environmental Education
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FHWA	Federal Highway Administration
FM	Farm-to-Market ( <i>State secondary road</i> )
FMP	Fire Management Plan
FONSI	Finding of No Significant Impact
FR	Federal Register
FTE	Full-time Employee
FUDS	Formerly Used Defense Site
GIS	Geographic Information Systems ( <i>mapping</i> )
GPS	Global Positioning System
HMP	Habitat Management Plan
ISD	Independent School District
LE	Law Enforcement
LEO	Law Enforcement Officer

## Planning and Terminology

LRGV	Lower Rio Grande Valley of Texas ( <i>Valley</i> ) - comprised of Cameron, Hidalgo, Starr, and Willacy counties in the southernmost portion of Texas
MMS	Maintenance Management System
MOUs	Memoranda of Understanding ( <i>Agreements</i> )
MPAs	Marine Protected Areas ( <i>EO 13158</i> )
NAWMP	North American Waterfowl Management Plan
NEPA	National Environmental Policy Act
NGOs	Non-governmental Organizations
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service ( <i>U.S. Department of Agriculture</i> )
NWR	National Wildlife Refuge
O&M	Operation and Maintenance
ORVs	Off-road vehicles ( <i>e.g., dune buggies, 4x4s, ATVs, cars, trucks, motorcycles</i> )
PCBs	Polychlorinated biphenyls
PIF	Partners in Flight
RNA	Research Natural Area
RRP	Refuge Roads Program
SAFE	State Areas for Wildlife Enhancement
SH	State Highway
SHC	Strategic Habitat Conservation
SORT	Special Operations Response Team
Service	U.S. Fish and Wildlife Service
SPI-WBC	South Padre Island - World Birding Center
STRC	South Texas Refuge Complex ( <i>includes Laguna Atascosa, Lower Rio Grande Valley, and Santa Ana National Wildlife Refuges</i> )
TEDs	Turtle Excluder Devices
T/E	Threatened and Endangered Species
TNC	The Nature Conservancy
TPWD	Texas Parks and Wildlife Department
TXDOT	Texas Department of Transportation
USDA	United States Department of Agriculture
USGS	United States Geological Survey

USFWS	United States Fish and Wildlife Service
UT	University of Texas
Refuge System	National Wildlife Refuge System
Valley	Lower Rio Grande Valley of Texas ( <i>LRGV</i> )
VSP	Visitor Services Plan
WHSRN	Western Hemisphere Shorebird Reserve Network
WUI	Wildland Urban Interface

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## **A. Refuge Biota**

### **A.1 Birds of Laguna Atascosa NWR**

\* - species has nested on the Refuge

† - exotic: introduced or escaped species

<sup>TX-P</sup> - identified in the Texas Comprehensive Wildlife Conservation Strategy as a priority species

<sup>FS</sup> - identified as a Service Migratory Bird Program focal species

#### **SEASONS:**

Sp - March-May

S - June-August

F - September-November

W - December-February

#### **ABUNDANCE**

a - abundant: sure to see

c - common: certain in proper habitat

u - uncommon: present, but may not be seen

o - occasional: seen a few times per season

r - rare: seen every 2 to 5 years

x - accidental: seen only once or twice

<b>Loons</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Red-throated Loon	-	-	x	x
Common Loon	r	x	r	o
<b>Grebes</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Least Grebe*	u	c	u	u
Pied-billed Grebe*	c	u	a	a
Horned Grebe	-	-	r	r
Red-necked Grebe	-	-	-	x
Eared Grebe	u	o	u	u
Western Grebe	o	-	o	o

**Appendix A: Refuge Biota**

<b>Gannets</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Northern Gannet	-	-	-	x
<b>Pelicans</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
American White Pelican <sup>TX-P</sup>	u	o	c	c
Brown Pelican <sup>TX-P FS</sup>	r	r	r	r
<b>Cormorants</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Double-crested Cormorant <sup>FS</sup>	u	u	c	a
Olivaceous Cormorant	u	u	o	o
<b>Anhingas</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Anhinga	o	o	o	o
<b>Frigatebirds</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Magnificent Frigatebird	r	r	r	-
<b>Bitterns and Herons</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
American Bittern	o	o	o	u
Least Bittern* <sup>TX-P</sup>	o	u	o	r
Great Blue Heron*	c	u	c	c
Great Blue Heron (Great White)	-	-	-	x
Great Egret	c	u	c	c
Snowy Egret <sup>TX-P</sup>	c	c	c	c
Little Blue Heron* <sup>TX-P</sup>	u	u	c	u
Tricolored Heron* <sup>TX-P</sup>	c	c	c	c
Reddish Egret* <sup>TX-P FS</sup>	c	u	c	c
Cattle Egret	u	u	c	u
Green Heron*	u	u	o	o
Black-crowned Night-Heron*	u	u	u	u
Yellow-crowned Night-Heron* <sup>TX-P</sup>	u	u	u	o

<b>Ibises and Spoonbills</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
White Ibis	c	u	c	o
White-faced Ibis <sup>TX-P</sup>	c	o	c	u
Roseate Spoonbill <sup>TX-P</sup>	u	o	u	o
<b>Storks</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Wood Stork	r	r	r	-
<b>Flamingos</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
American Flamingo	-	x	-	-
<b>Swans, Geese and Ducks</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Fulvous Whistling Duck	o	r	r	o
Black-bellied Whistling Duck*	c	a	u	o
Greater White-fronted Goose	o	-	u	u
Snow Goose	u	-	c	c
Ross' Goose	-	-	r	r
Brant	-	-	-	x
Barnacle Goose	-	-	-	x
Canada Goose <sup>FS</sup>	u	-	c	c
Wood Duck	-	-	r	r
Green-winged Teal	u	r	c	c
American Black Duck	-	-	x	x
Mottled duck* <sup>TX-P FS</sup>	c	c	c	c
Mallard <sup>FS</sup>	r	-	r	o
White-cheeked Pintail	x	-	x	x
Northern Pintail <sup>TX-P FS</sup>	u	r	c	a
Blue-winged Teal*	u	u	c	c
Cinnamon Teal	u	-	o	u
Northern Shoveler	c	o	c	c
Gadwall	u	r	c	c
Eurasian Wigeon	-	-	-	x
American Wigeon <sup>FS</sup>	u	r	c	a

## Appendix A: Refuge Biota

Canvasback <sup>TX-P</sup>	u	-	u	c
Redhead <sup>TX-P</sup>	u	r	c	c
Ring-necked Duck	o	-	o	u
Greater Scaup	-	-	r	r
Lesser Scaup	u	-	o	u
Surf Scoter	-	-	-	x
Common Goldeneye	-	-	r	r
Bufflehead	u	-	u	u
Hooded Merganser	-	-	o	u
Red-breasted Merganser	o	-	u	u
Ruddy Duck	c	r	a	a
Masked Duck*	x	x	x	x
<b>American Vultures</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Black Vulture	u	u	u	u
Turkey Vulture*	c	c	c	c
<b>Kites, Eagles, and Hawks</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Osprey	u	o	u	u
Swallow-tailed Kite	r	-	r	-
White-tailed Kite* <sup>TX-P</sup>	u	u	u	u
Mississippi Kite	o	-	-	-
Bald Eagle	-	-	-	r
Northern Harrier (Marsh Hawk) <sup>TX-P</sup>	c	r	c	c
Sharp-shinned Hawk	u	-	u	u
Cooper's Hawk	u	-	u	u
Common Black-Hawk	-	-	x	x
Harris' Hawk* <sup>TX-P</sup>	u	u	u	u
Red-shouldered Hawk	o	-	o	o
Broad-winged Hawk	u	-	o	-
Swainson's Hawk	o	-	o	r
White-tailed Hawk* <sup>TX-P</sup>	u	u	u	u
Zone-tailed Hawk	x	x	x	-

Red-tailed Hawk	u	-	u	u
Ferruginous Hawk	r	-	r	r
Rough-legged Hawk	-	-	-	x
Golden Eagle	-	-	x	x
<b>Caracaras and Falcons</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Crested Caracara*	u	u	o	o
American Kestrel <sup>TX-P</sup>	c	-	a	a
Merlin	o	-	o	u
Aplomado Falcon <sup>TX-P</sup>	r	r	r	r
Peregrine Falcon <sup>FS</sup> (Arctic- <sup>TX-P</sup> )	-	-	-	r
Prairie Falcon	-	-	r	r
<b>Chachalacas</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Plain Chachalaca*	c	c	u	u
<b>Turkeys, Quail, and Pheasants</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Chukar†	o	o	o	o
Ring-necked Pheasant†	o	o	o	o
Wild Turkey*	r	r	r	r
Northern Bobwhite* <sup>TX-P</sup>	c	c	c	c
<b>Rails, Gallinules, and Coots</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Clapper Rail <sup>FS</sup>	-	-	o	o
King Rail* <sup>TX-P FS</sup>	u	u	u	u
Virginia Rail	u	-	-	u
Sora*	u	r	u	u
Purple Gallinule* <sup>TX-P</sup>	o	o	r	-
Common Moorhen*	u	u	u	u
American Coot*	a	u	a	a
<b>Cranes</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Sandhill Crane <sup>FS</sup>	o	-	c	c

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Whooping Crane	-	-	x	-
<b>Plovers</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Black-bellied Plover	a	u	a	c
American Golden Plover (Lesser Gol-Pl.)	u	-	r	r
Snowy Plover* <sup>TX-PFS</sup>	u	-	u	u
Wilson's Plover* <sup>TX-PFS</sup>	a	a	c	r
Semipalmated Plover	u	-	u	u
Piping Plover <sup>TX-PFS</sup>	u	-	u	u
Killdeer*	c	c	c	c
Mountain Plover	r	-	o	r
<b>Oystercatchers</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
American Oystercatcher	-	r	r	r
<b>Stilts and Avocets</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Black-necked Stilt* <sup>TX-P</sup>	u	c	c	u
American Avocet* <sup>TX-P</sup>	c	c	c	u
<b>Jacanas</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Northern Jacana	x	x	-	x
<b>Sandpipers and Phalaropes</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Greater Yellowlegs <sup>TX-P</sup>	a	u	a	c
Lesser Yellowlegs <sup>TX-P</sup>	a	u	a	c
Solitary Sandpiper	u	-	u	r
Willet*	a	a	a	a
Spotted Sandpiper	u	u	u	u
Upland Sandpiper	u	-	u	-
Whimbrel	u	-	u	o
Long-billed Curlew <sup>TX-PFS</sup>	c	u	a	c
Hudsonian Godwit	o	-	-	-
Marbled Godwit	u	o	u	u

Ruddy Turnstone <sup>TX-P</sup>	u	o	u	u
Red Knot <sup>TX-P</sup>	o	o	o	-
Sanderling	u	o	u	u
Semipalmated Sandpiper	a	r	a	o
Western Sandpiper <sup>TX-P</sup>	a	o	a	a
Least Sandpiper	c	u	c	c
White-rumped Sandpiper	o	-	o	o
Baird's Sandpiper	o	-	o	-
Pectoral Sandpiper	u	-	u	o
Dunlin	a	o	a	c
Curlew Sandpiper	-	-	-	x
Stilt Sandpiper <sup>TX-P</sup>	u	o	c	o
Buff-breasted Sandpiper	u	-	u	-
Short-billed Dowitcher	-	-	o	-
Long-billed Dowitcher	a	o	a	c
Common Snipe	u	-	u	u
American Woodcock	-	-	-	x
Wilson's Phalarope	u	-	u	-
Red-necked Phalarope	r	-	r	-
Red Phalarope	-	-	r	-
<b>Gulls, Terns, and Skimmers</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Laughing Gull*	a	a	a	c
Franklin's Gull	u	-	u	-
Bonaparte's Gull	-	o	o	r
Ring-billed Gull	c	u	c	a
Herring Gull	u	o	u	u
Great Black-backed Gull	-	-	-	x
Gull-billed Tern* <sup>TX-PFS</sup>	c	c	c	u
Caspian Tern* <sup>FS</sup>	c	c	c	u
Royal Tern*	o	o	o	o
Sandwich Tern	o	o	o	o
Common Tern	u	-	u	r

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Forster's Tern* <sup>TX-P</sup>	c	c	c	c
Least Tern*	c	c	c	o
Sooty Tern	-	x	-	-
Black Tern	c	u	c	r
Black Skimmer* <sup>TX-P</sup>	c	c	u	u
<b>Pigeons and Doves</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Rock Dove†	-	-	r	r
Red-billed Pigeon	-	r	r	r
Band-tailed Pigeon	-	-	-	x
White-winged Dove*	o	o	o	r
Mourning Dove* <sup>TX-P</sup>	a	a	a	a
Inca Dove*	o	o	o	o
Common Ground-Dove*	c	c	c	c
Ruddy Ground-Dove	x	-	-	x
White-tipped dove*	o	u	u	o
<b>Parakeets and Parrots</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Green Parakeet	-	-	x	x
Red-crowned Parrot	x	-	-	-
Yellow-headed Parrot	-	x	-	-
<b>Cuckoos, Roadrunners, and Anis</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Black-billed Cuckoo	o	-	-	-
Yellow-billed Cuckoo* <sup>TX-P FS</sup>	c	c	o	-
Greater Roadrunner*	c	c	c	u
Groove-billed Ani*	u	c	c	o
<b>Barn owls</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Barn Owl*	u	u	u	u
<b>Typical Owls</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Eastern Screech-Owl*	u	u	u	u

Great Horned Owl*	u	u	u	u
Burrowing Owl <sup>TX-P</sup>	-	-	o	o
Short-eared Owl <sup>FS</sup>	u	-	u	u
<b>Night Jars</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Lesser Nighthawk*	u	u	u	-
Common Nighthawk* <sup>TX-P</sup>	c	a	a	-
Pauraque*	c	c	c	u
Chuck-will's-widow	o	-	u	-
Whip-poor-will	r	-	-	-
<b>Swifts</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Chimney Swift <sup>TX-P</sup>	c	-	-	o
<b>Hummingbirds</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Buff-bellied Hummingbird <sup>TX-P</sup>	r	r	r	-
Ruby-throated Hummingbird	u	-	-	u
Black-chinned Hummingbird	u	-	-	-
Rufous Hummingbird	-	-	r	r
<b>Kingfishers</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Ringed Kingfisher	-	-	-	r
Belted Kingfisher	u	-	c	c
Green Kingfisher	-	r	-	-
<b>Woodpeckers</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Red-headed Woodpecker	x	-	-	-
Golden-fronted Woodpecker* <sup>TX-P</sup>	a	a	a	a
Yellow-bellied Sapsucker <sup>FS</sup>	o	-	u	u
Ladder-backed Woodpecker* <sup>TX-P</sup>	c	c	c	c
Northern Flicker (Common Flicker)	-	-	o	o

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<b>Tyrant Flycatchers</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Northern beardless-Tyrannulet	r	r	r	r
Olive-sided Flycatcher	u	-	u	-
Western Wood-Pewee	u	-	u	-
Eastern Wood-Pewee <sup>TX-P</sup>	c	-	c	-
Yellow-bellied Flycatcher	r	-	-	-
Acadian Flycatcher	o	-	o	-
Least Flycatcher	u	-	u	-
Eastern Phoebe	c	u	c	c
Say's Phoebe	r	-	r	r
Vermilion Flycatcher*	u	-	u	o
Ash-throated Flycatcher	-	-	-	r
Great Crested Flycatcher	u	-	u	o
Brown-crested flycatcher*	c	c	-	-
Great Kiskadee*	u	c	u	u
Couch's Kingbird*	u	u	u	u
Western Kingbird	u	-	-	-
Eastern Kingbird* <sup>TX-P</sup>	c	-	c	-
Scissor-tailed Flycatcher* <sup>TX-P</sup>	a	u	c	r
<b>Larks</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Horned Lark* <sup>TX-P</sup>	c	c	c	c
<b>Swallows</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Purple Martin	u	-	u	-
Tree Swallow	c	-	c	r
Northern Rough-winged Swallow	a	-	c	-
Bank Swallow	c	o	c	-
Cliff Swallow	u	-	o	-
Barn Swallow	c	o	c	-
<b>Jays, Crows, and Ravens</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Blue Jay	-	-	r	r

Green Jay*	u	u	u	u
Mexican Crow	r	-	r	r
Chihuahuan Raven*	u	u	o	o
<b>Titmice</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Tufted Titmouse*	u	o	u	u
<b>Verdins</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Verdin*	u	u	u	u
<b>Wrens</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Cactus Wren*	c	c	c	c
Rock Wren	-	-	-	r
Canyon Wren	-	-	x	-
Carolina Wren*	o	o	o	o
Bewick's Wren* <sup>TX-P</sup>	u	u	u	u
House Wren	r	-	c	c
Sedge Wren	u	-	u	u
Marsh Wren	u	-	u	u
<b>Kinglets and Gnatcatchers</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Golden-crowned Kinglet	-	-	-	o
Ruby-crowned Kinglet	u	-	c	c
Blue-gray Gnatcatcher	u	o	c	c
<b>Thrushes</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Eastern Bluebird	o	-	o	r
Mountain Bluebird	r	-	-	r
Veery	u	-	-	-
Gray-cheeked Thrush	u	-	-	-
Swainson's Thrush	u	-	-	-
Hermit Thrush	u	-	u	u
Wood Thrush <sup>FS</sup>	u	-	-	-

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Clay-colored Thrush	-	-	-	x
American Robin	u	-	u	c
<b>Mimics and Thrashers</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Gray Catbird	c	-	c	-
Northern Mockingbird*	a	a	a	a
Sage Thrasher	o	-	o	o
Brown Thrasher	-	-	-	r
Long-billed Thrasher* <sup>TX-P</sup>	u	u	u	u
Curve-billed Thrasher* <sup>TX-P</sup>	c	c	c	c
<b>Pipits</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
American Pipit (Water Pipit)	o	-	c	c
Sprague's Pipit	-	-	-	o
<b>Waxwings</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Cedar Waxwing	o	-	u	u
<b>Silky-Flycatchers</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Gray Silky-Flycatcher	-	-	x	-
<b>Shrikes</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Loggerhead Shrike <sup>TX-P FS</sup>	u	-	u	u
<b>Starlings</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
European Starling†	-	-	r	r
<b>Vireos</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
White-eyed Vireo*	u	u	u	u
Solitary Vireo	u	-	u	u
Yellow-throated Vireo	u	-	u	-
Warbling Vireo	u	-	u	-
Philadelphia Vireo	u	-	u	-
Red-eyed Vireo	u	-	o	-

Yellow-green Vireo	x	x	x	x
<b>Wood-Warblers</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Blue-winged Warbler	u	-	-	-
Golden-winged Warbler	r	-	-	-
Tennessee Warbler	c	-	u	-
Orange-crowned Warbler	c	-	c	c
Nashville Warbler	u	-	u	u
Virginia's Warbler	-	-	-	x
Northern Parula	u	-	o	-
Tropical Parula	-	x	-	x
Yellow Warbler	u	-	c	-
Chestnut-sided Warbler	c	-	u	-
Magnolia Warbler	u	-	o	-
Cape May Warbler	x	-	-	-
Yellow-rumped Warbler	c	-	c	c
Black-throated Gray Warbler	x	-	x	-
Hermit Warbler	-	x	-	-
Black-throated Green Warbler	u	-	u	o
Blackburnian Warbler	u	-	o	-
Yellow-throated Warbler	u	-	u	o
Palm Warbler	r	-	-	r
Bay-breasted Warbler	u	-	-	-
Blackpoll Warbler	r	-	-	-
Cerulean Warbler <sup>FS</sup>	o	-	-	-
Black-and-white Warbler	c	r	c	u
American Redstart	u	-	o	-
Prothonotary Warbler <sup>FS</sup>	o	-	-	-
Worm-eating Warbler	u	-	-	-
Swainson's Warbler	r	-	-	-
Ovenbird	r	-	r	-
Northern Waterthrush	u	-	o	-
Louisiana Waterthrush	u	-	o	r

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Kentucky Warbler	o	-	o	-
Mourning Warbler	r	-	-	-
Common Yellowthroat*	c	u	c	u
Hooded Warbler	u	-	o	-
Wilson's Warbler	u	-	u	u
Canada Warbler	u	-	o	-
Red-faced Warbler	-	-	x	-
Yellow-breasted Chat*	u	-	o	-
<b>Tanagers</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Summer Tanager*	u	o	-	-
Scarlet Tanager	u	-	-	-
Western Tanager	r	-	-	r
<b>Cardinals and Grosbeaks</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Northern Cardinal*	c	c	c	c
Pyrrhuloxia	u	o	u	u
Rose-breasted Grosbeak	u	-	-	-
Black-headed Grosbeak	r	-	-	r
Blue Grosbeak*	c	o	u	-
Lazuli Bunting	r	-	-	-
Indigo Bunting	c	-	u	o
Varied Bunting*	u	o	-	-
Painted Bunting* <sup>TX-P FS</sup>	c	o	u	-
Dickcissel* <sup>TX-P</sup>	c	-	c	-
<b>Sparrows</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Olive Sparrow*	c	c	c	c
Green-tailed Towhee	-	-	o	o
Rufous-sided Towhee	-	-	-	r
White-collared Seedeater	r	r	r	r
Botteri's sparrow*	c	c	u	-
Cassin's Sparrow* <sup>TX-P</sup>	c	c	c	o

Chipping Sparrow	u	-	u	-
Clay-colored Sparrow	u	-	u	u
Field Sparrow	o	-	u	u
Vesper Sparrow	u	-	u	u
Lark Sparrow <sup>TX-P</sup>	c	u	c	c
Black-throated Sparrow*	o	o	o	o
Lark Bunting	o	-	o	o
Savannah Sparrow	a	-	a	a
Baird's Sparrow	-	-	-	r
Grasshopper Sparrow <sup>FS</sup>	u	-	o	o
Le Conte's Sparrow	-	-	-	u
Sharp-tailed Sparrow	-	-	-	r
Seaside Sparrow <sup>FS</sup>	-	-	-	r
Fox Sparrow	-	-	-	x
Song Sparrow	o	-	o	o
Lincoln's Sparrow	u	-	c	c
Swamp Sparrow	u	-	o	o
White-throated Sparrow	o	-	-	o
Golden-crowned Sparrow	-	-	-	x
White-crowned Sparrow	u	-	u	o
Harris' Sparrow	-	-	-	x
Dark-eyed Junco	-	-	-	r
<b>Blackbirds and Orioles</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Bobolink	x	-	-	-
Red-winged Blackbird*	a	a	a	a
Eastern Meadowlark* <sup>TX-PFS</sup>	a	a	a	a
Western Meadowlark	o	-	-	u
Yellow-headed Blackbird	o	-	o	r
Brewer's Blackbird	c	-	c	c
Great-tailed Grackle*	a	a	a	a
Bronzed cowbird*	c	a	u	o
Brown-headed Cowbird*	c	c	c	c

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Orchard Oriole <sup>TX-P</sup>	c	o	o	-
Hooded Oriole	r	r	-	r
Altamira Oriole	r	-	-	r
Audubon's Oriole* <sup>TX-P FS</sup>	r	r	r	r
Baltimore Oriole	c	-	u	-
<b>Finches</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
Pine Siskin	-	-	-	u
Lesser Goldfinch	r	-	-	r
American Goldfinch	u	-	u	u
<b>Old World Sparrows</b>	<b>Sp</b>	<b>S</b>	<b>F</b>	<b>W</b>
House Sparrow*†	c	c	c	c

***Hypothetical birds***, a status given to birds that have been recorded in Cameron County but not on the Refuge, follow:

Scarlet Ibis	Red-bellied Woodpecker
Tundra Swan	Rose-throated Becard
Oldsquaw	Brown Creeper
Black Scoter	Black-tailed Gnatcatcher
Common Merganser	Western Bluebird
Hook-billed Kite	Bell's Vireo
Gray Hawk	Black-capped Vireo
Roadside Hawk	Black-throated Blue Warbler
Scaled Quail	Golden-cheeked Warbler
Limpkin	Pine Warbler
Double-striped Thick-knee	Connecticut Warbler
Eskimo Curlew	Gray-crowned Yellowthroat
Ruff/Reeve	Golden-crowned Warbler
California Gull	Hepatic Tanager
Roseate Tern	Brewer's Sparrow
Ferruginous Pygmy-Owl	McCown's Longspur
Elf Owl	Chestnut-collared Longspur
Barred Owl	Boat-tailed Grackle

Long-eared Owl  
Elegant Trogon

Common Grackle  
Yellow “Mangrove” Warbler

Source:

U.S. Fish and Wildlife Service. 1987. Birds of Laguna Atascosa National Wildlife Refuge, Texas. U.S. Fish and Wildlife Service. Unpaginated. (Version: May 22, 1998).

## A.2 Amphibians and Reptiles

### Salamanders and relatives

Rio Grande Lesser Siren <sup>TX-P</sup>	<i>Siren intermedia texana</i>
Black-spotted Newt <sup>TX-P</sup>	<i>Notophthalmus meridionalis</i>

### Frogs and Toads

Great Plains Narrow-mouth Toad	<i>Gastrophryne olivacea</i>
Sheep Frog <sup>TX-P</sup>	<i>Hypopachus variolosus</i>
Rio Grande Chirping Frog	<i>Syrrophus cystignathoides campi</i>
Couch’s Spadefoot Toad	<i>Scaphiopus couchi</i>
Gulf Coast Toad	<i>Bufo valliceps</i>
Texas Toad	<i>Bufo speciosus</i>
Spotted Chorus Frog	<i>Pseudacris clarki</i>
Rio Grande Leopard Frog	<i>Rana berlandieri</i>

### Crocodiles

American Alligator <sup>TX-P</sup>	<i>Alligator mississippiensis</i>
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### Turtles

Red-eared Slider	<i>Trachemys scripta elegans</i>
Texas Spiny Softshell	<i>Trionyx spiniferus emoryi</i>
Yellow Mud Turtle	<i>Kinosternon f. flavescens</i>
Texas Tortoise <sup>TX-P</sup>	<i>Gopherus berlandieri</i>

### Sea Turtles

Kemp’s Ridley Sea Turtle <sup>TX-P</sup>	<i>Lepidochelys kempii</i>
Loggerhead Sea Turtle <sup>TX-P</sup>	<i>Caretta caretta</i>

Green Sea Turtle <sup>TX-P</sup>	<i>Chelonia mydas</i>
Hawksbill Sea Turtle <sup>TX-P</sup>	<i>Eretmochelys imbricate</i>

**Lizards**

Mediterranean Gecko†	<i>Hemidactylus turcius</i>
Four-lined Skink	<i>Eumeces tegragrammaus</i>
Texas Spotted Whiptail	<i>Cnemidophorus g. gularis</i>
Green Anole	<i>Anolis carolinensis</i>
Rosebelly Lizard	<i>Sceloporus variabilis marmoratus</i>
Texas Horned Lizard <sup>TX-P</sup>	<i>Phrynosoma cornutum</i>
Texas Spiny Lizard	<i>Sceloporus olivaceus</i>

TX-P - identified in the Texas Comprehensive Wildlife Conservation Strategy as a priority species

† - Introduced

**Snakes**

Texas Blind Snake	<i>Leptotyphlops d. dulcis</i>
Black Striped Snake	<i>Coniophanes i. Imperialis</i>
Bull Snake	<i>Pituophus melanoleucus sayi</i>
Eastern Checkered Garter Snake	<i>Thamnophis m. marcianus</i>
Great Plains Rat Snake	<i>Elahpe guttata emoryi</i>
Gulf Coast Ribbon Snake	<i>Thamnophis proximus orarius</i>
Mexican Hooknose Snake	<i>Ficimia streckeri</i>
Mexican Milk Snake	<i>Lampropeltis trianulum annulata</i>
Mexican Racer	<i>Coluber constrictor</i>
Plains Blackhead Snake	<i>Tantilla nigriceps nigriceps</i>
Ruthven's Whipsnake	<i>Masticophis taeniatus ruthveni</i>
Texas Brown Snake	<i>Storeria dekayi texana</i>
Texas Indigo Snake <sup>TX-P</sup>	<i>Drymarchon corais erebennus</i>
Texas Patchnose Snake	<i>Salvadora grahamiae lineata</i>
Diamondback Water Snake	<i>Nerodia r. rhombifera</i>
Texas Coral Snake	<i>Micrurus fulvius tenere</i>
Western Diamondback Rattlesnake	<i>Crotalus atrox</i>

TX-P- identified in the Texas Comprehensive Wildlife Conservation Strategy as a priority species

### A.3 Fish

		HABITAT*
Inland Silverside	<i>Menidia beryllina</i>	C
Warmouth	<i>Lepomis gulosus</i>	T
Mexican Tetra	<i>Astyanax mexicanus</i>	T
Gizzard Shad	<i>Dorosoma cepedianum</i>	C
Sheepshead Minnow	<i>Cyprinodon variegatus</i>	C, L, T
Gulf Killifish	<i>Fundulus grandis</i>	C
Striped Killifish	<i>Fundulus majalis</i>	C, L
Rainwater Killifish	<i>Lucania parva</i>	T
Code Goby	<i>Gobiosoma robustum</i>	L
Alligator Gar	<i>Atractosteus spatula</i>	B, C, T
Spotted Gar	<i>Lepisosteus oculatus</i>	B, C, T
Striped Mullet	<i>Mugil cephalus</i>	L, C
Mosquitofish	<i>Gambusia affinis</i>	T
Amazon Molly	<i>Poecilia formosa</i>	T
Sailfin Molly	<i>Poecilia latipinna</i>	T, C
Spot	<i>Leiostomus xanthurus</i>	L
Channel Catfish	<i>Ictalurus punctatus</i>	T
Common Carp	<i>Cyprinus carpio</i>	T
Redfish	<i>Sciaenops ocellatus</i>	L
Black Drum	<i>Pogonias cromis</i>	L
Southern Flounder	<i>Paralichthys lethostigma</i>	L
Spotted Seatrout	<i>Cynoscion nebulosus</i>	L
Sand Seatrout	<i>Cynoscion arenarius</i>	L
Menhaden	<i>Brevoortia tyrannus</i>	L
Dusky Pipefish	<i>Syngnathus floridae</i>	L

\*

L = Laguna Madre

C = Cayo Atascosa

T = freshwater ponds, tanks, resacas, or lakes

B = Bahia Grande

## A.4 Mammals

### Opossums

Virginia Opossum *Didelphis virginiana californica*

### Shrews

Least Shrew *Cryptotis parva berlandieri*

### Bats

Cave Myotis *Myotis velifer*

Mexican Long-tongued Bat *Choeronycteris mexicana*

Eastern Pipistrelle *Pipistrellus s. subflavus*

Evening Bat *Nycticeius humeralis mexicanus*

Brazilian Freetail Bat *Tadarida brasiliensis mexicana*

### Armadillos

Nine-banded Armadillo *Dasypus novemcinctus*

### Hares and Rabbits

Eastern Cottontail *Sylvilagus floridanus chapmani*

Black-tailed Jackrabbit *Lepus californicus merriami*

### Squirrels

Mexican Ground Squirrel *Spermophilus mexicanus parvidens*

### Pocket Mice

Silky Pocket Mouse *Perognathus flavus merriami*

Hispid Pocket Mouse *Chaetodipus h. hispidus*

Mexican Spiny Pocket Mouse *liomys irroratus texensis*

### New World Rats and Mice

Marsh Rice Rat *Oryzomys palustris aquaticus*

Coues' Rice Rat <sup>TX-P</sup> *Oryzomys couesi aquaticus*

Fulvous Harvest Mouse	<i>Reithrodontomys fulvescens intermedius</i>
White-footed Mouse	<i>Peromyscus leucopus texanus</i>
Deer Mouse	<i>Peromyscus maniculatus</i>
Northern Pygmy Mouse	<i>Baiomys t. taylori</i>
Northern Grasshopper Mouse	<i>Onchomys leucogasterlongipes</i>
Hispid Cotton Rat	<i>Sigmodon hispidus berlandieri</i>
Southern Plains Woodrat	<i>Neotoma m. micropus</i>

### Old World Rats and Mice

Norway Rat	<i>Rattus n. norvegicus</i>
Roof Rat	<i>Rattus rattus</i>
House Mouse	<i>Mus musculus</i>

### Nutria

Nutria	<i>Myocastor coypus bonariensis</i>
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### Dolphins

Bottle-nosed Dolphin	<i>Tursiops truncatus</i>
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### Wild Canids

Coyote	<i>Canis latrans</i>
Gray Fox	<i>Urocyon cinereoargenteus scotti</i>

### Raccoons

Raccoon	<i>Procyon lotor fuscipes</i>
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### Weasels

Long-tailed Weasel <sup>TX-P</sup>	<i>Mustela f. frenata</i>
Badger <sup>TX-P</sup>	<i>Taxidea taxus berlandieri</i>
Striped Skunk	<i>Mephitis mephitis</i>

### Wild Cats

Bobcat	<i>Lynx rufus</i>
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Mountain Lion <sup>TX-P</sup>	<i>Felis concolor</i>
Ocelot <sup>TX-P</sup>	<i>Leopardus pardalis</i>
Gulf Coast Jaguarundi <sup>TX-P</sup>	<i>Herpailurus yagouaroundi cacomitli</i>

**Pigs**

Feral Hog†	<i>Sus scrofa</i>
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**Peccaries**

Collared Peccary	<i>Tayassu tajacu</i>
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**Deer**

White-tailed Deer	<i>Odocoileus virginianus</i>
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**Cattle, Antelopes, and Allies**

Nilgai antelope†	<i>Boselaphus tragocamelus</i>
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<sup>TX-P</sup> - identified in the Texas Comprehensive Wildlife Conservation Strategy as a priority species

† - Introduced

**A.5 Butterflies of Laguna Atascosa NWR**

**Swallowtails - *Family Papilionidae***

Pipevine Swallowtail	<i>Battus philenor</i>
Black Swallowtail	<i>Papilio polyxenes</i>
Giant Swallowtail	<i>Papilio cresphontes</i>
Ornythion Swallowtail	<i>Papilio ornythion</i>
Ruby-spotted Swallowtail	<i>Papilio anchisiades</i>

**Whites and Sulphurs - *Family Pieridae***

Whites - *Subfamily Pierinae*

Florida White	<i>Appias drusilla</i>
Checkered White	<i>Pontia protodice</i>

Great Southern White	<i>Ascia monuste</i>
Giant White	<i>Ganyra josephina</i>
Common Melwhite	<i>Melete lycimnia isandra</i>

Sulphurs - Subfamily Coliadinae

Orange Sulphur	<i>Colias eurytheme</i>
Southern Dogface	<i>Colias cesonia</i>
White Angled-Sulphur	<i>Anteos clorinde</i>
Yellow Angled-Sulphur	<i>Anteos maerula</i>
Cloudless Sulphur	<i>Phoebis sennae</i>
Orange-barred Sulphur	<i>Phoebis philea</i>
Large Orange Sulphur	<i>Phoebis agarithe</i>
Lyside Sulphur	<i>Kricogonia lyside</i>
Tailed Orange	<i>Eurema proterpia</i>
Little Yellow	<i>Eurema lisa</i>
Mimosa Yellow	<i>Eurema nise</i>
Sleepy Orange	<i>Eurema nicippe</i>
Dainty Sulphur	<i>Nathalis iole</i>

**Gossamer-wing Butterflies - Family Lycaenidae**

Hairstreaks - Subfamily Theclinae

Great Purple Hairstreak	<i>Atlides halesus</i>
Silver-banded Hairstreak	<i>Chlorostrymon simaethis</i>
Xami Hairstreak	<i>Callophrys xami</i>
Gray Hairstreak	<i>Strymon melinus</i>
Mallow Scrub-Hairstreak	<i>Strymon istapa</i>
Red-crescent Scrub-Hairstreak	<i>Strymon rufofusca</i>
Lantana Scrub-Hairstreak	<i>Strymon bazochii</i>
White Scrub-Hairstreak	<i>Strymon albata</i>
Dusky-blue Groundstreak	<i>Calycopis isobea</i>
Gray Ministreak	<i>Ministrymon azia</i>
Clytie Ministreak	<i>Ministrymon clytie</i>

Blues - Subfamily Polyommatainae

Western Pygmy-Blue	<i>Brephidium exile</i>
Cassius Blue	<i>Leptotes cassius</i>
Marine Blue	<i>Leptotes marina</i>
Cyna Blue	<i>Zizula cyna</i>
Ceraunus Blue	<i>Hemiargus ceraunus</i>
Reakirt's Blue	<i>Hemiargus isola</i>

**Metalmarks - Family Riodinidae**

Fatal Metalmark	<i>Calephelis nemesis</i>
Rounded Metalmark	<i>Calephelis perditalis</i>
Red-bordered Metalmark	<i>Caria ino</i>
Blue Metalmark	<i>Lasia sula</i>

**Brush-footed Butterflies - Family Nymphalidae**

Snouts - Subfamily Libytheinae

American Snout	<i>Libytheana carinenta</i>
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Heliconians and Fritillaries - Subfamily Heliconiinae

Gulf Fritillary	<i>Agraulis vanillae</i>
Julia Heliconian	<i>Dryas iulia</i>
Zebra Heliconian	<i>Heliconius charitonius</i>
Variiegated Fritillary	<i>Euptoieta claudia</i>
Mexican Fritillary	<i>Euptoieta hegesia</i>

True Brush-foots - Subfamily Nymphalinae

Theona Checkerspot	<i>Thessalia theona</i>
Bordered Patch	<i>Chlosyne lacinia</i>
Elada Checkerspot	<i>Texola elada</i>
Definite Patch	<i>Chlosyne definita</i>

Texan Crescent	<i>Phyciodes texana</i>
Vesta Crescent	<i>Phyciodes vesta</i>
Phaon Crescent	<i>Phyciodes phaon</i>
Pearl Crescent	<i>Phyciodes tharos</i>
Question Mark	<i>Polygonia interrogationis</i>
American Lady	<i>Vanessa virginiensis</i>
Painted Lady	<i>Vanessa cardui</i>
Red Admiral	<i>Vanessa atalanta</i>
Common Buckeye	<i>Junonia coenia</i>
Tropical Buckeye	<i>Junonia genoveva</i>
White Peacock	<i>Anartia jatrophae</i>

Admirals and Relatives - Subfamily Limenitidinae

Mexican Bluewing	<i>Myscelia ethusa</i>
Dingy Purplewing	<i>Eunica monima</i>
Common Mestra	<i>Mestra amymone</i>
Red Rim	<i>Biblis hyperia</i>
Gray Cracker	<i>Hamadryas februa</i>
Guatemalan Cracker	<i>Hamadryas guatemalena</i>
Blue-eyed Sailor	<i>Dynamine dyonis</i>
Ruddy Daggerwing	<i>Marpesia petreus</i>
Many-banded Daggerwing	<i>Marpesia chiron</i>

Leafwings - Subfamily Charaxinae

Tropical Leafwing	<i>Anaea aidea</i>
Goatweed Leafwing	<i>Anaea andria</i>

Emperors - Subfamily Apaturinae

Hackberry Emperor	<i>Asterocampa celtis</i>
Tawny Emperor	<i>Asterocampa clyton</i>

Satyrs - Subfamily Satyrinae

Gemmed Satyr	<i>Cyllopsis gemma</i>
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Carolina Satyr *Hermeuptychia sosybius*

Monarchs - Subfamily Danainae

Monarch *Danaus plexippus*

Queen *Danaus gilippus*

Soldier *Danaus eresimus*

**Skippers - Family Hesperidae**

Spread-wing Skippers - Subfamily Pyrginae

Guava Skipper *Phocides polybius*

Brown Longtail *Urbanus procne*

White-striped Longtail *Chioides catillus*

Zilpa Longtail *Chioides zilpa*

Gold-spotted Aguna *Aguna asander*

Long-tailed Skipper *Urbanus proteus*

Dorantes Longtail *Urbanus dorantes*

Teleus Longtail *Urbanus teleus*

Two-barred Flasher *Astraptes fulgerator*

Potrillo Skipper *Cabares potrillo*

Fritzgaertner's Flat *Celaenorrhinus fritzgaertneri*

Mazan's Scalopwing *Staphylus mazans*

Texas Powdered-Skipper *Systasea pulverulenta*

Sickle-winged Skipper *Achlyodes thraso*

Brown-banded Skipper *Timochares ruptifasciata*

White-patched Skipper *Chiomara asychis*

Mournful Duskywing *Erynnis tristis*

Funereal Duskywing *Erynnis funeralis*

White Checkered-Skipper *Pyrgus albescens*

Tropical Checkered-Skip. *Pyrgus oileus*

Desert Checkered-Skip. *Pyrgus philetas*

Laviana White-Skipper *Heliopetes laviana*

Veined White-Skipper *Heliopetes arsalte*

Turk's-cap White-Skipper	<i>Heliopetes macaira</i>
Erichson's White-Skipper	<i>Heliopetes domicella</i>
Common Sootywing	<i>Pholisora catullus</i>

Grass Skippers - Subfamily Hesperinae

Pale-rayed Skipper	<i>Vidius perigenes</i>
Julia's Skipper	<i>Nastra julia</i>
Fawn-spotted Skipper	<i>Cymaenes odilia</i>
Clouded Skipper	<i>Lerema accius</i>
Double-dotted Skipper	<i>Decinea percosius</i>
Southern Skipperling	<i>Copaeodes minimus</i>
Fiery Skipper	<i>Hylephila phyleus</i>
Whirlabout	<i>Polites vibex</i>
Southern Broken-Dash	<i>Wallengrenia otho</i>
Sachem	<i>Atalopedes campestris</i>
Common Mellana	<i>Quasimellana eulogius</i>
Nysa Roadside-Skipper	<i>Amblyscirtes nysa</i>
Celia's Roadside-Skipper	<i>Amblyscirtes celia</i>
Eufala Skipper	<i>Lerodea eufala</i>
Olive-clouded Skipper	<i>Lerodea dysaules</i>
Brazilian Skipper	<i>Calpodes ethlius</i>
Obscure Skipper	<i>Panoquina panoquinoides</i>
Ocola Skipper	<i>Panoquina ocola</i>
Purple-washed Skipper	<i>Panoquina sylvicola</i>
Violet-banded Skipper	<i>Nyctelius nyctelius</i>

Notes:

Butterfly data compiled by Ellie Thompson, through July 31, 2007.

English names follow Cassie et al. 2001. NABA Checklist and English Names of North American Butterflies; Second Edition.

As of July 2007, 129 butterfly species have been reported at Laguna Atascosa NWR. The greatest diversity and number occur in the fall, generally peaking mid-October to mid-November. Diversity and numbers vary from year to year and are directly associated with the amount of rainfall—generous rainfall produces healthy plants on which they feed during the caterpillar stage. Also, some species can be common or abundant one year and rare or absent another year.

## A.6 Plants

### ACANTHACEAE

Wavyleaf snakeherb	<i>Dyschoriste crenulata</i>
Wheatspike scalystem	<i>Elytraria bromoides</i>
Runyon's wild petunia	<i>Ruellia runyonii</i> var. <i>runyonii</i>
Hairy tubetongue	<i>Siphonoglossa pilosella</i> var. <i>greggi</i>

### AIZOACEAE

Lotus sweetjuice	<i>Glinus lotoides</i>
Spreading sweetjuice	<i>Glinus radiatus</i>
Green carpetweed	<i>Mollugo verticillata</i>
Shoreline seapurslane	<i>Sesuvium portulacastrum</i>
Winged sesuvium	<i>Sesuvium verrucosum</i>
Desert horsepurslane	<i>Trianthema portulacastrum</i>

### ALISMATACEAE

Burhead	<i>Echinodorus berteroi</i> ( <i>E. Cordifolius</i> )
Lancehead burhead	<i>Echinodorus tenellus</i>
Longlobe arrowhead	<i>Sagittaria longiloba</i>

### AMARANTHACEAE

Smooth chaff flower	<i>Alternanthera polygonoides</i>
Berlandier amaranth	<i>Amaranthus berlandieri</i>
Gregg amaranth	<i>Amaranthus greggi</i>
Tropical amaranth	<i>Amaranthus polygonoides</i>
Bonebract amaranth	<i>Amaranthus scleropoides</i>
Albahaca	<i>Celosia nitida</i>
Nealley globe-amaranth	<i>Gomphrena nealleyi</i>
Woolly cottonflower	<i>Gossypianthus lanuginosus</i>
Woolly tidestromia	<i>Tidestromia lanuginosa</i> var. <i>lanuginosa</i>

**AMARYLLIDACEAE**

Century plant	<i>Agave americanum</i> var. <i>marginata</i>
Brazos rainlily	<i>Zephyranthes brazosensis</i>
Eveningstar rainlily	<i>Zephyranthes drummondii</i>
Showy zephyrlily	<i>Zephyranthes pulchella</i>

**ANACARDIACEAE**

Brazilian peppertree*† <sup>NP</sup>	<i>Schinus terebinthifolius</i>
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**ASCLEPIADACEAE**

Zizotes milkweed	<i>Asclepias oenotheroides</i>
Horsetail milkweed	<i>Asclepias subverticillata</i>
Talayote	<i>Cynanchum unifarium</i>

**ASTERACEAE (COMPOSITAE)**

Featherleaf desertpeony	<i>Acourtia (Perezia) runcinata</i>
Brownfoot	<i>Acourtia (Perezia) wrightii</i>
Field ragweed	<i>Ambrosia confertiflora</i>
Western ragweed	<i>Ambrosia psilostachya</i>
Plains dozedaisy	<i>Aphanostephus ramosissimus</i>
Saltmarsh aster	<i>Aster subulatus</i> var. <i>ligulatus</i>
Seepwillow baccharis	<i>Baccharis glutinosa</i>
Willow baccharis	<i>Baccharis neglecta</i>
Sea ox-eye daisy	<i>Borrchia frutescens</i>
Prostrate lawnflower	<i>Calypocarpus vialis</i>
Southern thistle	<i>Cirsium texanum</i>
Fleshyleaf clappia	<i>Clappia suaedaefolia</i>
Golden tickseed	<i>Coreopsis tinctoria</i> var. <i>tinctoria</i> ( <i>Coreopsis cardaminaefolia</i> )
Yerba de tajo	<i>Eclipta prostrata</i> (alba)
Goldenbush	<i>Ericameria austrotexana</i>
Rio Grande fleabane	<i>Erigeron tenellus</i>
Pink thoroughwort	<i>Fleischmannia incarnata</i> ( <i>Eupatorium incarnatum</i> )
Spring pygmycudweed	<i>Evax verna</i> var. <i>drummondii</i>

Sticky florestina	<i>Florestina tripteris</i>
Firewheel	<i>Gaillardia pulchella</i>
Indian blanket	<i>Gaillardia suavis</i>
Cudweed	<i>Gamochaeta pensylvanica (Gnaphalium peregrinum)</i>
Roundleaf snakeweed	<i>Gutierrezia sphaerocephala</i>
Gumhead	<i>Gymnosperma glutinosum</i>
Slimleaf sneezeweed	<i>Helenium linifolium</i>
Smallhead sneezeweed	<i>Helenium microcephalum</i>
Common sunflower	<i>Helianthus annuus</i>
Drummond's goldenbush	<i>Isocoma drummondii</i>
Narrowleaf marsh elder	<i>Iva angustifolia</i>
Annual marsh elder	<i>Iva annua</i>
Hairy lettuce	<i>Lactuca hirsuta var. albiflora</i>
Coulter's horseweed	<i>Laennecia coulteri (Conyza coulteri)</i>
Camphor daisy	<i>Machaeranthera phyllocephala</i>
Texas palafox	<i>Palafoxia texana var. ambigua</i>
False ragweed (feverfew)	<i>Parthenium hysterophorus</i>
Manzanilla bronca (rockdaisy)	<i>Perityle microglossa</i>
Marsh fleabane (stinkweed)	<i>Pluchea odorata (purpurascens)</i>
False dandelion	<i>Pyrrhopappus pauciflorus</i>
Mexican hat	<i>Ratibida peduncularis</i>
Yellow creeping zinnia	<i>Sanvitalia ozymoides</i>
Texas ragwort	<i>Senecio ampullaceus</i>
Butterweed	<i>Senecio tampicanus</i>
Mutis' burrweed	<i>Soliva mutisii</i>
Common sowthistle	<i>Sonchus oleraceus</i>
Blue boneset	<i>Tamaulipa azurea (Eupatorium azureum)</i>
Dogweed	<i>Thymophylla pentachaeta (Dyssodia p. var. p)</i>
Bristleleaf dogweed	<i>Thymophylla tenuiloba (Dyssodia t.)</i>
Limestone bugheal	<i>Trichocoronis wrightii</i>
Tropical threefold	<i>Trixis inula (Trixis radialis)</i>
Golden crownbeard	<i>Verbesina encelioides</i>
Texas crownbeard	<i>Verbesina microptera</i>

Hairy wedelia *Wedelia texana (Zexmenia hispida)*

#### **BASELLACEAE**

Texas madeira vine *Anredera vesicaria*

#### **BATIDOCEAE**

Maritime saltwort *Batis maritima*

#### **BORAGINACEAE**

Gray coldenia *Coldenia canescens*

Anacahuita (Wild olive) *Cordia boissieri*

Scorpion's tail *Heliotropium angiospermum*

Salt heliotrope *Heliotropium curassavicum*

Indian heliotrope *Heliotropium indicum*

#### **BROMELIACEAE**

Small ball moss *Tillandsia recurvata*

#### **CACTACEAE**

Triangle cactus *Acanthocereus pentagonus*

Turkshead echinocactus *Echinocactus texensis*

Miniature barrel cactus *Echinocactus (Thelocactus) setispinus*

Berlandier's alicoche *Echinocereus berlandieri*

Blanck's echinocereus *Echinocereus berlandieri var. blanckii*

Little nipple cactus *Mammillaria heyderi var. hemisphaerica*

Nipple mammillaria *Mammillaria sphaerica*

Christmas cactus *Opuntia leptocaulis*

Texas pricklypear *Opuntia engelmannii var. lindheimeri*

#### **CALLITRICHACEAE**

Nuttall water-starwort *Callitriche nuttallii*

**CAPPARIDACEAE**

Prickly spiderflower	<i>Cleome aculeata</i>
Roughseed clammyweed	<i>Polanisia dodecandra</i>

**CARYOPHYLLACEAE**

Prostrate starwort	<i>Stellaria prostrata</i>
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**CELASTRACEAE**

Leatherleaf	<i>Maytenus phyllanthoides</i>
Desert yaupon	<i>Schaefferia cuneifolia</i>

**CHENOPODIACEAE**

Armed saltbush	<i>Atriplex acanthocarpa</i>
Matamoros saltbush	<i>Atriplex matamorensis</i>
Crested saltbush	<i>Atriplex pentandra</i>
Texas saltbush	<i>Atriplex texana</i>
Wormseed goosefoot	<i>Chenopodium ambrosioides</i>
Pitseed goosefoot	<i>Chenopodium berlandieri</i>
Nettleleaf goosefoot	<i>Chenopodium murale</i>
Bigelow glasswort	<i>Salicornia bigelovii</i>
Woody glasswort	<i>Salicornia virginica</i>
Russian thistle*	<i>Salsola kali</i>
Beach seepweed	<i>Suaeda conferta</i>
Seepweed	<i>Suaeda linearis</i>

**COCHLOSPERMACEAE**

Yellowshow	<i>Amoreuxia wrightii</i>
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**COMMELINACEAE**

Spreading dayflower	<i>Commelina diffusa</i>
Tropical dayflower	<i>Commelina elegans</i>
Erect dayflower	<i>Commelina erecta var. angustifolia</i>
Littleflower spiderwort	<i>Tradescantia micrantha</i>

**CONVOLVULACEAE**

Leafless cressa	<i>Cressa nudicaulis</i>
Dodder	<i>Cuscuta glabrior</i> var. <i>glabrior</i>
Bigseed alfalfa dodder	<i>Cuscuta indecora</i>
Ponyfoot	<i>Dichondra micrantha</i>
Slender dwarf morning-glory	<i>Evolvulus alsinoides</i>
Silver dwarf morning-glory	<i>Evolvulus sericeus</i>
Morning glory	<i>Ipomoea fistulosa</i>
Railroad vine	<i>Ipomoea pes-caprae</i> var. <i>emarginata</i>
Cotton morning-glory	<i>Ipomoea trichocarpa</i> var. <i>torreyana</i>

**CRASSULACEAE**

Coastal stonecrop	<i>Sedum texanum</i>
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**CRUCIFERAE**

Southern pepperweed	<i>Lepidium austrinum</i>
Virginia pepperweed	<i>Lepidium virginicum</i> var. <i>virginicum</i>
Roughpod bladderpod	<i>Lesquerella lasiocarpa</i>
Lindheimer bladderpod	<i>Lesquerella lindheimeri</i>
Tansyleaf yellowcress	<i>Rorippa walteri</i>
Viereck's winged rockcress	<i>Sibara viereckii</i>
Rocket mustard	<i>Sisymbrium irio</i>

**CUCURBITACEAE**

Lindheimer's globeberry	<i>Ibervillea tenella</i> ( <i>lindheimeri</i> )
Slimlobe globeberry	<i>Ibervillea lindheimeri</i> var. <i>tenuisecta</i>

**CYPERACEAE**

Taperleaf flatsedge	<i>Cyperus acuminatus</i>
Jointed flatsedge	<i>Cyperus articulatus</i>
Finger flatsedge	<i>Cyperus digitatus</i>
Sticky flatsedge	<i>Cyperus elegans</i>
Hermaphrodite flatsedge	<i>Cyperus hermaphroditus</i>

Pond flatsedge	<i>Cyperus ochraceus</i>
Tropical flatsedge	<i>Cyperus surinamensis</i>
One flower flatsedge	<i>Cyperus uniflorus</i> , <i>Cyperus uniflorus</i> var. <i>pseudothyrsiflorus</i>
Sand flatsedge	<i>Cyperus virens</i>
Needle spikesedge	<i>Eleocharis acicularis</i>
White spikesedge	<i>Eleocharis albida</i>
Sand spikesedge	<i>Eleocharis montevidensis</i>
Squarestem spikesedge	<i>Eleocharis quadrangulata</i>
California bulrush	<i>Scirpus californicus</i>
Bulrush	<i>Scirpus maritimus</i>
Saltmarsh bulrush	<i>Scirpus maritimus</i> var. <i>paludosus</i>
Hall's Bulrush	<i>Scirpus supinus</i> var. <i>hallii</i>

**EBENACEAE**

Texas persimmon	<i>Diospyros texana</i>
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**EUPHORBIACEAE**

Round copperleaf	<i>Acalypha heteracea</i>
Poiret copperleaf	<i>Acalypha poretii</i>
Low wildmercury	<i>Argythamnia humilis</i>
Brush myrtle croton	<i>Bernardia myricaefolia</i>
Woolly croton	<i>Croton capitatus</i> var. <i>lindheimeri</i>
Lindheimer croton	<i>Croton glandulosus</i> var. <i>lindheimeri</i>
Low croton	<i>Croton humilis</i>
Two-color croton	<i>Croton leucophyllus</i>
Three-seed croton	<i>Croton lindheimerianus</i>
Soliman's croton	<i>Croton soliman</i>
Spotted euphorbia	<i>Euphorbia maculata</i>
Mat euphorbia	<i>Euphorbia serpens</i>
Berlandier's nettlespurge	<i>Jatropha cathartica</i>
Leatherstem	<i>Jatropha dioica</i> var. <i>dioica</i>
Knotweed leafflower	<i>Phyllanthus polygonoides</i>
Castor bean*†	<i>Ricinus communis</i>

**GENTIANACEAE**

Buckley centaury	<i>Centaurium calycosum</i>
Tall prairie gentian	<i>Eustoma exaltatum</i>

**HYDROPHYLLACEAE**

Ovate false fiddleleaf	<i>Hydrolea ovata</i>
Spiny false fiddleleaf	<i>Hydrolea spinosa</i>
Jamaica weed	<i>Nama jamaicense</i>

**LABIATAE**

Brown's savory	<i>Clinopodium brownei</i> ( <i>Micromeria brownei</i> var. <i>pilosiuscula</i> )
Shrubby blue sage	<i>Salvia ballotiflora</i>
Tropical sage	<i>Salvia coccinea</i>
Rio Grande skullcap	<i>Scutellaria muriculata</i>
Mousesear	<i>Stachys crenata</i>
Small coastal germander	<i>Teucrium cubense</i>

**LEGUMINOSAE**

Huisache	<i>Acacia farnesiana</i>
Huisachillo	<i>Acacia schaffneri</i> var. <i>bravoensis</i>
Joint-vetch	<i>Aeschynomone indica</i>
Nuttall milkvetch	<i>Astragalus nuttallianus</i>
Prairie senna	<i>Cassia fasciculata</i> var. <i>ferrisiae</i>
Lindheimer senna	<i>Cassia lindheimeriana</i>
Border paloverde*	<i>Cercidium macrum</i>
Shakeshake	<i>Crotalaria incana</i>
Wedgeleaf prairie clover	<i>Dalea emarginata</i>
Purple dalea	<i>Dalea lasianthera</i>
Bearded dalea	<i>Dalea pogonathera</i>
Low dalea	<i>Dalea thyrsiflora</i>
Bundleflower	<i>Desmanthus virgatus</i> var. <i>depressus</i>
Texas ebony	<i>Ebenopsis ebano</i> ( <i>Pithecellobium flexicaule</i> )

Kidneywood*	<i>Eysenhardtia texana</i>
Hoary milkpea	<i>Galactia canescens</i>
Indian rushpea	<i>Hoffmannseggia densiflora (H. glauca)</i>
Coast indigo	<i>Indigofera miniata</i>
Anil indigo	<i>Indigofera suffruticosa</i>
Tenaza	<i>Havardia pallens (Pithecellobium pallens)</i>
Tepeguaje (Great leadtree)	<i>Leucaena pulverulenta</i>
Black mimosa	<i>Mimosa pigra var. berlandieri</i>
Tropical neptunia	<i>Neptunia pubescens</i>
Retama	<i>Parkinsonia aculeata</i>
Honey mesquite	<i>Prosopis glandulosa</i>
Tornillo (Screwbean mesquite)	<i>Prosopis reptans var. cinerascens</i>
Gulf Indian breadroot	<i>Pediomelum rhombifolium (Psoralea rhombifolia)</i>
American snoutbean	<i>Rhynchosia americana</i>
Least snoutbean	<i>Rhynchosia minima</i>
Texas snoutbean	<i>Rhynchosia texana</i>
Sensitive brier	<i>Schrankia latidens</i>
Drummond sesbania	<i>Sesbania drummondii</i>
Coffeebean	<i>Sesbania macrocarpa</i>
Yellow sophora	<i>Sophora tomentosa</i>
Leavenworth vetch	<i>Vicia leavenworthii</i>

**LEMNACEAE**

Common duckweed	<i>Lemna minor</i>
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**LENTIBULARIACEAE**

Humped bladderwort	<i>Utricularia gibba</i>
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**LILIACEAE**

Lila de las lomas	<i>Echeandia texensis</i>
Lila de los llanos	<i>Echeandia chandleri</i>
Yellow false garlic (crowpoison)	<i>Nothoscordum bivalve</i>
Trecul Yucca	<i>Yucca treculeana</i>

**LOGANIACEAE**

Polly-prim *Polypremum procumbens*

**LORANTHACEAE**

Christmas mistletoe *Phoradendron serotinum var. pubescens*

**LYTHRACEAE**

Purple ammania *Ammannia coccinea*

Willow-leaf heimia *Heimia salicifolia*

California loosestrife *Lythrum californicum*

**MALPIGHIACEAE**

Barbados cherry *Malpighia glabra*

**MALVACEAE**

Indian-mallow *Abutilon incanum*

Shrubby Indian mallow *Abutilon lignosum*

Anglestem abutilon *Abutilon trisulcatum*

Field anoda *Anoda pentaschista (Anoda pentaschista var. obtusior)*

Viscid mallow *Bastardia viscosa*

Bladdermallow *Bogenhardia crispa (Herissantia crispa)*

Yellow fugosia *Cienfuegosia sulphurea var. glabra*

Heartleaf hibiscus *Hibiscus cardiophyllus*

Rio Grande falsemallow *Malvastrum americanum*

Threelobe falsemallow *Malvastrum coromandelianum*

Carolina modiola *Modiola caroliniana*

Lozano false-abutilon *Pseudabutilon lozani*

Bracted sida *Sida ciliaris var. mexicana*

Spreading sida *Sida filicaulis*

Violet sida *Sida filipes*

Copper sida *Sida helleri*

Showy sida *Sida lindheimeri*

Southern sida *Sida paniculata*

Spearleaf sida	<i>Sida physocalyx (Rhynchosida physocalyx)</i>
Prickly sida	<i>Sida spinosa</i>
Large-flowered velvetmallow	<i>Wissadula holosericea</i>
White velvetleaf	<i>Wissadula periplocifolia</i>

**MARSILEACEAE**

Hooked pepperwort	<i>Marsilea uncinata</i>
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**NAJADACEAE**

Southern naiad	<i>Najas guadalupensis</i>
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**NYCTAGINACEAE**

Berlandier trumpets	<i>Acleisanthes obtusa</i>
Scarlet spiderling	<i>Boerhaavia coccinea</i>
Erect spiderling	<i>Boerhaavia erecta</i>

**NYMPHAEACEAE**

Señorita waterlily	<i>Nymphaea elegans</i>
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**OLEACEAE**

Texas swampprivet	<i>Forestiera angustifolia</i>
Mexican ash	<i>Fraxinus berlandieriana</i>
Low menodora	<i>Menodora heterophylla</i>

**ONAGRACEAE**

Wavyleaf beeblossom	<i>Gaura sinuata</i>
Wolly beeblossom	<i>Gaura villosa</i>
Large-flower primrose-willow	<i>Ludwigia grandiflora ssp. grandiflora (Jussiaea repens)</i>
Kunth sundrops	<i>Oenothera kunthiana</i>
Cutleaf evening primrose	<i>Oenothera laciniata</i>
Yellow sundrops	<i>Oenothera serrulata (Calylophus serrulatus)</i>
Pink evening primrose	<i>Oenothera speciosa</i>

**OROBANCHACEAE**

Louisiana broomrape *Orobanche ludoviciana*

**OXALIDACEAE**

Ponyleaf oxalis *Oxalis dichondraefolia*

Yellow woodsorrel *Oxalis dillenii*

Drummond's woodsorrel *Oxalis drummondii*

**PALMACEAE**

Date palm\* *Phoenix canariensis*

**PAPAVERACEAE**

Prickly poppy *Argemone aenea*

Spiny prickly poppy *Argemone sanguinea*

**PASSIFLORACEAE**

White passionflower *Passiflora foetida* var. *gossypifolia*

Corkystem passionflower *Passiflora suberosa*

**PHYTOLACCACEAE**

Snake eyes *Phaulothamnus spinescens*

Bloodberry *Rivina humilis*

**PLANTAGINACEAE**

Redseed plantain *Plantago rhodosperma*

**PLUMBAGINACEAE**

Sea lavender *Limonium nashii* (*carolinianum*)

White plumbago (Hierba de Alacrán) *Plumbago scandens*

**POACEAE (GRAMINEAE)**

Winter bentgrass *Agrostis hyemalis*

Six-weeks threeawn *Aristida adscensionis*

Roemer threeawn	<i>Aristida roemeriana</i>
King Ranch bluestem*†	<i>Bothriochloa Ischaemum var. songarica</i>
Longspike silver bluestem	<i>Bothriochloa saccharoides</i>
Red grama	<i>Bouteloua trifida</i>
Buffalograss	<i>Buchloe dactyloides</i>
Southern sandbur	<i>Cenchrus echinatus</i>
Coast sandbur	<i>Cenchrus incertus</i>
Slimspike windmill grass	<i>Chloris andropogonoides</i>
Buryseed chloris	<i>Chloris chloridea</i>
Fringed chloris	<i>Chloris ciliata</i>
Hooded windmill grass	<i>Chloris cucullata</i>
Rhodes grass*	<i>Chloris gayana</i>
Nash windmill grass	<i>Chloris latisquamea</i>
Bermuda grass*†	<i>Cynodon dactylon</i>
Durban crowfootgrass	<i>Dactyloctenium aegyptium</i>
Kleberg bluestem*†	<i>Dichanthium annulatum</i>
Silky bluestem*	<i>Dichanthium sericeum</i>
Tropical crabgrass	<i>Digitaria diversiflora</i>
Seashore saltgrass	<i>Distichlis spicata</i>
Junglerice	<i>Echinochloa colonum</i>
Coast cockspur	<i>Echinochloa colonum</i>
Mediterranean lovegrass	<i>Eragrostis barrelieri</i>
Common annual weed	<i>Eragrostis diffusa</i>
Red lovegrass	<i>Eragrostis oxylepis</i>
Hairy creeping lovegrass	<i>Eragrostis reptans</i>
Tumble lovegrass	<i>Eragrostis sessilispica</i>
Spike lovegrass	<i>Eragrostis spicata</i>
Prairie cupgrass	<i>Eriochloa contracta</i>
Louisiana cupgrass	<i>Eriochloa punctata</i>
Texas cupgrass	<i>Eriochloa sericea</i>
Tanglehead	<i>Heteropogon contortus</i>
Little barley	<i>Hordeum pusillum</i>
Clubhead cutgrass	<i>Leersia hexandra</i>

Dominican sprangletop	<i>Leptochloa domingensis</i>
Green sprangletop	<i>Leptochloa dubia</i>
Red sprangletop	<i>Leptochloa filiformis</i>
Nealley sprangletop	<i>Leptochloa nealleyi</i>
Mexican sprangletop	<i>Leptochloa uninervia</i>
Tropic sprangletop	<i>Leptochloa virgata</i>
Fall witchgrass	<i>Leptoloma cognatum</i>
Ozarkgrass	<i>Limnodea arkansana</i>
Shoregrass	<i>Monanthochloe littoralis</i>
Blue panicum*	<i>Panicum antidotale</i>
Southern witchgrass	<i>Panicum capillarioides</i>
Browntop millet	<i>Panicum fasciculatum</i>
Filly panicum	<i>Panicum filipes</i>
Guineagrass*	<i>Panicum maximum</i>
Vine-mesquite	<i>Panicum obtusum</i>
Sprawling panicum	<i>Panicum reptans</i>
Texas panicum	<i>Panicum texanum</i>
Whiplash pappus grass	<i>Pappophorum mucronulatum</i>
Egyptian Paspalum	<i>Paspalidium geminatum</i>
Brook paspalum	<i>Paspalum acuminatum</i>
Knotgrass	<i>Paspalum distichum</i>
Hartweg paspalum	<i>Paspalum hartwegianum</i>
Rustyseed paspalum	<i>Paspalum langei</i>
Longtom	<i>Paspalum lividum</i>
Fringed-leaf paspalum	<i>Paspalum setaceum var. ciliatifolium</i>
Seashore paspalum	<i>Paspalum vaginatum</i>
Buffelgrass*†	<i>Pennisetum ciliare (Cenchrus ciliaris)</i>
Plains bristlegrass	<i>Setaria macrostachya</i>
Texas bristlegrass	<i>Setaria texana</i>
Hooked bristlegrass	<i>Setaria verticillata</i>
Johnsongrass*†	<i>Sorghum halepense</i>
Marshay cordgrass	<i>Spartina patens var. juncea</i>
Gulf cordgrass	<i>Spartina spartinae</i>

Sand dropseed	<i>Sporobolus cryptandrus</i>
Whorled dropseed	<i>Sporobolus pyramidatus</i>
Padre Island dropseed	<i>Sporobolus tharpii</i>
Seashore dropseed	<i>Sporobolus virginicus</i>
Big sacaton	<i>Sporobolus wrightii</i>
Texas wintergrass	<i>Stipa leucotricha</i>
Fourflower trichloris	<i>Trichloris pluriflora</i>
White tridens	<i>Tridens albescens</i>
Texas tridens	<i>Tridens texanus</i>
Seaoats	<i>Uniola paniculata</i>
Texas willkommia	<i>Willkommia texana</i>

**POLEMONIACEAE**

Splitleaf gilia	<i>Giliastrum incisum (Gilia incisa)</i>
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**POLYGALACEAE**

White milkwort	<i>Polygala alba</i>
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**POLYGONACEAE**

Smartweed	<i>Polygonum punctatum</i>
Amamastla	<i>Rumex chrysocarpus</i>
Winged dock	<i>Rumex spiralis</i>

**PONTEDERIACEAE**

Liebmann mudplantain	<i>Heteranthera liebmanni</i>
Blue mudplantain	<i>Heteranthera limosa</i>
Mudplantain	<i>Heteranthera reniformis</i>

**PORTULACACEAE**

Shaggy portulaca	<i>Portulaca pilosa</i>
Winged portulaca	<i>Portulaca umbraticola</i>
Orange flameflower	<i>Talinum aurantiacum</i>
Panicled flameflower	<i>Talinum paniculatum</i>

**POTAMOGETONACEAE**

Shoalgrass	<i>Diplanthera wrightii</i>
Widgeongrass	<i>Ruppia maritima</i>
Horned pondweed	<i>Zannichellia palustris</i>

**PRIMULACEAE**

Scarlet pimpernel	<i>Anagallis arvensis</i>
Brookweed	<i>Samolus parviflorus</i>

**RANUNCULACEAE**

Drummond's clematis	<i>Clematis drummondii</i>
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**RHAMINACEAE**

Brasil	<i>Condalia hookeri</i> var. <i>hookeri</i>
Coyotillo	<i>Karwinskia humboldtiana</i>
Lotebush	<i>Ziziphus obtusifolia</i>

**RUBIACEAE**

Prairie bluets	<i>Hedyotis nigricans</i>
Nodding bluets	<i>Hedyotis subviscosa</i>
Crucillo	<i>Randia rhagocarpa</i>
Prairie Mexican clover	<i>Richardia tricocca</i> ( <i>Crusea tricocca</i> )
Slender buttonweed	<i>Spermacoce tenuior</i>

**RUTACEAE**

Mexican amyris	<i>Amyris medrensis</i>
Chapatillo	<i>Amyris texana</i>
Texas desertrue	<i>Thamnosma texana</i>
Colima	<i>Zanthoxylum fagara</i>

**SALICACEAE**

Black willow	<i>Salix nigra</i>
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**SALVINIACEAE**

Mosquito-fern *Azolla caroliniana*

**SAPINDACEAE**

Tropical heartseed *Cardiospermum corindum L.f. villosum*

**SAPOTACEAE**

Coma *Bumelia celastrina*

**SCROPHULARIACEAE**

Seaside gerardia *Agalinis maritima*  
Waterhyssop *Bacopa procumbens*  
Disk waterhyssop *Bacopa rotundifolia*  
Cenizo *Leucophyllum frutescens*  
Speedwell (neckweed) *Veronica peregrina var. xalapensis*

**SIMAROUBACEAE**

Allthorn *Castela texana*

**SOLANACEAE**

Chilipiquín (bird pepper) *Capsicum annuum var. glabriusculum (minus)*  
Hairy false-nightshade *Chamaesaracha sordida*  
Berlandier wolfberry *Lycium berlandieri*  
Carolina wolfberry *Lycium carolinianum*  
Netted globeberry *Margaranthus solanaceus*  
Tree tobacco\*† *Nicotiana glauca*  
Wild petunia *Petunia parviflora*  
Beach groundcherry *Physalis viscosa var. cinerascens*  
Silver-leaf nightshade *Solanum elaeagnifolium*  
American black nightshade *Solanum americanum (S. Nodiflorum)*  
Buffalobur nightshade *Solanum rostratum*  
Texas nightshade *Solanum triquetrum*

**STERCULIACEAE**

Dwarf ayenia *Ayenia pusilla* (*A. pilosa*, *A. insulicola*)

**TAMARICACEAE**

Athel (Saltecedar)\*† NP *Tamarix aphylla*

**TYPHACEAE**

Narrowleaf cattail *Typha domingensis*

**ULMACEAE**

Sugar hackberry *Celtis laevigata*

Granjeño (Spiny hackberry) *Celtis spinosa* var. *pallida*

Cedar elm *Celtis crassifolia*

**UMBELLIFERAE**

Plains sand-parsley *Ammoselinum popei*

Slimlobe celery *Apium leptophyllum*

Southwestern carrot *Daucus pusillus*

Hierba del sapo *Eryngium nasturtiifolium*

Prairie dogshade *Limnoscium pumilum*

**URTICACEAE**

Pellitory *Parietaria obtusa*

Heartleaf nettle *Urtica chamaedryoides* var. *runyonii*

**VERBENACEAE**

Whitebrush *Aloysia gratissima*

Berlandier's fiddlewood *Citharexylum berlandieri*

Dakota mock vervain *Glandularia bipinnatifida* var. *bipinnatifida*  
(*Verbena bipinnatifida*)

Davis Mountain mock vervain *Glandularia bipinnatifida* var. *ciliata* (*Verbena ciliata*)

Rio Grande mock vervain *Glandularia polyantha* (*Verbena ciliata* var.  
*longidentata*)

Largeleaf lantana *Lantana camara*

Texas lantana	<i>Lantana horrida</i>
Veinyleaf lantana	<i>Lantana macropoda</i>
White lippia	<i>Lippia alba</i>
Scented lippia	<i>Lippia graveolens</i>
Sawtooth frogfruit	<i>Phyla incisa</i>
Turkeytangle	<i>Phyla nodiflora</i>
Gray vervain	<i>Verbena canescens</i>
Texas vervain	<i>Verbena halei</i>
Fanleaf vervain	<i>Verbena plicata</i>
Fourangle vervain	<i>Verbena quadrangulata</i>
Rio Grande vervain	<i>Verbena runyonii</i>
Gulf vervain	<i>Verbena xutha</i>

**VIOLACEAE**

Nodviolet	<i>Hybanthus verticillatus var. platyphyllus</i>
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**VITACEAE**

Ivy treevine (Sorrelvine)	<i>Cissus incisa (trifoliata)</i>
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**ZYGOPHYLLACEAE**

Hairy caltrop	<i>Kallistroemia hirsutissima</i>
Guayacan	<i>Porlieria angustifolia</i>

\* - Introduced

† - Plants on the "Invaders of Texas" early detection program list: <http://Texasinvasives.org>

<sup>NP</sup> - Noxious plant as identified in the State Noxious Weeds List.

**References:**

Richardson, A. 1995. Plants of the Rio Grande Delta. Univ. of Texas Press, Austin, TX. 332pp.  
U.S. Department of Agriculture-NRCS, Plants Database at <http://plants.usda.gov/index.html>

## B. FEDERAL THREATENED AND ENDANGERED SPECIES – LAGUNA ATASCOSA NWR\*

Ocelot ( <i>Leopardus pardalis</i> )	E
Gulf Coast jaguarundi ( <i>Herpailurus yagouaroundi cacomitli</i> )	E
Northern aplomado falcon ( <i>Falco femoralis septentrionalis</i> )	E
Piping plover ( <i>Charadrius melodus</i> )	T
Kemp's ridley sea turtle ( <i>Lepidochelys kempi</i> )	E
Loggerhead sea turtle ( <i>Caretta caretta</i> )	T
Green sea turtle ( <i>Chelonia mydas</i> )	T
Hawksbill sea turtle ( <i>Eretmochelys imbricata</i> )	E

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### Index

E (Endangered) = Any species that is in danger of extinction throughout all or a significant portion of its range.

T (Threatened) = Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

\* List of federally-threatened and endangered species that regularly occur and depend on the habitats of the Refuge, either seasonally or permanently. Accidentals or hypothetical listed species are not included for the purposes of this CCP.

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## C. TEXAS THREATENED AND ENDANGERED SPECIES – LAGUNA ATASCOSA NWR\*

Ocelot ( <i>Leopardus pardalis</i> )	E
Jaguarundi ( <i>Herpailurus yagouaroundi</i> )	E
Coues' Rice Rat ( <i>Oryzomys couesi</i> )	T
Peregrine Falcon ( <i>Falco peregrinus</i> )	T
Northern aplomado falcon ( <i>Falco femoralis septentrionalis</i> )	E
Brown pelican ( <i>Pelecanus occidentalis</i> )	E
Piping plover ( <i>Charadrius melodus</i> )	T
Northern Beardless-Tyrannulet ( <i>Camptostoma imberbe</i> )	T
Reddish Egret ( <i>Egretta rufescens</i> )	T
Texas Botteri's Sparrow ( <i>Aimophila botterii texana</i> )	T
White-faced Ibis ( <i>Plegadis chihi</i> )	T
Wood Stork ( <i>Mycteria americana</i> )	T
Kemp's ridley sea turtle ( <i>Lepidochelys kempii</i> )	E
Loggerhead sea turtle ( <i>Caretta caretta</i> )	T
Green sea turtle ( <i>Chelonia mydas</i> )	T
Hawksbill sea turtle ( <i>Eretmochelys imbricata</i> )	E
Black-striped Snake ( <i>Coniophanes imperialis</i> )	T
Indigo Snake ( <i>Drymarchon corais</i> )	T
Texas Horned Lizard ( <i>Phrynosoma cornutum</i> )	T
Texas Tortoise ( <i>Gopherus berlandieri</i> )	T
Black-spotted Newt ( <i>Notophthalmus meridionalis</i> )	T
Sheep Frog ( <i>Hypopachus variolosus</i> )	T
South Texas Siren ( <i>Siren intermedia ssp.</i> )	T

\* List of State-threatened and endangered species that regularly occur and depend on the habitats of the Refuge, either seasonally or permanently. Accidentals or hypothetical listed species are not included for the purposes of this CCP. Source: Texas Parks and Wildlife Department, Wildlife Division, Diversity and Habitat Assessment Programs. County Lists of Texas' Special Species (Cameron and Willacy County; Revision Date: 7/16/2009). Current TPWD county lists for rare species may be obtained from the following link: <http://tpwd.state.tx.us/>

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## D. APPROPRIATE REFUGE USES AND COMPATIBILITY DETERMINATIONS

### *Appropriate Refuge Uses Policy*

The Appropriate Refuge Uses Policy (Service Manual 603 FW 1) clarifies and expands on the compatibility policy (Service Manual 603 FW 2.10D), which describes when refuge managers should deny a proposed use without determining compatibility. When a use is determined to be appropriate, the refuge manager must then determine if the use is compatible before it may be allowed on the refuge. With the exception of the six wildlife-dependent recreational uses (hunting, fishing, wildlife observation and photography, and environmental education and interpretation), and the take of fish and wildlife under State regulations, the refuge manager will decide if a new or existing use is an appropriate refuge use. If an existing use is not appropriate, the refuge manager will eliminate or modify the use as expeditiously as practicable. If a new use is not appropriate, the refuge manager will deny the use without determining compatibility.

### *Compatibility Determinations*

These draft compatibility determinations describe the wildlife-dependent and other uses that may be included in the public use program under the proposed alternative and determines the conditions under which each use is considered compatible with the purposes of the Refuge or with the mission of the National Wildlife Refuge System. Under the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, and the Refuge Recreation Act of 1962, the Service may not permit recreational uses on a national wildlife refuge unless these uses are first determined to be compatible, wildlife-dependent uses. The 1997 Improvement Act now requires that the needs of fish, wildlife, and plant resources on national wildlife refuges come first. A use is compatible if it is determined that the activity does not materially interfere with, or detract from, the fulfillment of the National Wildlife Refuge System mission or the purposes of the Refuge. Furthermore, compatible activities that depend on healthy fish and wildlife populations will be recognized as priority public uses. The 1997 Improvement Act established the priority public uses to be hunting, fishing, wildlife observation and photography, and environmental education and interpretation. The following uses were evaluated to determine their compatibility with the purposes of the Refuge and the Refuge System mission:

### **Compatibility Determinations for Laguna Atascosa NWR to be revised in the future:**

Issue	CD issuance date	CD review date
A. Thomae Jr. County Park Cooperative Mgmt. Agreement	1994	2011

**Compatibility Determinations for Laguna Atascosa NWR issued with this Plan:**

<b>Issue</b>	<b>CD issuance date</b>	<b>CD review date</b>
Beach-related Uses	2010	2020
Bicycling	2010	2020
Boating	2010	2020
Commercial Photography	2010	2020
Environmental Education	2010	2025
Hunting	2010	2025
Interpretation	2010	2025
Noncommercial Photography	2010	2025
Picnicking	2010	2020
Recreational Fishing	2010	2025
Scientific Research	2010	2020
Virtual Geocaching	2010	2020
Wildlife Disease Control	2010	2020
Wildlife Observation	2010	2025

COMPATIBILITY DETERMINATION

USE: Beach-related, Non-wildlife Dependent Recreational Uses

REFUGE NAME: Laguna Atascosa National Wildlife Refuge

ESTABLISHING and ACQUISITION AUTHORITY(IES):

Migratory Bird Conservation Act of 1929; Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948; and the Fish and Wildlife Act of 1956.

REFUGE PURPOSE(s): 1) *"...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds,"* Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d), as amended; 2) *"...for wildlife conservation purposes if the real property has particular value in carrying out the national migratory bird management program..."* Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948 (16 U.S.C. 667b-667d), Public Law 80-537, as amended; and 3) *"...for the development, advancement, management, conservation and protection of fish and wildlife resources..."*, Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4), as amended, and *"...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..."*, Fish and Wildlife Act of 1956 (16 U.S.C. 742(b)(1), as amended.

NATIONAL WILDLIFE REFUGE SYSTEM MISSION: To administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

DESCRIPTION OF USE: In the 1999 Laguna Atascosa NWR Refuge Expansion Plan, the U.S. Fish and Wildlife Service stated that it would support and cooperate with the Texas Open Beaches Act, which provides for public access on all Texas Gulf beaches. The law requires public access to Gulf beaches from the line of mean low water, inland to the vegetation line. This will ensure the continued enjoyment by the public of traditional beach recreational activities such as beach combing, swimming, fishing, overnight camping, horseback riding, and other legal public uses. These, non-wildlife dependent recreational activities will continue to be allowed on the "open beaches" of the South Padre Island Unit, as defined by the Texas Open Beaches Act, and as stated in the 1999 Refuge Expansion Plan. Sensitive wildlife habitat, such as the dunes and tidal flats located inland, are not open to these activities.

AVAILABILITY OF RESOURCES: The main Refuge costs to manage this use are for law enforcement and litter clean-up. Resources to manage this use are marginal at best, given the size of the Refuge and the number of users. Refuge law enforcement staff are shared between the three refuges in the South Texas Refuge Complex, which limits the amount of staff time that can be spent managing this use. Other law enforcement personnel from State, county, and local agencies may assist with oversight of this use. Although not optimum, funding and staffing are available to allow this use at current levels. Strategies in the Comprehensive Conservation Plan call for additional staffing, funding, signage, and partnerships, which should help to manage these uses.

ANTICIPATED IMPACTS OF THE USE: Past experience indicates that most of the impacts would involve some violation of Refuge regulations (e.g., disturbing wildlife, removing plants, trespass, free roaming pets, vandalism, and littering). Human activity may disturb migratory birds utilizing the Refuge's habitats for feeding or nesting. Endangered sea turtles, such as the Kemp's ridley, nest in the beach area where human recreational activity occurs, which is monitored by Refuge staff in partnership with nongovernmental organizations on foot and by All-Terrain Vehicles. Recreational activity on the beach can potentially lead to soil compaction, vegetation trampling, and the introduction of invasive plants. Litter discarded by visitors can entangle wildlife or be ingested, resulting in injury or death.



COMPATIBILITY DETERMINATION

USE: Bicycling

REFUGE NAME: Laguna Atascosa National Wildlife Refuge

ESTABLISHING and ACQUISITION AUTHORITY(IES):

Migratory Bird Conservation Act of 1929; Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948; and the Fish and Wildlife Act of 1956.

REFUGE PURPOSE(s): 1) "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds," Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d), as amended; 2) "...for wildlife conservation purposes if the real property has particular value in carrying out the national migratory bird management program..." Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948 (16 U.S.C. 667b-667d), Public Law 80-537, as amended; and 3) "...for the development, advancement, management, conservation and protection of fish and wildlife resources..." Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4), as amended, and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." Fish and Wildlife Act of 1956 (16 U.S.C. 742(b)(1), as amended.

NATIONAL WILDLIFE REFUGE SYSTEM MISSION: To administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

DESCRIPTION OF USE: To increase wildlife observation and photography opportunities, four back-country hiking and bicycling trails, with associated trailheads, have been designated along service roads. These trails range from 4 to 20 miles in length. Bicycling, as a means to enjoy nature and observe wildlife, continues to be popular each year, particularly on the more accessible, paved Bayside Wildlife Drive. The Refuge is proposing to create up to four additional trails on the Bahia Grande Unit that would originate near the main entrances along State Highway 48). In addition, the Refuge may implement a bicycle rental program in partnership with the Friends of Laguna Atascosa NWR, consistent with the concession process, to improve access to more remote wildlife viewing locations (e.g., Kidney Pond) not accessible by motorized vehicles.

AVAILABILITY OF RESOURCES: Bicycling is one of the main methods of travel on the Refuge by visitors, in addition to motorized vehicles and walking. Current staffing levels provide minimal staff oversight of bicycling opportunities and maintenance of roads and trails open to bicycling. To increase and enhance bicycling opportunities on the Refuge, additional staff is needed, as well as funding for the new proposed trails. The additional staffing needs are outlined in the CCP.

ANTICIPATED IMPACTS OF THE USE: Past experience indicates that most of the impacts will involve some violation of Refuge regulations (e.g., off-road bicycling, disturbing wildlife, trespass, vandalism, and littering). However, these impacts generally are minimal, as they are short-term and minor. These impacts are not anticipated to be permanent or long-lasting. The majority of the activities occur in areas where human activities are already occurring, and wildlife has become habituated to the presence of humans.

Human activity may disturb migratory birds utilizing the Refuge's habitats for feeding or nesting. Off-trail human activity can potentially lead to soil compaction, vegetation trampling, and the introduction of invasive plants. Litter discarded by visitors can entangle wildlife or be ingested, resulting in injury or death.

PUBLIC REVIEW and COMMENT: Public comments on this draft determination will be received as part of the Comprehensive Conservation Plan for Laguna Atascosa NWR.

**Appendix D: Appropriate Refuge Uses and Compatibility Determinations**

DETERMINATION (check one below)

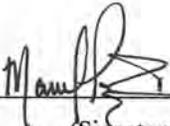
USE IS NOT COMPATIBLE

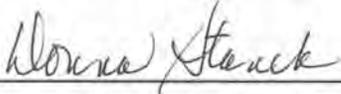
USE IS COMPATIBLE WITH THE FOLLOWING STIPULATIONS

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

1. Bicycling access would be limited to daylight hours only.
2. Bicycling would be conducted only on specially-designated trails and roads.
3. Organized bicycling groups (10 or more bicyclists) would be required to request a special use permit.
4. Bicycling would only be allowed as a means to facilitate other wildlife-dependent recreational uses (e.g., hunting, wildlife observation).

JUSTIFICATION: This use would facilitate priority wildlife-dependent uses (e.g., hunting, wildlife observation). With these stipulations in place, bicycling is not likely to materially interfere with or detract from the purposes of the Refuge.

SIGNATURE: Refuge Manager  8-13-2010  
(Signature and Date)

CONCURRENCE: Regional Chief  8/18/2010  
Acting (Signature and Date)

Mandatory 10- or 15-year  
Re-evaluation Date: August 2020

COMPATIBILITY DETERMINATION

USE: Boating

REFUGE NAME: Laguna Atascosa National Wildlife Refuge

ESTABLISHING and ACQUISITION AUTHORITY(IES): Migratory Bird Conservation Act of 1929; Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948; and the Fish and Wildlife Act of 1956.

REFUGE PURPOSE(s): 1) "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds," Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d), as amended; 2) "...for wildlife conservation purposes if the real property has particular value in carrying out the national migratory bird management program..." Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948 (16 U.S.C. 667b-667d), Public Law 80-537, as amended; and 3) "...for the development, advancement, management, conservation and protection of fish and wildlife resources..." Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4), as amended, and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." Fish and Wildlife Act of 1956 (16 U.S.C. 742(b)(1), as amended.

NATIONAL WILDLIFE REFUGE SYSTEM MISSION: To administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

DESCRIPTION OF USE: Currently, boating is allowed on State-navigable waters (e.g., Harlingen Ship Channel, San Martín Lake) within the Refuge. Adolph Thomae Jr. County Park, which is part of the Refuge, provides an important public boating access point to the lower Laguna Madre, as the nearest public boat ramps are located 25 miles to the south, and 20 miles to the north of the Park. Currently, about 70 percent of the park's annual visitation (91,000 to 105,000 people) come to fish, many using boats. The Comprehensive Conservation Plan proposes to allow non-motorized watercraft (e.g., canoe and kayak) and develop canoe and kayak launch sites in the Bahia Grande and Laguna Atascosa Units to enhance and expand wildlife-dependent activities (e.g., fishing, hunting, wildlife observation, and photography). In addition, designated access routes for motorized vehicles at traditional access locations (e.g., washovers) from the public beach side on South Padre Island to designated sites along the shore of the Laguna Madre are proposed to allow boating access to the bay.

AVAILABILITY OF RESOURCES: The main Refuge costs to manage existing and proposed boating uses are law enforcement, signage, and facility maintenance. Resources to manage this use are marginal at best, given the size of the Refuge and the number of users. Refuge law enforcement staff are shared between the three refuges in the South Texas Refuge Complex, which limits the amount of staff time that can be spent managing this use. Texas Parks and Wildlife Department law enforcement personnel would assist with enforcing boating regulations. Although not optimum, funding and staffing are available to allow this use at current and proposed levels. Strategies in the Comprehensive Conservation Plan call for additional staffing, funding, signage, facilities, and partnerships, which would help to manage this use.

ANTICIPATED IMPACTS OF THE USE: Non-motorized boating would cause minimal temporary disturbance to waterbirds, waterfowl, and other wildlife using the open water and nesting areas. Canoe and kayak access sites have the potential to impact vegetation as boaters trample vegetation in order to access the waters. Boating may have impacts to seagrasses. Use of motorized vehicles to access beach and bay fishing sites would disturb wildlife and impact habitat.

PUBLIC REVIEW and COMMENT: Public comments on this draft determination will be received as part of the Comprehensive Conservation Plan for Laguna Atascosa NWR.



COMPATIBILITY DETERMINATION

USE: Commercial Photography

REFUGE NAME: Laguna Atascosa National Wildlife Refuge

ESTABLISHING and ACQUISITION AUTHORITY(IES): Migratory Bird Conservation Act of 1929; Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948; and the Fish and Wildlife Act of 1956.

REFUGE PURPOSE(s): 1) "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds," Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d), as amended; 2) "...for wildlife conservation purposes if the real property has particular value in carrying out the national migratory bird management program..." Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948 (16 U.S.C. 667b-667d), Public Law 80-537, as amended; and 3) "...for the development, advancement, management, conservation and protection of fish and wildlife resources..." Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4), as amended, and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." Fish and Wildlife Act of 1956 (16 U.S.C. 742(b)(1), as amended.

NATIONAL WILDLIFE REFUGE SYSTEM MISSION: To administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

DESCRIPTION OF USE: Commercial photography and/or filming are activities that are conducted for an economic purpose. The commercial photographer or videographer captures the scenery, species, people, facilities, or other attraction for the sole, primary, or secondary purpose of deriving income. Commercial photography and filming with use of cameras, video, and film-making equipment are allowed on the Refuge by Special Use Permit only in accordance with Departmental and Service policy. The time, location, and methods will be stipulated within the Special Use Permit. The purpose of commercial photography and filming is to build support and appreciation for the National Wildlife Refuge System.

AVAILABILITY OF RESOURCES: Current staffing levels provide minimal staff oversight of the Special Use Permit process and monitoring of commercial photography activities. To accommodate increased commercial photography requests on the Refuge, additional staff and funding are needed. The additional staffing and funding needs are outlined in the CCP.

ANTICIPATED IMPACTS OF THE USE: Short-term impacts and disturbances may be anticipated to occur on Service lands and waters or to other Refuge activities. These impacts will be minimized through the Special Use Permit. Beneficial impacts are expected to result from the dissemination of photographs and/or filming on Refuge to the public and may support local economic activity. The public will have an opportunity to increase their awareness and understanding about the natural resources of south Texas. In addition, there is an opportunity for the public to increase their understanding about the U.S. Fish and Wildlife Service and purposes for which the Refuge was established in south Texas.

PUBLIC REVIEW and COMMENT: Public comments on this draft determination will be received as part of the Comprehensive Conservation Plan for Laguna Atascosa NWR.

DETERMINATION (check one below)

USE IS NOT COMPATIBLE



COMPATIBILITY DETERMINATION

USE: Environmental Education (EE)

REFUGE NAME: Laguna Atascosa National Wildlife Refuge

ESTABLISHING and ACQUISITION AUTHORITY(IES):

Migratory Bird Conservation Act of 1929; Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948; and the Fish and Wildlife Act of 1956.

REFUGE PURPOSE(s): 1) *"...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds,"* Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d), as amended; 2) *"...for wildlife conservation purposes if the real property has particular value in carrying out the national migratory bird management program..."* Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948 (16 U.S.C. 667b-667d), Public Law 80-537, as amended; and 3) *"...for the development, advancement, management, conservation and protection of fish and wildlife resources..."*, Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4), as amended, and *"...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..."*, Fish and Wildlife Act of 1956 (16 U.S.C. 742(b)(1), as amended.

NATIONAL WILDLIFE REFUGE SYSTEM MISSION: To administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

DESCRIPTION OF USE: The Refuge supports year-round environmental education for educators and organized groups with materials, equipment, location, facilities, training, and staff. The Refuge also develops curriculum to meet national or State educational standards for pre-K through 12<sup>th</sup> grade. The Refuge serves as an information resource and outdoor classroom for post-secondary schools. The purpose of the Refuge EE program is to lead to a greater understanding and appreciation for the fish, wildlife, plants, and their habitats within coastal south Texas. The Refuge will construct an outdoor classroom with restrooms and parking facilities.

AVAILABILITY OF RESOURCES: Direct costs to administer the current environmental education program are in the form of staff time. Additional funding would be required to prepare and implement a Visitor Services Plan. Major expenses would involve construction of an outdoor environmental education classroom and other EE support facilities.

To implement and administer the proposed environmental education program described, the following staffing, materials and/or facilities would be required.

Adequate staff positions and financial resources are currently available and committed to manage the continuation of existing opportunities for environmental education. The current Refuge budget is not adequate to fund the additional environmental education program proposed in the Comprehensive Conservation Plan. Projects would need to be broken into phases while funding sources are identified. Potential sources for additional funding include Federal cost share grants, State environmental education grants, private funding sources, and contributions from the Refuge's Friends group.

ANTICIPATED IMPACTS OF THE USE: Potential impacts associated with the continued and expanded implementation of environmental education program would result in some temporary, localized disturbance to wildlife and habitat. Future increases in facilities and participants would cause some displacement of habitat and increase in disturbance, but this is negligible given the controlled nature of environmental education and the size of the Refuge. These types of impacts would be minimized through appropriate program design, adequate Refuge oversight, supervision of educational activities, and ongoing coordination among partners.

**Appendix D: Appropriate Refuge Uses and Compatibility Determinations**

**PUBLIC REVIEW and COMMENT:** Public comments on this draft determination will be received as part of the Comprehensive Conservation Plan for Laguna Atascosa NWR.

**DETERMINATION** (check one below)

**USE IS NOT COMPATIBLE**

**USE IS COMPATIBLE WITH THE FOLLOWING STIPULATIONS**

**STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:**

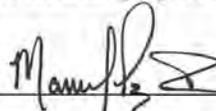
1. Refuge staff will coordinate with educators on daily class size limits, available staff and volunteer resources, and appropriate locations on the Refuge for the requested program.
2. Planning and construction of new facilities and infrastructure are coordinated by Refuge staff.

**JUSTIFICATION:** A primary goal of the Refuge System is connecting people with nature and environmental education are among the priority wildlife-dependent uses on refuges. Most environmental education will occur at, or be directed to, existing and future facilities in strategic locations, providing quality opportunities while limiting wildlife and habitat disturbance. Disturbance is typically short-term and should only temporarily displace wildlife. Adequate habitat is usually available for wildlife nearby. The approval process for groups will limit disturbance to wildlife and ensure avoidance of sensitive areas.

As one of the priority wildlife-dependent public uses of the National Wildlife Refuge System, this use is to be encouraged when compatible with the purpose of the Refuge. The Refuge provides excellent environmental education opportunities due to the diversity of wildlife and habitat on the Refuge and the range of environmental issues faced. With these stipulations in place, environmental education is not likely to materially interfere with or detract from the purposes of the Refuge.

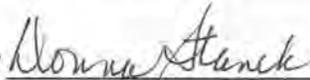
**SIGNATURE:**

Refuge Manager

 8-13-2010  
(Signature and Date)

**CONCURRENCE:**

Regional Chief  
**Acting**

 8/18/2010  
(Signature and Date)

Mandatory 10- or 15-year  
Re-evaluation Date:

August 2025

COMPATIBILITY DETERMINATION

USE: Hunting

REFUGE NAME: Laguna Atascosa National Wildlife Refuge

ESTABLISHING and ACQUISITION AUTHORITY(IES):

Migratory Bird Conservation Act of 1929; Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948; and the Fish and Wildlife Act of 1956.

REFUGE PURPOSE(s): 1) "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds," Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d), as amended; 2) "...for wildlife conservation purposes if the real property has particular value in carrying out the national migratory bird management program..." , Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948 (16 U.S.C. 667b-667d), Public Law 80-537, as amended; and 3) "...for the development, advancement, management, conservation and protection of fish and wildlife resources..." , Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4), as amended, and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." , Fish and Wildlife Act of 1956 (16 U.S.C. 742(b)(1), as amended.

NATIONAL WILDLIFE REFUGE SYSTEM MISSION: To administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

DESCRIPTION OF USE:

The Refuge allows big game hunting of white-tailed deer, nilgai antelope, and feral hogs on the Laguna Atascosa Unit only to provide a quality recreational and educational experience for a diverse audience and to manage and control exotic wildlife. The Refuge population of white-tailed deer is healthy and stable, and good deer habitat is abundant, primarily on the Laguna Atascosa Unit. Hunts are by Refuge permit only and are conducted during specific periods within the State's hunting season (usually Fall and Spring), which varies year to year. Special hunts (e.g., youth, disabled) and exotic-only hunts (e.g., feral hog and nilgai antelope) may be held at any time during the year at the discretion of the Refuge. Approximately 20,000 acres of the Laguna Atascosa Unit are currently open to hunting.

AVAILABILITY OF RESOURCES: Funding for the hunt program is supported by annual operating and Recreational Fee Program funds. Funds are used to cover administrative costs such as staff salaries, law enforcement coverage, hunt monitoring, and maintenance of access roads, hunt facilities, and signs. Material costs include permit printing, portable restroom rental, and check station operational costs.

ANTICIPATED IMPACTS OF THE USE: Hunting opportunities would result in an average deer harvest of 95 individuals annually, based on reported harvest data during the last five years. This level of harvest continues to maintain white-tailed deer populations at sustainable levels on the Refuge. Hunting is also conducted to reduce exotic wildlife. Based on five-year harvest data, an average harvest of 28 feral hogs and 10 nilgai antelope are taken annually. Refuge operations and public uses such as wildlife observation and photography are restricted to minimize conflicts on those Refuge management units open to hunting during the regular hunt periods (i.e., December and January).

Anticipated levels and duration of hunting disturbance are considered minimal and are well within the tolerance level of wildlife species and populations present on the Refuge. All hunting activities would be conducted within the constraints of sound biological principles and Refuge-specific hunting regulations (e.g., to regulate harvest and to ensure hunter safety). Monitoring activities through wildlife inventories and assessments of public use levels and activities would be used, and public use programs

would be adjusted as needed to limit disturbance. An effective law enforcement program and site-specific Refuge regulations that are reviewed annually should minimize most unauthorized activity and incidental take issues.

With respect to federally-listed species such as the ocelot and jaguarundi, radio-telemetry monitoring of collared ocelots indicates that these public hunts do not adversely affect radio-collared ocelots. Hunters avoid entering the dense brush areas where these cats occur but do hunt adjacent to these areas. Aplomado falcons have been established on the Refuge and are frequently seen in the more open grassland areas. Radio-telemetry monitoring of released Aplomado falcons indicates that these public hunts do not adversely affect the Aplomado falcons that have been fitted with radio transmitters.

**PUBLIC REVIEW and COMMENT:** Public comments on this draft determination will be received as part of the Comprehensive Conservation Plan for Laguna Atascosa NWR.

**DETERMINATION** (check one below)

USE IS NOT COMPATIBLE

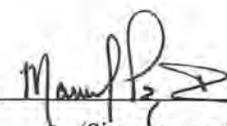
USE IS COMPATIBLE WITH THE FOLLOWING STIPULATIONS

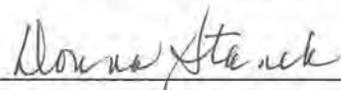
**STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:**

1. All hunts would be by Refuge permit only.
2. Hunting rules and regulations would be enforced by U.S. Fish and Wildlife Service refuge officers and Texas Parks and Wildlife Department law enforcement officers. State hunting regulations apply (but may be more restrictive in the Refuge permit).
3. Hunting would be conducted only in specially-designated areas and during specific time periods to reduce conflicts with other wildlife-dependent recreational uses (e.g., wildlife observation, photography) and Refuge operations.
4. Hunters may only use firearms and bows and arrows to engage in permitted hunting activities and not for any unauthorized activities (e.g., zeroing, test firing, target practice).

**JUSTIFICATION:** The Refuge hunting program provides affordable and accessible public hunting opportunities that are very limited in south Texas. Hunting is an important wildlife management tool to control populations of some species that might otherwise exceed the carrying capacity of their habitat and threaten the well-being of other wildlife species, and in some instances, that of human health and safety. Exotics negatively affect native wildlife through competition for limited resources, predation, and damage to habitat.

With these stipulations in place, hunting is not likely to materially interfere with or detract from the purposes of the Refuge.

SIGNATURE: Refuge Manager  8-13-2010  
(Signature and Date)

CONCURRENCE: Regional Chief  8/19/2010  
Acting (Signature and Date)

Mandatory 10- or 15-year  
Re-evaluation Date:

August 2025



COMPATIBILITY DETERMINATION

USE: Interpretation

REFUGE NAME: Laguna Atascosa National Wildlife Refuge

ESTABLISHING and ACQUISITION AUTHORITY(IES):

Migratory Bird Conservation Act of 1929; Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948; and the Fish and Wildlife Act of 1956.

REFUGE PURPOSE(S): 1) "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds," Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d), as amended; 2) "...for wildlife conservation purposes if the real property has particular value in carrying out the national migratory bird management program..." Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948 (16 U.S.C. 667b-667d), Public Law 80-537, as amended; and 3) "...for the development, advancement, management, conservation and protection of fish and wildlife resources..." Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4), as amended, and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." Fish and Wildlife Act of 1956 (16 U.S.C. 742(b)(1), as amended.

NATIONAL WILDLIFE REFUGE SYSTEM MISSION: To administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

DESCRIPTION OF USE: The Refuge supports year-round interpretation for tourists, local residents, seasonal residents, private landowners, and organized groups (e.g., school groups, church groups, Rotary Club) on the Refuge. The Refuge staff, partners, and volunteers provide interpretation through signs, guided and self-guided tours, virtual geocaching, auto-tour routes, displays, trails, maps, brochures, websites, presentations, and audio/visual programs. The Refuge will create similar interpretive programs in the Bahia Grande and South Padre Island units. The Refuge will construct a new visitor center at a new site. The purpose of the Refuge interpretation program is to lead to a greater understanding and appreciation for fish, wildlife, plants, and their habitats within coastal south Texas. The Refuge interpretation program will also build support for the National Wildlife Refuge System.

AVAILABILITY OF RESOURCES: Direct costs to administer the interpretation program are in the form of staff time and operating funds. Major expenses would involve construction of a new visitor center, including land acquisition; construction of new restroom facilities; construction of new trailhead parking lot; construction of new interpretive signs; and replacement of existing interpretive signs.

Adequate staff positions and financial resources are currently available and committed to manage the continuation of existing opportunities for interpretation. The current Refuge budget is not adequate to fund the additional interpretive programs proposed in the Comprehensive Conservation Plan. Projects would need to be broken into phases while funding sources are identified. Potential sources for additional funding include Federal cost share grants, State grants, private funding sources, and contributions from the Refuge's Friends group.

ANTICIPATED IMPACTS OF THE USE: Potential impacts associated with the continued and expanded implementation of interpretation programs would result in some temporary, localized disturbance to wildlife. Future increases in facilities and participants would cause some displacement of habitat and increase in disturbance but this is negligible given the controlled nature of interpretation program and the size of the Refuge. These types of impacts would be minimized through appropriate program design, adequate Refuge oversight, supervision of interpretative activities, and ongoing coordination among partners.

**Appendix D: Appropriate Refuge Uses and Compatibility Determinations**

**PUBLIC REVIEW and COMMENT:** Public comments on this draft determination will be received as part of the Comprehensive Conservation Plan for Laguna Atascosa NWR.

**DETERMINATION** (check one below)

**USE IS NOT COMPATIBLE**

**USE IS COMPATIBLE WITH THE FOLLOWING STIPULATIONS**

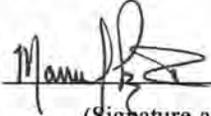
**STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:**

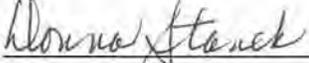
1. Guided (e.g. tram/van/kayak tours, nature walks) and signage for self-guided interpretation tours will be coordinated by Refuge staff, volunteers, and partners.
2. Planning and construction of new facilities and infrastructure will be coordinated by Refuge staff.

**JUSTIFICATION:** A primary goal of the Refuge System is connecting people with nature through interpretation which is among the priority wildlife-dependent uses on refuges. In addition, many of the interpretive facilities, programs, signs, brochures, exhibits, and kiosks are 10–20 years old and need to be updated, especially on the newly acquired tracts (e.g., Bahia Grande).

Most interpretation programs will occur at, or be directed to, existing and future facilities in strategic locations, providing quality opportunities while limiting wildlife and habitat disturbance. Disturbance is typically short-term and should only temporarily displace wildlife. Adequate habitat is usually available for wildlife nearby. The approval process for groups will limit disturbance to wildlife and ensure avoidance of sensitive areas.

As one of the priority wildlife-dependent public uses of the National Wildlife Refuge System, this use is to be encouraged when compatible with the purpose of the Refuge. The Refuge provides excellent interpretation opportunities due to the diversity of wildlife and habitat on the Refuge and the range of environmental issues faced. With these stipulations in place, interpretation is not likely to materially interfere with or detract from the purposes of the Refuge.

**SIGNATURE:** Refuge Manager  8-13-2010  
(Signature and Date)

**CONCURRENCE:** Regional Chief  8/18/2010  
Acting (Signature and Date)

Mandatory 10- or 15-year  
Re-evaluation Date: August 2025

COMPATIBILITY DETERMINATION

USE: Non-commercial Photography

REFUGE NAME: Laguna Atascosa National Wildlife Refuge

ESTABLISHING and ACQUISITION AUTHORITY(IES): Migratory Bird Conservation Act of 1929; Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948; and the Fish and Wildlife Act of 1956.

REFUGE PURPOSE(s): 1) "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds," Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d), as amended; 2) "...for wildlife conservation purposes if the real property has particular value in carrying out the national migratory bird management program..." Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948 (16 U.S.C. 667b-667d), Public Law 80-537, as amended; and 3) "...for the development, advancement, management, conservation and protection of fish and wildlife resources..." Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4), as amended, and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." Fish and Wildlife Act of 1956 (16 U.S.C. 742(b)(1), as amended.

NATIONAL WILDLIFE REFUGE SYSTEM MISSION: To administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

DESCRIPTION OF USE: Non-commercial photography and filming with use of cameras and video equipment are one of six priority public uses for consideration on our national wildlife refuges. In particular, non-commercial photography and filming are allowed year-round on public use facilities and public use areas during daylight hours only. The type of photography described here is solely that conducted by an individual who is not in the business of taking and/or selling photos but merely wishes to capture scenery, wildlife, and refuge features, signs, buildings, wetlands, etc., for purposes of documenting their visit to the refuge. The Refuge will construct additional photo blinds, boardwalks, and observation platforms to enhance wildlife photography opportunities. The purpose of non-commercial photography and filming is to gain a greater appreciation and understanding for the natural diversity of south Texas, particularly the fish, wildlife and habitat, and the conservation of those species. Additionally, non-commercial photography and filming builds support and appreciation for the National Wildlife Refuge System.

AVAILABILITY OF RESOURCES: Current staffing levels provide minimal staff oversight of the program and maintenance of the necessary visitor services facilities. To increase and enhance non-commercial photography opportunities on the Refuge, additional staff and funding are needed. The additional staffing and funding needs are outlined in the CCP.

ANTICIPATED IMPACTS OF THE USE: This is an existing use on the Refuge. Based on past experience, we believe that the impacts to resources will be minimal, as they are short-term and minor. These impacts are not anticipated to be permanent or long-lasting. The majority of the activities occur in areas where human activities are already occurring, and wildlife has become habituated to the presence of humans. Beneficial impacts, on the other hand, are expected to result from the dissemination of photographs and/or filming on Refuge to the public. The public will have an opportunity to increase their awareness and understanding about the natural resources of south Texas. In addition, there is an opportunity for the public to increase their understanding about the U.S. Fish and Wildlife Service and purposes for which the Refuge was established in south Texas.

**Appendix D: Appropriate Refuge Uses and Compatibility Determinations**

**PUBLIC REVIEW and COMMENT:** Public comments on this draft determination will be received as part of the Comprehensive Conservation Plan for Laguna Atascosa NWR.

**DETERMINATION** (check one below)

**USE IS NOT COMPATIBLE**

**USE IS COMPATIBLE WITH THE FOLLOWING STIPULATIONS**

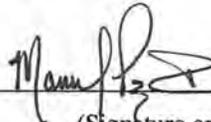
**STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:**

1. No staging of wildlife or habitat.
2. No construction of blinds (portable or pre-constructed blinds allowed only).
3. Photographers will be restricted to designated public use facilities or public use areas.
4. Filming and/or photography will be for non-commercial uses only.

**JUSTIFICATION:** Refuge visitors come to observe and photograph flora, fauna, and landscapes on the Refuge. Wildlife photography is one of the priority public uses of the Refuge System and is to be encouraged when possible. With these stipulations in place, wildlife photography, videography, or film-making is not likely to materially interfere with or detract from the purposes of the Refuge.

**SIGNATURE:**

Refuge Manager

 8-13-2010  
(Signature and Date)

**CONCURRENCE:**

Regional Chief  
Acting

 8/18/2010  
(Signature and Date)

Mandatory 10- or 15-year  
Re-evaluation Date:

August 2025

COMPATIBILITY DETERMINATION

USE: Picnicking

REFUGE NAME: Laguna Atascosa National Wildlife Refuge

ESTABLISHING and ACQUISITION AUTHORITY(IES):

Migratory Bird Conservation Act of 1929; Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948; and the Fish and Wildlife Act of 1956.

REFUGE PURPOSE(S): 1) "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds," Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d), as amended; 2) "...for wildlife conservation purposes if the real property has particular value in carrying out the national migratory bird management program..." Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948 (16 U.S.C. 667b-667d), Public Law 80-537, as amended; and 3) "...for the development, advancement, management, conservation and protection of fish and wildlife resources..." Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4), as amended, and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." Fish and Wildlife Act of 1956 (16 U.S.C. 742(b)(1), as amended.

NATIONAL WILDLIFE REFUGE SYSTEM MISSION: To administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

DESCRIPTION OF USE: Picnicking occurs on the Refuge at a small picnic site located near the Visitor Center. Picnic tables and trash collection facilities are provided.

AVAILABILITY OF RESOURCES: Staff and funding are available for conducting management and maintenance activities related to picnicking at its current level.

ANTICIPATED IMPACTS OF THE USE: Picnicking has the potential to cause temporary disturbance to wildlife using the area where picnicking would occur by concentrating people at a site. Litter is typically a concern associated with picnicking, as discarded beverage containers, bags, and food remains are often left behind.

PUBLIC REVIEW and COMMENT: Public comments on this draft determination will be received as part of the Comprehensive Conservation Plan for Laguna Atascosa NWR.

DETERMINATION (check one below)

USE IS NOT COMPATIBLE

USE IS COMPATIBLE WITH THE FOLLOWING STIPULATIONS

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

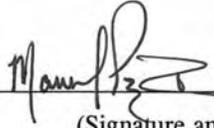
1. Picnicking would be limited to daylight hours only.
2. Picnicking would be allowed only on specially-designated areas.

JUSTIFICATION: Refuge visitors spend multiple hours on-site participating in priority wildlife-dependent uses. A designated picnic area facilitates their ability to stay many hours by providing an area to rest and eat while enjoying their natural surroundings.

Appendix D: Appropriate Refuge Uses and Compatibility Determinations

SIGNATURE:

Refuge Manager

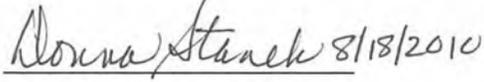


8-13-2010

(Signature and Date)

CONCURRENCE:

Regional Chief



8/18/2010  
(Signature and Date)

Mandatory 10- or 15-year  
Re-evaluation Date:

August 2020

COMPATIBILITY DETERMINATION

USE: Recreational Fishing

REFUGE NAME: Laguna Atascosa National Wildlife Refuge

ESTABLISHING and ACQUISITION AUTHORITY(IES):

Migratory Bird Conservation Act of 1929; Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948; and the Fish and Wildlife Act of 1956.

REFUGE PURPOSE(S): 1) *"...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds,"* Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d), as amended; 2) *"...for wildlife conservation purposes if the real property has particular value in carrying out the national migratory bird management program..."* Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948 (16 U.S.C. 667b-667d), Public Law 80-537, as amended; and 3) *"...for the development, advancement, management, conservation and protection of fish and wildlife resources..."*, Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4), as amended, and *"...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..."*, Fish and Wildlife Act of 1956 (16 U.S.C. 742(b)(1), as amended.

NATIONAL WILDLIFE REFUGE SYSTEM MISSION: To administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

DESCRIPTION OF USE: Fishing opportunities on the Refuge are currently available at Adolph Thomae Jr. County Park (Laguna Atascosa Unit), along the Gulf beaches (South Padre Island Unit), and at San Martín Lake (Bahia Grande Unit). Boating and fishing is available along the Harlingen Ship Channel at Adolph Thomae Jr. County Park and at San Martín Lake, which are both situated within the Refuge boundary. About 70 percent of the park's visitation is for saltwater fishing access to the Laguna Madre. The park includes facilities such as fishing piers, picnic sites, overnight camping sites, restrooms, a boat ramp, and parking areas. A public boat ramp is also located along State Highway (SH) 48, which provides access to the Brownsville Ship Channel and San Martín Lake. Fishing also occurs on the South Padre Island Unit, where anglers either fish on the beach and bay fronts, or on the rock jetties at the Mansfield Channel. Freshwater fishing on the Laguna Atascosa Unit is not allowed due to high contaminant levels in the fishery resource. The rest of the Refuge is not currently open to fishing.

The Refuge will continue to enhance fishing access and opportunities for a safe, quality fishing experience for diverse audiences and to expand fishing opportunities over current levels,. This includes the development of a fishing plan.

In addition, the Refuge is proposing new fishing opportunities as follows: 1) seasonal wade-fishing access to the Laguna Madre from the Bayside Wildlife Drive in Management Unit 7, including any additional infrastructure (e.g., parking areas and access points); and 2) bank-fishing, wade-fishing and non-motorized watercraft (e.g., canoe and kayak) on the Bahia Grande off SH 48, including the addition of parking areas and a fishing and boat access pier.

AVAILABILITY OF RESOURCES: The main Refuge costs to manage existing and proposed uses are for law enforcement, litter clean-up, signage, and facility maintenance. Resources to manage this use are marginal at best, given the size of the Refuge and the number of users. Refuge law enforcement staff are shared between the three refuges in the South Texas Refuge Complex, which limits the amount of staff time that can be spent managing this use. Texas Parks and Wildlife Department law enforcement personnel would assist with enforcing fishing regulations. County personnel would assist with litter clean-up at Bahia Grande and South Padre Island Unit fishing access sites. Although not

optimum, funding and staffing are available to allow this use at current and proposed levels. Strategies in the Comprehensive Conservation Plan call for additional staffing, funding, signage, facilities, and partnerships, which would help to manage this use.

**ANTICIPATED IMPACTS OF THE USE:** Recreational fishing has the potential to cause temporary disturbance to waterbirds, waterfowl, and other wildlife using the open water and shorelines where fishing would occur. Bank-fishing has the potential to affect vegetation, as anglers trample vegetation to access or fish along the shoreline. Litter is typically a concern associated with bank-fishing, as discarded fishing line, bait containers, etc., are often found in fishing areas. Wade-fishing may affect seagrasses. Use of motorized vehicles to access beach and bay fishing sites would disturb wildlife and affect habitat. However, these impacts generally are minimal, as they are short-term and minor. These impacts are not anticipated to be permanent or long-lasting. The majority of the activities occur in areas where human activities are already occurring, and wildlife has become habituated to the presence of humans.

**PUBLIC REVIEW and COMMENT:** Public comments on this draft determination will be received as part of the Comprehensive Conservation Plan for Laguna Atascosa NWR.

**DETERMINATION** (check one below)

USE IS NOT COMPATIBLE

USE IS COMPATIBLE WITH THE FOLLOWING STIPULATIONS

**STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:**

1. Wade-fishing would be conducted only in specially-designated areas and during specific time periods to reduce conflicts with other wildlife-dependent recreational uses (e.g., wildlife observation, photography) and Refuge operations.
2. Fishing access to the Bahia Grande and San Martín Lake would be limited to designated sites along SH 48.
3. Fishing access would be limited to daylight hours only.
4. Fishing access to the bay side of the South Padre Island Unit would be along designated access routes for motorized vehicles at traditional access locations (e.g., washovers) from the public beach.
5. Unimproved parking areas on the bay side of the South Padre Island Unit would be used by anglers.

**JUSTIFICATION:** Fishing is an important wildlife-dependent use enjoyed by many local residents on the Refuge. Fishing is an appropriate use of the Refuge System; however, the Refuge manager must still determine if and where fishing is compatible on the Refuge. It is also considered a priority general public use of the Refuge System and will receive enhanced consideration over non-priority uses. Fishing programs can promote understanding and appreciation of natural resources and their management on lands and waters in the Refuge System. With these stipulations in place, recreational fishing is not likely to materially interfere with or detract from the purposes of the Refuge.

SIGNATURE:

Refuge Manager

 8-13-2010  
(Signature and Date)

CONCURRENCE: Regional Chief Norma Stenek 8/18/2010  
Acting  
(Signature and Date)

Mandatory 10- or 15-year  
Re-evaluation Date: August 2025



COMPATIBILITY DETERMINATION

USE: Scientific Research

REFUGE NAME: Laguna Atascosa National Wildlife Refuge

ESTABLISHING and ACQUISITION AUTHORITY(IES):

Migratory Bird Conservation Act of 1929; Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948; and the Fish and Wildlife Act of 1956.

REFUGE PURPOSE(s): 1) "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds," Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d), as amended; 2) "...for wildlife conservation purposes if the real property has particular value in carrying out the national migratory bird management program..." Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948 (16 U.S.C. 667b-667d), Public Law 80-537, as amended; and 3) "...for the development, advancement, management, conservation and protection of fish and wildlife resources..." Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4), as amended, and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." Fish and Wildlife Act of 1956 (16 U.S.C. 742(b)(1), as amended.

NATIONAL WILDLIFE REFUGE SYSTEM MISSION: To administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

DESCRIPTION OF USE: The Refuge allows federal, state, and local governments, non-profit organizations, universities, and private individuals to conduct scientific research on the Refuge by special-use permit or agreement. Research activities are undertaken on the Refuge to better understand the dynamics of ecological processes (e.g., climatic trends, vegetation, geology, soils, water, and wildlife) and impacts of human use. Appropriate research is implemented on a continuing basis to fill many of these informational gaps. The Refuge may construct a research field station to enhance scientific research occurring on the Refuge.

AVAILABILITY OF RESOURCES: Refuge staff currently issue Special Use Permits (SUPs) for research projects that occur solely on the Refuge. South Texas Refuge Complex staff issue SUPs for research activities that occur on more than one of the three refuges within the STRC. Staff resources are deemed adequate to manage this use at the anticipated use levels.

Miscellaneous equipment and limited logistical support are available on the Refuge. Occasionally, temporary housing is also available for use by researchers while studying Refuge resources.

ANTICIPATED IMPACTS OF THE USE: Research activities may disturb fish, wildlife, and their habitats. Efforts to capture animals can cause disturbance, injury, or death to groups of wildlife or individuals. To wildlife, the energy cost of disturbance may be appreciable in terms of disruption of feeding, displacement from preferred habitat, and the added energy expended to avoid disturbance.

Sampling activities can cause compaction of soil and the trampling of vegetation, establishment of temporary trails through vegetation beds, and disruption of bottom sediments. The removal of vegetation or sediments by core sampling methods can cause increased localized turbidity and disrupt non-target plants and animals.

PUBLIC REVIEW and COMMENT: Public comments on this draft determination will be received as part of the Comprehensive Conservation Plan for Laguna Atascosa NWR.

**Appendix D: Appropriate Refuge Uses and Compatibility Determinations**

DETERMINATION (check one below)

       USE IS NOT COMPATIBLE

  X   USE IS COMPATIBLE WITH THE FOLLOWING STIPULATIONS

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

1. Researcher investigations would be conducted by Special Use Permit or agreement.
2. Research that either contributes to Refuge purposes or the mission of the Refuge System or does not cause unreasonable resource disturbance or harm would be allowed.
3. Annual status reports and a final report concerning scientific research activities would be completed by the researcher and provided to the Refuge manager.
4. High summer temperatures and humidity must be taken into consideration and established protocols followed when live trapping mammals and mist netting birds.

JUSTIFICATION: There is a continuing need for research and investigation for the conservation of Federal trust and focal species that occur on Laguna Atascosa NWR (e.g., ocelot, Aplomado falcon, Kemp's ridley sea turtle, waterfowl, and shorebirds). Many research needs, if undertaken, would support Refuge conservation and management efforts, as well as implement recovery plan action items. Some of these research needs are to meet the objectives found in various plans and Federal mandates. Priority will be given to research projects that can be applied to current wildlife management or conservation issues. Research activities will be reviewed periodically by the Service and other representatives to evaluate results. With these stipulations in place, scientific research activities are not likely to materially interfere with or detract from the purposes of the Refuge.

SIGNATURE:

Refuge Manager

Manny P. [Signature] 8-13-2010  
(Signature and Date)

CONCURRENCE:

Regional Chief

Acting

Donna Starck 8/18/2010  
(Signature and Date)

Mandatory 10- or 15-year  
Re-evaluation Date:

August 2020

COMPATIBILITY DETERMINATION

USE: Virtual Geocaching

REFUGE NAME: Laguna Atascosa National Wildlife Refuge

ESTABLISHING and ACQUISITION AUTHORITY(IES):

Migratory Bird Conservation Act of 1929; Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948; and the Fish and Wildlife Act of 1956.

REFUGE PURPOSE(S): 1) "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds," Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d), as amended; 2) "...for wildlife conservation purposes if the real property has particular value in carrying out the national migratory bird management program..." Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948 (16 U.S.C. 667b-667d), Public Law 80-537, as amended; and 3) "...for the development, advancement, management, conservation and protection of fish and wildlife resources..." , Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4), as amended, and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." , Fish and Wildlife Act of 1956 (16 U.S.C. 742(b)(1), as amended.

NATIONAL WILDLIFE REFUGE SYSTEM MISSION: To administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

DESCRIPTION OF USE: Geocaching is played throughout the world by adventure seekers equipped with GPS (global positioning system) devices. The basic idea is to locate outdoor geocaches by their coordinates and share your experiences online. Virtual geocaching is the search for destinations or locations and does not involve a hidden container or other such item. The Refuge proposes utilizing virtual geocaching as a method of encouraging Refuge visitation and participation in priority wildlife-dependent recreational uses (e.g., wildlife observation, photography) by establishing Refuge Web site virtual geocache links and by providing Refuge virtual geocaching links to recognized, reputable geocaching Web sites.

AVAILABILITY OF RESOURCES: Direct costs to administer a virtual geocaching program would be in the form of staff time and training. Additional staffing and funding are available to adequately oversee and administer this new use.

ANTICIPATED IMPACTS OF THE USE: Human activity may disturb wildlife utilizing the Refuge's habitats for feeding or nesting. Off-trail human activity can potentially lead to soil compaction and vegetation trampling. Litter discarded by visitors can entangle wildlife or be ingested, resulting in injury or death.

PUBLIC REVIEW and COMMENT: Public comments on this draft determination will be received as part of the Comprehensive Conservation Plan for Laguna Atascosa NWR.

DETERMINATION (check one below)

USE IS NOT COMPATIBLE

USE IS COMPATIBLE WITH THE FOLLOWING STIPULATIONS

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

1. Only virtual geocaching would be allowed.



COMPATIBILITY DETERMINATION

USE: Wildlife Disease Control

REFUGE NAME: Laguna Atascosa National Wildlife Refuge

ESTABLISHING and ACQUISITION AUTHORITY(IES): Migratory Bird Conservation Act of 1929; Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948; and the Fish and Wildlife Act of 1956.

REFUGE PURPOSE(s): 1) "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds," Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d), as amended; 2) "...for wildlife conservation purposes if the real property has particular value in carrying out the national migratory bird management program..." Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948 (16 U.S.C. 667b-667d), Public Law 80-537, as amended; and 3) "...for the development, advancement, management, conservation and protection of fish and wildlife resources..." Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4), as amended, and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." Fish and Wildlife Act of 1956 (16 U.S.C. 742(b)(1), as amended.

NATIONAL WILDLIFE REFUGE SYSTEM MISSION: To administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

DESCRIPTION OF USE: Disease control conducted by non-Service staff will be permitted on a case-by-case basis under a Special Use Permit or agreement. Disease outbreaks with a compelling case of potential for harm to the public or to trust resources will be dealt with promptly. Dead and/or infected animals will be removed from the Refuge, when feasible, and disposed of properly. Vectors such as mosquitoes, ticks, etc., will be reduced or removed in accordance with established policies.

AVAILABILITY OF RESOURCES: Existing Refuge staff currently issue Special Use Permits (SUPs) for wildlife disease control activities that occur solely on Laguna Atascosa National Wildlife Refuge. South Texas Refuge Complex staff issue SUPs for wildlife disease control activities that occur on more than one of the three refuges within the STRC. Staff resources are deemed adequate to manage this use at the anticipated use levels. In the event of large scale, catastrophic wildlife disease outbreak, additional funding, staffing, and other resources would be requested from the Regional Office.

ANTICIPATED IMPACTS OF THE USE: Wildlife disease control and clean-up activities following a disease outbreak most likely will disturb other, non-target fish, wildlife, and their habitats, as well as the affected species. Disturbance due to periodic sampling for disease vectors or other disease indicators is expected to be minimal and would be limited by special conditions within the responsible party's SUP.

PUBLIC REVIEW and COMMENT: Public comments on this draft determination will be received as part of the Comprehensive Conservation Plan for Laguna Atascosa NWR.

DETERMINATION (check one below)

USE IS NOT COMPATIBLE

USE IS COMPATIBLE WITH THE FOLLOWING STIPULATIONS

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:



COMPATIBILITY DETERMINATION

USE: Wildlife Observation

REFUGE NAME: Laguna Atascosa National Wildlife Refuge

ESTABLISHING and ACQUISITION AUTHORITY(IES): Migratory Bird Conservation Act of 1929; Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948; and the Fish and Wildlife Act of 1956.

REFUGE PURPOSE(s): 1) "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds," Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d), as amended; 2) "...for wildlife conservation purposes if the real property has particular value in carrying out the national migratory bird management program..." Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948 (16 U.S.C. 667b-667d), Public Law 80-537, as amended; and 3) "...for the development, advancement, management, conservation and protection of fish and wildlife resources...", Fish and Wildlife Act of 1956 (16 U.S.C. 742(a)(4), as amended, and "...for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude...", Fish and Wildlife Act of 1956 (16 U.S.C. 742(b)(1), as amended.

NATIONAL WILDLIFE REFUGE SYSTEM MISSION: To administer a national network of lands and waters for the conservation, management and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

DESCRIPTION OF USE: Wildlife observation is one of the six wildlife-dependent priority uses identified in the National Wildlife Refuge System Improvement Act of 1997. The Refuge is open for wildlife observation all year from sunrise to sunset. Foot travel is allowed on Refuge roads and trails. Motorized vehicles are restricted to the two tour roads, with most of the use occurring on Bayside Drive. Bicycling on designated bike trails and boating on state navigable waters are methods of facilitating wildlife observation on Refuge. The Refuge will construct additional, universally accessible trails, photo blinds, boardwalks, visitor contact station, and viewing platforms, as well as improve existing roads and parking areas as needed to further wildlife observation opportunities.

AVAILABILITY OF RESOURCES: Current staffing levels provide minimal staff oversight of the program and maintenance of the necessary visitor services facilities. To increase and enhance wildlife observation opportunities on the Refuge, additional staff are needed. The additional staffing needs are outlined in the CCP.

ANTICIPATED IMPACTS OF THE USE: Wildlife observation activity may temporarily disturb or displace wildlife. Off-trail human activity can potentially lead to soil compaction and vegetation trampling. The construction and maintenance of trails, boardwalks, and viewing platforms may affect soils, vegetation, and in some instances, hydrology around the facilities. Litter discarded by visitors can entangle wildlife or be ingested, resulting in injury or death. Some animals are killed or injured by vehicles while crossing Refuge roads.

PUBLIC REVIEW and COMMENT: Public comments on this draft determination will be received as part of the Comprehensive Conservation Plan for Laguna Atascosa NWR.

DETERMINATION (check one below)

USE IS NOT COMPATIBLE

USE IS COMPATIBLE WITH THE FOLLOWING STIPULATIONS

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:



## E. Refuge Establishing Documents

SECRETARY OF THE INTERIOR, CHAIRMAN  
 SECRETARY OF AGRICULTURE  
 SECRETARY OF COMMERCE  
 GEORGE L. RADCLIFFE, SENATOR FROM MARYLAND  
 C. WAYLAND BRADDOCK, SENATOR FROM ILLINOIS  
 JOHN J. COCHRAN, REPRESENTATIVE FROM MISSOURI  
 WALTER E. GIBSON, REPRESENTATIVE FROM OREGON  
 RUDOLPH DIEFFENBACH, SECRETARY  
 OFFICE: DEPARTMENT OF THE INTERIOR

MIGRATORY BIRD CONSERVATION COMMISSION  
 WASHINGTON

*J. H. K.*  
*Bennett*

October 12, 1945.

Mr. R. D. Dodgen, Executive Secretary,  
 Game, Fish, and Oyster Commission,  
 Austin, Texas.

Dear Mr. Dodgen:

The Fish and Wildlife Service, working under the provisions of the Migratory Bird Conservation Act (48 Stat. 1335), has reached price agreement for the purchase of approximately 11,275 acres of land within the limits of an approved migratory waterfowl refuge in Cameron County, Texas, the total area of which approximates 35,000 acres of land. This tract includes a portion of the Laguna Atascosa. The proposed purchase will be presented to the Migratory Bird Conservation Commission for consideration at a meeting scheduled to be held Wednesday, October 31, 1945, at 10:00 A.M. in the conference room of the Secretary of the Interior, as is provided for under the Migratory Bird Conservation Act.

That Act provides that: "The ranking officer of the branch or department of a State to which is committed the administration of its game laws, or his authorized representative, and in a State having no such branch or department, the governor thereof, or his authorized representative, shall be a member ex-officio of said commission for the purpose of considering and voting on all questions relating to the acquisition, under this Act, of areas in his State."

You are invited to attend this meeting to consider with other members of the Commission the proposed acquisition in your State. If you cannot attend, an appropriate letter on the project should be addressed to me in care of the Fish and Wildlife Service, Merchandise Mart, Chicago 64, Illinois.

It is advisable to tell you that, since Congress has made no appropriations for the expenses of the Migratory Bird Conservation Commission, there is no legal authority to make reimbursement for expenses incurred to attend the meeting.

Very truly yours,  
 Rudolph Dieffenbach  
 Secretary, Migratory Bird  
 Conservation Commission.

Copy for Regional Director *Albuquerque*

Price agreement for the first tract of land forming Laguna Atascosa NWR

*J. I. C.*

STANDARD FORM NO. 64

*Office Memorandum* • UNITED STATES GOVERNMENT

*N.D. Rodgers*

TO : Regional Director - Albuquerque

FROM : Chief, Division of Lands

SUBJECT: Approval of Project by Migratory Bird Conservation Commission

DATE: October 31, 1945

IA - TEXAS  
Laguna Atascosa

At the meeting of the Migratory Bird Conservation Commission held this morning, Representative Cochran a member of the Commission submitted a letter to Secretary Ickes from which I quote, as follows:

"Congressman Milton H. West of Texas has likewise requested that he have an opportunity to contact some of his constituents in Cameron County, Texas, in regard to the establishment of the Wildlife Refuge to be known as Laguna Atascosa before the Commission approves the Project which is No. 4."

It is suggested that you take whatever steps are appropriate to see to it--insofar as you can do that--that Congressman West is properly advised regarding the program there and the importance of the proposed acquisition of the Continental Oil Company tract, as well as the importance of the waterfowl project in its entirety.

As a guide to you in the latter respect, we have limited our objectives to approximately 45,000 acres which would comprise the part best adapted for use by migratory waterfowl, which 45,000 acres embraces the 10,000 acres of War Department land which we hope eventually to obtain. The duck refuge would probably comprise all of the lands lying between the Continental Oil Company property on the west up to and including the War Department lands.

Our present ideas are that we will treat the white-winged dove section as a separate unit--at least insofar as presentation of our proposed program to the Commission is concerned, and that will not be done until we have secured options on lands within it.

A copy of this letter is being sent to Dr. Saunders so that he may be fully advised as to what has happened.

Incidentally, up to this time we have not received a reply from the Executive Secretary of the Texas Commission to our request for his presence here or his favorable consideration of this proposed acquisition. You know that the Executive Secretary is an ex-officio member of the Migratory Bird Conservation Commission. It is highly important for us to have his approval and I think it might be a good idea for you to get in touch with him immediately to ascertain what he has done, if anything, and if he needs more advice about the project, please get it to him with the hope that we can obtain his approval.

*Rudolph Dieffenbach*

Cc to Dr. Saunders

*Memorandum approving the establishment of Laguna Atascosa NWR in 1945*



# FEDERAL REGISTER

Wednesday, January 26, 1949

355

## WAR ASSETS ADMINISTRATION

[Wildlife Order 1]

TRANSFER OF 8,486 ACRES OF LAND AT HAR-  
LINGEN ARMY AIR FIELD (LAGUNA MADRE  
SUB-BASE), CAMERON COUNTY, TEXAS,  
TO THE SECRETARY OF THE INTERIOR

1. Pursuant to the authority granted under the provisions of Public Law 537, 80th Congress, notice is hereby given that by letter of transfer from the War Assets Administrator, to the Secretary of the Interior, dated January 12, 1949, a portion of that property known as Laguna Madre Sub-Base, Harlingen Army Air Field, Cameron County, Texas, and more particularly described in such letter, has been transferred to the Secretary of the Interior.

2. The above described property is transferred to the Secretary of the Interior for migratory bird conservation purposes in accordance with the provisions of said Public Law 537.

JESS LARSON,  
*Administrator,*

JANUARY 12, 1949.

[F. R. Doc. 49-640; Filed, Jan. 25, 1949;  
9:54 a. m.]

Federal Register notice transferring lands from the War Department to the Refuge in January 1949

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## F. Key Legislation and Service Policies\*

**Administrative Procedure Act (1966; 5 U.S.C. 551-559, 701-706 and 801-808, as amended):** Contains procedures that Federal agencies must follow, including public information, open meetings, and privacy of information requirements, and provisions for hearings, adjudications, rule making, and judicial and congressional review of Federal agency actions.

**Agricultural Credit Act of 1987 (7 U.S.C. 5104; P.L. 100-233):** Authorizes the Farmer's Home Administration (FmHA) to transfer land to any Federal or State agency for conservation purposes (e.g., the FmHA can transfer fee-title or assign interests in real estate to the U.S. Fish and Wildlife Service for the protection of floodplains, wetlands, and surrounding uplands).

**American Indian Religious Freedom Act (1978):** Directs agencies to consult with Native traditional religious leaders to determine appropriate policy changes necessary to protect and preserve Native American religious cultural rights and practices.

**Americans with Disabilities Act (1992):** The Americans with Disabilities Act is the most comprehensive Federal civil-rights statute that prohibits discrimination on the basis of disability in employment, State and local government, public accommodations, commercial facilities, transportation, and telecommunications.

**Antiquities Act of 1906 (16 U.S.C. 431-433):** First United States law to provide general protection of cultural or natural resources. This act authorizes the scientific investigation of antiquities on Federal land and provides penalties for unauthorized removal of objects taken or collected without a permit.

**Archaeological and Historic Preservation Act (1974):** Requires that Federal agencies provide for *"...the preservation of historical and archeological data (including relics and specimens) which might otherwise be irreparably lost or destroyed as the result of...any alteration of the terrain caused as a result of any Federal construction project of federally licensed activity or program."*

**Archaeological Resources Protection Act of 1979, as amended (16 U.S.C. 470aa-470mm):** The Archaeological Resources Protection Act (ARPA) was enacted *"...to secure, for the present and future benefit of the American people, the protection of archaeological resources and sites which are on public lands and Indian lands, and to foster increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals."* The main focus of ARPA is on regulation of legitimate archaeological investigation on public lands and the enforcement of penalties against looting or vandalism of these resources. Protects materials of archaeological interest from unauthorized removal or destruction and requires Federal managers to develop plans and schedules to locate archaeological resources.

**Appropriate Uses Policy (2006) Service Manual 603 FW1:** Describes procedures for refuge managers to follow when deciding if uses are appropriate on a refuge. Appropriate uses are either proposed or existing uses on a refuge that meet at least one of the following four conditions:

- The use is a wildlife-dependent recreational use as identified in the 1997 Improvement Act;
- The use contributes to fulfilling the refuge purpose(s), the Refuge System mission, or goals or objectives described in a refuge management plan approved after October 9, 1997, the date the Improvement Act was signed into law;
- The use involves the take of fish and wildlife under State regulations; or
- The use has been found to be appropriate as described further in the Appropriate Refuge Uses policy.

This policy applies to all proposed and existing uses in the National Wildlife Refuge System only where the Service has jurisdiction over the use. The policy does not apply in: 1) situations where reserved rights or legal mandates provide that the Service must allow the use, and 2) refuge management activities (e.g., fish and wildlife population or habitat management actions, including but not limited to prescribed burns, water level management, invasive species control, routine scientific monitoring, law enforcement activities, and maintenance of existing refuge facilities).

**Architectural Barriers Act (1968):** Requires federally-owned, leased, or funded buildings and facilities to be accessible to persons with disabilities.

**Bald and Golden Eagles Protection of 1940 (16 U.S.C. 668-668d; 54 Statute 250), as amended:** Provides for the protection of the bald eagle (the national emblem) and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession, and commerce of such birds.

**Biological Integrity, Diversity, and Environmental Health (2001) Service Manual 601 FW 3:** As part of the comprehensive conservation planning process, this policy provides for the consideration and protection of the broad spectrum of fish, wildlife, and habitat resources found on refuges and associated ecosystems. It provides refuge managers with an evaluation process to analyze their refuge and recommend the best management direction to prevent further degradation of environmental conditions; and, where appropriate and in concert with refuge purposes and Refuge System mission, restore lost or severely degraded components.

**Clean Air Act (1970; 42 U.S.C. 7401 et seq.), as amended:** A comprehensive Federal law that regulates air emissions from area, stationary, and mobile sources. This law authorizes the U.S. Environmental Protection Agency to establish National Ambient Air Quality Standards to protect public health and the environment.

**Clean Water Act (1977); Federal Water Pollution Control Act:** This is the principal law that governs pollution of the nation's surface waters. The Clean Water Act employs several regulatory and non-regulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. Section 404 of the Clean Water Act requires permits (issued by the U.S. Army Corps of Engineers) for the discharge of dredged or fill material into waters of the United States, including wetlands.

**Coastal Barrier Resources Act (1982; 16 U.S.C. 3501 et seq.), as amended:** This Act (CBRA) designated various undeveloped coastal barrier islands, depicted by specific maps, for inclusion in the Coastal Barrier Resources System. Areas so designated were made ineligible for direct or indirect Federal financial assistance that might support development, including

flood insurance, except for emergency life-saving activities. Exceptions for certain activities, such as fish and wildlife research, are provided, and National Wildlife Refuges and other otherwise protected areas are excluded from the System.

**Compatibility Policy (2000) Service Manual 603 FW 2:** Incorporates the compatibility provisions of the National Wildlife Refuge System Improvement Act of 1997 that amends the National Wildlife Refuge System Administration Act of 1966. The Compatibility Policy is for determining whether proposed and existing uses, which the Service has jurisdiction over and are occurring on national wildlife refuges, are compatible (i.e., will not detract from or materially interfere) with the purpose(s) of the refuge or with the Refuge System’s mission. The policy is to ensure that the Service administers proposed and existing national wildlife refuge uses according to laws, regulations, and policies concerning compatibility, and provide procedures for documentation and periodic review of existing refuge uses.

**Comprehensive Conservation Plans (2000) Service Manual 602 FW 3:** As required by the National Wildlife Refuge System Improvement Act of 1997, Comprehensive Conservation Plans (CCPs) describe the desired future conditions of a refuge and provide long-range guidance and management direction to achieve refuge purposes; help fulfill the Refuge System mission; maintain and, where appropriate, restore the ecological integrity; as well as meet other mandates. The purpose of developing the CCP is to provide the refuge manager with a 15-year management plan for the conservation of fish, wildlife, and plant resources and their related habitats, while providing opportunities for compatible wildlife-dependent recreational uses.

**Convention between the United States of America and the Mexican States for the Protection of Migratory Birds and Game Mammals, 1936 (50 Statute 1311).**

**Convention of Nature Protection and Wildlife Preservation in the Western Hemisphere, 1940 (56 Statute 1354).**

**Convention between the United States and Great Britain (for Canada for the Protection of Migratory Birds). (39 Statute 1702; TS 628), as amended.**

**Convention on Wetlands of International Importance, Especially as Waterfowl Habitats (I.L.M. 11:963-976, September 1972, Ramsar Convention).**

**Cooperative Research and Training Units Act (1960; 16 U.S.C. 753a-753b), as amended:** Authorizes the Secretary of the Interior to enter into cooperative agreements with colleges and universities, State fish and game agencies, and non-profit organizations for the purpose of developing adequate, coordinated, cooperative research and training programs for fish and wildlife resources.

**Criminal Code Provisions of 1940 (18 U.S.C. 41), as amended:** Provides for fines and penalties for the unlawful taking, disturbing, hunting, trapping, capturing of “...*any bird, fish, or wild animal of any kind whatever, or takes or destroys the eggs or nest of any such bird or fish, on any lands or waters which are set apart or reserved as sanctuaries, refuges or breeding grounds for such birds, fish, or animals under any law of the United States or willfully injures, molests, or destroys any property of the United States on any such lands or waters...*”

**Disaster Relief Act of 1974 (42 U.S.C. 5121 et seq.), as amended:** Provides authority for Federal agencies to assist State and local governments during Presidentially-declared emergencies.

**Economy Act (1932; 31 U.S.C. 1535):** Provides authority for Federal agencies to order goods and services from other Federal agencies and to pay the actual costs of those goods and services. The act was passed to obtain economies of scale and eliminate overlapping activities of the Federal government.

**Emergency Wetlands Resources Act of 1986 (16 U.S.C. 3901-3932, as amended):** The purpose of this act is to promote wetlands conservation for the public benefit and to help fulfill international obligations in various migratory bird treaties and conventions. The act authorizes the purchase of wetlands from Land and Water Conservation Fund monies. The act also requires the Secretary of the Interior to establish a National Wetlands Priority Conservation Plan, requires the states to include wetlands in their Comprehensive Outdoor Recreation Plans, and transfers funds from import duties on arms and ammunition to the Migratory Bird Conservation Fund.

**Endangered Species Act of 1973, as amended:** The main purposes of the Endangered Species Act are to: 1) provide a means whereby ecosystems of threatened and endangered species may be conserved; and 2) provide a program for the conservation of threatened and endangered species. The provisions of the Endangered Species Act include but are limited to land acquisition, cooperative programs with the states, and interagency cooperation (Section 7). Section 7(a)(1) directs Federal agencies to carry out programs for the conservation of threatened and endangered species.

**Environmental Education Act of 1990 (20 U.S.C. 5501-5510):** Established the Office of Environmental Education within the Environmental Protection Agency, to develop and administer a Federal environmental education program. The office is required to develop and support environmental programs in consultation with other Federal natural resource management agencies, including the U.S. Fish and Wildlife Service.

**Executive Order 11514; Protection and Enhancement of Environmental Quality (1970):** This directs that the “...*Federal Government shall provide leadership in protecting and enhancing the quality of the Nation's environment to sustain and enrich human life. Federal agencies shall initiate measures needed to direct their policies, plans and programs so as to meet national environmental goals...*”

**Executive Order 11593; Protection and Enhancement of the Cultural Environment (1971):** Establishes policy that the Federal government shall provide leadership in preserving, restoring and maintaining the historic and cultural environment of the Nation. Federal agencies “...shall (1) administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations; (2) initiate measures necessary to direct their policies, plans, and programs in such a way that federally owned sites, structures, and objects of historical, architectural, or archaeological significance are preserved, restored, and maintained for the inspiration and benefit of the people; and (3), in consultation with the Advisory Council on Historic Preservation (16 U.S.C. 4701), institute procedures to assure that Federal plans and programs contribute to the preservation and enhancement of non-federally owned sites, structures and objects of historical, architectural, or archaeological significance.”

**Executive Order 11644; Use of off-road vehicles on the public lands (1972):** Requires that the Service designate areas as open or closed to off-highway vehicles to protect refuge resources, promote safety, and minimize conflict among the various refuge users; monitor

the effects of these uses once they are allowed; and amend or rescind any area designation as necessary based on the information gathered.

**Executive Order 11987; Exotic organisms (1977):** Executive agencies shall, to the extent permitted by law, restrict the introduction of exotic species into the natural ecosystems on lands and waters that they own, lease, or hold for purposes of administration; and shall encourage the states, local governments, and private citizens to prevent the introduction of exotic species into natural ecosystems of the United States.

**Executive Order 11988; Floodplain Management (1977):** This directs that each Federal agency “...shall provide leadership and take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains...” in carrying out its responsibilities.

**Executive Order 11989; Off-Road Vehicles on Public Lands (1977):** Requires the Service to close areas to off-highway vehicles when we determine that the use causes or will cause considerable adverse effects on the soil, vegetation, wildlife, habitat, or cultural or historic resources.

**Executive Order 11990; Protection of Wetlands (1977):** This directs that each Federal agency “...shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency’s responsibilities...”

**Executive Order 12962; Recreational Fisheries (1995):** Federal agencies shall, to the extent permitted by law and where practicable, and in cooperation with states and tribes, improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities.

**Executive Order 12996; Management and General Public Use of the National Wildlife Refuge System (1996):** This spells out the mission of the National Wildlife Refuge System, along with establishing guiding principles to help insure the long-term enjoyment of the Refuge System for present and future generations. The order directs the Secretary of the Interior to recognize compatible wildlife-dependent recreational activities involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation as priority public uses of the Refuge System.

**Executive Order 13007; Indian Sacred Sites (1996):** Directs Federal land management agencies to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, avoid adversely affecting the physical integrity of such sacred sites, and where appropriate, maintain the confidentiality of sacred sites.

**Executive Order 13112; Invasive Species (1999):** This order was established to address the growing ecological and economic damage caused by invasive species. Executive Order 13112 requires Federal agencies to: 1) identify actions that might affect the status of invasive species and prevent introductions of invasive species; 2) not authorize, fund, or carry out actions likely to cause the introduction or spread of invasive species; 3) detect and respond rapidly to control invasive species populations; 4) monitor and conduct research on invasive species; 5) restore native species and habitat conditions in ecosystems that have been invaded; and 6) promote public education on invasive species.

**Executive Order 13158; Marine Protected Areas (2000):** directs protection of the significant natural and cultural resources within the marine environment for the benefit of present and future generations by strengthening and expanding the Nation's system of marine protected areas (MPAs). An MPA is any area of the marine environment that has been reserved by Federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein. The EO directs Federal agencies to work together with states, territories, tribes, and non-governmental partners to develop and maintain an effective national system of MPAs in the United States and to accomplish a variety of related tasks working with public and private partners. The "marine environment" is defined as those areas of ocean and coastal waters, the Great Lakes and their connecting waters, and submerged lands thereunder, over which the United States exercises jurisdiction, consistent with international law.

**Executive Order 13186; Responsibilities of Federal agencies to protect migratory birds (2001):** Provides guidance for Service programs relative to the management and conservation of migratory birds. Its purpose is to minimize the potential adverse effects of migratory bird take, with the goal of striving to eliminate take, while implementing our mission. This guidance includes but is not limited to integrating migratory bird conservation measures into our activities; restoring and enhancing the habitat of migratory birds; ensuring our actions and plans promote migratory bird conservation; promoting inventory, monitoring, research, management studies, and information exchange related to migratory birds; promoting education and outreach related to migratory birds; identifying special migratory bird habitats; and strengthening non-Federal partnerships to further bird conservation.

**Executive Order 13443; Facilitation of Hunting Heritage and Wildlife Conservation (2007):** Directs Federal agencies that have programs and activities that have a measurable effect on public land management, outdoor recreation, and wildlife management, including the Department of the Interior and the Department of Agriculture, to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat.

**Executive Order 13514; Federal Leadership in Environmental, Energy, and Economic Performance (2009):** Provides guidance for federal agencies to increase energy efficiency; reduce greenhouse gas emissions; design, construct, maintain, and operate high performance sustainable buildings, etc.

**Farmland Protection Policy Act (7 U.S.C. 4201 et seq.):** Requires Federal agencies to identify and take into account the adverse effects of their programs on the preservation of farmlands.

**Federal Aid in Sport Fish Restoration Act (1950; 16 U.S.C. 777-777k), as amended:** Commonly called the Dingell-Johnson Act or Wallop-Breaux Act, this provides Federal aid to the States for management and restoration of fish having "*...material value in connection with sport or recreation in the marine and/or fresh waters of the United States.*" In addition, amendments to the act provide funds to the States for aquatic education, wetlands restoration, boat safety, and clean vessel sanitation devices (pumpouts), and a non-trailerable boat program. Funds are derived from a 10-percent excise tax on certain items of sport fishing tackle, a 3-percent excise tax on fish finders and electric trolling motors, import duties on fishing tackle, yachts and pleasure craft, interest on the account, and a portion of motorboat fuel tax revenues and small engine fuel taxes. To participate in the Federal Aid in Sport Fish Restoration program, States are required to agree to this law and pass laws for the

conservation of fish, which include a prohibition against the diversion of license fees for any other purpose than the administration of the State fish department.

**Federal Aid in Wildlife Restoration Act (1937; 16 U.S.C. 669-669i), as amended:** Commonly called the Pittman-Robertson Act, this provides Federal aid to States for management and restoration of wildlife. Funds from an 11-percent excise tax on sporting arms and ammunition are appropriated to the Secretary of the Interior and apportioned to States on a formula basis for paying up to 75 percent of the cost-approved projects. Project activities include acquisition and improvement of wildlife habitat, introduction of wildlife into suitable habitat, research into wildlife problems, surveys and inventories of wildlife problems, acquisition and development of access facilities for public use, and hunter education programs, including construction and operation of public target ranges.

**Federal Environmental Pesticide Control Act of 1972 (7 USC 136-136y), as amended:** This established, under the Administrator of the Environmental Protection Agency (EPA), a program for controlling the sale, distribution, and application of pesticides through an administrative registration process. The amendments provided for classifying pesticides for "general" or "restricted" use. "Restricted" pesticides may only be applied by or under the direct supervision of a certified applicator. Amendments to this act also authorized experimental use permits and provided for administrative review of registered pesticides and for penalties for violations of the statute. States were authorized to regulate the sale or use of any pesticide within a state, provided that such regulation does not permit any sale or use prohibited by the act. The Federal Environmental Pesticide Control Act of 1972 amended the **1947 Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)**. The 1947 statute (FIFRA), prohibited the sale or distribution of "*economic poisons*," provided for the registration of such materials, and authorized penalties for violation of the Act. The Endangered Species Act later amended FIFRA to define imminent hazard to include situations involving *unreasonable hazard to the survival of a species declared by the Secretary of the Interior to be endangered or threatened*.

**Federal Fire Prevention and Control Act of 1974 (15 U.S.C. 2201 et seq.), as amended:** This authorizes reimbursement to State and local fire services for costs incurred in firefighting on Federal property.

**Federal Noxious Weed Act (1990):** Requires the use of integrated management systems to control or contain undesirable plant species, and an interdisciplinary approach with the cooperation of other Federal and State agencies.

**Federal Property and Administrative Services Act of 1949 (40 U.S.C. 471-535), as amended:** Sets forth requirements for the management and disposal of government property, including excess property (property under the control of any Federal agency, but which it no longer needs) and surplus property (excess property not required for the needs of any Federal agency).

**Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j, not including 742 d-l), as amended:** This established a comprehensive national fish and wildlife policy and broadened the authority for acquisition and development of refuges. The policy emphasizes the commercial fishing industry but also with a direction to administer the act with regard to the inherent right of every citizen and resident to fish for pleasure, enjoyment, and betterment, and to maintain and increase public opportunities for recreational use of fish and wildlife resources. Among other things, the act directs a program of continuing research, extension, and information services on fish and wildlife matters, both domestically and internationally. A 1974 amendment

to the Fish and Wildlife Act of 1956 abolished the “Bureau of Sport Fisheries and Wildlife” and re-designated it as the “United States Fish and Wildlife Service”(Public Law 93-271). In 1978, the Fish and Wildlife Act was amended to allow the Service to accept donations of both real and personal property. In 1998, the Fish and Wildlife Act of 1956 was further amended to promote volunteer programs and community partnerships for the benefit of national wildlife refuges. This also required the Secretary of the Interior to develop refuge education programs to provide outdoor classroom opportunities for students to promote understanding of the National Wildlife Refuge System and to improve scientific literacy in conjunction with both formal and informal education programs.

**Fish and Wildlife Conservation Act of 1980 (“Nongame Act”)(16 U.S.C. 2901-2911), as amended:** Authorizes financial and technical assistance to the States for the development, revision, and implementation of conservation plans and programs for nongame fish and wildlife. A 1988 amendment requires the Service to monitor and assess migratory nongame birds, determine the effects of environmental changes and human activities, identify those likely to be candidates for endangered species listing, identify appropriate actions, and report to Congress one year from enactment. It also requires the Service to report at five-year intervals on actions taken.

**Fish and Wildlife Coordination Act (1934), as amended:** Authorizes the Secretary of the Interior to assist Federal, State, and other agencies in development, protection, rearing, and stocking fish and wildlife on Federal lands and in studying effects of pollution on fish and wildlife. The act also requires consultation with the U.S. Fish and Wildlife Service and the wildlife agency of any State wherein the waters of any stream or other water body are proposed to be impounded, diverted, channelized or otherwise controlled or modified by any Federal agency or any private agency under Federal permit or license; with a view to preventing loss of, or damage to, wildlife resources in connection with such water resource projects. The act further authorizes Federal water resource agencies to acquire lands or interests in connection with water use projects specifically for mitigation and enhancement of fish and wildlife.

**Fish and Wildlife Improvement Act of 1978 (16 U.S.C. 7421; 92 Stat. 3110), as amended:** Authorizes the Secretary of the Interior and the Secretary of Commerce to establish, conduct, and assist with national training programs for State fish and wildlife law enforcement personnel. It also authorized funding for research and development of new or improved methods to support fish and wildlife law enforcement. The law provides authority to the Secretaries to enter into law enforcement cooperative agreements with State or other Federal agencies and authorizes the disposal of abandoned or forfeited items under the fish, wildlife, and plant jurisdictions of these Secretaries. It strengthens the law enforcement operational capability of the Service by authorizing the disbursement and use of funds to facilitate various types of investigative efforts.

**Flood Control Act of 1944, as amended:** This act, supplemented by other flood control acts and river and harbor acts, authorizes various U.S. Army Corps of Engineers water development projects. The Flood Control Act expressed Congressional intent to limit the authorization and construction of navigation, flood control, and other water projects to those having significant benefits for navigation and those that could be operated consistent with other river uses. This authorized the construction of numerous dams and modifications to previously existing dams. Several provisions of this act impact the responsibilities of the Service under the **Fish and Wildlife Coordination Act**.

**Food Security Act of 1985 “Farm Bill” (99 Stat. 1354), as amended by the Food, Agriculture, Conservation, and Trade Act of 1990:** This contains several provisions that contribute to wetland conservation. The “Swampbuster” provisions stated that farmers who produce an agricultural commodity on wetlands converted after enactment are ineligible for most farmer program subsidies. Administration of the program in the Department of Agriculture (USDA), which is required to consult with the U.S. Fish and Wildlife Service on matters relating to wetland identification, determination of exemptions to the wetland conservation provisions, issuance of implementing regulations, mitigation, and restoration of values and functions on converted wetlands. This act also authorized the Secretary of Agriculture to grant or sell conservation easements, which may include wetlands, to State or local governments or private non-profit organizations for conservation purposes. In addition, the 1985 act also established a Conservation Reserve program, providing incentives to private landowners (e.g., farmers) to return farmland to permanent vegetative cover and for applying soil conservation prescriptions such as wildlife habitat development. The program was expanded in 1988 by regulation to make cropped wetlands eligible for the program, with the intended result of wetland restoration (i.e., The Wetland Reserve Program).

**Freedom of Information Act (1966; 5 U.S.C. 552):** Requires all Federal agencies to make available to the public, for inspection and copying, administrative staff manuals and staff instructions, official, published and unpublished policy statements, final orders deciding case adjudication, and other documents. Special exemptions have been reserved for nine categories of privileged material, including but not limited to confidential matters relating to national defense or foreign policy, law enforcement records, and trade or commercial secrets. The Act requires the party seeking the information to pay reasonable search and duplication costs.

**Historic Sites, Buildings, and Antiquities Act (16 U.S.C. 461-462, 464-467), as amended:** Also known as the Historic Sites Act, this declared it a national policy to preserve historic sites and objects of national significance, including those located on refuges. It provided procedures for designation, acquisition, administration, and protection of such sites. Among other things, national historic and natural Landmarks are designated under authority of this act. As of January, 1989, 31 national wildlife refuges contained such sites, including Laguna Atascosa NWR.

**Lacey Act of 1900 (16 U.S.C. 701), as amended:** Makes it unlawful to import, export, sell, acquire, or purchase fish, wildlife, or plants taken, possessed, transported, or sold: 1) in violation of U.S. or Indian law, or 2) in interstate or foreign commerce involving any fish, wildlife, or plants taken possessed or sold in violation of State or foreign law. The Lacey Act covers all fish and wildlife and their parts or products, and plants protected by the Convention on International Trade in Endangered Species and those protected by State law. Commercial guiding and outfitting are considered to be a sale under the provisions of the act. The act also includes prohibitions on the importation of wild vertebrates and other animals listed in the act or declared by the Secretary of the Interior to be injurious to man or agriculture, wildlife resources, or otherwise, except under certain circumstances and pursuant to regulations. The Lacey Act includes penalties and fines for violations involving imports or exports or violations of a commercial nature.

**Land and Water Conservation Fund Act (1965):** Authorizes the use of the receipts from the sale of surplus Federal land, outer continental shelf oil and gas sales, and other sources for land acquisition. Section 7(a)(1) of this Act provides authority to use Land and Water

Conservation Fund money for acquisition of refuge areas under paragraph (5) of section 7(a) of the Fish and Wildlife Act of 1956.

**Migratory Bird Conservation Act (1929; 16 U.S.C. 715-715d, 715e, 715f-715r), as amended:** This established a Migratory Bird Conservation Commission to approve areas recommended by the Secretary of the Interior for acquisition with Migratory Bird Conservation Funds.

**Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712), as amended:** The Migratory Bird Treaty Act (MBTA) is one of the earliest Federal wildlife management laws enacted to protect migratory birds, which were rapidly declining from unregulated sport and commercial hunting. Specific provisions in the MBTA include the establishment of a Federal prohibition, unless permitted by regulations, to "*...pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention...for the protection of migratory birds...or any part, nest, or egg of any such bird.*"

**Migratory Bird Hunting and Conservation Stamp Act (1934; 16 U.S.C. 718-718j), as amended:** Known as the "Duck Stamp Act," this requires each waterfowl hunter 16 years of age or older to possess a valid Federal hunting stamp. Receipts from the sale of the stamp are deposited in a special Treasury account known as the Migratory Bird Conservation Fund and are not subject to appropriations. Funds appropriated under the Wetlands Loan Act (16 U.S.C. 715k-3-715k-5), as amended, are merged with duck stamp receipts and provided to the Secretary of the Interior for the acquisition of migratory bird refuges under provisions of the Migratory Bird Conservation Act (16 U.S.C. 715 et seq), as amended, and since August 1, 1958, for acquisition of "Waterfowl Production Areas."

**National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347), as amended:** The National Environmental Policy Act (NEPA) requires that all Federal agencies prepare detailed environmental impact statements for "every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment." NEPA stipulates factors to be considered in environmental impact statements, and requires that Federal agencies employ an interdisciplinary approach in related decision-making and develop means to ensure that un-quantified environmental values are given appropriate consideration, along with economic and technical considerations.

**National Historic Preservation Act of 1966 (16 U.S.C. 470-470b, 470c-470n), as amended:** Provides for preservation of significant historical features (buildings, objects, and sites) through a grant-in-aid program to the States. It established a National Register of Historic Places and a program of matching grants under the existing National Trust for Historic Preservation (16 U.S.C. 468-468d). The act established an Advisory Council on Historic Preservation, which was made a permanent independent agency in 1976. That act also created the Historic Preservation Fund. Federal agencies are directed to take into account the effects of their actions on items or sites listed or eligible for listing in the National Register. As of January, 1989, 91 historic sites on national wildlife refuges have been placed on the National Register.

**National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. 668dd-668ee. (Refuge Administration Act):** Defines the National Wildlife Refuge System and authorizes the

Secretary of the Interior to permit any use of a refuge provided such use is compatible with the purposes for which the refuge was established. The Refuge Improvement Act clearly defines a unifying mission for the Refuge System; establishes the legitimacy and appropriateness of the six priority public uses (hunting, fishing, wildlife observation and photography, and environmental education and interpretation); establishes a formal process for determining compatibility; establishes the responsibilities of the Secretary of the Interior for managing and protecting the Refuge System; and requires a comprehensive conservation plan for each refuge by the year 2012. This act amended portions of the Refuge Recreation Act and National Wildlife Refuge System Administration Act of 1966.

**National Wildlife Refuge System Improvement Act (1997):** Sets the mission and administrative policy for all refuges in the National Wildlife Refuge System. Clearly defines a unifying mission for the Refuge System; establishes the legitimacy and appropriateness of the six priority public uses (hunting, fishing, wildlife observation and photography, and environmental education and interpretation); establishes the responsibilities of the Secretary of the Interior for managing and protecting the system; and requires a comprehensive conservation plan for each refuge by the year 2012. This Act amended portions of the Refuge Recreation Act and National Wildlife Refuge System Administration Act of 1966.

**National Wildlife Refuge System Volunteer and Community Partnership Enhancement Act (1998; 16 U.S.C. 742f):** The purposes of this Act are to: 1) encourage the use of volunteers to assist the Service in the management of refuges within the Refuge System; 2) facilitate partnerships between the Refuge System and non-Federal entities to promote public awareness of the resources of the Refuge System and public participation in the conservation of those resources; and 3) encourage donations and other contributions by persons and organizations to the Refuge System. The act helps develop public participation in programs that enhance our ability to increase awareness and understanding of the individual refuge and the Refuge System through the development, publication, or distribution of educational materials and products.

**Native American Graves Protection and Repatriation Act (1990):** Requires Federal agencies and museums to inventory, determine ownership of, and repatriate cultural items under their control or possession.

**North American Wetlands Conservation Act (1989; 16 U.S.C. 4401-4412), as amended:** Provides funding and administrative direction for implementation of the North American Waterfowl Management Plan and the Tripartite Agreement on wetlands between Canada, the United States, and Mexico.

**Protection Act (1922; 16 U.S.C. 594):** Provides for the Secretary of the Interior to protect and preserve, from fire, disease, or the ravages of beetles or other insects, timber on the public lands owned by the United States.

**Reciprocal Fire Protection Act of 1955 (42 U.S.C. 1856), as amended by the Wildfire Suppression Assistance Act of 1989 (102 Stat. 1615):** Provides authority for Federal agencies to enter into mutual assistance agreements with foreign, State, and local governments for combating wildfires, and to provide emergency assistance when no agreement exists.

**Refuge Recreation Act of 1962 (16 U.S.C. 460k-460k-4), as amended:** Authorizes the Secretary of the Interior to administer refuges, hatcheries, and other conservation areas for recreational use, when such uses do not interfere with the area's primary purposes. The act

provides for public use fees and permits, and penalties for violation of regulations. It also authorizes the acceptance of donations of funds and real and personal property to assist in carrying out its purposes. Amendments to the act authorize acquisition of lands and interests suitable for: 1) fish and wildlife-oriented recreation, 2) protection of natural resources, 3) conservation of endangered or threatened species, or 4) carrying out two or more of the mentioned purposes. Such lands were required to be adjacent to or within an existing conservation area. Acquisition was not permitted with "duck stamp" receipts for these purposes.

**Refuge Revenue Sharing Act of 1935 (16 U.S.C. 715s), as amended:** Provides for payments to county governments in lieu of taxes, using revenues derived from the sale of products from refuges. Revenues received from refuge products, such as animals, timber, and minerals, or from leases or other privileges, are required to be deposited in a special Treasury account and net receipts distributed to counties. Remaining monies are required to be transferred to the Migratory Bird Conservation Fund for land acquisition under provisions of the Migratory Bird Conservation Act. The act was later amended to expand the revenue sharing system to include National Fish Hatcheries and Service research stations. It also included in the Refuge Revenue Sharing Fund receipts from the sale of salmonid carcasses. Payments to counties were established as: 1) on acquired land, the greatest amount calculated on the basis of 75 cents per acre, three-fourths of one percent of the appraised value, or 25 percent of the net receipts produced from the land; and 2) on land withdrawn from the public domain, 25 percent of net receipts and basic payment, in lieu of taxes on public lands. Amendments to the act authorized appropriations to make up any difference between the amount in the Revenue Sharing Fund and the amount scheduled for payment in any year. Counties are also required to pass payments along to other units of local government within the county which suffer losses in revenues due to the establishment of Service areas.

**Refuge Trespass Act of 1948 (18 U.S.C. 41):** This consolidated penalty provisions of various acts from 1905 through 1934, establishing and protecting fish and wildlife areas, and restated the intent of Congress to protect all wildlife within Federal sanctuaries, refuges, fish hatcheries and breeding grounds.

**Rehabilitation Act (1973):** Requires programmatic accessibility in addition to physical accessibility for all facilities and programs funded by the Federal government to ensure that anybody can participate in any program.

**Rivers and Harbors Act (1899; 33 U.S.C. 403):** Section 10 of this act requires the authorization by the U.S. Army Corps of Engineers prior to any work in, on, over, or under a navigable water of the United States.

**Secretarial Order No. 3226; Evaluating Climate Change Impacts in Management Planning (2001):** Directs each Department of the Interior bureau to consider and analyze potential climate change impacts when undertaking long-range planning efforts or multi-year management plans.

**Transportation Equity Act for the 21st Century (TEA-21); 23 U.S.C., as amended:** In part, this established the Refuge Roads Program and requires that all projects funded under the Refuge Roads Program be consistent with the Service's CCP plans and step-down management plans.

**Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948 (16 U.S.C. 667b-d), as amended:** This act provides that, upon a determination by the

administrator of the General Services Administration, real property no longer needed by a Federal agency can be transferred without reimbursement to the Secretary of the Interior if the land has particular value for migratory birds, or to a State agency for other wildlife conservation purposes.

**Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C. 4601 et seq.), as amended:** Provides for uniform and equitable treatment of persons who sell their homes, businesses, or farms to the Service. The act requires that any purchase offer be no less than the fair market value of the property.

**Waterfowl Depredations Prevention Act (1956; 7 U.S.C. 442-445), as amended:** This act authorizes the Secretary of the Interior to use surplus grain owned by Commodity Credit Corporation to feed waterfowl to prevent crop damage. Findings regarding possible crop damage are to be made by the Secretary of the Interior, and grain is to be used to lure waterfowl away from crops, while not exposing them to shooting over areas to which they have been lured. Such grain may be made available to Federal, State, or local governments or private organizations or individuals. Appropriations are authorized to reimburse Commodity Credit Corporation for packaging and transporting such grain.

**Water Resources Planning Act (1965), as amended:** This established a Water Resources Council to be composed of Cabinet representatives, including the Secretary of the Interior. The council was empowered to maintain a continuing assessment of the adequacy of water supplies in each region of the U.S. In addition, the council was mandated to establish principles and standards for Federal participants in the preparation of river basin plans and in evaluating Federal water projects. Upon receipt of a river basin plan, the council was required to review the plan with respect to agricultural, urban, energy, industrial, recreational, and fish and wildlife needs. This also established a grant program to assist states in participating in the development of related comprehensive water and land use plans.

**Wetlands Reserve Program:** The Wetlands Reserve Program (WRP) is a voluntary program. It provides technical and financial assistance to eligible landowners to address wetland, wildlife habitat, soil, water, and related natural resource concerns on private lands in an environmentally beneficial and cost-effective manner. The program provides an opportunity for landowners to receive financial incentives to restore, protect, and enhance wetlands in exchange for retiring marginal land from agriculture. There are three enrollment options for landowners: 1) permanent easement, 2) a 30-year easement, and 3) a restoration cost-share agreement. The WRP was re-authorized in the Farm Security and Rural Investment Act of 2002 (Farm Bill). The Natural Resources Conservation Service administers the program (*See Also: Food Security Act of 1985*).

**Wilderness Act of 1964 (16 U.S.C. 1131):** The purpose of this act is to preserve and protect wild lands in their natural condition “...to secure for the American people of present and future generations the benefits of an enduring resource of wilderness.” This directed Federal agencies such as the U.S. Fish and Wildlife Service to survey their roadless lands for possible wilderness designation. Wilderness areas are protected from development and the operation of motorized equipment. A Wilderness Area is defined as an area with at least 5,000 acres of undisturbed, undeveloped land affected by the forces of nature and may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

**Wildlife-dependent Recreation, General Guidelines (Service Manual 605 FW1):** This provides Service policies, strategies, and requirements concerning the management of

wildlife-dependent recreation programs within the Refuge System (*See also Section 3.10 of this CCP*). Subsequent chapters (e.g., Service Manual 605 FW2 - Hunting and Service Manual 605 FW3 - Fishing) outline specific Service policy on these priority public uses of the Refuge System.

\* *U.S. Fish and Wildlife Service policies are available online at: <http://www.fws.gov/policy/>*

## G. Intra-Service Section 7 (Endangered Species) Consultation

### INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

[*Note: This form provides the outline of information needed for intra-Service consultation. If additional space is needed, attach additional sheets, or set up this form to accommodate your responses.*]

Originating Person: Manuel Perez III, Refuge Manager

Telephone Number: 956-748-3607

Date: August 3, 2009

Cons. # 21410-2009-I-0320

- I. **Region:** Southwest
- II. **Service Activity (Program):** Implementation of a Comprehensive Conservation Plan (CCP) for Laguna Atascosa National Wildlife Refuge (Refuge), National Wildlife Refuge System.
- III. **Pertinent Species and Habitat:**
- A. **Listed species and/or their critical habitat within the action area:**
- Laguna Atascosa NWR—Cameron and Willacy Counties
- Ocelot – Dense thornbrush habitats including on lomas and along resacas  
Jaguarundi – Dense thornbrush and cordgrass habitats  
Northern Aplomado Falcon - Coastal prairie  
Piping Plover with Critical Habitat (CH), 74 FR 23475-23600 – Beaches, tidal flats, washovers, and marshes  
Brown Pelican - Gulf and bay waters and beaches  
Sea Turtles (five species) - Gulf and bay waters
- B. **Proposed species and/or proposed critical habitat within the action area:**
- None
- C. **Candidate species within the action area:**
- None
- 
- D. **Include species/habitat occurrence on a map:** See attached map.
- IV. **Geographic area or station name and action:** Laguna Atascosa NWR, Rio Hondo, Texas; Comprehensive Conservation Plan Implementation.

**V. Location (attach map):** See attached draft CCP

- A. County and state: Cameron and Willacy Counties, Texas
- B. Latitude and longitude: Laguna Atascosa NWR Headquarters: N 26 13' 42" and W 97 20' 54"
- C. Distance (miles) and direction to nearest town: About 18 miles east of Rio Hondo, TX (Refuge Headquarters)

**VI. Description of proposed action:**

The proposed action is to implement the Comprehensive Conservation Plan (CCP) for Laguna Atascosa NWR over the next 15 years. The CCP is divided into a series of goals, objectives, and strategies that will be implemented throughout the 15-year term of this plan. Specific goals associated with the CCP are to: 1) to protect, conserve, and manage for native wildlife such as endangered species, other Federal trust species, and priority species with an emphasis on Refuge focal species; 2) to protect, restore, enhance, and maintain the ecological integrity and diversity of native habitats with an emphasis on wetlands, brushlands, coastal prairies, and barrier island habitats within the Gulf Coast Ecosystem, while controlling the spread of invasive or exotic plants; and 3) to connect people with nature by providing compatible wildlife-dependent recreation, interpretation and environmental education to a diverse audience by offering quality visitor services and facilities with an emphasis on reaching local residents. Implementation of the CCP is consistent with the goals of the Refuge, the Refuge System, and ecosystem and other landscape-level plans and initiatives.

The overall management of the Refuge will focus on protecting and restoring native habitats; protecting and providing habitat for waterfowl, migratory birds, Federally-listed species, and providing increased opportunities for public use, environmental education, and interpretation. Based on an ecosystem approach, the wildlife and habitat goals and objectives focus more on providing viable and healthy habitats whereby wildlife can naturally flourish. For detailed descriptions of CCP goals and proposed actions (objectives and strategies), please refer to Chapter 4 (Management Direction) in the attached draft CCP.

**VII. Determination of Effects:**

- A. Explanation of effects of the action on species and critical habitat in item III A (attach additional pages as needed):

Wildlife and Habitat Actions

Federally-listed species which breed or seasonally utilize the Refuge's habitats are the ocelot, jaguarundi, northern aplomado falcon, brown pelican, piping plover, and sea turtles (i.e., Kemp's ridley, green, hawksbill, loggerhead, and leatherback sea turtles). Specific activities of the CCP which may affect these listed species include:

prescribed burning, native brush restoration, maintaining and restoring wetlands for waterfowl and other waterbirds, and invasive species management. Invasive species management includes direct control of feral hogs (*Sus scrofa*) and nilgai antelope (*Boselaphus tragocamelus*) and control treatments of invasive plants such as guineagrass (*Panicum maximum*), buffelgrass (*Pennisetum ciliare*), saltcedar (*Tamarix spp.*), and Brazilian peppertree (*Schinus terebinthifolius*), using prescribed fire and chemical and mechanical treatments. Feral hogs are an invasive species found on the Refuge that damage fragile wetland resources and are predators to native wildlife. Nilgai antelope, a native of India and Pakistan, are an exotic species on the Refuge. Their populations have increased recently and they compete with native species such as white-tailed deer for food. Both of these species require aggressive and continuing control efforts such as public hunts, hog trapping, and selective shooting. For more information on CCP objectives and strategies related to all proposed habitat management activities, please see Goal 2 in Chapter 4 of the CCP.

With respect to the ocelot, the CCP proposes several objectives to help meet recovery plan goals for downlisting from endangered to threatened status. For the most part, these objectives follow with established recovery plans, both current and future. The six priority recovery actions proposed in the CCP for the Refuge are: 1) addressing the potentially deleterious effects of small population size, population isolation, and loss of genetic diversity in the Cameron County ocelot population; 2) protecting existing ocelot habitat and minimizing habitat loss on and in the vicinity of the Refuge; 3) restoring, connecting, and increasing the availability of ocelot habitat; 4) continuing the long-term monitoring and research of ocelots; 5) increasing water availability during times of drought; and 6) reducing the risk of ocelot road mortalities. Some of the specific strategies in the CCP for ocelot conservation include the establishment of several wildlife corridors to connect ocelot populations and various Refuge tracts. In addition, there are efforts proposed to translocate ocelots or "genetic material" from the State of Tamaulipas, Mexico to address the genetic diversity issues of ocelot populations in the U.S. Please see Wildlife Objectives 1 and 2 and Habitat Objectives 1, 4, and 7 in Chapter 4 of the CCP for more detail on proposed actions affecting this species.

The endangered jaguarundi has not been verified in South Texas in more than 20 years. The last verified specimen was a road-killed individual in Cameron County in 1986, along State Highway 4, just east of Keller's corner (intersection of FM 1419 and State Highway 4). Since then, there have been numerous unconfirmed sightings in or near the Refuge and at Sabal Palm Grove Sanctuary, near Brownsville. The CCP proposes to determine the status of the jaguarundi by investigating all credible jaguarundi reports and to conduct trapping and surveillance on the Refuge specifically for jaguarundi, based on trapping information gained in Mexico. Trapped cats may be radio-collared (similar to ocelots) to determine habitat use, movements, and reproduction. Please see Wildlife Objective 3 in the CCP for more specific details.

With respect to sea turtles, the Refuge contributes to recovery plan tasks primarily through monitoring nesting and stranding, patrolling beaches, moving eggs to protected corrals, participating in recovery work groups, and partnering with organizations and agencies such as Sea Turtle, Inc., and Padre Island National Seashore. Nest monitoring includes all-terrain vehicle (ATV) beach patrols on the

South Padre Island Unit from April through July, which corresponds with the primary nesting season of the Kemp's ridley. The Refuge participates in the Sea Turtle Stranding and Salvage Network, as recommended in recovery plans. The CCP proposes to continue protection of nesting sea turtles through patrols and moving eggs to a protective corral and to use sea turtle hatchling releases as public outreach events to raise awareness of sea turtle conservation efforts and the importance of the Refuge to these efforts. The CCP proposes to investigate and identify sea turtle nesting "hotspots" during sea turtle monitoring to designate these areas for special protection. These areas would be protected through seasonal closures, if feasible, with posted signs; increased patrols of these areas; and by posting public informational signs to encourage reporting of nesting sea turtles in these areas.

With respect to the northern aplomado falcon, releases of aplomado falcons on the Refuge were conducted from 1993 up until 2003. Today, aplomado falcons nest on the Refuge (Laguna Atascosa, Coastal Corridor, and Bahia Grande units) and will continue to be monitored on Laguna Atascosa NWR, as part of this CCP. Specific actions proposed in the CCP are to partner with others such as The Peregrine Fund to monitor the population and protect nesting areas. Please see Wildlife Objective 6 in Chapter 4 of the CCP.

Piping plovers primarily occur on the beaches and bays on the Refuge from mid-September through mid-March. The piping plover typically occurs on South Padre Island along the beaches or washover areas, but also occurs on the Laguna Atascosa and Bahia Grande Units. The CCP proposes protective measures that include limiting public uses to designated areas and seasons to avoid disturbing piping plovers as well as other sensitive shorebirds by: 1) identifying and marking beach-to-bay access routes for off-road vehicles; and 2) reducing human disturbance and adverse impacts to plover habitats. This will be accomplished through increased law enforcement patrols, additional signage, educational outreach, and partnerships consistent with the Texas Open Beaches Act (beachfront habitat).

The brown pelican occurs on South Padre Island and in the bay waters and marshes of the Lower Laguna Madre coastline. The CCP includes general objectives and strategies to protect this species from disturbance and harm. The Refuge will support management and conservation actions, as described in other federal or state plans for this species (e.g., recovery plans, Texas Comprehensive Wildlife Conservation Strategy).

For additional information on CCP objectives and strategies related to all activities that may potentially affect federally-listed species on or near the Refuge, please see all objectives and strategies within Chapter 4 of the CCP.

#### Wildlife-dependent Recreational Actions

The CCP proposes improving hunting and fishing opportunities. For example, under hunting and fishing opportunities, the CCP proposes to evaluate the compatibility of developing a hunt program on the Bahia Grande Unit and to determine the compatibility of allowing seasonal wade fishing access (e.g., Memorial Day to Labor Day) to the Laguna Madre from the Bayside Wildlife Drive in Management Unit 7, including any additional infrastructure (e.g., parking areas and access points). The

CCP also proposes providing guided canoe/kayak tours on the Laguna Atascosa and Bahia Grande Units, improving outreach, and establishing additional partnerships.

Infrastructure and Public Access Actions

The CCP proposes to improve visitor use facilities and infrastructure. For example, approximately six miles of hike/bike trails, an auto tour route, a visitor contact station, and two parking areas are proposed for the Bahia Grande Unit. In addition, a new visitor center is envisioned near the Laguna Atascosa Unit headquarters area.

B. Explanation of actions to be implemented to reduce adverse effects:

All proposed actions outlined above and described in the CCP which may affect listed species will be individually submitted to the Corpus Christi Ecological Services Field Office (ESFO) for compliance with the Endangered Species Act. As a working document, modifications to the objectives and strategies are anticipated. If modifications result in changes to the effects analysis, or include actions that are not considered in this document, the Refuge will re-initiate consultation or consult with the Corpus Christi ESFO over any proposed actions that may affect federally-listed species and/or critical habitat.

**VIII. Effect determination and response requested: [\* = optional]**

A. Listed species/designated critical habitat:

<u>Determination</u>	<u>Response Requested</u>
No effect on species/critical habitat (species: none)	_____ *Concurrence
May affect, is not likely to adversely affect species /critical habitat (species: <u>Ocelot, Jaguarundi, Northern Aplomado Falcon, Brown Pelican, Piping Plover w/CH, and Kemp's ridley, Green, Loggerhead, Hawksbill, Leatherback Sea Turtles)</u>	_____ <b>X</b> Concurrence
May affect, is likely to adversely affect species /critical habitat (species: n/a)	_____ Formal Consultation

B. Proposed species/proposed critical habitat:

<u>Determination</u>	<u>Response Requested</u>
No effect on proposed species/critical habitat (species: <u>none</u> )	_____ *Concurrence
Is not likely to jeopardize proposed species/ adversely modify proposed critical habitat (species: n/a)	_____ Concurrence
Is likely to jeopardize proposed species/ adversely modify proposed critical habitat (species: n/a)	_____ Conference

C. Candidate species:

<u>Determination</u>	<u>Response Requested</u>
No effect on candidate species (species: <u>none</u> )	_____ *Concurrence
Is not likely to jeopardize candidate species (species: n/a)	_____ Concurrence
Is likely to jeopardize candidate species (species: n/a)	_____ Conference

/s/ Manuel Perez III

8/3/2009

\_\_\_\_\_  
Signature  
[Title/office of supervisor at originating office]

\_\_\_\_\_  
Date

IX. Reviewing ESFO Evaluations:

- A. Concurrence:   X   Nonconcurrency: \_\_\_\_\_
- B. Formal consultation required: \_\_\_\_\_
- C. Conference required \_\_\_\_\_
- D. Informal conference required \_\_\_\_\_
- E. Remarks (attach additional pages as needed):

S. Dawn Whitehead  
Acting Field Supervisor  
Signature  
[Title/office of reviewing official]

9-1-09  
Date

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## H. Public Involvement – Response to Comments

This appendix identifies public comments received on the Laguna Atascosa National Wildlife Refuge Draft Comprehensive Conservation Plan (Draft Plan) and Environmental Assessment (EA) and the U.S. Fish and Wildlife Service’s response to those comments.

The Notice of Availability for the Draft Plan/EA was published in the Federal Register on December 14, 2009 (Volume 74, Number 238, pp.66148-66150). The public comment period was open for sixty (60) days and closed on February 12, 2010. The Service received eighty-eight (88) responses – including letters and comments made during four (4) public open house meetings. All responses were analyzed using a process called content analysis. Content analysis organizes and groups comments made during the public comment period to reflect different resource issues. A number of issues were identified in the public’s response to the Draft Plan/EA. Respondents were self-selected (i.e., they voluntarily provided comments); therefore, their comments do not necessarily represent the sentiments of the public as a whole.

### Habitat

1. There is too much emphasis on ocelots in the plan and not enough focus on raptors, such as the aplomado falcon. Native grass habitat needs are also not addressed enough.

*Response:* The ocelot is a major focus of habitat protection and preservation because the species is declining precipitously and may be on the brink of extinction in the United States. The Laguna Atascosa NWR is at the center for ocelot recovery in the United States. The Aplomado Falcon Recovery Plan developed in 1990 is currently being implemented, and programs to re-establish the species were deemed a success in the LRGV. To maintain that momentum toward greater sustainability, enhancement, and protection of native grass habitats are addressed in the following objectives:

- Habitat Objective 2, Strategy 2; Monitor grassland restoration and maintenance annually in areas treated with prescribed fire or other practices and adjust management techniques, as necessary, consistent with an approved HMP.
  - Habitat Objective 4, Strategy 3; Manage Gulf cordgrass habitat with a fire management program that utilizes both prescribed fire and wildlife to enhance mottled duck nesting habitat and to create green forage for migratory waterfowl and sandhill cranes.
  - Habitat Objective 7, Strategy 1; Pursue wildlife habitat land acquisition. Seek to acquire from willing sellers, and contingent upon Congressional funding, lands that contain high quality or restorable habitats.
  - Wildlife Objective 6 (all strategies in this objective and Strategy 10 specifically); Identify and rank potential habitat and land protection specific to aplomado falcons to provide additional protected habitat (e.g., coastal prairie and savannah).
2. Adopt a policy of “no net loss” of grasslands and savannahs. Restore grasslands and savannahs. Control brush.

*Response:* Brush control is accomplished through fire management, as prescribed in Section 3.7, Fire Management, for the benefit of grassland species, including the aplomado falcon. Please refer to:

- Section 2.4, Other Plans and Initiatives Relevant to CCP Planning, page 2-16 (Federally-listed Species' Recovery Plans): "The Aplomado Falcon Recovery Plan (USFWS 1990b) states that "...suitable habitat in the United States and Mexico should be identified and protected, especially in areas close to reintroduction sites." Additionally, "Particular attention should be directed toward suitable habitat on public lands." Other elements of the recovery plan emphasize a reintroduction program to establish populations in the United States. The criteria for down listing the aplomado to threatened is when "...a minimum self-sustaining population of 60 breeding pairs has been established in the United States." In partnership with the Peregrine Fund, a non-profit conservation group based in Boise, Idaho, the first major aplomado falcon releases began in 1993 on the Refuge. The Refuge contains some of the best coastal prairie and savannah habitat for this species, particularly the Bahia Grande Unit. As of 2004, over 900 falcons have been released in the LRGV, and 25 nesting pairs were documented in 2006. The release program in the LRGV and on the Refuge was deemed a success, and efforts have now shifted to West Texas and New Mexico. Monitoring of aplomado falcons continues on the Refuge in order to document nesting and fledgling success and to monitor contaminant levels. Prescribed fire is used to manage for healthy grassland habitat that would benefit the aplomado falcon."
  - Section 3.2.6, Federally-listed Species, page 3-12: "Prescribed fire is used to manage for healthy grassland habitat that would benefit the aplomado falcon."
  - Section 3.7, page 3-21: "Prescribed fire is used at Laguna Atascosa to reduce hazardous fuel loads and fire risk, and to maintain and restore native functioning prairie and marshland ecosystems."
  - Habitat Objective 4, Strategy 5 (page 4-18): "Use prescribed fire, or other treatments, to reduce brush encroachment into grassland areas and to help manage grassland habitat to increase population densities of rodents and other prey to benefit species such as the aplomado falcon, white-tailed kite, and other avian predators."
  - Habitat Objective 5, Strategy 8 (page 4-19): "Use prescribed and wild land fire to maintain and restore coastal prairie communities at four- to seven-year fire frequencies to enhance native species abundance and landscape diversity, and to reduce non-native invasive species."
3. Strategy 5 specifies fire to control brush encroachment, but gives no details about where or under what conditions.

*Response:* Detailed plans and procedures for fire management are specified in the Fire Management Plan for the South Texas Refuges Complex and the Prescribed Fire Plan for the Laguna Atascosa NWR. Please refer to Section 5.2, Step-down Plans, page 5-5: "Fire management objectives include efforts to protect from fire all important scientific, cultural, historic, and prehistoric sites; visitor facilities, administrative sites

and Refuge housing; restore and perpetuate habitat important to migratory and native wildlife species by maintaining a diversity of plant communities; prevent human-caused wildfires; and educate the public regarding the role of prescribed fire within the STRC. The STRC FMP was completed in 2009 and incorporates elements of Laguna's FMP, completed in 1988.”

4. Acquire more land under a Habitat Conservation Plan.

*Response:* Land acquisition is accomplished through the Refuge Expansion Plan, approved in 1999. A Habitat Management Plan is in draft form and may include management for any newly acquired lands, but will not include acquisition of new Refuge lands per se.

5. I support designating critical habitat for the Refuge's threatened and endangered (T&E) species to guard against oil and gas activities, roads, and agriculture.

*Response:* Critical habitat designation is outside the scope of this plan and is done through the Fish and Wildlife Service's Ecological Services (ES) office. ES is responsible for implementation of the Endangered Species Act (ESA). The Refuge staff has forwarded this comment to the Corpus Christi ES office.

6. Dialogue with land owners concerning in-holdings.

*Response:* The Service, including the Refuge staff, will maintain a dialogue with property owners and other interested parties potentially affected by acquisition and management direction. Please refer to the Laguna Atascosa National Wildlife Refuge Expansion Plan, 1999, Section 4.2.7, Land Use.

7. Outline a plan to inventory/monitor climate change-related variables and trends.

*Response:* Please refer to:

- Wildlife Objective 7, Strategy 12 (page 4-10): “Incorporate relevant strategies from the proposed Climate Change Strategic Plan and the associated five-year Action Plan by updating appropriate wildlife management step-down plans, as discussed in Section 5.2 of this CCP.”
- Habitat Objective 7, Strategy 9 (page 4-21): “The Refuge will update or modify existing plans and create new plans. The Refuge will also coordinate with other agencies as it develops a step-down Habitat Management Plan (HMP).”

8. The HMP must be revised to incorporate elements of the Final CCP.

*Response:* The Refuge will update and modify the existing Habitat Management Plan to reflect new policies, plans, and projects.

9. Include better inventory/assessment of water resources to meet goal of protecting, maintaining, restoring freshwater habitats.

*Response:* The Refuge will add a strategy to Habitat Objective 3 to “update and expand the existing Water Management Plan to assess the adequacy and reliability of existing freshwater resources and supplies” and add the word “freshwater” into Habitat Objective 3. Also, please refer to Wildlife Objective 7, Strategy 1 (page 4-9): “Revise the Refuge Inventory and Monitoring Plan to include needed baseline studies, per Service Manual 701 FW2 (e.g., Update the Wildlife Inventory Monitoring step-down plan) to include all focal species (as listed in Sections 3.2.8).”

10. Explain and analyze proposal to provide “guzzlers” at the Refuge; Draft EA does not mention/analyze installing “guzzlers.”

*Response:* The Refuge will determine actual number, location, and usage of “guzzlers” in an updated Ocelot Recovery Plan and Habitat Management Plan, which will be analyzed for environmental impacts. Also, please refer to Wildlife Objective 1, Strategy 4 (page 4-2): “Maintain existing supplemental freshwater sources (e.g., guzzlers and stock tanks) for ocelots during periods of drought. Consult with Ecological Services to determine optimal location and number of any new artificial water sources to sustain population viability. Conduct environmental assessment of any new artificial water sources.”

11. There is no information in the draft plan about Turtle grass.

*Response:* Sea grass restoration in the Bahia Grande may include Turtle grass, as appropriate. Also, please refer to:

- Habitat Objective 3, Strategies 24 and 25 (page 4-17): “Restore sea grass beds in the Bahia Grande tidal wetland system upon completion of the main channel that connects it to Brownsville Ship Channel. 2012; Implement management and protection measures to protect and enhance sea grass habitats per the Sea grass Conservation Plan for Texas as they apply to Laguna Atascosa NWR.”
- The Sea grass Conservation Plan of Texas, page 2-13.

12. Account for effects of climate change on the Refuge and integrate those effects into management goals/strategies; prioritize in EE programs.

*Response:* The effects of climate change on the Refuge are under study at this time. Integrating climate change into environmental education will be conducted in the step-down Interpretation and Education Plan.

13. Supports habitat (land) acquisition and restoration for the ocelot and jaguarondi and sea turtles.

*Response:* Please refer to Habitat Objective 7 (pages 4-19 through 4-21): “Protect and conserve wildlife habitat, particularly tracts that provide connecting links between adjacent Refuge tracts and tracts containing unique or declining habitat, through working closely with the Lower Rio Grande Valley NWR and through partnerships, land protection, and land acquisition.”

14. Supports conservation easements on private land to guarantee expansion of habitat conservation; would like FWS to support more efforts on this.

*Response:* Please refer to Habitat Objective 7, Strategy 7 (pages 4-20 and 4-21): “Continue to develop partnerships for habitat conservation and protection with other Federal agencies, private landowners, communities, and NGOs, such as Environmental Defense, The Nature Conservancy, and The Conservation Fund. Examples include USDA’s SAFE Initiative.”

15. Must better consider and analyze impacts of climate change in Vision, Planning Issues, Refuge Resources.

*Response:* Incorporating the evolving information and decisions related to potential climate change impacts is a relatively recent and ongoing process in Refuge planning. Please refer to:

- Section 2.4, Other Plans and Initiatives Relevant to CCP Planning, page 2-12 (Draft Climate Change Strategic Plan and Five-Year Action Plan, 2008): “Recognizing that climate change is one of the greatest environmental and conservation challenges, the Service began development on a Climate Change Strategic Plan and associated Five-Year Action Plan to consider and address the impacts of climate change on fish and wildlife resources. The Strategic Plan envisions efforts in adaptation, mitigation, and education, and provides flexibility for the Service to respond to evolving science, technology, and implementation experience. Coastal refuges, such as Laguna Atascosa NWR, may be most affected by global environmental trends such as climate change and sea level rise.”
- Habitat Objective 7, Strategies 8 and 9 (page 4-21): “Incorporate relevant strategies from the proposed Climate Change Strategic Plan and the associated five-year Action Plan by updating the Refuge’s Habitat Management Plan (HMP). Coordinate with agencies such as the USGS, NOAA, and others regarding global climate change or sea level rise and its potential effects at Laguna Atascosa NWR for consideration in Refuge management activities.”
- The Refuge supplemented its Vision Statement with following: “The refuge will serve as a resilient source of evolving habitats and ecosystem processes even as structure and composition are altered due to climate changes.”

16. Lack of public information to local ranchers on land acquisition; lack of acknowledgment of private contributions to conservation.

*Response:* Please refer to:

- Habitat Objective 7, Strategies 6-7 (pages 4-20 and 40-21): “Coordinate with the Corpus Christi Ecological Services Field Office and non-governmental organizations (NGOs) such as Environmental Defense, to promote or encourage private landowners to participate in Safe Harbor agreements and other landowner incentive programs. Emphasis will be placed on establishing or protecting wildlife corridors between Refuge tracts and other protected areas

for the benefit of ocelots and other listed species, as necessary; Continue to develop partnerships for habitat conservation and protection with other Federal agencies, private landowners, communities, and NGOs, such as Environmental Defense, The Nature Conservancy, and The Conservation Fund. Examples include USDA’s SAFE Initiative.”

- Section 2.4, Other Plans and Initiatives Relevant to CCP Planning, page 2-4 (Refuge Specific Plans): “Laguna Atascosa NWR Refuge Expansion and Conceptual Management Plan (1999). This plan outlines several alternatives regarding Refuge expansion and includes a Conceptual Management Plan for any lands acquired after 1999. The alternative adopted by the Service outlines a plan to buy additional lands or conservation easements from willing sellers—up to 108,127 acres of land adjacent to or near the existing 45,187-acre Laguna Atascosa NWR, bringing the Refuge’s acquisition goal to 153,314 acres. The acquisition area is limited to eastern Cameron County (around the Laguna Atascosa Unit and on South Padre Island north of Park Road 100) and Willacy County (South Padre Island). (See Figure 5).”
- The Laguna Atascosa Refuge Boundary Expansion Plan, 1999.

## Infrastructure

1. Opposed to the addition of new roads under Alternative B because they are too much of a threat to ocelots, which goes against protecting refuge's natural resources.

*Response:* The EA found no significant impact from constructing new roads in the Bahia Grande unit. However, the Plan does not include building new roads in Bahia Grande, but converting existing service roads to public use trails. The Refuge has clarified Public Use Objective 3, Strategy 12 (page 4-25) in the Final Plan to state "...on existing roads...."

2. Employ one full-time raptor biologist to take care of aplomado falcon and other focal species.

*Response:* The Refuge has modified that staffing table in Chapter 5 (page 5-2) to reflect two biologists (Wildlife), GS-5/7.

3. Work closely with Cameron County Regional Mobility Authority on 2nd Access Project.

*Response:* Please refer to Section 3.10, Public Access and Wildlife-dependent Recreational Uses, page 3-26 (Transportation Management and Public Access): “Refuge transportation infrastructure and related issues will be coordinated with the respective State or county transportation agencies and metropolitan and rural road planning organizations to assure that, among other considerations, there are no negative impacts to traffic congestion or air quality on the Refuge.”

4. Build Park Road 100 to alleviate vehicular traffic on the beachfront.

*Response:* The Refuge does not support building a new paved roadway through Refuge lands on the barrier island. Federal funds cannot be used to build a roadway or other development in the CBRA (Coastal Barrier Resources Act) area.

5. Make provisions for wildlife (ocelots) to cross Highways 100 and 48. Concrete traffic barriers cannot be crossed easily; use cables?

*Response:* There are existing wildlife crossings in these corridors. Also, please refer to:

- Wildlife Objective 1, Strategy 9 (page 4-2): “Partner with TXDOT and Cameron, Hidalgo, and Willacy counties to install road crossings, fencing, and warning signs at locations where ocelot road mortalities have been documented to help reduce the risk of mortality.”

6. Need signage at Bahia Madre along Highway 48; advisory board explaining why lands are closed. Need trails/overlooks to view restoration project.

*Response:* Please refer to People Objective 3, Strategies 10-12 (pages 4-24 and 4-25): “Develop an informational kiosk, boardwalk, observation deck and tower, and canoe and/or kayak launch site adjacent to the TXDOT parking area along SH 48, bordering the Bahia Grande Unit in partnership with TXDOT and others. Establish a visitor contact station and wildlife drive on the Bahia Grande Unit by 2015; establish a minimum of four hike-and-bike trails, including paved parking lot and informational kiosk, at select access points off of SH 48 and SH 100 on the Bahia Grande Unit by 2012.”

### Public Use Opportunities

1. Favor setting date for archery hunt from Saturday to Saturday.

*Response:* Decisions on hunt dates to be made annually by Refuge Manager based on other management activities, needs, and resources. Also, please refer to People Objective 1, Strategy 1 (page 4-22): “Revise the hunting plan as part of the Visitor Services Plan by 2011.”

2. Offer hog hunts after other hunts are finished for the year.

*Response:* Hog hunts will be addressed in the step-down Visitor Services Plan, Hunting Chapter. Also, please refer to People Objective 1, Strategy 4 (page 4-22): “Determine the feasibility of developing a big game hunting program (e.g., nilgai antelope and feral hogs) on the Bahia Grande Unit by 2011.”

3. Increase public access areas; accessible fishing areas by foot (not only by boat); wants a kayak trail and launch from the Lower Laguna Madre even if have to pay small fee.

*Response:* Please refer to:

- Fishing, People Objective 2, Strategies 2 through 5 (page 4-23): “Evaluate the Adolph Thomae Jr. County Park Cooperative Management Agreement, which is set to expire in 2011, if requested by Cameron County for the continuation of

public fishing and boating access at the park by 2011. An appropriate use finding and compatibility determination will be conducted at that time; Determine the feasibility of allowing seasonal wade-fishing access (e.g., Memorial Day to Labor Day) to the Laguna Madre from the Bayside Wildlife Drive in Management Unit 7, including any additional infrastructure (e.g., parking areas and access points) by 2011; Determine the feasibility of allowing wade-fishing and non-motorized watercraft (e.g., canoe and kayak) on the Bahia Grande off SH 48, including the addition of parking areas and a fishing and boat access pier by 2012; Enhance fishing access opportunities at San Martin Lake along SH 48 in partnership with TXDOT and TPWD to provide better parking and other infrastructure by 2012.”

- Section 3.10.2, Fishing, pages 3-29 and 3-30: “Saltwater fishing is the most popular wildlife-dependent recreational activity, particularly by local residents in the LRGV. Freshwater fishing areas are limited in the Valley, and those areas open to public fishing (e.g., irrigation canals, water settling ponds) have water quality issues that may limit human consumption of fish caught in these areas. Surf-fishing, wade-fishing, bank-fishing, and fishing from boats are popular methods of fishing in the Valley. Common saltwater species pursued are red drum (redfish), sea trout, and flounder. Fishing opportunities on the Refuge are currently available at Adolph Thomae Jr. County Park (Laguna Atascosa Unit), along the Gulf beaches (South Padre Island Unit), and at San Martin Lake (Bahia Grande Unit). Boating and fishing is available along the Harlingen Ship Channel at Adolph Thomae Jr. County Park and at San Martin Lake, which are both situated within the Refuge boundary. The rest of the Refuge is not currently open to boating or fishing.”
4. Hunting, Strategy 1, set an opening date so that people can plan; recommend Saturday to Saturday to ensure two weekends.

*Response:* Hunting dates set by the Refuge Manager approximately eight months prior to hunting season. Decisions on hunt dates will be made annually by Refuge Manager based on other management activities, needs, and resources. Also, please refer to People Objective 1, Strategy 1 (page 4-22): “Revise the hunting plan as part of the Visitor Services Plan by 2011.”

5. Hunting, Strategy 4, get rid of pigs; they destroy habitat.

*Response:* Please refer to People Objective 1, Strategy 1 (page 4-22): “Revise the hunting plan as part of the Visitor Services Plan by 2011.”

6. Hunting, Strategy 7, ensure no ATV usage.

*Response:* Any on- or off-road vehicle access to Refuge hunting areas will be addressed in the step-down Visitor Services Plan, to be developed by 2011.

7. Hunting, Strategy 6, discriminates in favor of people who have boats; no land access.

*Response:* There are no plans for road access to Unit 4. Boat access will continue to be the only method of accessing Unit 4 for hunting.

8. Hunting, Strategy 5, no quail hunting because shotgun use will spook deer for deer hunting.

*Response:* There is no quail hunting on the Refuge. All hunting will be addressed by the step-down Visitor Services Plan in 2011.

9. Open Unit 4 and Bahia Grande to hunters.

*Response:* Please refer to:

- People Objective 1, Strategies 2 through 4 and 6 (page 4-22): “Determine the feasibility of developing a migratory bird hunting program (e.g., waterfowl and doves); an upland game bird hunting program (e.g., quail); and a big game hunting program (e.g., nilgai antelope and feral hogs) on the Bahia Grande Unit by 2011. Determine the feasibility of opening Management Unit 4 (area north of the Harlingen Ship Channel) to big game hunting and to waterfowl hunting on the Laguna Atascosa Unit by 2011.”
- Hunting will be determined in detail in the step-down Visitor Services Plan, to be completed in 2011.

10. Not in favor of crossbows during archery season; favor opening Bahia Grande; favor opening Unit 4 to boat access.

*Response:* Crossbows are not permitted, except by special use permit for disabled hunters.

11. Archery hunts Saturday to Saturday; second archery hunt first come-first served; open Unit 4 to archery hunting only.

*Response:* Second archery hunt will be first-come, first-served. Also, please refer to People Objective 1, Strategy 6 (page 4-22): “Determine the feasibility of opening Management Unit 4 (area north of the Harlingen Ship Channel) to big game hunting and to waterfowl hunting on the Laguna Atascosa Unit by 2011.”

12. Not in favor of crossbows during archery season; favor opening Bahia Grande; favor opening Unit 4 to boat access.

*Response:* Please refer to People Objective 1, Strategy 6 (page 4-22): “Determine the feasibility of opening Management Unit 4 (area north of the Harlingen Ship Channel) to big game hunting and to waterfowl hunting on the Laguna Atascosa Unit by 2011.”

13. Open banks of Plover Point and Redhead Ridge to duck hunters. Vehicle access through refuge and park to get to banks.

*Response:* These areas are to remain closed to hunting due to public use opportunities. Waterfowl hunting is permitted in Laguna Madre in the water or by boat, but not on the banks.

14. Not in favor of crossbows as substitute for compound archery. Require archery qualification for hunters.

*Response:* There are no federal or state policies or standards for archery or firearms qualification to hunt on the Refuge.

15. Make duck hunts available on refuge ponds and lakes, along banks of Plover Point & Redhead Ridge. Offer more to sportsmen.

*Response:* Please refer to People Objective 1 (pages 4-21 and 4-22): “Annually evaluate the hunting program on the Laguna Atascosa Unit to enhance hunting access and opportunities for a safe, quality hunting experience for diverse audiences, and develop hunting opportunities, as compatible, for other Refuge units.”

16. Visitors should be allowed to carry concealed handguns on refuge to kill wounded game during hunting.

*Response:* As of February 22, 2010, visitors are allowed to *possess* firearms on National Wildlife Refuges provided they comply with applicable provisions of Federal, State, and local law. Persons with firearm “carry” permits will be able to possess firearms on a refuge in accordance with the provisions of the state issued permit. While the law changed the application of rules regarding possession of firearms, it has no impact on the authorized *uses* of firearms on National Wildlife Refuges. The law does not allow visitors to fire or discharge the firearms in any way, brandish the weapon in the view of others, or any other use of the firearm. Enforcement of regulations concerning firearms use remains under the purview of the Department of the Interior. Hunting, trapping, and fishing are considered to be a legitimate, traditional recreational and wildlife management use of renewable natural resources on refuges. However, this new law does not change or expand hunting opportunities on national wildlife refuges or exempt hunters from state or federal hunting regulations.

17. Hunting for deer, nilgai, and feral hogs is okay as long as hunting benefits management and outweighs disturbance.

*Response:* Please refer to People Objective 1, Strategy 1 (page 4-22): “Revise the hunting plan as part of the Visitor Services Plan by 2011.”

18. Only supports the addition of new trails if they are created in areas not potentially suitable for ocelots, jaguarondis, and other federally-listed species.

*Response:* Hiking and biking would occur in Bahia Grande on existing unimproved roads. Also, please refer to:

- People Objective 3, Strategies 6 and 12 (pages 4-24 and 4-25): “Complete the back-country hike-and-bike trail system to include informational kiosks along

the trails and a leaflet describing wildlife observation opportunities. 2010; Establish a minimum of four hike-and-bike trails, including paved parking lot and informational kiosk, at select access points off of SH 48 and SH 100 on the Bahia Grande Unit by 2012.”

- Appendix G, Intra-service Section 7 (Endangered Species) Consultation: the Section 7 consultation with our Ecological Services Field Office in Corpus Christi determined that there are no significant impacts to threatened and/or endangered species by the actions in this Plan.

19. Deny access to Paisano and Moranco Blanco hiking/biking trails; deny access to Bahia Grande until aquatic ecosystem is stable.

*Response:* Bicycle opportunities will be addressed in the step-down Visitor Services Plan in 2011.

20. Archery hunts Saturday to Saturday; open new duck and dove hunts; favor hunting in Bahia Grande; not in favor of crossbow hunting; favor opening Unit 4 to hunts.

*Response:* Please refer to People Objective 1, Strategies 2 and 5 (page 4-22): “Determine the feasibility of developing a migratory bird hunting program (e.g., waterfowl and doves) on the Bahia Grande Unit by 2011; Determine the feasibility of developing a migratory bird hunting program (i.e., doves only) and an upland game bird hunting program (e.g., quail) on the Laguna Atascosa Unit by 2011.”

21. Hunters violating rules: not being courteous to other hunters; not complying with check out policy for harvesting game.

*Response:* Proposed future staffing on page 5-2 include several new law enforcement positions on the Refuge to, in part, increase compliance with hunting regulations. Also please refer to People Objective 2, Strategy 9 (Section, page): “Increase LE presence on the Refuge to prevent poaching and illegal fishing in partnership with the Law Enforcement (LE) Division of the Texas Parks and Wildlife Department (TPWD).”

22. The Strategic Habitat Conservation approach is not wholly utilized in the case of the Falcon and other prairie obligates such as the Texas Botteri's sparrow.

*Response:* Please refer to:

- Sections 2.1 through 2.4 in the Plan.
- The main way that the SHC approach is incorporated into the Plan is in the way that the Planning Team identified the Refuge focal species, which includes the aplomado falcon as referred to in Section 3.2.8.
- Section 3.2.7, Refuge Priority Species, page 3-16 (Texas Botteri's sparrow): “The Texas Botteri's sparrow is a Texas-threatened species of subtropical grasslands whose breeding range is limited to South Texas. Preferred nesting habitat includes tall bunchgrasses with scattered bushes or fence posts for perching. The Refuge provides important coastal grassland habitat for this species and

other grassland-dependent species. Although they are secretive, like many grassland species, the Botteri's sparrow has experienced significant declines due to the conversion of grassland habitats to farm fields and urban developments.”

## Wildlife

1. Disagrees with the Refuge's main focus being the Ocelot; in favor of more attention to the recovery of the northern aplomado falcon; falcon should be mentioned in 1-7, Section 4 linking Laguna as a refuge of endangered species along with the ocelot.

*Response:* LANWR is the Service-designated lead recovery station for the ocelot. The text on page 1-7 is referring to those stations that have lead recovery for other endangered species. Aplomado falcon is a Refuge focal species. (See Refuge purpose, page 2-15). The ocelot is a major focus of habitat protection and preservation because the species is declining precipitously and may be on the brink of extinction in the United States. The Laguna Atascosa NWR is at the center for ocelot recovery in the United States. The Aplomado Falcon Recovery Plan developed in 1990 is currently being implemented, and programs to re-establish the species were deemed a success in the LRGV. To maintain that momentum toward greater sustainability, enhancement and protection of native grass habitats are addressed in the following objectives:

- Habitat Objective 2, Strategy 2; Monitor grassland restoration and maintenance annually in areas treated with prescribed fire or other practices and adjust management techniques, as necessary, consistent with an approved HMP.
  - Habitat Objective 4, Strategy 3; Manage Gulf cordgrass habitat with a fire management program that utilizes both prescribed fire and wildlife to enhance mottled duck nesting habitat and to create green forage for migratory waterfowl and sandhill cranes.
  - Habitat Objective 7, Strategy 1; Pursue wildlife habitat land acquisition. Seek to acquire from willing sellers, and contingent upon Congressional funding, lands that contain high quality or restorable habitats.
  - Wildlife Objective 6 (all strategies in this objective and Strategy 10 specifically); Identify and rank potential habitat and land protection specific to aplomado falcons to provide additional protected habitat (e.g., coastal prairie and savannah).
2. Should be information and management for Bottlenose Dolphins, since they inhabit areas around the Laguna Madre.

*Response:* Bottlenose Dolphins are addressed under partnerships for management of marine mammals who have jurisdiction over dolphin habitat, including the National Marine Fisheries within the National Oceanographic and Atmospheric Administration (NOAA) and the Coastal Studies Lab. Additionally, the Texas General Land Office leads several agencies, including the U.S. Fish and Wildlife Service, on coordination efforts to implement the Oil Spill Response Plan.

3. There are mollusks on the shoreline, but I don't see any reference to them in the draft plan/EA.

*Response:* The Refuge's protection of habitats has the side benefit of protecting mollusks as well as other marine biota. Also, please refer to:

- Section 3.1.1, Wetlands, page 3-2: "The largest wetland feature on the Refuge is the expansive estuarine system along the lower Laguna Madre boundaries. Water regimes are affected by tides, rainfall, freshwater runoff, evaporation, and wind, which create the unique hyper saline conditions found in the Laguna Madre. These conditions have created a rich resource of fish, shellfish, algal mats, bird colonies, migratory bird wintering and staging areas, and sea grass beds. Thus, it is one of the most productive estuarine systems in the United States (Jones 1999)."
- Habitat Objective 6, Strategy 3 (page 4-19): "Identify information gaps regarding distribution and abundance of flora and fauna, particularly on Bahia Grande and South Padre Island Units."

4. There is no information in the draft plan about the Mangrove Warbler.

*Response:* The Mangrove Warbler may have been seen in Cameron County, but has not been recorded on the Refuge. It is added to Appendix A, Refuge Biota, Section A.1, Birds of Laguna Atascosa NWR, under the category "Hypothetical Birds."

5. EA should consider an alternative that emphasizes T&E species; Disagrees with "current and proposed management actions include sufficient measures to ensure that these species are adequately addressed..." EA p. 8

- *Response:* The alternative that emphasizes threatened and endangered (T&E) species was considered, but eliminated from further analysis. Please refer to page 8 of the Draft Environmental Assessment: "The Refuge considered concentrating all efforts and resources on maintaining and enhancing the specific habitats required by endangered or threatened species. Although the Refuge provides resident, wintering, migratory, and nesting habitat for rare or declining species, including federally-listed (threatened or endangered) species, this proposed alternative was not analyzed in detail because current and proposed management actions include sufficient measures to ensure that these species are adequately addressed. In addition, it is the Service's responsibility to conserve and protect threatened and endangered species regardless of which alternative is implemented."

6. Add more information in CCP about the aplomado falcon re-introduction on Laguna; information about the migrating peregrine falcons and South Padre Island as an important wintering area for tundra peregrine falcons.

*Response:* Please refer to:

- Section 2.4, Other Plans and Initiatives Relevant to CCP Planning, pages 2-15 and 2-16 (Federally-listed Species Recovery Plans, Aplomado Falcon, 1990):

“The Aplomado Falcon Recovery Plan (USFWS 1990b) states that “...suitable habitat in the United States and Mexico should be identified and protected, especially in areas close to reintroduction sites.” Additionally, “Particular attention should be directed toward suitable habitat on public lands.” Other elements of the recovery plan emphasize a reintroduction program to establish populations in the United States. The criteria for down-listing the aplomado to threatened is when “...a minimum self-sustaining population of 60 breeding pairs has been established in the United States.” In partnership with the Peregrine Fund, a non-profit conservation group based in Boise, Idaho, the first major aplomado falcon releases began in 1993 on the Refuge. The Refuge contains some of the best coastal prairie and savannah habitat for this species, particularly the Bahia Grande Unit. As of 2004, over 900 falcons have been released in the LRGV, and 25 nesting pairs were documented in 2006. The release program in the LRGV and on the Refuge was deemed a success, and efforts have now shifted to West Texas and New Mexico. Monitoring of aplomado falcons continues on the Refuge in order to document nesting and fledgling success and to monitor contaminant levels. Prescribed fire is used to manage for healthy grassland habitat that would benefit the aplomado falcon.”

- Section 3.2.2, Birds, page 3-6: “In 1993, the aplomado falcon re-introduction program began with the first large-scale releases occurring on the Laguna Atascosa Unit. The Refuge’s coastal prairie, savannah, and marshes offer some of the best aplomado falcon habitat. The re-introduction in South Texas has been deemed a success, and pairs of released birds and their offspring regularly nest and reside on the Bahia Grande and Laguna Atascosa units. Padre Island is also well-known for hosting large concentrations of fall and spring migrating peregrine falcons (Hunt *et al.* 1975, Earthspan 2003). It is an internationally important staging area for these falcons.”
- Section 3.2.6, Federally-listed Species, pages 3-11: “Today, the aplomado falcon has made a comeback in south Texas due to an aggressive recovery program involving captive breeding and re-introduction efforts. In 1993, releases began on the Laguna Atascosa Unit in partnership with The Peregrine Fund, a non-profit conservation group based in Boise, Idaho. In 1995, the first known United States nest of an aplomado falcon since 1952 was documented near Old Port Isabel Road and Loma Alta, a few miles southwest of the Bahia Grande Unit. As of 2004, over 900 falcons have been released in the LRGV, and 25 nesting pairs were documented in 2006. The release program in the LRGV was deemed a success, and efforts have now shifted to West Texas and New Mexico. Established territories and nesting have been annually documented in recent years on both the Bahia Grande and Laguna Atascosa units, and monitoring of aplomado falcons continues on the Refuge to document nesting and fledgling success and to monitor contaminant levels. Prescribed fire is used to manage for healthy grassland habitat that would benefit the aplomado falcon.”
- Section 3.2.7, Refuge Priority Species, page 3-16: “The arctic peregrine falcon is a medium-size raptor that breeds in the arctic tundra and winters in South America. South Padre Island is a major staging area for arctic peregrines moving southward and northward along the Texas coast. Peregrines may be seen on the South Padre Island Unit in early October through November and

again in April through May. Although this species (formerly endangered) was de-listed in 1994 (59 FR 50796), the Refuge will continue to protect important habitats for this species. According to Hunt and Ward (1988), the majority of spring migrant peregrine falcons were found in the dune areas and wind-tidal flat portions of South Padre Island.”

- Additional information on falcon reintroduction can be found at The Peregrine Fund website: <http://www.peregrinefund.org>.

7. Use only non-toxic/non-lead ammo to control invasive fauna (feral hogs, nilgai).

*Response:* Service policy requires nontoxic shot for upland birds and waterfowl. The caliber of projectiles used for hunting feral hogs and nilgai is too large and in low numbers to pose a threat to ingestion by raptors and their prey.

8. Under Wildlife Objective 6, strategies should include: bird surveys on population dynamics, outreach to support tree yucca savannahs for Falcons, unit specific habitat issues such as mesquite/huisache encroachment, identification of habitat acquisition on west side of LANWR.

*Response:* The Refuge is implementing the Aplomado Falcon Recovery Plan. Recommendations will be forwarded to our Ecological Services Office, who has responsibility for developing recovery plans, for consideration. Also, please refer to:

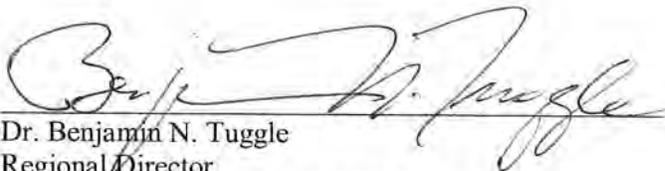
- Please refer to Wildlife Objective 6, Strategies 2, 3, and 7; Partner with The Peregrine Fund and others to monitor the status of the population on the Refuge. Annually count all breeding falcons on the Refuge. This includes monitoring nesting success from April through August and identifying any factors that may adversely affect nesting; Monitor the aplomado falcon population when The Peregrine Fund ceases their monitoring program, including nesting activity and locations each year from April through August, consistent with recovery plan objectives; Implement applicable recovery plan task items such as construction of artificial nest structures, to ensure continued success of the Refuge’s aplomado falcon population based on monitoring results.
- For land acquisition, refer to the Lower Rio Grande NWR and Laguna Atascosa NWR Refuge Expansion Plans.

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# I. U.S. Fish and Wildlife Service Environmental Action Statement

## U.S. FISH AND WILDLIFE SERVICE ENVIRONMENTAL ACTION STATEMENT

Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA) and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and determined that the action of implementing the Laguna Atascosa National Wildlife Refuge Comprehensive Conservation Plan is found not to have significant impacts as determined by the *Finding of No Significant Impact* (following) and the *Draft Comprehensive Conservation Plan and Environmental Assessment*.



Dr. Benjamin N. Tuggle  
Regional Director  
Region 2, U.S. Fish and Wildlife Service

9/9/10  
Date



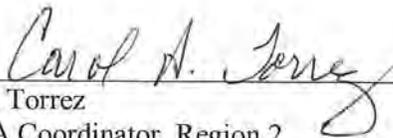
Manuel Perez III  
Refuge Manager  
Laguna Atascosa NWR

9/9/10  
Date



Chris Pease  
Regional Chief, NWR System, Region 2

9-9-10  
Date



Carol Torrez  
NEPA Coordinator, Region 2

9/9/10  
Date

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**FINDING OF NO SIGNIFICANT IMPACT**

**ENVIRONMENTAL ASSESSMENT OF THE  
LAGUNA ATASCOSA NATIONAL WILDLIFE REFUGE  
COMPREHENSIVE CONSERVATION PLAN  
U.S. FISH AND WILDLIFE SERVICE**

The U.S. Fish and Wildlife Service (Service) has developed a Comprehensive Conservation Plan (Plan) and Environmental Assessment (EA) for the Laguna Atascosa National Wildlife Refuge (NWR) located in Cameron and Willacy Counties, Texas. The Plan provides management direction to present and future Refuge managers for the next 15 years. It will achieve the Refuge's vision for the future and the purposes for which the Refuge was originally established. The Plan describes management activities that occur on the Refuge and provides management goals, measurable objectives, and specific management strategies designed to protect and restore wildlife habitats, conserve "trust resources" such as migratory birds and threatened and endangered species, enhance compatible wildlife-dependent recreation opportunities, and related facilities.

An Environmental Assessment (EA) was completed to fulfill the requirements of the National Environmental Policy Act (NEPA) of 1969 and to inform the public of the possible environmental consequences of implementing the Plan. A total of three alternatives were evaluated and analyzed for potential impacts on the human environment. The EA was prepared to provide a decision-making framework that 1) explores a reasonable range of alternatives to meet project objectives, 2) evaluates potential issues and impacts to the Refuge, resources and values, and 3) identifies mitigation measures to minimize the degree or extent of these impacts.

**ALTERNATIVES CONSIDERED AND ANALYZED**

**Alternative A: Current Management (No Action Alternative)**

This alternative represents the status quo or no change from current management of the Refuge. Existing or traditional Refuge management practices would continue as they have in the past, including habitat management (prescribed burning, chemical and mechanical invasive species control), water management, biological inventory, facility and equipment maintenance, staffing, law enforcement, public uses (e.g., hunting, fishing, wildlife observation, environmental educational, hiking, etc.), and research. The Refuge would continue its emphasis on wintering and migratory bird habitat and Federal trust species, and on maintaining public uses of existing facilities and education programs at current levels. Current base funding and staffing levels would allow the Refuge to focus on limited habitat management and maintenance projects.

**Alternative B: Proposed Action**

Alternative B, which is the Service's proposed action, would adopt and implement the actions making up the Refuge's Plan. This includes an emphasis on all Federal trust species (e.g., migratory birds and federally-listed species) and priority species and their habitats within the Refuge, and invasive species control. This alternative also would improve and expand compatible public uses, improve and add new facilities, and enhance educational and outreach programs. The objectives and strategies detailed in the Plan would provide for short- and long-term conservation and enhancement of resources and values on the Refuge, above that of the current management scenario. With State and public input, the actions proposed within this alternative reflect a need to continue and enhance the major goals of resource

management and protection, as well as to focus on connecting people with nature through improving the Refuge's environmental education and interpretation programs, and fostering dynamic partnerships.

**Alternative C**

This alternative incorporates and emphasizes the public use activities identified by the public during scoping. In this alternative, the Refuge will concentrate efforts and resources on public uses to the maximum extent practicable when appropriate and compatible with the purposes of the Refuge. Under this alternative, wildlife, habitat, or biological diversity activities would essentially be allowed to remain as is. Current base funding and staffing levels would increase by up to four positions more than the existing staffing level. The Refuge would specifically maximize recreational opportunities and conveniences to visitors. Traditional programs such as hunting and fishing would be expanded as much and as often as possible to accommodate these popular activities.

**DECISION: THE SELECTED ALTERNATIVE**

Alternative B was selected as the Service's proposed action and is the basis for the Comprehensive Conservation Plan. This alternative describes how habitat objectives will be accomplished through a combination of management activities to encourage ecological integrity, promote restoration of coastal prairie habitats, control invasive plant species, and provide/enhance brush land, wetland and grassland habitat for ocelots, grassland and other migratory birds, migratory waterfowl, and other resident wildlife. This alternative was selected because it best meets refuge purposes and goals of the Laguna Atascosa National Wildlife Refuge. This action will not adversely impact endangered or threatened species or their habitat. Opportunities for wildlife-dependent recreation activities, such as hunting, fishing, observation, photography, environmental education, and interpretation will be enhanced. Future management actions will have a neutral or positive impact on the local economy and the recommendations in the Plan will ensure that Refuge management is consistent with the mission of the National Wildlife Refuge System.

**SUMMARY EFFECTS OF EACH ALTERNATIVE**

Implementation of the Service's decision would be expected to result in environmental, social and economic effects as described in the Comprehensive Conservation Plan/EA and summarized here. The Plan describes habitat management, wildlife management, and public use objectives that would result in increased migratory bird utilization and production; increased protection of threatened and endangered species; enhanced wildlife populations; and improved habitat conditions. The proposed visitor service management activities would result in enhanced prospects for wildlife-dependent recreational opportunities.

Refuge management activities (habitat preservation and restoration, infrastructure improvements, water management) would result in short-term minor negative impacts to soils, air, water, habitat and wildlife as described in the EA; however, the long-term impacts are expected to be beneficial. These management activities would result in the creation and improvement of habitat to provide components such as native grassland protection, brush land restoration, and artificial water source protection. The Refuge would also take a proactive approach to working with information provided through biological surveys, inventories, and monitoring to determine changing conditions and vegetative and associated wildlife needs.

Opportunities for wildlife-dependent activities such as wildlife observation, photography, environmental education, interpretation, fishing and hunting would be enhanced. Disturbance to wildlife at some level is an unavoidable consequence of any public use program, regardless of the activity involved. Obviously, some activities innately have the potential to cause greater disturbance than others. As currently proposed, the known and anticipated levels of disturbance associated with management actions are considered

minimal and well within the tolerance levels of known wildlife species and populations present in the area. Implementation of activities provided by the visitor services program would take place through carefully controlling timing and placement to avoid direct contact with sensitive areas, such as nesting habitat, or wildlife. Hunting activities would be enhanced, including the use of bilingual public hunting information and developing a revised hunting plan, and would be conducted within the constraints of sound biological principles for the management. Monitoring activities through wildlife inventories and assessments of public use levels and activities would be utilized and visitor use programs would be adjusted as needed to limit disturbance.

The increased opportunities for wildlife dependent recreational opportunities on the Refuge would also have beneficial impacts on the local economy through increased visitation and revenue. Partnerships with county, state and federal agencies, private landowners, and conservation groups would enable the Refuge to achieve goals and objectives, minimize costs, and strengthen relationships.

Implementing the Service's management action is not expected to have any significant adverse effects on wetlands and floodplains, pursuant to Executive Order 11990 and 11988, because there would be no development of Refuge facilities within wetlands or floodplains. There would be no effect on threatened, endangered, proposed or candidate species and/or critical habitat, as documented in the intra-service Section 7 (Endangered Species) Consultation completed with the Ecological Services Field Office in Corpus Christi and signed on September 16, 2009. In addition, archeological and/or historical resources would not be impacted.

The Refuge is not aware of any other past, present, or reasonably foreseeable future planned actions that would result in a significant cumulative impact when added to the Refuge's proposed action, as outlined in Alternative B. The adverse direct and indirect effects of the proposed action on air, water, soil, habitat, wildlife and scenery resource values are expected to be minor and short term. The benefits to long-term ecosystem health that the proposed action will accomplish will outweigh any of the short-term impacts discussed in this document.

#### **PUBLIC OUTREACH, REVIEW AND COMMENT**

Development of the Aransas National Wildlife Refuge Complex Comprehensive Conservation Plan has been thoroughly coordinated with all interested and/or affected parties. The U.S. Fish and Wildlife Service filed a Notice of Intent to prepare a Comprehensive Conservation Plan in the Federal Register (69 FR 43010; July 19, 2004). This was followed by a Notice of Availability in the Federal Register (74 FR 66148; December 14, 2009) that the Draft Plan/EA were available for 60 days of public review. Subsequently, the Draft Plan/EA were made available for public review starting on December 14, 2009, at the Refuge, at eight local municipal and county libraries in the south Texas area near the Refuge, and at the Regional Office in Albuquerque, New Mexico. Four open house meetings were held in communities near the Refuge in January 2010. In all, ninety-eight (98) individuals signed the attendance rosters at the open house meetings and a total of fifty-two (52) comments were submitted in writing or phoned in to the Refuge/Regional Office. Additionally, one state agency, one university, and six non-governmental organizations responded prior to the end of the 60-day public comment period.

#### **FINDINGS**

Based on the analysis documented in the Environmental Assessment and with due consideration given to comments from the public and through consultation with the State of Texas, it is my determination that the proposed action does not constitute a major Federal action that will have a significant effect on the quality of the human environment under the meaning of Section 102 (2) (C) of the National

## Appendix J: Finding of No Significant Impact

Environmental Policy Act of 1969 (as amended). As such it is my conclusion that an Environmental Impact Statement is not required for this Plan and the selected alternative may be implemented as soon as practicable. This determination is based on the following factors (40 C.F.R. 1508.27), as addressed in the attached Environmental Assessment.

1. Both beneficial and adverse effects have been considered and this action will not have a significant effect on the environment. (Environmental Assessment, pages 4-15 through 5-31).
2. The actions will not have a significant effect on public health and safety. (Environmental Assessment, pages 4-18 through 4-20 and 4-25 through 5-31).
3. The project will not significantly affect any unique characteristics of the geographic area such as proximity to historical or cultural resources, wild and scenic rivers, or ecologically critical areas. (Environmental Assessment, pages 4-24 through 4-25 and 5-29 through 5-30).
4. The effects on the quality of the human environment are not likely to be highly controversial. (Environmental Assessment, pages 4-24 through 5-31).
5. The actions do not involve highly uncertain, unique, or unknown environmental risks to the human environment. (Environmental Assessment, pages 4-18 through 4-20 and 4-25 through 5-31).
6. The actions do not establish a precedent for future actions with significant effects nor do they represent a decision in principle about a future consideration. (Environmental Assessment).
7. There will be no cumulatively significant impacts on the environment. Cumulative impacts have been analyzed with consideration of other similar activities on adjacent lands, in past action, and in foreseeable future actions. (Environmental Assessment, pages 4-15 through 5-31).
8. The actions will not significantly affect any site listed in, or eligible for listing in, the National Register of Historic Places, nor will they cause loss or destruction of significant scientific, cultural, or historic resources. (Environmental Assessment, pages 4-24 through 4-25 and 5-29 through 5-30).
9. The actions are not likely to adversely affect threatened or endangered species, or their habitats. (Environmental Assessment, pages 4-20 through 4-24).
10. The actions will not lead to a violation of federal, state, or local laws imposed for the protection of the environment. (Environmental Assessment, pages 1-3 through 1-6).

It is the intent of the Service to revisit questions of significant environmental consequences in accordance with NEPA upon consideration of the implementation of site specific proposals call for and discussed in the final Plan.

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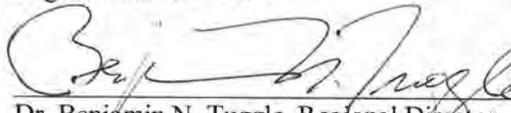
Fish and Wildlife Service, 2010. Comprehensive Conservation Plan for the Laguna Atascosa National Wildlife Refuge, Cameron and Willacy Counties, Texas. U.S Department of the Interior, Fish and Wildlife Service, Southwest Region.

Recommended:

  
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Manuel Perez III, Refuge Manager  
Laguna Atascosa NWR

9/9/10  
\_\_\_\_\_  
Date

Approved:

  
\_\_\_\_\_  
Dr. Benjamin N. Tuggle, Regional Director  
U.S. Fish and Wildlife Service, Region 2

9/9/10  
\_\_\_\_\_  
Date

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**U.S. Fish & Wildlife Service  
National Wildlife Refuge System  
Division of Planning**



**Leavenworth National Wildlife Refuge**



*Ocelot*  
Photograph by Larry Ditto

**September 2010**



**From:** [Gardiner, Dawn](#)  
**To:** [Skaar, Karen S](#); [Ardizzone, Chuck CA](#); [Reyes, Ernesto](#); [delaGarza, Laura](#); [Perez, Chris](#); [Perez, Sonny](#); [Winton, Bryan](#); [Skoruppa, Mary Kay](#)  
**Cc:** [King, Susan E](#)  
**Subject:** EPA comments to USACE on Space X 404 permit - ARNI 3(a) Elevation Letter  
**Date:** Wednesday, April 7, 2021 4:35:39 PM  
**Attachments:** [SWG-2012-00381 - SpaceX Mod - EPA 3\(a\) Comment Letter \(4-7-21\).pdf](#)

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Excellent letter. I have only seen a handful of elevation letters in my career. It puts the USACE on notice that if things cannot be worked out elevation to higher levels will occur. Often FWS may pursue a similar elevation process but did not do so here. We do need to let our RO fed activities folks know. The letter's summary is: This project may have substantial and unacceptable adverse impacts on the ARNI (aquatic resources of national importance). The EPA continues to have concerns for the alternatives analysis, avoidance and minimization of impacts, evaluation of direct, secondary, and cumulative impacts, and proposed compensatory mitigation for unavoidable impacts. The EPA recommends the Corps work with the applicant to enhance the information provided to assist the Corps in determining compliance with the Guidelines. Without providing additional information, it is unclear how the project can be fully evaluated. **The EPA requests that the Corps work with EPA and other involved resource agencies to resolve the issues raised during the permit review period. The EPA also requests that prior to the decision to issue the permit, the Corps provide the EPA a copy of the draft permit and decision document in the interest of facilitating inter-agency coordination.** We believe this information exchange is critical to ensure that all relevant factors and remaining issues are addressed prior to a permit decision.

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**From:** Kaspar, Paul <[REDACTED]>  
**Sent:** Wednesday, April 7, 2021 2:52 PM  
**To:** Jackie Robinson <[REDACTED]> Gardiner, Dawn  
<[REDACTED]> 401CERTS <[REDACTED]> charrish stevens - NOAA  
Federal <[REDACTED]>  
**Subject:** [EXTERNAL] FW: Space X SWG-2012-000381 Permit Modification Public Notice - ARNI 3(a) Elevation Letter

**This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.**

All,

Attached is EPA's Comment Letter on the SpaceX Permit Modification.

Paul Kaspar  
Environmental Engineer  
US. EPA - Region 6 (Houston Lab)

Water Division, NPDES/Wetlands Review Section (WDPN)

[REDACTED]

[REDACTED]

Office: [REDACTED]

Fax: [REDACTED]

Email: [REDACTED]



# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
South Texas Refuge Complex  
Lower Rio Grande Valley National Wildlife Refuge



[REDACTED]

January 22, 2021

Daniel P. Murray  
Manager, Safety Division  
Federal Aviation Administration  
800 Independence Ave., SW  
Washington, D.C. 20591

Dear Mr. Murray:

It is our understanding that SpaceX is working with the Federal Aviation Administration (FAA) to prepare a draft Environmental Assessment (EA) for a Starship/Super Heavy launch program near Boca Chica, Cameron County, Texas. This program is occurring on land surrounded by the Lower Rio Grande Valley National Wildlife Refuge (Refuge). The FAA is holding a public scoping period to assist in determining the scope of issues for analysis in the draft EA. The following are U.S. Fish and Wildlife Service's (FWS) comments for consideration in your analysis:

## National Environmental Policy Act (NEPA)

NEPA emphasizes cooperative consultation among agencies. 50 C.F.R. 1501.2(3) requires agencies to “...*study, develop, and describe appropriate alternatives to recommend courses of action in any proposal which involves unresolved conflicts...*” The process is intended to help public officials make decisions that are based on an understanding of the environmental consequences of federal agency actions and to protect the quality of the human environment, which includes ecological systems. In order to conduct a meaningful analysis consistent with the spirit and intent of NEPA, adequate and clear information regarding the proposed SpaceX activities is critical in developing informed analysis. 40 C.F.R. 1501.5(a) states that an agency shall prepare an EA for an action that is “...*not likely to have significant effects or when the significance of the effects is unknown...*” An environmental impact statement (EIS) may be the more appropriate NEPA pathway for this proposed action if significant effects cannot be avoided.

As stated in our previous correspondence dated October 7, 2020, and December 14, 2020 (attached); and reiterated here, the FWS does not concur with the FAA's determination that the action will not result in a "*constructive use*" of the Boca Chica Tract of the Lower Rio Grande Valley National Wildlife Refuge (Refuge). The FAA is subject to Section 4(f) regulations which "*require rigorous exploration and objective evaluation of alternative actions that would avoid all use of Section 4(f) properties...that would avoid some or all adverse effects*" (OEPC Section 4(f) Handbook, per 23 CFR § 774). Furthermore, 23 U.S.C. § 138 precludes the Secretary of Transportation from approving a program or project unless "*such program includes all possible planning to minimize harm*" to wildlife refuges. It is the FWS's opinion that FAA has failed to comply with its own regulations in this regard. Based on the Section 4(f) definitions, a "*constructive use*" occurs when there is "*a temporary occupancy of land that is adverse in terms of the statute's preservation purpose*" or when "*a project's proximity impacts are so severe that the protected activities, features, or attributes of a property are substantially impaired.*" The level, nature, and extent to which an area is constructively used is subject to the expertise and determination of the agency responsible for management and administration of the 4(f) lands impacted by the constructive use, in this case, the FWS. Frequent closures of the Refuge caused by SpaceX activities are already substantially impairing both the Refuge's ability to adequately manage the Refuge and the public's enjoyment of the Boca Chica Beach area for wildlife-dependent recreation. There are both "*adverse*" and "*severe*" impacts to Refuge public use, management, wildlife, and habitat from the SpaceX activities. The protected public activities on the Refuge that are being substantially impaired include fishing, wildlife observation, photography, environmental education, and interpretation. Annually an estimated 110,000 visitors access the Refuge for these uses. The majority are beachgoers or anglers visiting the Boca Chica tract and these activities occur throughout the year.

Since 2014, SpaceX has undertaken activities not covered in FAA's 2014 EIS which addressed only 12 launches per year, not continual experimentation related to the Starship/Super Heavy proposal as is currently being carried out. SpaceX activities not covered include a higher frequency of road closures extending well beyond 180 hours, large explosions from reported anomalies, the appearance of significantly large staffing, 24/7 operations, traffic, and construction activities not analyzed in the 2014 EIS. In addition, SpaceX rocket debris falling onto the Refuge has damaged the sensitive wind tidal flats. And, the vehicles or machinery used to retrieve rocket debris have created ruts and caused other damage that interrupts water sheet flow across these flats. Two SpaceX incidents on July 25, 2019 and again in August 2019 resulted in wildfires of 130-acres and 10-acres respectively burned through coastal prairie and dune habitats on refuge managed land. Anomalies resulting in explosions on November 20, 2019, February 28, 2020, and December 9, 2020 resulted in debris scattered onto refuge managed lands. Retrieval methods damaged the sensitive alkaline flat and refuge cable fencing installed to protect the area from disturbance.

Due to operations by SpaceX, the FWS's ability to maintain the biological integrity, diversity and environmental health of Refuge resources, as well as our ability to ensure the viability of the six wildlife-dependent recreational uses, has been significantly diminished at the Boca Chica tract. This occurs by preventing or constraining public access year-round, hampering biological and monitoring studies including sea turtle patrols, sea turtle cold-stunning responses, hampering refuge management and law enforcement patrol, increased observations of road mortality of wildlife at all hours of daytime and nighttime, damage to sensitive habitats such as the wind tidal flats and to the salt prairie from explosions and fires, as well as adversely impacting nesting

habitat for sensitive species. According to the Coastal Bend Bays and Estuaries Program, Wilson's and Snowy Plovers, have essentially stopped nesting near the SpaceX site in the last two years.

Currently, the FAA is requesting to increase the number of Refuge closure hours from 180 to 300 per year. The FWS believes the FAA/SpaceX closure reporting computation needs to be revised to consider the accounting of the extended closures occurring for anomalies or delays that are deterrents for public access to the Boca Chica tract and the beaches for the duration of all published closure timeframes. In 2019, the FWS recorded over 1,000 closure hours and SpaceX reported a total of 158 hours. When closures occur, all aforementioned wildlife-dependent recreational uses are substantially impaired because they are not available to the public. These features and attributes will be substantially impaired by increased closures.

The FAA has previously stated the road closures comprise only 2.1 percent of the total annual Refuge closure hours they calculated, which would appear to be minimal. However, the FAA's decision omitted the recreational hours lost to Refuge visitors. The Refuge is visited by approximately 110,000 visitors annually with 50% or more visiting the Boca Chica tract. Therefore, approximately 55,000 people visit the Boca Chica tract each year. Assuming each visitor to the Boca Chica tract spends only one hour there, closing access to the tract for 180 hours per year (the current closure rate) will result in a loss of 9,900,000 recreational hours per year. Increasing the number of closure hours to 300 per year will result in 16,500,000 recreational hours lost per year. This loss of public recreational hours is significant. Therefore, we reiterate that the impacts of the increased road closures are significant as that term is defined by NEPA and rise to the level of a substantial impairment and thus constitute a "*constructive use*," as defined under Section 4(f). We recommend FAA's NEPA analysis include adequate consideration of these unresolved issues.

### Endangered Species Act (ESA)

The FWS is concerned about effects of SpaceX experimental rocket development activities and testing on endangered species. On three separate occasions in 2020, rocket launch failures resulted in explosions and the spread of debris on and off Refuge lands. Videos of these events show evidence of different species of birds being impacted by the blast. However, it is difficult to ascertain what species of migratory birds and/or birds listed as threatened or endangered under the ESA were harmed or harassed. We cannot determine if the blasts and fires resulted in harm (death or injury) to some of the birds or just harassed them. It is unknown if terrestrial species were killed or injured. There is documented evidence that the debris and its removal has impacted and scarred various habitats in the area, including tidal flats which are foraging habitat for the threatened piping plover and red knot. It is unclear how far vibration and noise resulting from the explosions and cleanup have impacted listed species, such as the ocelot, jaguarundi, and northern aplomado falcon. The FWS's inability to enter the action area immediately to survey the area hinders efforts to document these types of impacts before evidence is compromised or lost entirely.

The ESA prohibits the taking of endangered species except as provided for in sections 7 or 10. Since there is no way to promptly assess damages or collect injured or dead animal species, there is no mechanism to document whether SpaceX has exceeded the incidental take for individual species or habitat (sea turtles, ocelots, jaguarundi, piping plover, red knot, northern aplomado

falcon) issued in the original project biological opinion. We believe SpaceX's increase in construction, traffic, personnel levels, closures, lighting, noise and vibration, has exceeded what was evaluated in the biological opinion SUMMARY OF THE FINAL BIOLOGICAL AND CONFERENCE OPINION ON THE EFFECTS TO THE ENDANGERED OCELOT (*Leopardus pardalis*), ENDANGERED GULF COAST JAGUARUNDI (*Herpailurus yagouaroundi cacomitli*), ENDANGERED NORTHERN APLOMADO FALCON (*Falco femoralis septentrionalis*), ENDANGERED KEMP'S RIDLEY SEA TURTLE (*Lepidochelys kempii*), ENDANGERED HAWKSBILL SEA TURTLE (*Eretmochelys imbricata*), ENDANGERED LEATHERBACK SEA TURTLE (*Dermochelys coriacea*), THREATENED GREEN SEA TURTLE (*Chelonia mydas*), THREATENED LOGGERHEAD SEA TURTLE (*Caretta caretta*), THREATENED PIPING PLOVER (*Charadrius melodus*) AND ITS CRITICAL HABITAT, AND PROPOSED TO BE LISTED AS THREATENED RED KNOT (*Calidris canutus rufa*) FROM THE PROPOSED ISSUANCE OF FEDERAL AVIATION ADMINISTRATION LAUNCH LICENSE AUTHORIZING SPACEX TO LAUNCH FALCON 9 AND FALCON HEAVY ORBITAL VERTICAL LAUNCH VEHICLES AND A VARIETY OF REUSABLE SUBORBITAL LAUNCH VEHICLES FROM PRIVATE PROPERTY, BOCA CHICA, CAMERON COUNTY, TEXAS; December 18, 2013; Consultation No. 02ETCC00-2012-F-0186, and the FWS has informed SpaceX and FAA they are not in compliance with the current biological opinion numerous times. The FWS is available to assist SpaceX in reducing its risk by avoiding or minimizing impacts and potential take of threatened or endangered species in future activities. The FWS believes reinitiation of section 7 consultation on the aforementioned biological opinion is warranted. We are aware that the FAA is working on a new Biological Assessment and SpaceX is in favor of reinitiation. To date we have not received the document.

Another option to obtain ESA compliance for SpaceX would be to seek a section 10(a)(1)(B) permit that authorizes take of endangered species that is incidental to "otherwise lawful activities."

The FWS believes that an EIS may be the more appropriate NEPA pathway for this proposed action if significant effects cannot be avoided. The FWS requests that you give adequate consideration to and objective analysis of our NEPA concerns; that you adequately comply with the ESA; and, that you conduct an alternative action analysis per Section 4(f) of the Transportation Act of 1966. We appreciate your consideration of our concerns. You may contact me via email at [REDACTED]

Sincerely,

*Manuel Perez III*

Manuel "Sonny" Perez III  
Complex Refuge Manager  
South Texas Refuges Complex

*Charles Ardizzone*

Charles Ardizzone  
Project Leader  
Texas Coastal Ecological Services Office

Enclosures (2)

cc:

Stacey Zee, Federal Aviation Administration, Washington, DC.

Bryan R. Winton, Refuge Manager, Lower Rio Grande Valley NWR

Kelly McDowell, Refuge Supervisor, TX Gulf Coast Refuges

Dawn Gardiner, Assistant Field Supervisor, Texas Coastal ES Field Office

Stacey Dwyer, EPA Compliance Assurance and Enforcement Division



# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
South Texas Refuge Complex  
Lower Rio Grande Valley National Wildlife Refuge



[REDACTED]

December 14, 2020

Daniel P. Murray  
Manager, Safety Division  
Federal Aviation Administration (FAA)  
800 Independence Ave., SW  
Washington, D.C. 20591

Dear Mr. Murray:

This responds to your letter dated December 1, 2020, establishing your disagreement with U.S. Fish and Wildlife Service (USFWS) opinion that an increase in closure hours from 180 to 300 on the Lower Rio Grande Valley National Wildlife Refuge (Refuge) will not result in a “*constructive use*” as defined by Section 4(f) of the Department of Transportation Act of 1966.

Before you finalize your decision, USFWS restates its wildlife and public recreational purposes below and requests that you consider this letter establishing metrics to public disruption that should be considered. Additionally, USFWS has special expertise with respect to the potential wildlife impacts and public disruption of the proposed action. Lastly, I request that you identify or provide guidance for the Federal Aviation Administration (FAA) Section 4(f) determination appeal process.

- The Refuge, and the national Refuge System in general, maintains the biological integrity, diversity and environmental health of these natural resources for the benefit of present and future generations of Americans (National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. 668dd-668ee). The Refuge was established in 1979, as a long-term program of acquiring lands to protect and restore the unique biodiversity of the Lower Rio Grande Valley of Texas. The stated purposes and legislative authorities for this Refuge are “...for the development, advancement, management, conservation, and protection of fish and wildlife resources...” 16 U.S.C. § 742f (a)(4); “... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ...” 16 U.S.C. § 742f(b)(1) (Fish and Wildlife Act of 1956); “... particular value in carrying out the national migratory bird management program” 16 U.S.C. § 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes); “... suitable for— (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ...” 16 U.S.C. § 460k-1 “... the Secretary ... may accept and use ... real ... property. Such

*acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ...* 16 U.S.C. § 460k-2 (Refuge Recreation Act) (16 U.S.C. § 460k-460k-4, as amended); and, *"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds"* 16 U.S.C. § 715d (Migratory Bird Conservation Act). The Refuge therefore ensures the conservation of fish, wildlife and plant populations and their habitat, which is necessary for the scientific study of wildlife, conservation biology and ecosystem management.

- The Refuge also provides six wildlife-dependent recreational uses, which include: hunting, fishing, wildlife observation, photography, environmental education, and interpretation.

The Boca Chica tract can only be accessed by Highway 4, which as of now can be closed 180 hours per year because of SpaceX activities. The SpaceX complex is accessed by Highway 4, which SpaceX now wants to close for approximately 300 hours per year. Refuge trend data suggests that 110,000 visitors access the Refuge for these uses and more than half are visitors to the Boca Chica tract and other associated public use tracts along Highway 4. These areas are, and will continue to be, substantially impaired by road closures required for SpaceX activities. Each road closure requires the temporary occupancy by SpaceX officials only (no public).

FAA frames their decision upon the total number of road closure hours (2.1 percent of a total 8,760 annual hours), which they determine 2.1 percent to be minimal. However, the FAA's decision does not consider the recreational hours lost to Refuge visitors caused by road closures associated with SpaceX activities. The Refuge is visited by approximately 110,000 visitors annually with 50% or more visiting the Boca Chica tract. Therefore, approximately 55,000 people visit the Boca Chica tract each year. Assuming each visitor to the Boca Chica tract spends only one hour there, closing access to the tract for 180 hours per year (the current closure rate) will result in a loss of 9,900,000 visitor hours per year. Increasing the number of closure hours to 300 per year will result in 16,500,000 recreational hours lost per year. This loss of public recreation hours is significant. And, we reiterate our belief that the indirect impacts of the increased highway closures rise to the level of a substantial impairment and are so adverse and severe that they result in a constructive use.

- Each closure requires the temporary occupancy of the closed Highway 4 by SpaceX officials only (no public). SpaceX officials are the only people allowed access to 8 Refuge tracts, including the Boca Chica tract, totaling 22,500 acres which is 56% of the Refuge's total public use acres. More importantly, it is 100% of the Refuge's acres readily accessible to the City of Brownsville's 183,000 people (2018 data).

Based upon our calculations, the proximity impact of this transportation project is potentially so great that the purposes of the Refuge are substantially impaired even with the estimation of only one hour of visitation per person. Road closures on the Refuge that are required for SpaceX activities, albeit temporary in nature, have a negative impact on the Refuge because 100% of Refuge recreational acreage readily accessible to the City of Brownsville is lost for use by the public at a rate of 180 hours per visitor each year.

We appreciate your consideration of these additional figures and look forward to discussing these or other concerns as pertains to the SpaceX Boca Chica site. You may contact me via email at [REDACTED] or my direct line at [REDACTED]

Sincerely,

Manuel "Sonny" Perez III  
Acting Complex Refuge Manager

cc:

Stacey Zee, Federal Aviation Administration, Washington, DC.  
Bryan R. Winton, Refuge Manager, Lower Rio Grande Valley NWR  
Kelly McDowell, Refuge Supervisor, Texas Gulf Coast Refuges  
Dawn Gardiner, Assistant Field Supervisor, Texas Coastal ES Field Office



# United States Department of the Interior

FISH AND WILDLIFE SERVICE

**South Texas Refuge Complex**

Lower Rio Grande Valley National Wildlife Refuge

3325 Green Jay Road

Alamo, Texas 78516

(956) 784-7500

October 7, 2020



Daniel P. Murray  
Manager, Safety Division  
Federal Aviation Administration (FAA)  
800 Independence Ave., SW  
Washington, D.C. 20591

Dear Mr. Murray:

This responds to your letter dated August 27, 2020, requesting our concurrence with FAA's determination that an increase in closure hours from 180 to 300 on the Lower Rio Grande Valley National Wildlife Refuge (Refuge) will not result in a "*constructive use*" as defined by Section 4(f) of the Department of Transportation Act of 1966. For the reasons provided in this letter, we do not concur.

The U.S. Fish and Wildlife Service (FWS) does not concur with the FAA determination that the action will not result in a "constructive use" to the Refuge. The Refuge, and the national Refuge System in general, maintains the biological integrity, diversity and environmental health of these natural resources for the benefit of present and future generations of Americans (National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. 668dd-668ee). The refuge was established in 1979, as a long-term program of acquiring lands to protect and restore the unique biodiversity of the Lower Rio Grande Valley of Texas. The stated purposes and legislative authorities for this Refuge are "*...for the development, advancement, management, conservation, and protection of fish and wildlife resources...*" 16 U.S.C. § 742f (a)(4); "*... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ...*" 16 U.S.C. § 742f(b)(1) (Fish and Wildlife Act of 1956); "*... particular value in carrying out the national migratory bird management program*" 16 U.S.C. § 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes); "*... suitable for— (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ...*" 16 U.S.C. § 460k-1 "*... the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ...*" 16 U.S.C. § 460k-2 (Refuge Recreation Act) (16 U.S.C. § 460k-460k-4, as amended); and, "*... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds*" 16 U.S.C. § 715d (Migratory Bird Conservation Act). The Refuge therefore ensures the conservation of fish, wildlife and plant populations and their habitat, which is necessary for the scientific study of wildlife, conservation biology and ecosystem management. In addition to its primary task of conserving wildlife, the Refuge also provides six wildlife-dependent recreational

uses, which include: hunting, fishing, wildlife observation, photography, environmental education, and interpretation. Each year, an estimated 110,000 visitors access the Refuge for these uses and the majority (63 percent) are beachgoers or fishers to the Boca Chica tract at all times of the year.

Section 4(f) protects publicly owned parks, recreation areas, and wildlife and waterfowl refuges of national, state, or local significance and historic sites of national state, or local significance from use by transportation projects. Due to operations by SpaceX at all times, the FWS's ability to maintain the biological integrity, diversity and environmental health of Refuge resources, as well our ability in ensuring the viability of the six wildlife-dependent recreational uses, are significantly diminished at the Boca Chica tract. This occurs by preventing or constraining public access year-round, hampering biological and monitoring studies including sea turtle patrols, hampering refuge management and law enforcement patrol, increased observations of road mortality of wildlife at all hours of daytime and nighttime, damaging sensitive habitats such as the wind tidal flats and the salt prairie from explosions and fires, as well as impacting nesting habitat for sensitive species. According to the Coastal Bend Bays and Estuaries Program, Wilson's and Snowy Plovers have essentially stopped nesting near the SpaceX site.

Since 2014, SpaceX has undertaken activities not covered in FAAs 2014 environmental impact statement (EIS). These activities include a higher frequency of road closures plausibly extending well beyond 180 hours, large explosions from reported anomalies, the appearance of significantly large staffing, traffic, and construction activities not analyzed in the EIS. In addition, debris falling onto the Refuge damages the sensitive wind tidal flats and the vehicles or machinery used to retrieve debris creates rutting and damage that interrupts tidal water sheet flow across these flats. These have prompted concerns including re-evaluating FAA's current EIS, as well as the potential need to reinitiate consultation with the FWS on the Biological Opinion analyzing SpaceX operations pursuant to 50 C.F.R. 402.16. Currently, the FAA is requesting to increase the number of Refuge closure hours from 180 to 300. However, for the past six years, closures of the road to Boca Chica Beach are increasingly frequent and may occur for one or more days due to delays or problems occurring during testing. The FAA/SpaceX closure reporting computation remains in question as the extended closures occurring for anomalies or delays are deterrents for public access to the Boca Chica tract and the beaches for the duration of all published closure timeframes. In 2019, the FWS conservatively quantified closure hours (over 1,000) and noted a significant disparity in accounting between SpaceX's reported total of 158 hours and the conservative total being tracked by FWS staff.

Based on the Section 4(f) definitions, a *"constructive use"* occurs when there is *"a temporary occupancy of land that is adverse in terms of the statute's preservation purpose"* or when *"a project's proximity impacts are so severe that the protected activities, features, or attributes of a property are substantially impaired."* The level, nature, and extent to which an area is constructively used is subject to the expertise and determination of the agency responsible for management and administration of the 4(f) lands impacted by the constructive use, in this case, the FWS. Frequent closures caused by SpaceX activities are already substantially impairing both the Refuge's ability to adequately manage the Refuge and the public's enjoyment of the Boca Chica Beach area for wildlife-dependent recreation. There are both *"adverse"* and *"severe"* impacts to Refuge public use, management, wildlife, and habitat from the SpaceX activities as exemplified above. Increasing the "official" closure hours to 300 will only exacerbate the levels of impairment of Refuge properties. The protected activities of the Refuge that will be

substantially impaired include fishing, wildlife observation, photography, environmental education, and interpretation. When closures occur, all of these wildlife-dependent recreational uses are substantially impaired because they are not available to the public. As previously mentioned, features and attributes of the Refuge that will be substantially impaired include the sensitive tidal flats, salt prairies, wildlife, and sensitive bird nesting and wintering sites. These features and attributes will be substantially impaired by increased closures because explosions, debris, traffic, building construction, and invasive plant species will continue to threaten the health and diversity of the Refuge's habitats and wildlife.

Section 4(f) regulations "*require rigorous exploration and objective evaluation of alternative actions that would avoid all use of Section 4(f) properties...that would avoid some or all adverse effects*" (OEPIC Section 4(f) Handbook, after 23 CFR § 774). 23 U.S.C. § 138 precludes the Secretary of Transportation from approving a program or project unless "*such program includes all possible planning to minimize harm*" to wildlife refuges. Your letter provides no evidence that either of these requirements have been met. The FWS therefore disagrees with the FAA determination now, as well as in the past, (see January 10, 2014 letter to the FAA, Stacey Zee), and requests a Section 4(f) analysis be undertaken to explore all reasonable and prudent alternatives that completely avoid Section 4(f) properties and/or to ensure "*all possible planning to minimize harm to the Section 4(f) property*" will occur.

We appreciate your consideration of the above issues and look forward to discussing these or other concerns as pertains to the SpaceX Boca Chica site. You may contact me via email at [sonny\\_perez@fws.gov](mailto:sonny_perez@fws.gov) or my direct line at (956) 784-7542.

Sincerely,

Manuel "Sonny" Perez III  
Acting Complex Refuge Manager

cc:

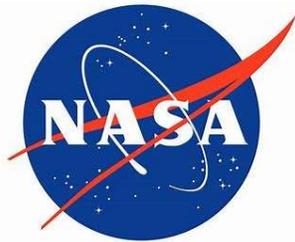
Stacey Zee, Federal Aviation Administration, Washington, DC.  
Bryan R. Winton, Refuge Manager, Lower Rio Grande Valley NWR  
Kelly McDowell, Refuge Supervisor, OK/TX Refuges  
Dawn Gardiner, Assistant Field Supervisor, Texas Coastal ES Field Office

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**Environmental Assessment  
for Exploration Park North at the  
John F. Kennedy Space Center,  
Kennedy Space Center, Florida**

**August 2021**

**National Aeronautics and Space Administration  
John F. Kennedy Space Center  
Kennedy Space Center, Florida**



**Prepared for:  
Space Florida, Cape Canaveral, Florida**



# ENVIRONMENTAL ASSESSMENT FOR EXPLORATION PARK NORTH JOHN F. KENNEDY SPACE CENTER, FLORIDA

## Abstract

This Environmental Assessment (EA) evaluates the environmental effects of the proposed construction of an Astronaut Training Facility on a site referred to as Exploration Park North. The site is located north of Space Florida's Exploration Park Phase I at Kennedy Space Center (KSC).

The purpose of the Proposed Action is to construct and operate an Astronaut Training Facility at Exploration Park North that would include astronaut training facilities—and various support facilities for future commercial astronauts and other aerospace customers. The need for the Proposed Action is consistent with National Aeronautics and Space Administration Interim Directive 8600.121, KSC's 2020 Vision Plan, and Section 6.3.1 of Space Florida's 2017 Master Plan. Project construction is proposed to begin in 2021 and the Astronaut Training Facility would be fully operational in 2022.

This EA evaluated the potential environmental impacts associated with the No Action Alternative and the Proposed Action (Space Florida's Preferred Alternative), and include the following resources categories: transportation, utilities, air quality, biological resources (habitat and non-listed wildlife species), threatened and endangered wildlife species, cultural resources, geology and soils, noise, surface water quality, groundwater quality, and socioeconomics.

Environmental impacts from the Proposed Action and No Action Alternatives were classified as **none**, **negligible**, or **minor**. Under the No Action Alternative, the astronaut training facility would not be constructed. Apart from socioeconomics, the No Action Alternative would result in **no** impacts; **minor adverse** impacts to socioeconomics would be expected. However, the No Action Alternative was not selected because it does not meet the purpose and need of the Proposed Action. As required by the National Environmental Policy Act, the No Action Alternative was carried forward for analysis in the EA for the purposes of analyzing the consequences of not undertaking the Proposed Action and establishing a comparative baseline.

Specifically, the construction portion of the Proposed Action would result in **negligible adverse impacts** to utilities, threatened and endangered species, and cultural resources; **minor adverse** impacts to transportation, vegetation, wildlife, and floodplains; and **minor beneficial** impacts to socioeconomics. Further, implementation of the operation portion of the Proposed Action would result in **negligible adverse** impacts to vegetation, wildlife, threatened and endangered species, and floodplains. **Minor adverse** impacts to transportation and utilities and **minor beneficial** impacts to socioeconomics are expected as a result of the operation of the Proposed Action. Mitigation is proposed for the Proposed Action to compensate for the **minor** impacts to wetlands.

**LEAD AGENCY:** National Aeronautics and Space Administration  
John F. Kennedy Space Center  
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## **List of Abbreviations and Acronyms**

APE	Archaeological Area of Potential Effects
BO	Biological Opinion
CANA	Canaveral National Seashore
CCSFS	Cape Canaveral Space Force Station
CCS	Cape Canaveral Spaceport
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cm	centimeter
CRAS	Cultural Resource Assessment Survey
EA	Environmental Assessment
ERP	Environmental Resource Permit
FAA	Federal Aviation Administration
FDEP	Florida Department of Environmental Protection
FLUCFCS	Florida Land Use, Cover and Forms Classification System
FPL	Florida Power & Light
ft <sup>2</sup>	square feet
GIS	geographic information system
ha	hectare(s)
IRL	Indian River Lagoon
KSC	Kennedy Space Center
kV	kilovolt(s)
LC	Launch Complex
LEED	Leadership in Energy and Environmental Design
LiDAR	Light Detection and Ranging
LPZ	low-probability zone
m	meter(s)
m <sup>2</sup>	square meter(s)
MINWR	Merritt Island National Wildlife Refuge
MPZ	moderate-probability zone

### ***List of Abbreviations and Acronyms***

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NASA	National Aeronautics and Space Administration
NAVD 88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NID	NASA Interim Directive
NPDES	National Pollutant Discharge Elimination System
NPR	NASA Procedural Requirements
NPS	National Park Service
OLS	orbital launch system
REC	Record of Environmental Consideration
SCW	Space Commerce Way
SJRWMD	St. Johns River Water Management District
SLSL	Space Life Sciences Laboratory
SMS	stormwater management system(s)
SR	State Road
U.S.	United States
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
VAB	Vehicle Assembly Building
VC	Visitor Complex
WWTP	wastewater treatment plant
ZAP	Zone of Archaeological Potential

## EXECUTIVE SUMMARY

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S. Code [U.S.C.] Sections 4321–4370) and according to the *Procedures of Implementation of NEPA for the National Aeronautics and Space Administration (NASA)* (Title 14, Code of Federal Regulations [CFR], Part 1216 Subparts 1216.1 and 1216.3), the Council on Environmental Quality (CEQ) NEPA implementing regulations (40 CFR Parts 1500–1508), and Federal Aviation Administration Order 1050.1F, *Environmental Impacts: Policies and Procedures*.

This EA addresses the Proposed Action, which is also the Preferred Alternative, and the No Action Alternative. The Proposed Action is for NASA to execute a real property agreement with Space Florida for Exploration Park North which would allow construction of an Astronaut Training Facility, and to determine the extent of impacts on the environment at the Kennedy Space Center (KSC). The Proposed Action consists of the proposed construction and operation of an Astronaut Training Facility at Exploration Park North. The facility would include astronaut training facilities and various support facilities for future commercial astronauts and other aerospace customers. The No Action alternative would involve not constructing the training facility.

The Proposed Action will require permits from the St. Johns River Water Management District (SJRWMD) and the Florida Department of Environmental Protection (FDEP).

This document describes those portions of the KSC environment that relate to each of the proposed alternatives. Resources evaluated in this document include transportation, utilities, air quality, land use, biological resources including habitat and non-listed wildlife species, threatened and endangered wildlife species, cultural resources, geology and soils, noise, surface water quality, groundwater quality, and socioeconomics.

Impacts resulting from implementing the Proposed Action and No Action Alternative were identified then classified into one of the following pre-determined categories: **None, Negligible, or Minor**. The results of the assessment of environmental issues from constructing the Proposed Action indicate overall **minor adverse impacts** would occur on transportation due to the increased traffic during construction, on vegetation habitat and wildlife due to the habitat impacts proposed, and on floodplains due to site development fill requirements. A wetland mitigation plan to offset primary and secondary wetland impacts as a result of the construction of the Proposed Action would be prepared and implemented in accordance with state and federal agency regulations. **Negligible adverse impacts** would occur to utilities, threatened and endangered wildlife, and cultural resources as a result of construction of the Proposed Action. Construction of the Proposed Action would result in **Minor beneficial impacts** on socioeconomics.

Based on current information available, **negligible adverse impacts** would occur to threatened and endangered species, cultural resources, and floodplains as a result of the operation of the Proposed Action. **Minor adverse impacts** would occur to transportation, utilities and **minor**

## ***Executive Summary***

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**beneficial impacts** to socioeconomics as a result of the operation of the Proposed Action. No monitoring strategies are provided or recommended for these resource areas.

Cumulative Impacts analysis indicates that **no significant cumulative impacts** would occur to transportation, utilities, vegetation, wildlife, threatened and endangered species, cultural resources, and floodplains from implementation of the Proposed Action.

Impacts from the No Action Alternative are expected to have **no** impacts on the various resource categories. **Minor adverse** impacts to socioeconomics are expected if the No Action Alternative were selected. Table 3-1 of this document summarizes the results of the analyses, to include the impacts on each environmental issue for each proposed action.

The No-Action alternative and Proposed Action are not expected to produce any consequences related to Environmental Justice, since all activities are located away from population centers. The Proposed Action is not expected to affect the surrounding communities any differently than the current programs at KSC.

Space Florida expects to begin project construction in 2022, and the Astronaut Training Facility would be operational in 2023.

## **1.0 PURPOSE OF AND NEED FOR THE PROPOSED ACTION**

### **1.1 Introduction**

This Environmental Assessment (EA) evaluates the environmental effects of the proposed construction and operation of an Astronaut Training Facility at a site referred to as Exploration Park North, which is just north of Exploration Park Phase I. The facility would include astronaut training facilities, astronaut accommodations, support facilities, parking, and stormwater management ponds. Space Florida expects to begin project construction in 2021, and the Astronaut Training Facility would be fully operational in 2022.

Space Florida has prepared this EA in accordance with the National Environmental Policy Act (NEPA) (42 U.S. Code [U.S.C.] Sections 4321–4370), as implemented by the Council on Environmental Quality (CEQ) Regulations (40 Code of Federal Regulations [CFR] Parts 1500–1508), and National Aeronautics and Space Administration (NASA) procedural requirements for implementing NEPA (NASA Procedural Requirements [NPR] 8580.1). NASA is the lead agency in the preparation of this EA and has participated in the document development to ensure the document meets their agency requirements.

### **1.2 Background**

Space Florida was created pursuant to Chapter 331, Part II, Florida Statutes, as an independent special district and subdivision of the State of Florida. The purpose of Space Florida is to foster the growth and development of a sustainable and world-leading aerospace industry in Florida. Space Florida leverages Florida’s highly skilled workforce and existing infrastructure to attract and expand the next generation of space industry businesses.

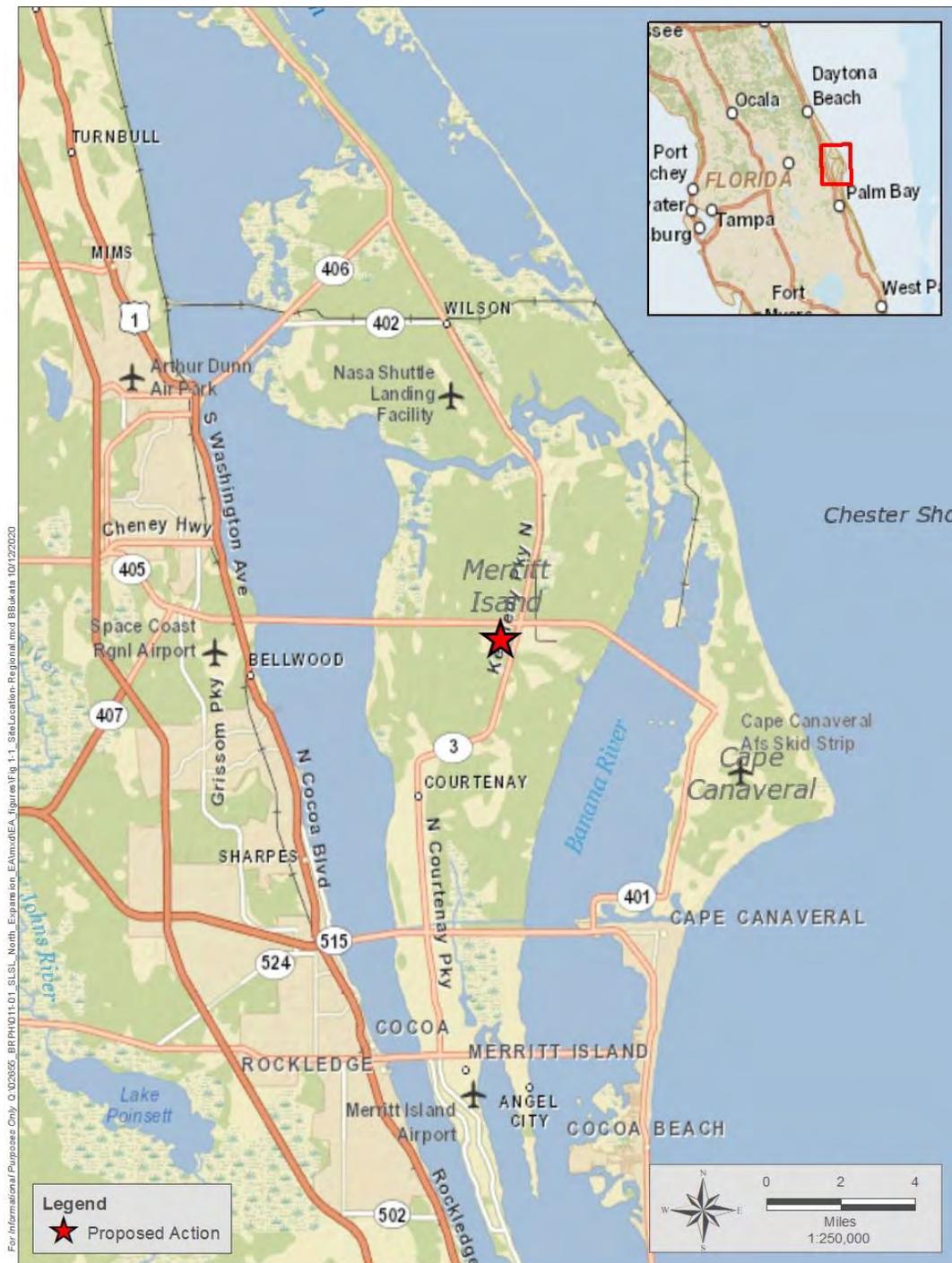
Exploration Park is leased for 60 years by Space Florida from NASA. Space Florida and NASA jointly developed plans and a lease for Exploration Park Phase I with State-funded construction of horizontal infrastructure. In accordance with the 2017 Cape Canaveral Spaceport Master Plan, planned expansion of Exploration Park would create an opportunity for the first inter-connected commerce and mission zone for multiple users, provide an opportunity to further enhance the workplace environment with community support functions, and promote the Cape Canaveral Spaceport (CCS) as a unified multi-sector spaceport (Space Florida, 2017). The CCS, in which Space Florida has an operational spaceport authority role, is the premiere transportation hub for global commercial space commerce. Space Florida oversees management and operation of key elements of Florida’s existing space transportation capability.

### **1.3 Location**

Exploration Park Phase I is a 60-acre (24-hectare [ha]) property just outside the secured perimeter of Kennedy Space Center (KSC) (Figures 1-1 and 1-2; NASA, 2020a). The Proposed Action (Exploration Park North) is an approximately 66-acre (27-ha) site immediately north of Exploration Park Phase I. From the north and south, Interstate (I)-95 provides highway access to Exploration Park via State Road (SR) 405 and SR 528. Multi-lane arterial highways, including

**Chapter 1 Purpose of and Need for the Proposed Action**

SR 50 and SR 528, provide access to Exploration Park from the west. An EA for Exploration Park Phase I was completed in 2008 (NASA, 2008).



**Figure 1-1 Regional Location Map**

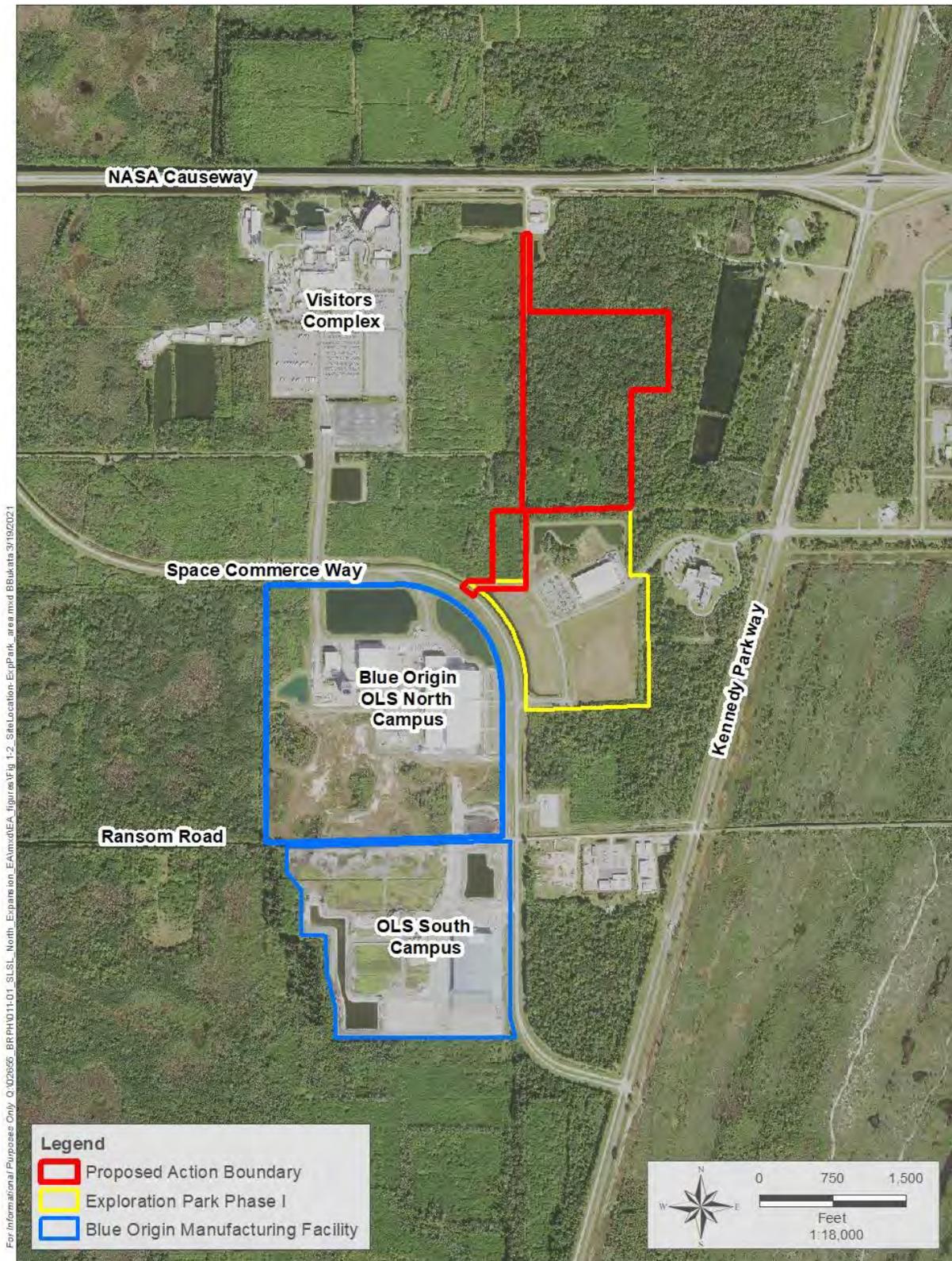
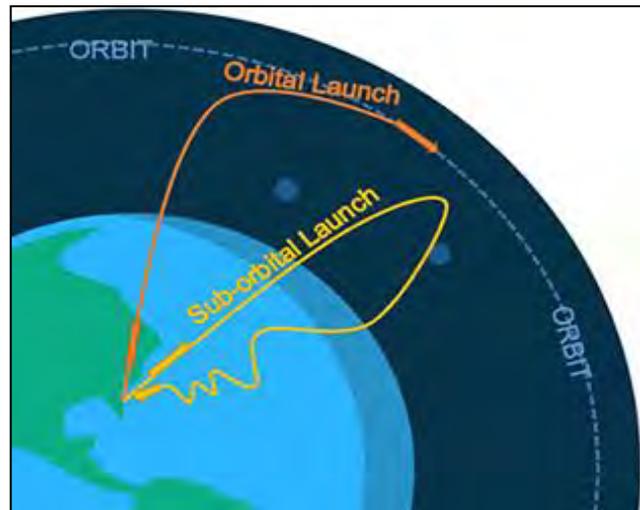


Figure 1-2 Aerial Location Map

## **1.4 Purpose of and Need for the Proposed Action**

The purpose of the Proposed Action is in support of Space Florida to execute a real property agreement with NASA for Exploration Park North to allow for the construction of an on-site multi-purpose facility and various support facilities required to support commercial human spaceflight (astronaut) training and space tourism. The Proposed Action is consistent with NASA Interim Directive (NID) 8600.121, KSC’s 2020 Vision Plan, and Section 6.3.1 of Space Florida’s 2017 Master Plan as it is a related commercial space facility.



As stated in NID 8600.121, “NASA Strategic Objective 2.1 directs the Agency to lay the foundation for America to maintain a constant human presence in low-Earth orbit to be enabled by a commercial market” (NASA, 2019a). This directive will enable private astronaut missions of up to 30 days on the International Space Station to perform duties that fall into the approved commercial and marketing mission outlined in NID 8600.121 (NASA, 2019b). The President’s National Space Policy, issued in December 2020, outlines America’s principles and goals regarding our national interests and activities in space. The policy reaffirms America’s leadership in outer space, emphasizes the importance of the commercial space sector to economic growth, and reaffirms the importance of all nations acting responsibly for the safety, stability, security, and long-term sustainability of space activities. While the United States would prefer that the space domain remain free of conflict, we will be prepared to meet and overcome any challenges that arise, while promoting burden sharing and marshaling cooperative responses to threats. In collaboration with other U.S. government agencies and private sector partners, the Department of State will:

- Demonstrate U.S. leadership in international fora to strengthen deterrence and contribute to international security and stability.
- Encourage and uphold the right of nations to responsibly and peacefully use space, while identifying and resolving behaviors that threaten that right.
- Encourage other nations to adopt regulations and practices for the commercial space sector which encourage transparent, private sector opportunities and reduce costs associated with unnecessary regulatory differences.
- Facilitate new commercial market opportunities for U.S. space capabilities and services.

- Expand a U.S.-led coalition of space exploration partners to return humans to the Moon for long-term exploration and utilization, followed by human missions to Mars and other destinations.
- Encourage international support for the responsible recovery and use of outer space resources.

In addition to NASA’s directive, KSC’s 2020 Vision Plan describes creating space tourist support infrastructure as a future project consistent with future space demands (NASA, 2020b). The historic success of the May 30, 2020 launch by SpaceX, which sent the first two commercially flown NASA astronauts to the International Space Station, was a milestone for the commercial space industry. This launch proved the commercial space sector has the capability and wherewithal to meet the stringent requirements set forth by NASA, making human spaceflight commercially viable in the 21st Century. Although the individual cost to travel to the International Space Station, or to the Moon in the future, may be limited to individuals of high net-worth at this time, this success provides opportunities for other entrepreneurial-minded commercial space entities to identify more affordable space experiences to the outer edge of Earth’s atmosphere for short-duration flights in the foreseeable future. Figure 1-3 depicts the human spaceflight vision. One market forecaster predicts commercialized space travel is likely to become a significant part of the \$1.5 trillion global tourism industry within the current decade (Masters, 2020). With the expansion of available competitors within the commercial launch vehicle market, a concurrent demand for privatized training for this sector of commercial astronauts is also growing for them to safely and effectively experience the edge of space and beyond.

Space Florida’s 2017 Master Plan describes the expansion of Exploration Park for commercial and industrial uses supporting CCS. This Master Plan envisions a time on or before 2025 where CCS “will be home to a fleet of many types of space-faring vehicles, with all combinations of vertical and horizontal modes of launch and landing. It will host multiple space carriers serving multiple markets with demand for services to suborbital space and high-value Earth orbits. Launch frequency will increase from the present tempo of one or more per month, to one or more per week, and then to one or more per day” (Space Florida, 2017).

According to NASA (2019c), up to two short-duration private astronaut missions would be enabled per year to the International Space Station in the near term. The missions would use U.S. transportation vehicles certified by NASA in accordance with NASA’s Commercial Crew Program. Per NASA (2015), anyone traveling to the International Space Station would have to train with NASA, and orbital missions would require training that meets Federal Aviation Administration (FAA) requirements. Up to 3 months of training is expected to be required before the space flight (Harwood, 2020; Quine, 2020).

- Flight Crew – crew on board a vehicle during launch and/or reentry.
  - Human Spaceflight Participant – someone engaged in spaceflight as a paying passenger and is not a member of the crew or launch provider.
  - Orbital Flight – occurs when a spacecraft is placed on a trajectory with sufficient velocity to place it into orbit around the Earth.
  - Suborbital Flight – occurs when a spacecraft reaches space, but its velocity is such that it cannot achieve orbit.
- Source: FAA, 2020b.

## ***Chapter 1 Purpose of and Need for the Proposed Action***

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However, private spaceflight astronauts could be trained at commercial space campuses that would involve short- to longer-duration training in the form of classes lasting days to weeks to meet the needs of a growing market for space tourism. Within this context, “space tourism” is defined as space travel for recreational, leisure, or business purposes. The suborbital space tourism could come from a number of space vehicle methods such as horizontal lift and landing commercial space providers, as well as vertical lift and landing vehicles and even balloon-based commercial space operations that could be served by the CCS.

NASA established a Suborbital Crew Office within NASA’s Commercial Crew Program, which is overseeing development of new orbital-class space capsules (Clark, 2020). These suborbital flights are expected to be more accessible, affordable, and available than missions to the International Space Station (NASA, 2020c). NASA released a Request for Information on June 23, 2020, from potential sources for suborbital crew space transportation services. The FAA codified training requirements for crew, operators, and space flight participants in 14 CFR Part 460, Human Space Flight Requirements. These requirements pertain to all applicants seeking a license or permit for suborbital or orbital spaceflight for the purposes of putting flight crew and/or spaceflight participants into space (FAA, 2020a).

As part of the Proposed Action, the training capabilities of this new commercial astronaut training campus are expected to include orbital and suborbital training facilities in support of prospective commercial space trainees.



<https://www.nasa.gov/multimedia/imagegallery/index.html>

## 2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

### 2.1 Proposed Action

A critical action to complete for any proposed new site development at KSC is for the project proponent to submit a KSC Environmental Checklist (KSC Form 21-608v2). This form is reviewed by KSC Environmental Management Branch (SI-E3) staff who then generate a Record of Environmental Consideration (REC) in response to the Checklist, which is provided to the project proponent. Refer to Appendix 1 for a copy of this REC form.

The Proposed Action is to construct and operate an Astronaut Training Facility at Exploration Park North. Figure 2-1 shows the relationship of the Proposed Action project limits and the boundaries of Exploration Park Phase I. The facility would include astronaut training facilities, astronaut accommodations, and auxiliary support facilities for future commercial astronauts and other customers. Figure 2-2 shows the approximately 66-acre (27-ha) development area, outlined in green, would include a master stormwater management system. The new development would be accessed via a road connected to New Space Drive. A secondary access road would be constructed at the northwest corner of the campus connecting to Range Road. Minor road improvements including paving and drainage would be required. This secondary road would provide redundant access to the campus for emergency and security vehicles only. A security gate would be constructed at this northwest, secondary access point to the campus.



<https://www.nasa.gov/multimedia/imagegallery/index.html>

In addition to the proposed development area as shown in Figure 2-2, are various support facilities and covered parking equipped with a solar panel array south and contiguous to the Proposed Action area in a portion of Exploration Park Phase I. The parking area will initially be within the Proposed Action boundary and if overflow parking is necessary at a future date it would occur in portions of Exploration Park I. The potential environmental impacts from support facilities outside the Proposed Action boundary were addressed in the Exploration Park Phase I EA and are not analyzed in this EA (NASA, 2008). The Exploration Park Phase 1 EA analyzed the development and operation of a 66-acre (27-ha) parcel of land to be used as a mixed use technology and commerce park. Specific to roads, the Exploration Park Phase 1 EA analyzed impacts from a connector road that would be constructed at the intersection of SCW and Ransom Road which would be followed by a road connecting Exploration Park to the Space Life Science Lab (i.e., Odyssey Way). Impacts to air quality, climate, biological resources, threatened and endangered species, cultural resources, geology and soils, noise, surface water quality, groundwater quality, socioeconomics and land use were analyzed. No significant impacts were expected (NASA, 2008).

A security gate would separate the publicly accessible dining facility from the training campus and astronaut accommodations facilities. In addition to the access route from New Space Drive

in Exploration Park Phase I to the main entrance of the publicly accessible Astronaut Training Visitor Complex and dining facilities, a second access to Space Commerce Way (SCW) will also be constructed. As noted above, the proposed development of this area was included in the Exploration Park Phase I EA and will not be analyzed in detail in this EA. This proposed access road will be addressed in the cumulative analysis portion of this EA to confirm that the environmental conditions and potential environmental impacts of this area remain the same as those assessed under the previous NEPA coverage.

## **2.2 Screening Factors**

The location and views from the site are critical to Space Florida's customers' envisioned program. The Proposed Action objective is to create a training experience for commercial space astronaut trainees, their guests, and visitors in an area benefiting from NASA's natural areas that provides a buffer and seclusion from nearby developed areas, including natural or manmade water features, and offers rooftop views of launches from NASA and Cape Canaveral Space Force Station (CCSFS) from the centralized complex (expected to be approximately 100 feet [30.5 m]). While achieving the program and vision of the client, NASA safety and security requirements must be considered, and as such, the secured entrance gates must not be visible from the proposed buildings.

NEPA's implementing regulations provide guidance on the consideration of alternatives to a Proposed Action and require rigorous exploration and objective evaluation of reasonable alternatives. Only those alternatives determined to be reasonable and meet the purpose and need require detailed analysis. Potential alternatives that meet the purpose and need were evaluated against the following screening factors:

- Consistent with 2014 Master Plan long-term planning initiatives and within 2020 Vision Plan Spaceport Growth Boundary and provide for future phased development.
- Near launch and landing sites at KSC and CCSFS, and on lands leased from Space Florida in support of commercial aerospace.
- Close to the KSC security gate to limit the distance a quarantined commercial space astronaut would have to travel to access a commercial space launch vehicle for health and safety reasons.
- A location that can provide a private and secluded setting surrounded by natural areas.
- In an area with existing utility and transportation infrastructure.
- Close to the KSC operational areas but outside of the NASA KSC security boundary for KSC security reasons.
- Minimize or avoid unnecessary adverse environmental and/or cultural impacts.



Figure 2-1 Aerial Map



- Minimize or avoid development in floodplain.
- Minimize overall development costs (i.e., wetland mitigation, fill, and utilities).

Various alternatives were evaluated against the screening factors and only one reasonable action alternative was determined. Therefore, the Proposed Action is also the Preferred Alternative.

## **2.3 Alternatives Carried Forward for Analysis**

Using the screening factors listed in Section 2.2, reasonable alternatives were considered that met the purpose and need for the Proposed Action. As a result of that effort, the Preferred Alternative and No Action Alternative were carried forward for analysis.

### **2.3.1 No Action Alternative**

Under the No Action Alternative, an Astronaut Training Facility would not be constructed, and Space Florida would be unable to support NID 8600.121, KSC's 2020 Vision Plan, and Section 6.3.1 of Space Florida's 2017 Master Plan. The No Action Alternative would not meet the purpose and need for the Proposed Action; however, as required by NEPA, the No Action Alternative is carried forward for analysis and will be used to analyze the consequences of not undertaking the Proposed Action. The No Action Alternative serves to establish a comparative baseline for analysis.

### **2.3.2 Proposed Action (Preferred Alternative) – Construct Astronaut Training Facility**

After applying the screening factors, only one reasonable alternative existed; therefore, the Preferred Alternative will also be known as the Proposed Action hereafter and is depicted on Figure 2-1.

Figure 2-2 shows the Proposed Action comprises approximately 60 acres (24 ha) north of Exploration Park Phase I. The Proposed Action parcel and development footprint provides adequate natural buffers that would remain undeveloped, allows for future expansion, reduces environmental impacts and development costs, and meets the program requirements and objectives.

The Proposed Action would require the following permits:

- An Environmental Resource Permit (ERP) through St. Johns River Water Management District (SJRWMD) to construct a new stormwater management system and to authorize wetland impacts and the proposed wetland mitigation plan.
- A Section 404 Dredge and Fill Permit issued by the FDEP to authorize wetland impacts and the proposed wetland mitigation plan if the wetlands are considered jurisdictional.

- A National Pollutant Discharge Elimination System (NPDES) Permit through the Florida Department of Environmental Protection (FDEP) for stormwater discharges associated with construction activities greater than 5 acres (2 ha).
- FDEP water and wastewater permits.

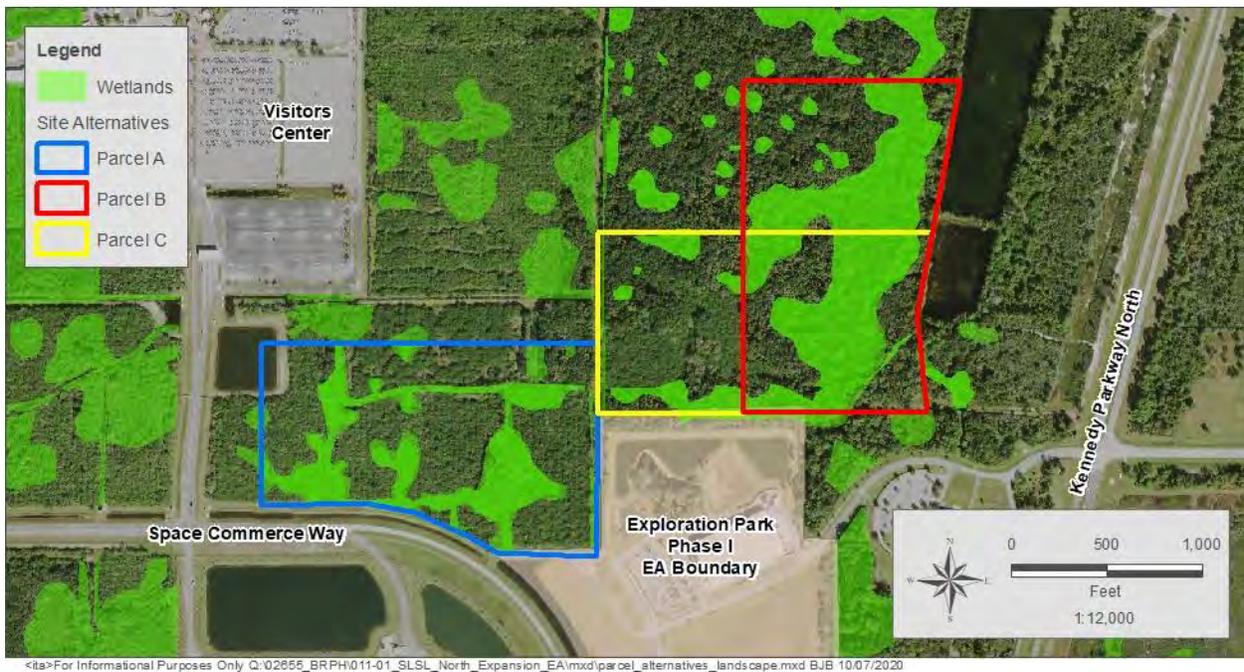
Project construction is proposed to begin in 2021, and the Astronaut Training Facility would be fully operational in 2022.

## **2.4 Alternatives Considered But Not Carried Forward to Detailed Analysis**

CEQ Regulations (40 CFR 1502.14) require a reasonable range of alternatives be analyzed to include the No Action Alternative. Reasonable alternatives include those alternatives that meet the purpose and need of the Proposed Action.

In addition to the Preferred Alternative location, three approximately 40-acre (16-ha) parcels were evaluated (Figure 2-3). When assessed against the nine screening factors listed in Section 2.2, the following conclusions were determined for Parcels A, B, and C:

- Parcel A is a former citrus grove now dominated by a monoculture of Brazilian pepper (*Schinus terebinfolius*) and thus would not provide the desired aesthetics of siting the accommodations nestled within a natural forest or other natural habitat.
- All three parcels possess poor quality land cover and would not provide the desired aesthetics of siting the accommodations nestled within a natural forest or other natural habitat.
- Parcel B is comprised primarily of high-quality wetlands and floodplains and thus would result in unnecessary adverse impacts.
- Minimizing or avoiding unnecessary adverse environmental (including wetlands and floodplains) and/or cultural impacts at Parcels A, B, and C would result in an overall smaller contiguous developable area, affecting the ability to support future expansion.
- Development on any one of the three parcels would result in excessive development costs (i.e., wetland mitigation, fill, and utilities), resulting in the effort to identify additional alternative sites. (See Appendix 2, Exploration Park North: Preliminary Site Evaluation [BRPH, 2020].)



**Figure 2-3 Parcel Alternatives Aerial and Wetland Map**

Specific to wetlands, a Light Detection and Ranging (LiDAR)-derived digital elevation model and ground truthing determined large amounts of wetlands were scattered throughout Parcels A, B, and C. Table 2-1 summarizes these parcels’ acreage. As a result, Parcels A, B, and C as standalone individual parcels did not meet all of the nine screening factors (Section 2.2). Using conceptual design footprints, Space Florida created hybrid layouts using portions of each of the three previously identified Parcels (Figure 2-3). These hybrid parcels were then assessed against the nine screening factors, and ultimately one area was identified as meeting all screening factors and subsequently became the Preferred Alternative as described in Section 2.3.2.

**Table 2-1 Upland and Wetland Acreage Summary for Parcel Alternatives**

Parcel	Parcel Acreage	Wetland Acreage and Surface Water Acreage	Upland Acreage
A	38	11	27
B	40	20	20
C	37	14	23

**2.4.1 Alternatives 1 through 4**

Based on results of the alternatives analysis for the three initial parcels, none of the three fully met the Proposed Action objectives and development was not feasible due to expected development costs. Additional sites were then identified However, Figure 2-4 shows that within the vicinity of the three parcel alternatives, four viable site-development alternatives were

## Chapter 2 Description of Proposed Action and Alternatives

identified. These alternatives were selected to further reduce environmental impacts and optimize development while accommodating the proposed facilities and stormwater management system. Parcel B itself was not directly included in the evaluation since it is comprised primarily of high-quality wetlands and floodplains, leaving little to no contiguous area available for development.

Alternatives 1 through 4 were evaluated for the following nine criteria:

1. Land cover.
2. Wetlands.
3. Floodplains.
4. Listed Wildlife Species.
5. Topography (Fill Cost).
6. Soils.
7. Security.
8. Utilities and access.
9. Developable area.

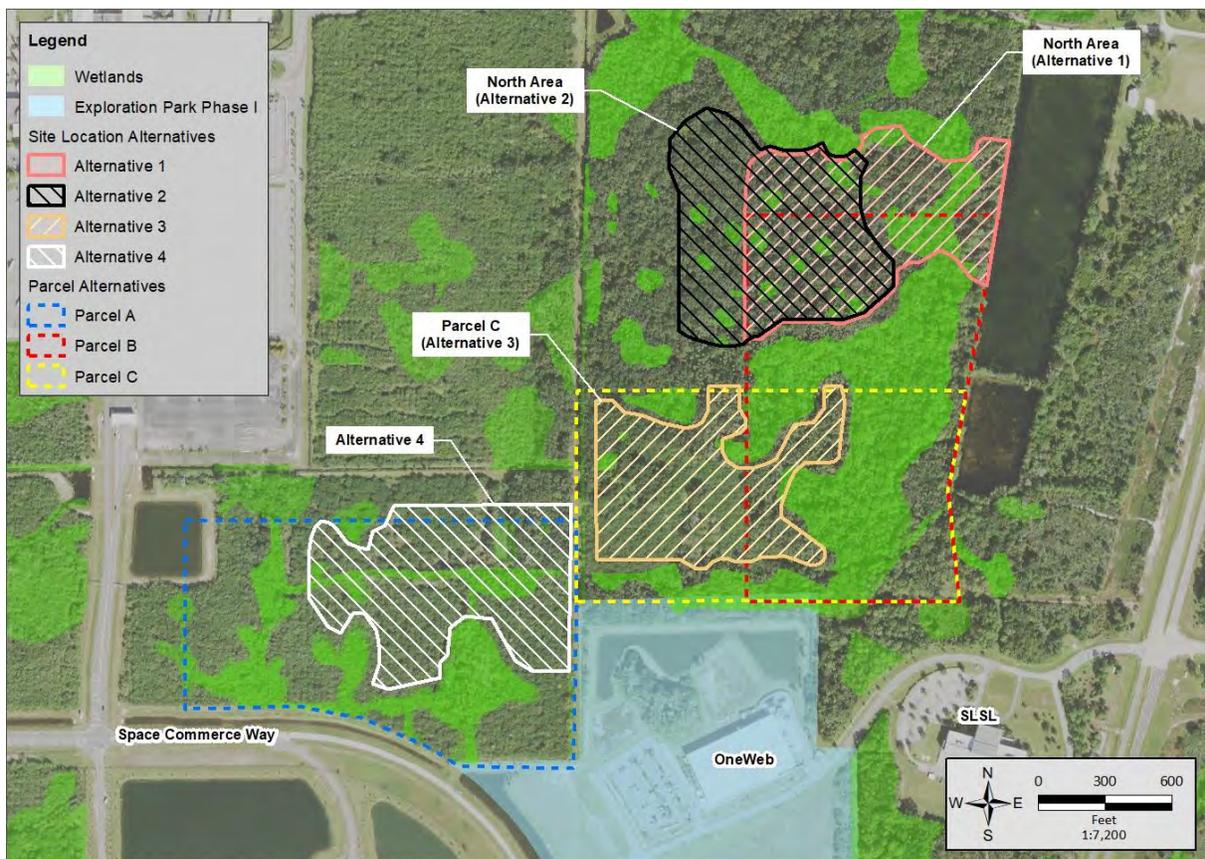


Figure 2-4 Alternatives 1 Through 4 Aerial Map

**Chapter 2 Description of Proposed Action and Alternatives**

Although the initial three parcels (A through C) may have scattered portions of areas that are viable for development, the area to the north presents greater development potential and fewer environmental impacts. Table 2-2 provides a weighted ranking comparison of each alternative in relation to the nine criteria. Based on site constraints and the desired facility program, Alternative 2 was determined to be the optimal site to focus the proposed development, with auxiliary and future support areas within the Alternative 3 and 4 areas. The hybridized developable area identified contiguous portions within Alternatives 1 through 4 that could be developed resulting in the least environmental impacts. The Proposed Action, identified as the Preferred Action, is an approximately 66.4-acre (26.9-ha) parcel (Figure 2-1).

**Table 2-2 Alternatives 1 through 4 Analysis Summary Table**

Category Weight	Land Cover		Wetlands		Floodplains		Listed Species		Topography (Fill Cost)		Soils		Security		Utilities & Access		Developable Area		Weighted Avg
	1	3	2	2	2	1	3	2	2	3	2	3	2	3	3				
North Area Alternative 2	4	Most Desirable	4	2.5 ac	5	Least impact	5	N/A	4	\$1.8 M	3	C/D	3	Least Desirable	2		5	16.5 ac	<b>3.9</b>
PARCEL C (Alternative 3)	2		5	0.3 ac	1	Most impact	5	N/A	3	\$2.0 M	3	C/D	5		4		2	13 ac	<b>3.5</b>
PARCEL A (Alternative 4)	3		2	1.3 ac	3		5	N/A	2	\$2.1 M	4	B/D	5	Most Desirable	5	Most Accessible	3	15.4 ac	<b>3.5</b>
North Area Alternative 1	3		2	2.6 ac	4		5	N/A	3	\$2.0 M	3	C/D	4		1	Least Accessible	5	16.6 ac	<b>3.4</b>
PARCEL B	1	Least Desirable	1	6.3 ac	2		5	N/A	1	\$2.3 M	3	C/D	4		3		1	7.5 ac	<b>2.3</b>



### 3.0 Affected Environment and Environmental Consequences

This chapter presents a description of the environmental resources and baseline conditions that could be affected from implementing the Proposed Action and an analysis of the potential direct and indirect effects.

Changes to the natural and human environment that could result from the Proposed Action are evaluated relative to the existing environmental conditions. Four levels of impact may be identified:

- Negligible – The impact is barely perceptible or measurable, remains confined to a single location, and would not result in a sustained recovery time for the resource impacted.
- Minor – The impact is readily perceptible and measurable; however, the impact would be temporary and the resource should recover in a relatively short period.
- Moderate – The impact is perceptible and measurable, and may not remain localized, impacting areas adjacent to the Proposed Action area; adverse impacts to a resource may require several years to recover.
- Major – An impact is predicted that meets the intensity/context significance criteria for the specified resource.

All potentially relevant environmental resource categories were initially considered for analysis in this EA. Discussion and analysis of the affected environment (i.e., existing conditions) focuses only on those resource areas potentially subject to impacts. In addition, the level of detail describing each resource below is commensurate with the expected level of potential environmental impact. Section 3.1 presents, describes, and justifies resource categories that were assessed but not carried forward for detailed analysis due to negligible or non-existing adverse impacts expected as a result of the Proposed Action.

#### 3.1 Resource Categories Not Carried Forward for Detailed Analysis

The potential impacts to the following resource areas are considered to be negligible or non-existent and were eliminated from detailed analysis in this EA – air quality, geology and soils, noise, water resources, environmental justice (Table 3-1). The following presents, describes, and justifies this determination for these resource categories.

**Table 3-1 Summary of Potential Environmental Impacts**

Issues		Proposed Action	No Action
Transportation	C	Minor Adverse	None
	O	Minor Adverse	None
Utilities	C	Negligible	None
	O	Minor Adverse	None
Habitats and Vegetation	C	Minor Adverse	None
	O	Negligible	None

### Chapter 3 Affected Environment and Environmental Consequences

Issues		Proposed Action	No Action
Wildlife	C	Minor Adverse	None
	O	Negligible	None
Threatened & Endangered Species	C	Negligible	None
	O	Negligible	None
Cultural Resources	C	Negligible	None
	O	Negligible	None
Floodplains	C	Minor Adverse	None
	O	Negligible	None
Socioeconomic	C	Minor Beneficial	Minor Negative
	O	Minor Beneficial	Minor Negative

Note: The “C” and “O” in the second column refer to “Construction” and “Operation”, respectively.

**Air Quality:** Site preparation and construction of the Proposed Action would produce **negligible adverse** impacts on the surrounding air quality. Land clearing and other construction activities would generate airborne particulates from earth moving and vegetation burning as well as hydrocarbon exhaust from heavy equipment, but such activities are expected to be small in scope and of very short (weeks to months) duration. Best management practices (BMPs) would be employed to minimize emissions from earth movement and burning. These BMPs include water spraying, placement of hay bales, and other forms of dust control. Once the contractor obtains a burn permit from KSC, burning (vegetation debris) would likely be conducted using a high-efficiency burn pit with forced-air injection, which allows for a high-temperature burn with little smoke and particulates. Operation of the Proposed Action is expected to have **negligible adverse impact** on surrounding air quality since the site will generate minimal emissions compared to manufacturing or launch facilities.

**Geology and Soils:** Land clearing and excavation for facility foundations and stormwater management system would require the upper soil strata layers be removed. This may affect shallow subsurface flows of water from rainfall events. However, this would be minimized with site grading and construction of the State-required stormwater management systems (SMSs). As a result, construction of the Proposed Action would result in **negligible adverse impacts** to this resource category. No operational activities would require disturbing soils or geology of the Proposed Action site. As a result, operation of the Proposed Action would be expected to produce **negligible adverse impacts** on the geologic strata or soils of the local area or region.

**Noise:** Ambient noise levels are expected to increase during construction activities and daily operations as a result of the Proposed Action site construction. Noise generated by construction vehicles is expected to be below all noise thresholds and would occur for a brief period. Noise levels would increase marginally in the vicinity of SCW temporarily due to increased construction traffic. However, this construction-related noise increase would be negligible compared to roadway and regional noise levels. Operation of the Proposed Action is expected to have **negligible adverse impact** on noise levels locally along SCW and adjacent to the roadway and **negligible adverse impact** on the noise levels regionally.

**Water Resources:** Construction of the Proposed Action would require the constructing dry-retention and wet-detention SMSs to treat runoff from all new impervious surfaces in accordance

with Florida water quality and quantity treatment regulations. These SMSs ensure that the new facilities have **negligible adverse impacts** on downstream surface and groundwater quality. During actual construction activities, impacts on surface waters would be minimized by ensuring that BMPs are initiated and maintained to control erosion and sedimentation. Operation of the Proposed Action is expected to have **negligible adverse impacts** on surface and groundwater resources since the SMS would offer high pollutant-removal efficiency and have no impact on the before and after surface water stages pursuant to state regulations.

**Environmental Justice:** The Proposed Action is not occurring near minority and/or low-income populations. Additionally, the KSC Child Development Facility is within the KSC secured area east of Kennedy Parkway and approximately 0.4 miles from the Proposed Action. As a result, the Proposed Action would not result in disproportionate impacts to minority and low-income populations and would not result in environmental health or safety risks to children.

## **3.2 Resource Categories Carried Forward for Detailed Analysis**

Resource categories for which the Proposed Action is expected to cause potential impacts are transportation, utilities, biological resources, threatened and endangered species, cultural resources, floodplains, and socioeconomics. The following sections present the analyses of these resource categories.

### **3.2.1 Transportation**

KSC is served by over 211 miles (340 km) of roadways with over 163 miles (263 km) of paved roads and 48 miles (77 km) of unpaved roads. KSC also has approximately 40 miles (64 km) of railroad. Of the four access roads onto KSC, NASA Parkway West serves as the primary access road for cargo, tourists, and personnel entering and leaving. This four-lane road originates in Titusville as SR 405 and crosses the Indian River Lagoon (IRL) onto KSC. After passing through the KSC Industrial Area, the road reduces to two lanes, crosses over the Banana River, and enters CCSFS. The second point of entry onto KSC is from the south via Kennedy Parkway South which originates on north Merritt Island as SR 3 (Kennedy Parkway). This road is the major north-south artery for KSC. The third entry point is accessible from Titusville along Beach Road, which intersects Kennedy Parkway North. The fourth entry point is south of Oak Hill at the intersection of U.S. Highway 1 and Kennedy Parkway North in Volusia County (Figure 1-1).

#### **3.2.1.1 No Action Alternative**

Under the No Action Alternative, the Proposed Action would not occur and no change to traffic patterns or additional trips would occur. Therefore, no adverse impacts to Transportation would occur with implementation of the No Action Alternative.

#### **3.2.1.2 Proposed Action**

**Construction:** The Proposed Action will be served via Exploration Parkway off of SCW at Exploration Park Phase I and via a right turn in and right turn out only secondary access road at the southwest corner of the facility. These two access roads will serve as the only access for staff

### **Chapter 3 Affected Environment and Environmental Consequences**

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and clientele. A third access road will be off of NASA Causeway at the badging station and will utilize Range Road. This access road will be used solely as a secondary access for emergency services.

SCW was designed and permitted as a four-lane highway, but only two lanes were constructed (Figure 1-2). However, SCW is currently being planned for expansion to four lanes within the next several years as part of a separate planning project. A design firm was selected by Space Florida in October 2020 and has begun roadway design. This will provide significant additional roadway capacity.

Construction of the Proposed Action is expected to have only **minor adverse impacts** on transportation within KSC due to the temporary construction workforce required to build the facilities. Increased construction traffic would occur during normal working hours and may cause temporary increased traffic delays.

**Operation:** The Proposed Action is expected to employ 20 to 50 permanent staff and will host approximately 30 astronaut trainees at any one time. A majority of these trainees will likely be escorted to and from the Orlando International Airport or a nearby regional airport to the Proposed Action facilities. In addition, the Proposed Action will house a café that can accommodate 70 people and a restaurant for up to 110 people, which will be open to the public. As a result, these facilities will likely attract KSC visitors as well as employees at nearby commercial aerospace facilities such as Blue Origin, OneWeb, and SpaceX. Although these facilities will attract individuals and thus increase traffic trips, many of these visitors and employees would be driving on SCW regardless of their final destination. Therefore, the main increase in traffic counts as a result of the Proposed Action will predominantly be a result of facility staff and, minimally, astronaut trainees. The proposed Range Road access will be for emergency services and operations only and would be gated.

Operation of the Proposed Action may increase traffic slightly on SCW and NASA Parkway West due to daily staff and astronaut trainee trips; however, with the four-lanes of SCW, this impact will have a **minor adverse impact** on SCW and the primary feeder roads NASA Parkway West and SR 3 (Kennedy Parkway)(Table 3-1).

#### **3.2.2 Utilities**

##### **3.2.2.1 No Action Alternative**

Under the No Action Alternative, the Proposed Action would not occur and no increase in utility demand would occur. Therefore, no adverse impacts to Utilities would occur with implementation of the No Action Alternative.

##### **3.2.2.2 Proposed Action**

#### **Wastewater Disposal**

Sanitary sewer service at KSC is provided by a wastewater collection and transmission system that is separated into two primary areas – one in the Industrial Area and one in the Vehicle Environmental Assessment for Exploration Park North

Assembly Building (VAB) Area. The combined flows are pumped through a force main across the Banana River to a regional wastewater treatment plant (WWTP) at CCSFS. The Proposed Action is close to KSC's wastewater collection system infrastructure that is part of the greater Industrial Area system.

For the Proposed Action, on-site wastewater collection and transmission to KSC's system will be required. Given topography and existing system elevations, on-site lift station(s) with force (pressure) main will likely be required to achieve connection to the KSC system. Two likely options for tying the new development to the KSC system exist. One option is to construct the new force main and connect to the existing lift station along Odyssey Way southeast of the OneWeb facility. The second option is to extend the force main to an existing force main that runs along SR-3.

The wastewater flows expected to be produced by this facility will be relatively low given the proposed occupancy and because this is a proposed Leadership in Energy and Environmental Design (LEED)-certified Platinum facility. According to NASA, the KSC wastewater system and the downstream CCAFS wastewater treatment plant are approaching capacity limits due to current flows and ongoing development at KSC. The KSC system should have available capacity for the small increase in wastewater flows expected from the Proposed Action. However, until NASA and CCFAS can implement modification to increase available capacity, even small increases in flow impact the current wastewater system. As such, the construction and operation of the Proposed Action is considered to cause **minor adverse impacts** to the wastewater system.

Note: LEED is an internationally recognized green building certification system, providing third-party verification that a building (or community) was designed and built using strategies aimed at improving performance across energy savings, water efficiency, CO<sub>2</sub> emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. Developed by the U.S. Green Building Council (USGBC), LEED provides building owners and operators a concise framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions. LEED provides a point system to score green building design and construction. The system is categorized in five basic areas: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, and Indoor Environmental Quality. Buildings are awarded points based on the extent various sustainable strategies are achieved. The more points awarded the higher the level of certification achieved from Certified, Silver, Gold, to Platinum.

#### **Power**

The electric power distribution system at KSC is provided by Florida Power & Light Company (FPL) which transmits 115 kilovolts (kV) to KSC that are distributed to two major substations – the C-5 substation, which serves the Launch Complex 39 (LC-39) Area providing 13.8 kV; and the Orsino substation, which serves the Industrial Area providing 13.2 kV. From 2014 through 2019, electricity usage on KSC ranged between 102,832 (2019) and 187,793 (2014) megawatt-hours. Electricity consistently provides 91 percent of KSC's total energy (NASA, 2020d). The high-voltage power is distributed from the substations by over 270 miles (434 km) of overhead and underground power lines to transformers and substations at various facilities. In late 2016,

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FPL installed a new “Mars” substation along SCW to serve commercial aerospace customers along SCW, Space Florida facilities in Exploration Park I, and the KSC Visitors Center (VC). In addition, FPL has constructed a solar farm on Jerome Road and is currently constructing an approximately 500-acre (202 ha) solar farm north of the VC.

For this Proposed Action, electrical service will be provided by the proposed 1-megawatt (MW) solar array that will be constructed with a series of canopies over the parking facilities. Any additional electrical power needed would be provided by an existing FPL underground service primary feeder currently situated along Odyssey Way. Service would then extend north to the facility via underground infrastructure. The 1-MW solar array, the newly constructed “Mars” substation, and other recent upgrades, combined with this facility being a LEED Platinum facility indicate sufficient power is available for the project. As a result, the construction and operation of the Proposed Action is expected to have **negligible adverse impacts** on power.

LEED’s Energy & Atmosphere credits aim to reduce energy use and increase renewable forms of energy. The Energy & Atmosphere credits optimizes energy performance in order to reduce the energy consumption of the building, thereby decreasing negative environmental impacts. This involves building commissioning, energy modeling, use of non-ozone depleting substances and encouragement to use renewable energy technologies.

#### **Communications**

The KSC communications system provides a variety of services at KSC including (1) conventional telephone service, (2) transmission of large volumes of test data to central collection or reduction stations, (3) transmission of timing information from operation centers to data-gathering instrumentation at widely scattered locations, (4) transmission of weather and range safety data, and (5) communication with satellites and other hardware in space. The major segments are the three distribution and switching stations in the Industrial Area (First Switch) and LC-39 Area (Second and Third Switches).

The Exploration Park area is served with communications infrastructure from KSC and independent vendors. These communications currently all flow through the communications room at the Space Life Sciences Laboratory (SLSL) facility. However, some Exploration Park tenants have direct independent feeds from the vendor. For the Proposed Action, necessary communications lines will be installed and connected to the existing system at Exploration Park Phase I. The existing communications system can provide the necessary increased capacity for these new facilities. As such, the construction and operation of the Proposed Action is expected to have **negligible adverse impacts** to the communications system.

#### **Potable Water**

KSC’s potable water is supplied by the City of Cocoa, which obtains its water from artesian wells west of the St. Johns River in Orange County. Water enters KSC along SR 3 from a 24-inch (60-centimeter [cm]) water main and extends north along Kennedy Parkway serving KSC. The average daily demand for water is 700,000 gallons per day (2.6 million liters per day).

Various aboveground storage tanks and secondary pump systems supply water throughout KSC (NASA, 2019d).

For the Proposed Action, new water service pipelines for fire protection and potable water are expected to be extended from the existing 12-inch (30-cm) water main running along Odyssey Way. Based on the occupancy of the proposed facilities, combined with the proposed LEED Platinum goal, the potable water consumption is expected to be relatively low. Fire flow requirements are expected to be commensurate with other similar occupancies in the area. KSC water system modeling for this area indicates sufficient flow will be available to accommodate fire flows. As such, the existing water distribution system can provide the necessary increased capacity for the new facilities. Based on the size of the existing water main and expected demand associated with LEED Platinum facilities, the construction and operation of the Proposed Action is expected to have a **negligible adverse impacts** on potable water infrastructure.

### **3.2.3 Biological Resources**

KSC covers approximately 140,000 acres (56,600 ha), of which 91 percent remains undeveloped area including uplands, wetlands, mosquito-control impoundments, and open water areas. Undeveloped areas, including abandoned citrus groves, are managed by the U.S. Fish and Wildlife Service (USFWS) Merritt Island National Wildlife Refuge (MINWR). Due to its physical location, geologic history, and mix of temperate and subtropical flora, extensive areas of NASA KSC serve as important wildlife habitat.

#### **3.2.3.1 No Action Alternative**

Under the No Action Alternative, the Proposed Action would not occur and no change to biological resources would occur. Therefore, no significant impacts to biological resources would occur with implementation of the No Action Alternative.

#### **3.2.3.2 Proposed Action**

##### **Habitats and Vegetation**

Vegetation on KSC can generally be categorized into upland and wetland communities. A “ridge and swale” topography that includes bands of uplands and wetlands oriented northeast-southwest is found on KSC primarily east of Kennedy Parkway. Scrub and pine flatwoods are the common upland communities with freshwater marshes and wet prairies between the upland bands. Large areas of mangroves and salt marsh are adjacent to the estuaries on KSC.

Land cover near and within the Proposed Action can generally be categorized into forested uplands, forested wetlands, and open-water communities. The on-site land cover documented at the Proposed Action site was categorized according to the Florida Land Use, Cover and Forms Classification System (FLUCFCS) developed by the Florida Department of Transportation. Land cover within the Proposed Action site consists of three distinct upland land uses and two wetland communities.

### Uplands

Approximately 33,033 acres (13,368 ha) of uplands are on KSC. These uplands are composed of several vegetation communities. Upland communities on KSC are found on well-drained, acidic, sandy soils that experience brief periods of standing water. Scrub and pine flat woods are the most common upland communities that rely on periodic fire for maintenance of habitat structure and vegetation composition. These upland communities support numerous upland-dependent listed wildlife species such as the Florida scrub-jay (*Aphelocoma coerulescens*) and gopher tortoise (*Gopherus polyphemus*).

Figure 3-1 shows that the Proposed Action site consists of approximately 4.6 acres (1.9 ha) of uplands that are classified as Brazilian Pepper (FLUCFCS Code 4220), 38.4 acres (15.5 ha) of uplands classified as Temperate Hardwood (FLUCFCS Code 4250), and 5.5 acres (2.2 ha) of uplands classified as Roads and Highways (FLUCFCS Code 8140). The Brazilian Pepper community consists of low-quality upland habitat that was historically citrus groves until they were abandoned in 2008. This area is now dominated by dense Brazilian pepper and other exotic invasive vegetation. The Temperate Hardwood community is a medium- to high-quality forest dominated by live oak (*Quercus virginiana*), laurel oak (*Quercus laurifolia*), sweetgum (*Liquidambar styraciflua*), sabal palm (*Sabal palmetto*), and Brazilian pepper (*Schinus terebinthifolia*) with an understory dominated by saw palmetto (*Serenoa repens*), beautyberry (*Callicarpa americana*), wild coffee (*Psychotria nervosa*), grapevine (*Vitis rotundifolia*), and greenbriar (*Smilax* sp.). The Roads and Highways land use consists of Range Road, which is an improved dirt road that contains buried utilities and an adjacent swale and unimproved portions of Exploration Park Phase I.

### Wetlands

Approximately 106,403 acres (43,061 Action ha) of freshwater and saltwater wetlands are found on KSC and include diverse types such as mangrove swamps, salt marshes, shrub swamps, freshwater marshes, wet prairies, and cattail marshes (NASA, 2015). Impounded salt marsh waters are found throughout KSC and are managed by USFWS on MINWR. The wetlands and surrounding waters of KSC support large wintering populations of waterfowl as well as transient and resident wading bird populations.

The Proposed Action site contains two wetland communities (Figure 3-1). The Exotic Wetland Hardwoods community (FLUCFCS 6190) comprises approximately 6.6 acres (2.7 ha) and occurs in former citrus groves. This low-quality community is now dominated by the exotic invasive species Brazilian pepper with little to no understory consisting of dayflower (*Commelina diffusa*), pennwort (*Hydrocotyle umbellata*), and sapling sabal palm. The medium-quality Mixed Wetland Hardwood community (FLUCFCS 6170) comprises approximately 11.3 acres (4.6 ha) and is dominated by red maple (*Acer rubrum*), American elm (*Ulmus americana*), sabal palm, swamp dogwood (*Cornus foemina*), Brazilian pepper, groundseltree (*Baccharis halimifolia*), leather fern (*Acrostichum aureum*), pennywort (*Hydrocotyle umbellata*), and dayflower (*Commelina diffusa*).

**Construction:** Development of and around the Proposed Action is consistent with the KSC Vision 2020 Environmental Assessment, which has identified future development regions called Spaceport Growth Boundaries within KSC. Figure 3-2 shows the Proposed Action falls within the Central Space Commerce District. Figure 3-3 shows the conceptual development footprint of the Proposed Action site which would result in the loss of Brazilian pepper (4.1 acres [1.7 ha]) and Temperate Hardwood (25.1 acres [10.1 ha]) uplands and wetlands consisting of Exotic Wetland Hardwoods (6.0 acres [2.4 ha]) and Mixed Wetland Hardwoods (2.1 acres [0.8 ha]). Table 3-2 summarizes the land cover impacts. Construction is expected to have **negligible to minor adverse impacts** on upland vegetation and **negligible to minor adverse impacts** on wetland vegetation **on KSC** due to the small impact acreage, lower quality of vegetation impacted, wetland mitigation that will provide for any impacts, and the vast acreage of higher quality upland and wetland communities at KSC.

**Table 3-2 Summary of Conceptual Land Cover Impacts**

<b>FLUCFCS Land Cover</b>	<b>FLUCFCS Code</b>	<b>Proposed Action (Acres [Ha])</b>	<b>Conceptual Impact (Acres [Ha])</b>
Brazilian Pepper	4220	4.6 (1.9)	4.1 (1.7)
Temperate Hardwood	4250	38.4 (15.5)	25.1 (10.1)
Mixed Wetland Hardwood	6170	11.3 (4.6)	2.1 (0.8)
Exotic Wetland Hardwood	6190	6.6 (2.7)	6.0 (2.4)
Roads and Highways	8140	5.5 (2.2)	0.5 (0.2)
	TOTAL=	66.4 (26.9)	37.8 (15.3)

Before conducting any construction activities, NASA would obtain an ERP from SJRWMD and a Federal Dredge and Fill 404 Program Permit from FDEP if required. These permits will necessitate mitigation compensation for unavoidable wetland loss. Compensatory mitigation would be provided by the purchase of federal palustrine mitigation bank credits from a regional commercial mitigation bank which serves the KSC hydrologic basin.

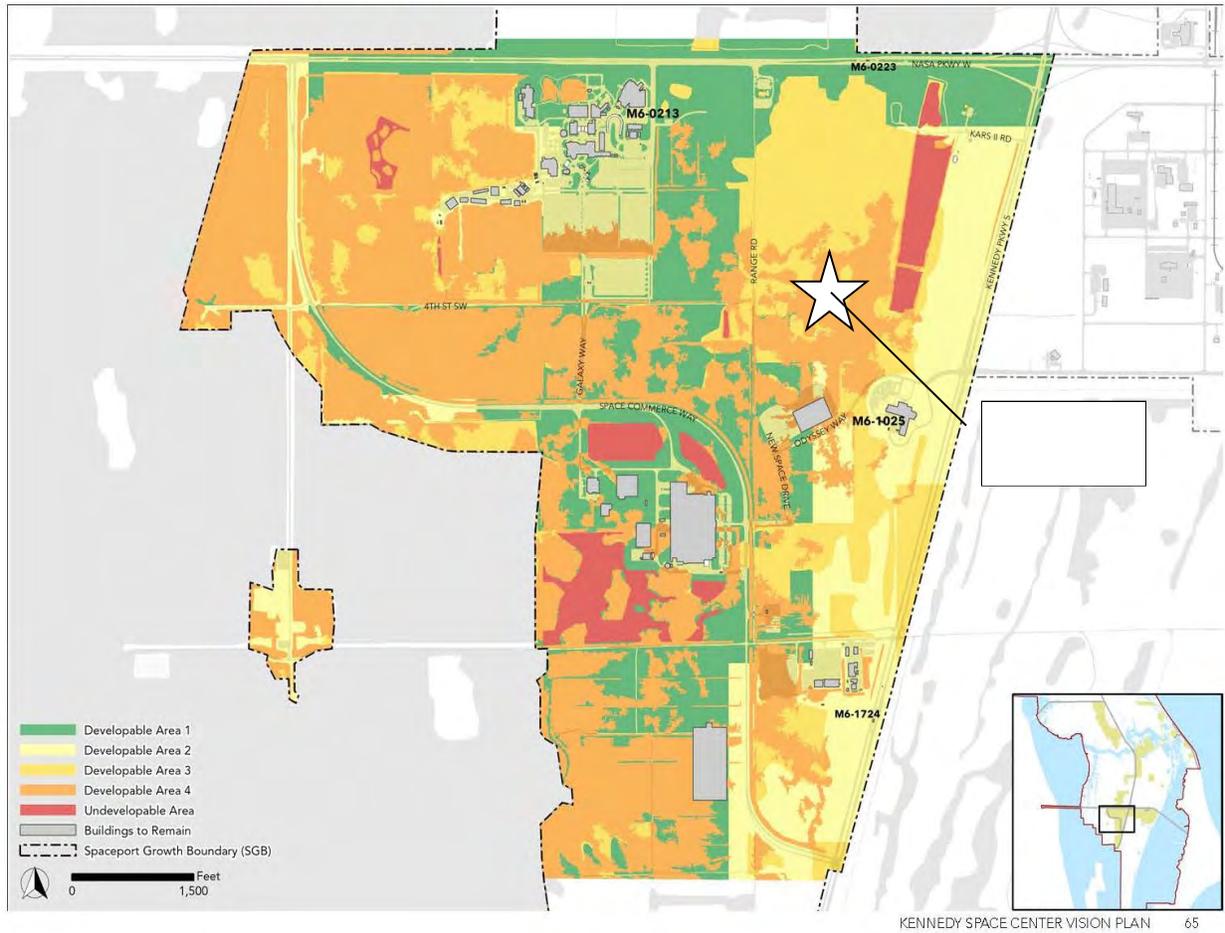
**Operation:** **Negligible adverse impacts** on vegetation are expected from the operation of the Proposed Action since the proposed use is low intensity compared to manufacturing or launch facilities that occur at KSC.



Figure 3-1 Existing Land Use

**DEVELOPABLE AREA**

SPACE COMMERCE DISTRICT SGB - CENTRAL



**Figure 3-2 Central Space Commerce District (NASA, 2020b)**

**3.2.3.3 Wildlife**

**Birds**

KSC and the surrounding coastal areas provide habitat for 318 bird species, and MINWR is considered one of the top 10 birding destinations in the U.S. Approximately 87 of these species are breeding residents, over 100 species have been documented to winter on KSC, and the remaining species are transients that regularly use KSC terrestrial and aquatic habitats for brief periods (NASA, 2020e). Non-listed bird species that could utilize or be found near the Proposed Action project area are primarily passerine birds that prefer forested habitat such as American robin (*Turdus migratorius*), Northern cardinal (*Cardinalis cardinalis*), Carolina wren (*Thryothorus ludovicianus*), Carolina chickadee (*Poecile carolinensis*), tufted titmouse (*Baeolophus bicolor*), grey catbird (*Dumetella carolinensis*), red-shouldered hawk (*Buteo lineatus*), yellow-rumped warbler (*Dendroica coronata*), and other common avian species. However, the Proposed Action site provides no foraging habitat for wading or shore birds.

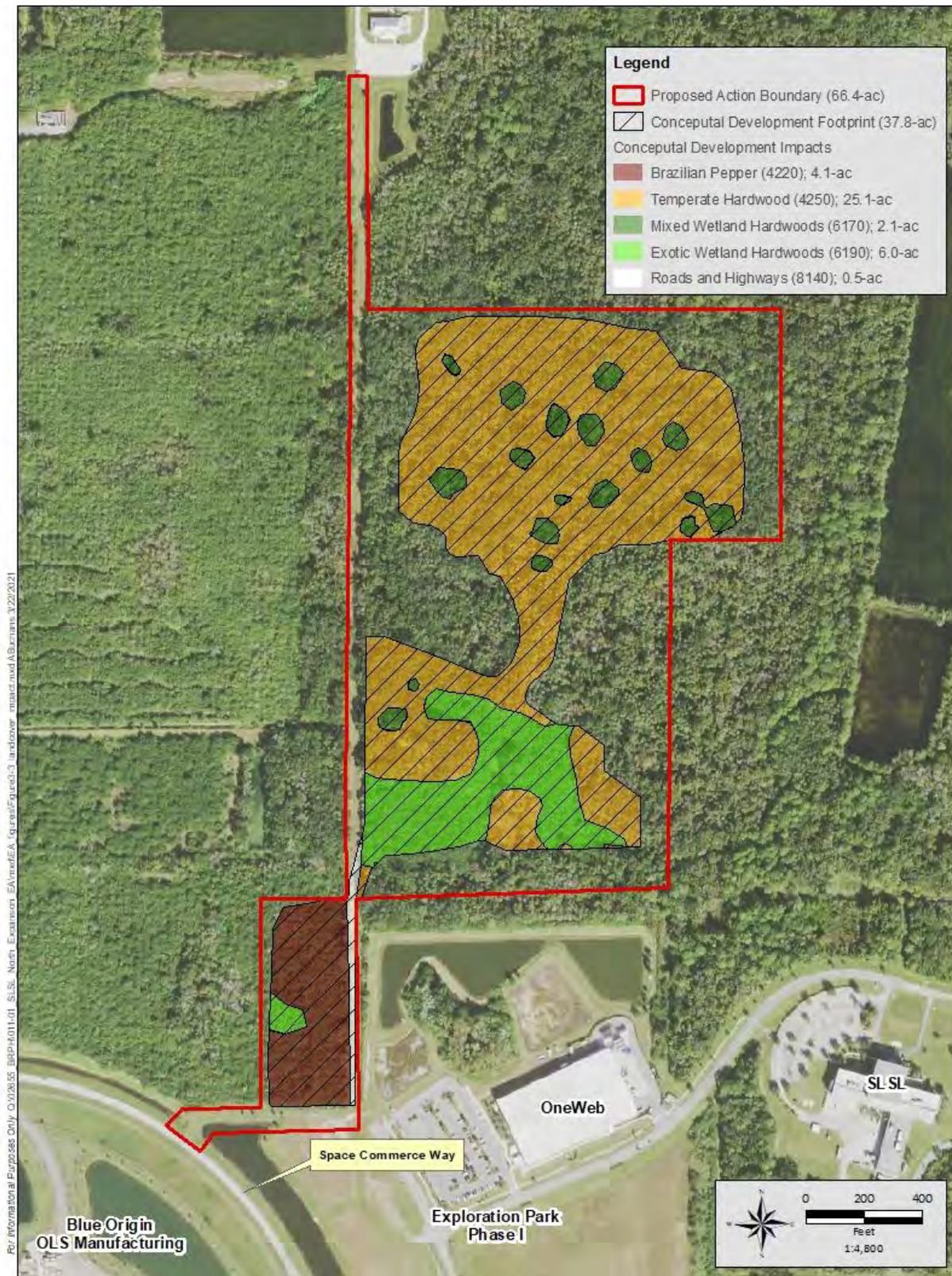


Figure 3-3 Proposed Vegetation Community Impact Map

### Mammals

Twenty-nine species of mammals inhabit KSC lands and waters (NASA, 2020d). Typical terrestrial species include the opossum (*Didelphis virginiana*), hispid cotton rat (*Sigmodon hispidus*), raccoon (*Procyon lotor*), river otter (*Lutra canadensis*), and bobcat (*Lynx rufus*). Due to the regional loss of large carnivores such as the Florida panther (*Puma concolor coryi*) and red wolf (*Canis rufus*), the bobcat, coyote (*Canis latrans*), and otter now hold the position of top mammalian predators on KSC.

In addition, a proliferation of mid-level predators such as the raccoon and opossum has resulted from an imbalance of predator/prey ratios. Opportunistic species such as the cotton rat and Eastern cottontail rabbit (*Sylvilagus floridanus*) account for a large portion of the small mammal biomass. At least three species of bats have been documented that occasionally use KSC facilities as roost sites and must be relocated and excluded from re-entry when their use of the facility conflicts with facility operations or renovations.

Terrestrial mammalian species that may use the low to medium-quality uplands within the Proposed Action site include the raccoon, armadillo, feral hog, Eastern cottontail rabbit, hispid cotton rat, white-tailed deer, and opossum. Due to the low to medium quality of on-site habitats and presence of humans, roads or developments to the north, east, and south, most of these mammals would use native vegetation communities found off site and likely only be passing through the Proposed Action site on their way to higher quality habitat.

### Herpetofauna

Seventy-four species of reptiles and amphibians are known to occur at KSC (NASA, 2020d). Due to the dense canopy, high water table, and lack of well drained soils, the gopher tortoise does not inhabit the Proposed Action site. Non-listed herpetofauna that could potentially inhabit or occasionally forage the Proposed Action site include green anole (*Anolis carolinensis*), brown anole (*Anolis sagrei*), green tree frog (*Hyla cinerea*), garter snake (*Thamnophis sirtalis*), rat snake (*Pantherophis* spp.), water moccasin (*Agkistrodon piscivorus*), and black racer (*Coluber constrictor*).

Potential impacts on wildlife by the Proposed Action construction and operation are based on habitats removed by typical construction activities for clearing, road construction, and the expected long-term use of the proposed site. Effects from the construction phase of the project would undoubtedly occur and are expected to be temporary except for those caused by habitat removal and alteration. However, on-site natural habitats are composed of low- to medium-quality uplands and wetlands that provide lower habitat value and are much less accessible as a result of being bound on three sides by roadways as compared to the vast acreage of natural vegetation communities found on KSC.

**Construction:** Construction noise and activities of the Proposed Action would have **minor** impacts on wildlife due to the presence of wildlife habitat within the project area. Thus, **minor adverse impacts** on wildlife are expected due to habitat loss and but would not be significant to the species' continued existence. Wide-ranging species such as large mammals should not be

impacted by habitat removal since they likely avoid the Exploration Park and KSC VC complex currently, and thus, a disruption of wildlife species movement patterns due to the new facilities should not occur. The impacted species are typically sensitive to human activity and will move away from disturbance, thereby causing at least a temporary shift in the population structure.

**Operation:** Long-term use of the proposed site would have minimal impact on wildlife species and is expected to have **negligible to minor adverse impacts** on wildlife populations. However, wildlife species such as raccoon, opossum, and American alligator (*Alligator mississippiensis*) can propose a nuisance to facility operations due to their foraging at waste disposal areas and the potential for the American alligator to utilize open water areas such as stormwater retention ponds, pools, other water features which could put them in close contact with people. As such, a nuisance species operational plan will need to be developed to address nuisance wildlife species issues and resolutions.

### **3.2.4 Threatened and Endangered Species**

#### **3.2.4.1 Listed Wildlife**

Numerous federal and state laws deal directly with the conservation and preservation of flora and fauna in Florida. The primary objectives of these laws are to establish the listing and de-listing processes for endangered and threatened species, maintain data on current populations of species, identify and maintain critical habitat, and protect those species that have been identified as threatened or endangered. KSC and the adjacent CCSFS provide habitat for more threatened and endangered species than any other federal property in the continental United States (Breininger et al., 1994). Thirty Florida or federally listed wildlife species regularly use the lands or waters of KSC. Of the 30 listed wildlife species, 14 are federally listed as candidate, threatened, or endangered and 16 are state listed (NASA 2020d). The Florida Fish and Wildlife Conservation Commission (FWC) in 2017 published the 2016-2026 Imperiled Species Management Plan (ISMP) for state listed species. The goal of the ISMP is to ‘conserve or improve the status of threatened species to effectively reduce the risk of extinction.’ This comprehensive document also incorporates Species Action Plans and other documents.

The lack of xeric, aquatic, and coastal habitat in the Proposed Action boundary eliminates the potential for numerous listed species. Of the 30 Florida or federally listed terrestrial wildlife species, only the eastern indigo snake could potentially use habitat of the Proposed Action site. An eastern indigo snake was observed during wildlife surveys west of the Blue Origin Orbital Launch System South Campus in association with the International Space Research Park EA. However, no indigo snakes were observed during the Proposed Action site assessments. Although indigo snakes do forage in habitats that occur in the Proposed Action boundary, their preferred habitat is well-drained sites that support gopher tortoises, which they use for refugia. The Proposed Action site is poorly drained and does not contain gopher tortoise habitat. In addition, the presence of Exploration Park Phase I to the south, the Badging Station and NASA Causeway to the north, Kennedy Parkway to the east, and SCW/Blue Origin Campus to the west greatly limit this species movements to the Proposed Action site and render the site unsuitable to support the long-term presence of eastern indigo snakes. However, the USFWS Eastern Indigo Snake Protective Measures will be implemented prior to and during construction activities.

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The majority of the listed bird species, such as the wood stork (*Mycteria americana*), would likely not use the densely vegetated communities since these species require more open foraging areas with standing water or are restricted to coastal habitats. In addition, with regard to the wood stork, Figure 3-4 shows that the project area falls within a 15-mile (42.1-km) radius from a wood stork nesting colony and, therefore, is considered core wood stork foraging area. The closest bald eagle (*Haliaeetus leucocephalus*) nest is 1.7 miles (2.7 km) to the east (Figure 3-4).

KSC has one of three remaining core Florida scrub-jay populations across the species range and has developed a habitat model that maps Auxiliary, Core, and Support Habitat. Based on this model, some Auxiliary Habitat does occur within the Proposed Action boundary (Figure 3-4). Habitat in the Proposed Action site is low- to medium-quality, poorly drained mesic forested upland and wetland habitat with areas of dense Brazilian pepper. Thus, the Proposed Action site does not currently and would not support suitable and sustainable xeric habitat for this listed species. However, prior to final design of the Proposed Action, a determination will be made by KSC staff if habitat mitigation for this species is required. If mitigation is deemed to be warranted by KSC staff, mitigation will be provided in accordance with the Florida Scrub-Jay Compensation Plan (KSC 2014).

**Construction:** The on-site habitats are not necessary for the survival of threatened or endangered species. However, existing habitats could possibly on occasion support listed species such as the eastern indigo snake due to their large home range. Construction impacts are not expected to cause changes in the overall population size or structure of any of listed species on KSC. As a result, impacts on local threatened and endangered species from land clearing and construction of the Proposed Action are expected to be **negligible**.

**Operation:** KSC is required to protect marine turtle nesting habitat by NEPA and the USFWS through the Endangered Species Act (ESA). The NEPA of 1969, as amended (42 U.S.C. 4321-4370d), and according to the procedures of implementation of NEPA for NASA [Title 14, CFR, Part 1216 subparts 1216.1 and 1216.3], requires federal agencies to assess how programs and associated actions may affect the environment. As part of this assessment, KSC has coordinated with the USFWS on the effects of exterior lighting on protected species. USFWS has issued a biological opinion (BO) based on their review of historical and expected future light management activities by KSC, and the associated effects on the loggerhead (*Caretta caretta*), green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*), hawksbill (*Eretmochelys imbricata*), and Kemp's ridley (*Lepidochelys kempii*) sea turtles in accordance with Section 7 of the ESA of 1973, as amended (16 U.S.C. 1531 et seq).

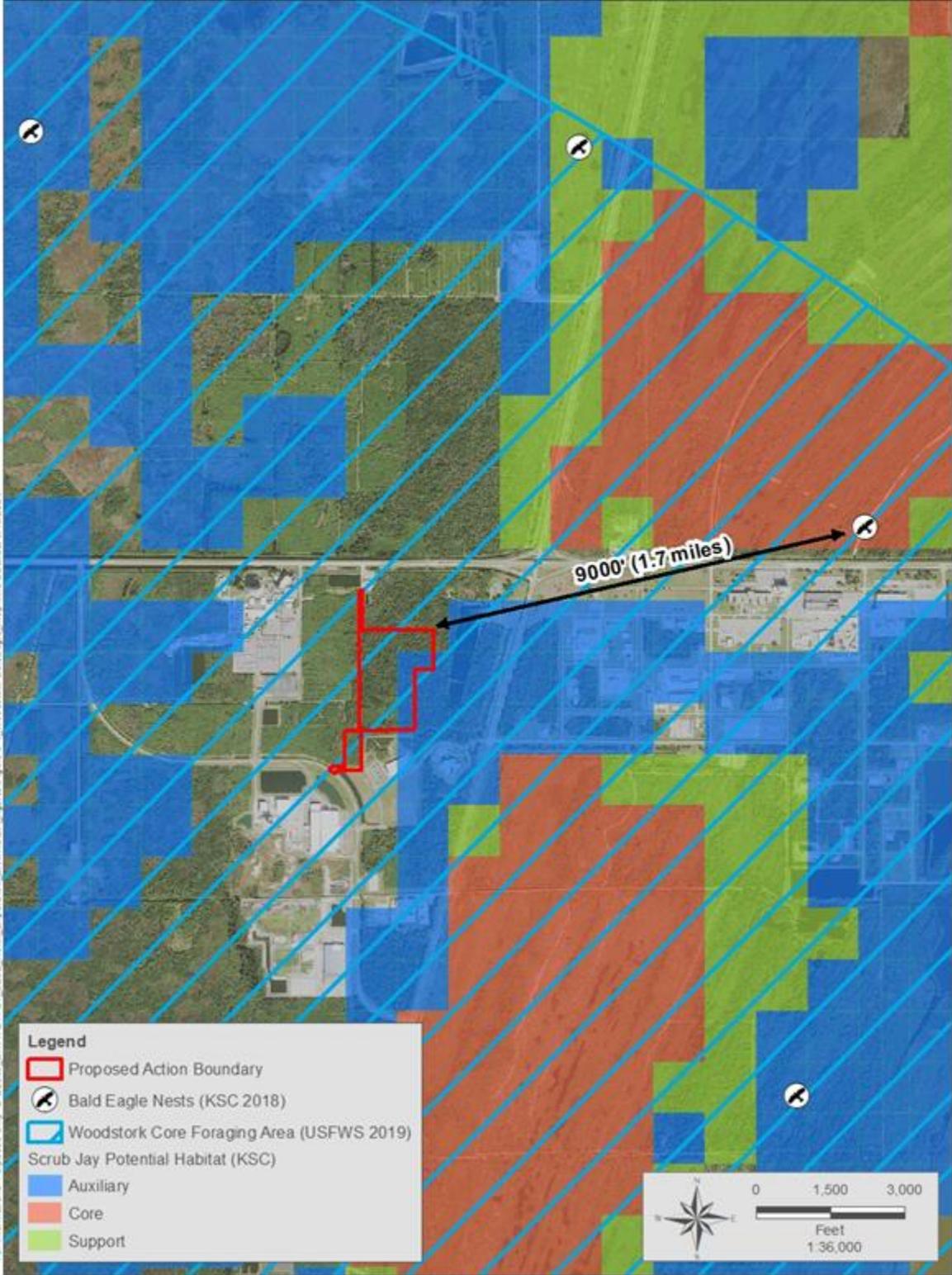


Figure 3-4 Bald Eagle Nest and Wood Stork Core Foraging Area Map

As such, exterior lighting at KSC is intended to be limited to internal lighting of signs, security, and safety illuminations of adjacent streets, parking areas, loading areas, service areas, access drives, walkways, and building entrances and exterior lighting of overall building surfaces. Such lighting will not produce any excessive glare or reflection onto any portion of any adjacent street or parcel or into the path of any oncoming or passing vehicle. All parking lots, loading areas, service areas, pedestrian walkways, and security lights, whether wall-mounted or free-standing, must be concealed-source fixtures where the lenses do not project below the opaque section of the fixture. Lighting fixtures for parking areas will be selected from NASA and USFWS standards and may only be varied with prior approval. Refer to lighting requirements in Chapter 24 of Kennedy NASA Procedural Requirements 8500.1 Rev. D (NASA 2017) for details.

The Proposed Action is within KSC Burn Unit 8.3 but only the easternmost portions of this burn unit contains fire dependent habitat (Figure 3-5). However, the operation of the Proposed Action is not expected to negatively impact MINWR's ability to conduct controlled burns in the vicinity.

Terrestrial species would avoid the Proposed Action site and can use similar habitats to the north, east, and south. However, resident populations of eastern indigo snakes are unlikely to be found due to the isolated and low quality of habitats within and adjacent to the Proposed Action. The long-term operation of the Proposed Action is not expected to have a long-term impact on local populations of listed terrestrial species such as the eastern indigo snake. As a result, **negligible adverse impacts** on threatened or endangered species are expected due to the operation of the Proposed Action.

#### **3.2.4.2 Listed Plants**

Thirty-nine plant species occurring on KSC are listed as threatened, endangered, or of special concern on state lists. For some of these species, KSC populations appear to be important to their regional and global survival (NASA, 2020e). These species are identified by agencies as being rare or restricted to sensitive habitats with many of them occurring in coastal dune areas that are not found in the Proposed Action site. No regulatory implications for the occurrences of listed plant species exist on the project site. Although a formal intensive vegetation survey was not completed, no listed plant species are expected to occur within the Proposed Action site since it does not contain or is within several miles of coastal dune habitat and also contains a large area of former citrus groves currently dominated by exotic invasive plant species. As a result, **negligible adverse impacts** are expected as a result of the construction and operation of the Proposed Action.

#### **3.2.5 Cultural Resources**

Sites containing potential archaeological and/or historical resources on KSC are protected under the National Historic Preservation Act and the Archaeological Resources and Protection Act, which require that every federal agency "take into account" how each undertaking could affect historic properties. NASA has executed a Programmatic Agreement among the NASA KSC, Advisory Council on Historic Preservation, and the Florida State Historic Preservation Officer

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regarding management of historic properties at KSC. This agreement outlines roles, responsibilities, and protocols for cultural resources at KSC. NASA has mapped areas proposed for construction in previous studies and has also developed an archaeological site location predictive model to aid NASA personnel when reviewing any siting and/or dig permit activities (ACI, 1992; *Archaeological Survey to Establish Zones of Archaeological Potential (ZAPs) in the Shuttle Landing/KSC South Areas (Option 2) of the Kennedy Space Center*). Areas that have low potential and/or no known archaeological sites within the Area of Potential Effect generally do not require a Phase I or II archaeological survey.

The preservation of archaeological deposits is directly influenced by a number of variables including soil drainage characteristics. In general, the probability of encountering archaeological resources in poorly drained soils is low. Conversely, in well drained or moderately well drained soils, the probability of encountering archaeological resources is generally considered high or moderate, respectively. Accordingly, 9.4 acres (3.8 ha) of the Proposed Action boundary are designated as a moderate-probability zone (MPZ), and 52 acres (21 ha) are designated as a low-probability zone (LPZ) due to their poorly to very poorly drained soils. As such, a Phase I Cultural Resource Assessment Survey (CRAS) was completed for the 9.4-acre (3.8 ha) MPZ area.

#### **3.2.5.1 No Action Alternative**

Under the No-Action Alternative, the Proposed Action would not be implemented, and the area would remain undeveloped. As such, **no impacts** to cultural resources would occur.

#### **3.2.5.2 Proposed Action**

In determining whether archaeological materials may be present within the project's Archaeological Area of Potential Effects (APE), a review of background information was completed in conjunction with probability modeling based on the proximity to natural, prehistoric, and historic resources. Due to the APEs proximity to previously recorded sites, aquatic environments, and historic roadways and towns, the overall project APE is classified as having a low to moderate probability for containing archaeological sites.

A Phase I CRAS was conducted December 7–9, 2020 and consisted of a historic background research, pedestrian survey, and the excavation of 31 shovel tests probes. All of the subsurface tests were negative for cultural material. Additionally, a surface scatter was documented as “The Granite Rock Homestead,” and a historic road in the southwestern portion of the APE was documented as “Howe Grove Road”. Neither of these two resources meets the minimum criteria for inclusion on the National Registry of Historic Places; therefore, both of these resources are recommended not eligible. No further archaeological investigations are proposed. The February 2021 CRAS report is included as Appendix 3 of this EA.

**Construction:** No significant cultural resources were identified within the APE, therefore, construction of the Proposed Action would generate **negligible impacts** to significant cultural resources.

**Operation:** No significant cultural resources were identified within the APE, therefore, operation of the Alternative Action will result in **negligible impacts** to significant cultural resources.

### **3.2.6 Floodplains**

The topography in and around the Proposed Action site is relatively flat with a swale adjacent to Range Road being the lowest elevation and the crown of Range Road being the highest. Figure 3-6 shows the topography within the Proposed Action boundary ranges between approximately elevation -1.3 to 4.6 feet (-0.4 to 1.4 meters [m]) North American Vertical Datum of 1988 (NAVD 88).

Figure 3-7 shows much of KSC west of Kennedy Parkway is floodplain. FEMA Flood Insurance Rate Maps (FIRMs) 12009C12606 and 12009C 13174 were reviewed and the Proposed Action site and conceptual development footprint were determined to contain approximately 26 acres (10.5 ha) and 12.5 acres (5.1 ha) of Zone AE Floodplain, respectively (Figure 3-8). The base flood elevation for these floodplains ranges from 2.6 to 2.8 feet (0.8 to 0.85 m) NAVD 88.

#### **3.2.6.1 No Action Alternative**

Under the No-Action Alternative, the Proposed Action would not be implemented, and the area would remain undeveloped. As such, **no impacts** on floodplains would occur.

#### **3.2.6.2 Proposed Action**

**Construction:** Construction of the Proposed Action will impact approximately 12.5 acres (5.1 ha) of Zone AE floodplain (Figure 3-7). The Proposed Action will have **minor adverse impacts** overall due to the filling of floodplain that is required for site development and the floodplain loss is an extremely small acreage in relation to the total floodplain acreage in the region west of NASA Parkway.

**Operation:** Operation of the Alternative Action will result in **negligible** impact to floodplains.

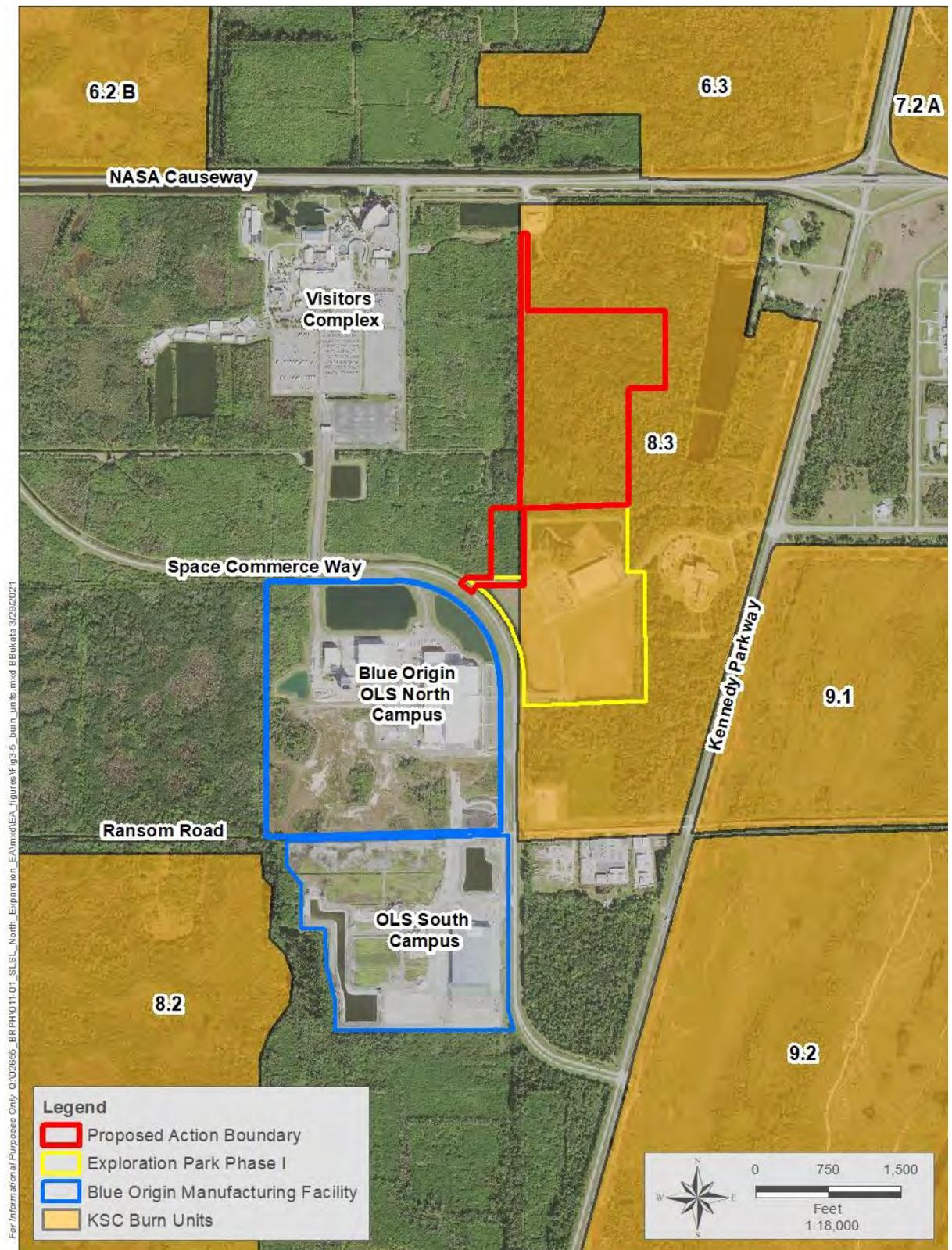


Figure 3.5 Burn Unit Location Map

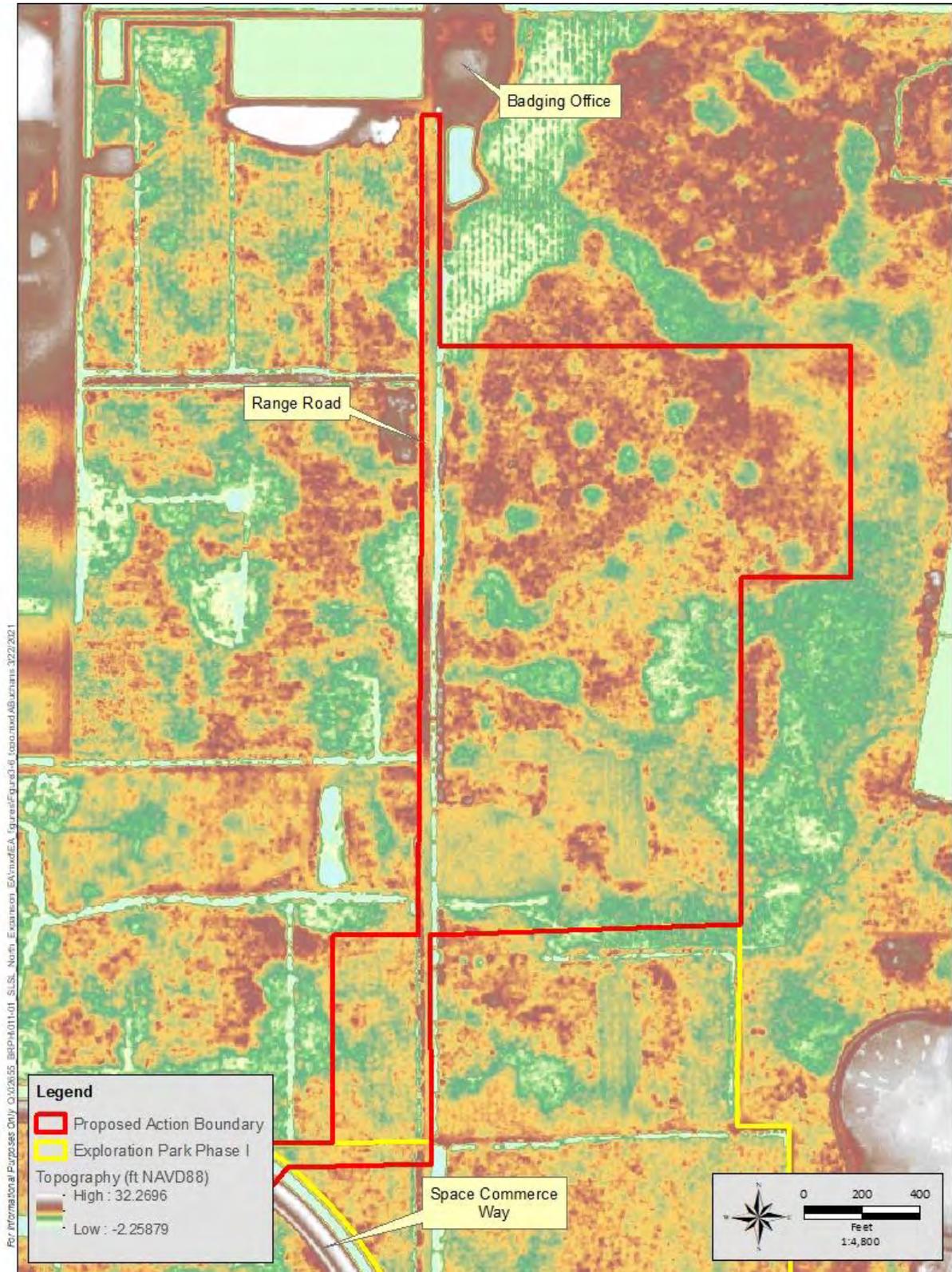


Figure 3-6 Topographic Map

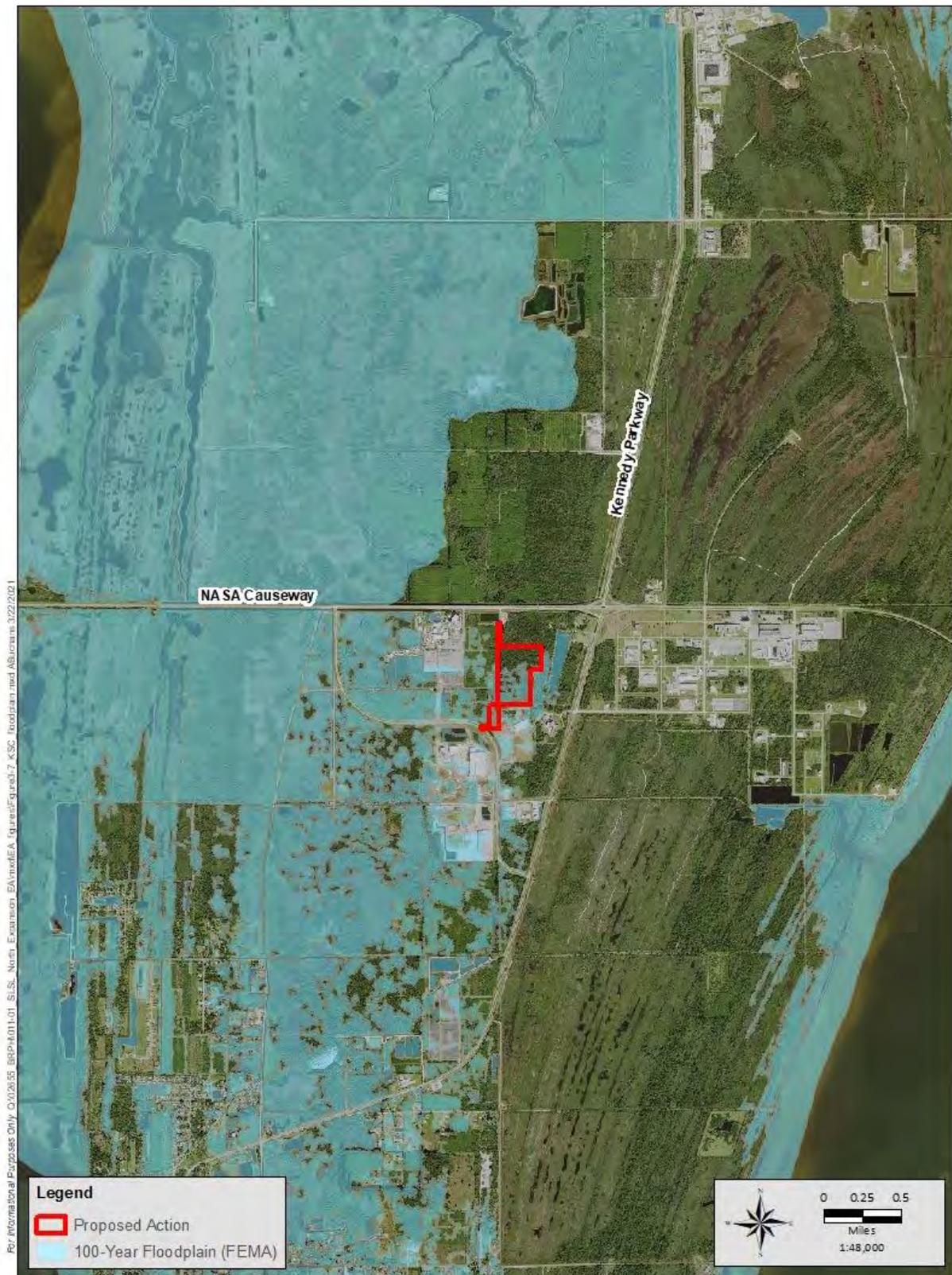


Figure 3-7 Regional Floodplain Map

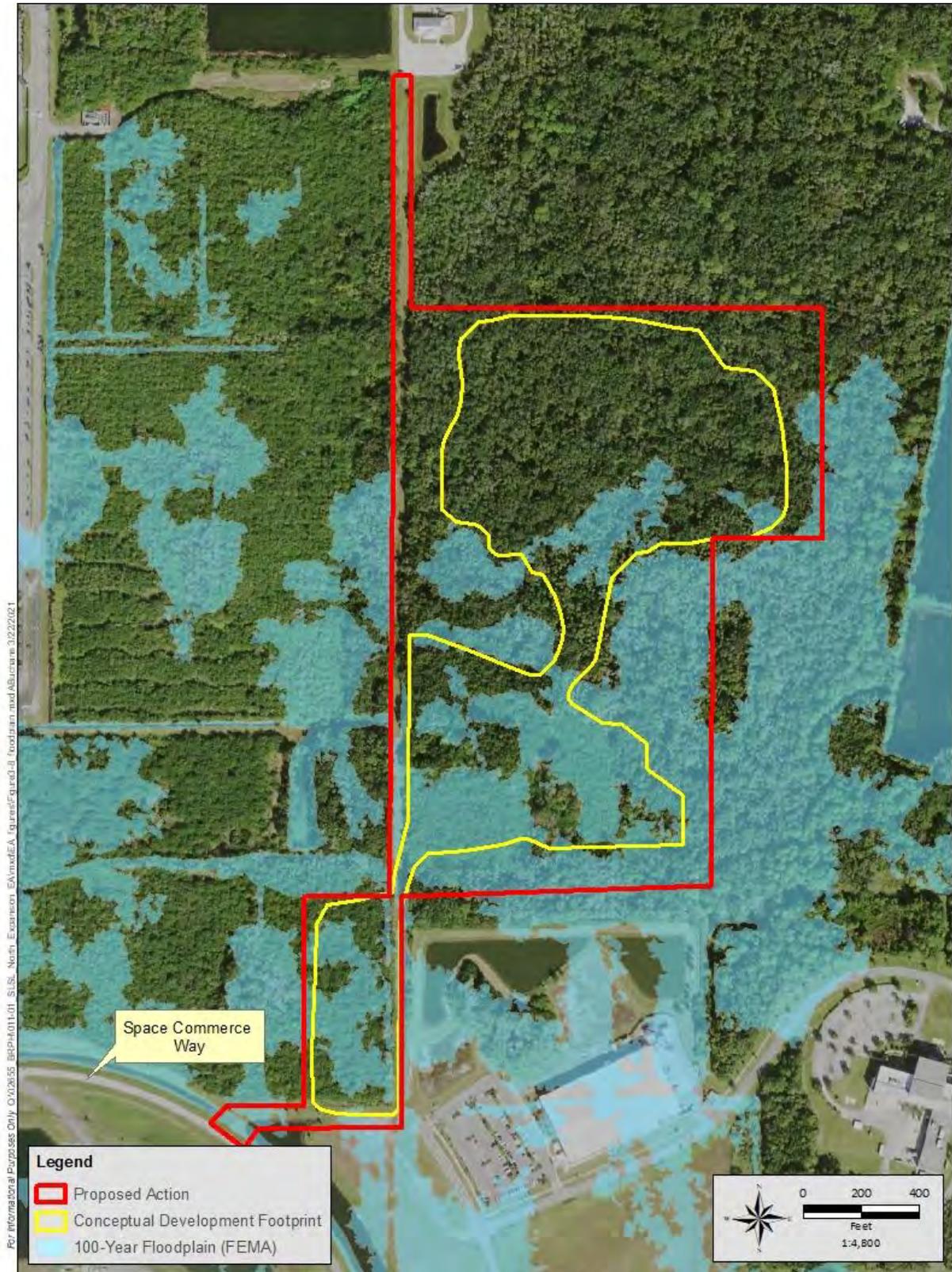


Figure 3-8 Proposed Action Floodplain Map

### **3.2.7 Socioeconomics**

KSC is Brevard County’s largest single employer and a major source of revenue for the local economy. KSC operations create a chain of economic effects throughout the region. Other large employers in the County are CCSFS, Patrick Air Force Base, the Brevard County School District, and Health First. The highest employment levels at KSC were recorded during the Apollo program, and KSC recorded a peak population of 25,895 employees in 1968 with an estimated 1 of 4 workers in Brevard County employed at KSC. Employment levels dropped precipitously following the Apollo program conclusion to a historic low in 1976 when 8,441 personnel were employed. Employment levels rose sharply in 1979 when KSC was designated as the launch and operations support center for the Space Shuttle program. In 2010, an 11.6-percent decrease in the contractor work force resulted from downsizing as the Space Shuttle Program came to an end. However, since 2010, KSC began transforming from a program-focused, single-user launch complex to a multi-user spaceport shared by government and commercial partners. Today, KSC has transitioned from a government-only space launch complex to a public-private space gateway that facilitates the largest concentration of space launch operators in the world. In 2019, the multi-user spaceport’s workforce totaled 11,170 employees, an increase of 25 percent from the 8,304 jobholders in 2011, with approximately 3,333 private sector positions, compared to only 564 in 2011 (NASA, 2020b). The diverse workforce has resulted in a positive economic impact to the local communities and Brevard County.

#### **3.2.7.1 No Action Alternative**

Under the No-Action Alternative, the Proposed Action would not be implemented, and the area would remain undeveloped. No construction would occur, and no jobs would be generated by the construction nor operation of the Proposed Action, and thus, a **minor negative impact** on socioeconomics would occur.

#### **3.2.7.2 Proposed Action**

**Construction:** The Proposed Action would support the local economy since the construction phase of this project is expected to generate jobs for the local workforce with an expected positive impact on the local economy. Although a slight increase to the local population from the construction of the Proposed Action may occur, the growth rate as a result of construction would be temporary and would not be significant. Construction of the Proposed Action would not significantly affect the local housing market and would not negatively affect the local economy. Therefore, construction of the Proposed Action would generate **no adverse socioeconomic impacts** on the region and may generate a temporary **minor beneficial impact**.

**Operation:** Operation of the Proposed Action will provide employment for an estimated 150 staff by 2027. Staff positions will range from maintenance services to highly skilled astronaut training and medical staff. Although a slight increase to the local population from the Proposed Action may occur, the growth rate would not be significant. The Proposed Action would not significantly affect the local housing market and would not negatively affect the local economy. Therefore, the Proposed Action would generate **no adverse socioeconomic impacts** on the region and may generate a **minor beneficial impact** as a result of permanent job creation.

## 4.0 CUMULATIVE IMPACTS

### 4.1 Definition of Cumulative Impacts

The approach taken in the analysis of cumulative impacts in this document follows the objectives of NEPA, CEQ regulations, and CEQ guidance. For the purposes of this EA, and consistent with 40 CFR 1508.1(g), cumulative impacts are considered changes to the human environment that occur at the same time and place as the Proposed Action or alternatives, as well as changes that occur at a later time or geographically distanced from the Proposed Action or alternatives. Cumulative impacts require more than a “but for” causal relationship. Consistent with CEQ regulations, projects that are remote in time, geographically remote, or the product of a lengthy causal chain are not considered. Furthermore, cumulative impacts do not include those from projects that NASA has no ability to prevent due to its limited statutory authority or would occur regardless of the Proposed Action.

Actions overlapping with or close to the Proposed Action would be expected to have more potential for a relationship than those more geographically separated. Similarly, relatively concurrent actions would tend to offer a higher potential for cumulative impacts. To identify cumulative impacts, the analysis needs to address the following three fundamental questions:

1. Does a relationship exist such that impacts to affected resource areas by the Proposed Action might interact with the impacts to resources of past, present, or reasonably foreseeable actions?
2. If so, what would the combined impact be?
3. Are there any potential significant impacts not identified when the Proposed Action is considered alone?

### 4.2 Actions Affecting Resources of Concern

The overall geographic scope of analysis consists of the entirety of KSC, including the undeveloped 60-acre (24-ha) area north of Exploration Park Phase I, and near the intersection of NASA Causeway and Kennedy Parkway. The time frame for the analysis must include the past, present, and future. For most resource areas, the period within the last 5 years at KSC marks the past temporal boundary for the cumulative impact analysis. The future temporal boundary includes the construction period (i.e., 2021 through 2022) and other reasonably foreseeable actions associated with continued operation of the Astronaut Training Facility that are located within close proximity to the Proposed Action site. The temporal boundary for the present is defined by actions in detailed planning, under construction, or that have been recently initiated that could reasonably result in a cumulative interaction with the resources analyzed in this EA.

### 4.3 Cumulative Impacts Analysis

#### 4.3.1 No Action Alternative

Under the No Action Alternative, an Astronaut Training Facility would not be constructed, and baseline environmental conditions would remain. Therefore, no cumulative impacts would occur.

### 4.3.2 Proposed Action

For the purposes of this EA, the Proposed Action was found to result in no or negligible impacts to the following resource areas: utilities (with exception of waste water), threatened and endangered species, cultural resources, and socioeconomics. Therefore, these resource areas are not carried forward in the cumulative impact analysis.

Impacts to socioeconomics would be considered minor-beneficial during construction and negligible during operation of the Astronaut Training Facility. Since construction is expected to be temporary, occurring over a 1-year period, the local area, which handles surges in tourist visits on a regular basis is expected to be able to accommodate additional demand on services. Therefore, socioeconomics is not carried forward in the cumulative impact analysis.

In addition, the Proposed Action was found to potentially result in minor direct/indirect impacts to the following resource areas: transportation (construction and operation), wastewater (operation), wetland vegetation (construction), wildlife (construction), and floodplains (construction). Therefore, these resources are carried forward for cumulative impacts analysis. Table 4-1 lists the other past, present, and reasonably foreseeable actions that could influence the resource areas carried forward for further analysis. The cumulative impacts analysis considers other actions, their temporal and geographic extent, their direct and indirect effects, and their relative contribution to cumulative impacts on the specific resource.

Actions overlapping with or close to the Proposed Action are expected to have more potential for a relationship than those actions occurring remotely in time and distance. As summarized in Table 4-1, only the FPL Solar Energy Center, Blue Origin Orbital Launch Site, and SLF projects have the potential for a relationship that might result in a cumulative impact to wetlands and/or floodplains. With regard to any impacts to wetlands and wetland vegetation, there are 36,183 acres (14,642 ha) of wetlands found on KSC. Under the Proposed Action, up to 6.6 acres (2.7 ha) of low-quality wetlands and 11.3 acres (4.6 ha) of medium-quality wetlands would be impacted. Impacts resulting from implementation of the Proposed Action, as well as the FPL Solar Energy Center, Blue Origin Orbital Launch Site, and SLF projects would be mitigated through the use of BMPs to minimize erosion and sedimentation during construction activities. These practices include minimizing the length of time bare soil is exposed, along with timely reseeding and mulching. In addition, construction and maintenance of the stormwater treatment pond would further reduce the potential for erosion and sedimentation. Before conducting any construction activities, NASA would obtain an ERP from SJRWMD and a Federal Dredge and Fill Permit from the FDEP. These required permits would result in compensation for unavoidable wetland loss. Compensation could include purchase of credits from a wetland mitigation bank, a monetary compensation for wetland loss, or wetland restoration or preservation. Therefore, given the Proposed Action would not impact high-quality wetlands, the overall abundance of wetlands found on KSC, and the mitigation measures that would be taken, the Proposed Action would not result in a significant cumulative impact to wetlands or wetland vegetation.

With regards to impacts to floodplains, the Proposed Action would impact approximately 12.5 acres (5.1 ha) of Zone AE floodplain as will the FPL Solar Energy Center, Blue Origin Orbital Launch Site, and SLF projects; however, much of KSC west of Kennedy Parkway is located within a floodplain due to KSC's close proximity to the coast and flood mitigation is not

required. In addition, construction of the Proposed Action would include protection of structures from flood damage, and no short- or long-term impacts to water resources, wildlife habitat, or increase in the risk of future risk of flood damage is expected from implementation of the Proposed Action when considered cumulatively with other past, present, and reasonably foreseeable projects.

In addition, as summarized in the cumulative impacts analysis in Table 4-1, there are no construction-related actions overlapping with or in close proximity to the Proposed Action that would have the potential for cumulative impacts to transportation or wildlife. Specifically, any construction-related impacts are expected to be temporary in nature, and it is expected that there would be adequate time for the respective resource in the areas near the Proposed Action site to recover prior to being minorly impacted from construction of the Proposed Action.

As summarized in the cumulative impacts analysis in Table 4-1, there would be a long-term increase in traffic from the operation of the Proposed Action when combined with additional other past, present, and reasonably foreseeable actions. The Proposed Action would be accessed via Exploration Parkway off of SCW at Exploration Park Phase 1. Once completed, the Proposed Action would employ up to 50 permanent staff, host up to 30 astronaut trainees, and up to 180 café and restaurant patrons at any given time. At this time, it is expected that the astronaut trainees would arrive without a vehicle and be escorted to and from area airports. Furthermore, it is expected that café and restaurant patrons would largely be associated with employees located at nearby commercial aerospace facilities. As part of a launch, access from the manufacturing facility to the launch complexes is from SCW to NASA Parkway to KSC Gate 3. Since transported loads require a slower-than-posted speed, transportation generally are scheduled to avoid peak flow periods in the morning and afternoon. Plans to expand SCW to four lanes SCW is currently underway, which would provide additional roadway capacity. Therefore, no significant cumulative impacts to transportation is expected from implementation of the Proposed Action.

There would also be long-term increases to wastewater demand as KSC is developed. To address capacity issues, KSC is undergoing a wastewater study and will complete a master plan process for utilities. The findings of the study would be used to ensure future development is planned in a manner that provides adequate wastewater capacity for existing and future initiatives. Therefore, no significant cumulative impacts to wastewater is expected from implementation of the Proposed Action.

Therefore, **no significant cumulative impacts** would occur to wetlands, vegetation, wildlife, floodplain, transportation, and wastewater utilities from implementation of the Proposed Action.

**Table 4-1 Past, Present, and Reasonably Foreseeable Actions Considered**

Project	Project Description	Cumulative Impacts Analysis
<p>Blue Origin Manufacturing Facility North Campus</p>	<p>Constructed a rocket manufacturing facility on 139 acres (56 ha) on the west side of SCW in support of the development of reusable launch vehicles using rocket-powered Vertical Take-off and Vertical Landing systems.</p> <p>The facility was fully operational in 2018, and the New Glenn rockets are expected to launch in 2021.</p>	<p>Impacts from construction were temporary and do not overlap with the Proposed Action.</p> <p>Operationally, any direct or indirect impacts are considered as part of this EA (i.e., affected environment) since the manufacturing facility has been operational since 2018.</p>
<p>Blue Origin Manufacturing South Campus Expansion</p>	<p>Constructed an approximate 90-acre (36-ha) warehouse and manufacturing support facility in support of Blue Origin’s New Glenn program. The site includes a warehouse, roads, parking, landscaping, and lighting improvements.</p> <p>Facility was fully operational in 2019.</p>	<p>Impacts from construction were temporary, and do not overlap with the Proposed Action.</p>
<p>Blue Origin Manufacturing South Campus Expansion – “Deep South” Site</p>	<p>Construct an approximate 65-acre (36-ha) warehouse and manufacturing support facility in support of Blue Origin’s New Glenn program. The site would include a warehouse, roads, parking, landscaping, and lighting improvements.</p> <p>Construction is expected to begin in 2021.</p>	<p>Impacts from construction will be temporary, and do not overlap with the Proposed Action.</p>
<p>Blue Origin Orbital Launch Site at LC-11 and LC-36</p>	<p>Construct and operate an Orbital Launch Site at the combined areas of LC-11 and LC-36 at Cape Canaveral Air Force Station.</p> <p>No significant impacts to 16 resources analyzed, and no effect on historic properties would occur from implementation of this project. Specific to this EA, primary wetlands would be impacted.</p> <p>First launch from LC-36 is expected to occur in 2021.</p>	<p>With exception of wetland and floodplain impacts, any impacts associated with construction would be temporary and would not overlap with the Proposed Action. Specific to wetland impacts, construction of the Orbital Launch Site and the Proposed Action would result in unavoidable impacts to wetlands. Impacts would be mitigated through compensation. In addition, BMPs would be implemented as part of the Proposed Action to minimize erosion and sedimentation during construction activities, and all necessary permits would be obtained before commencement of any construction activities. Therefore, no significant cumulative impacts would occur.</p> <p>Impacts from launch operations are considered short in duration and would not result in a</p>

**Table 4-1 Past, Present, and Reasonably Foreseeable Actions Considered**

Project	Project Description	Cumulative Impacts Analysis
		potential for a cumulative impact due to the geographical distance between LC-11 and LC-36 and the Proposed Action location.
Exploration Park Phase 1	<p>Develop and operate a 60-acre (24-ha) parcel of land on SCW near the Space Life Science Lab to be used as a mixed use technology and commerce park. Phase 1 included constructing eight buildings and associated parking.</p> <p>Impacts to air quality, climate, biological resources, threatened and endangered species, cultural resources, geology and soils, noise, surface water quality, groundwater quality, socioeconomics and land use were analyzed. No significant impacts were expected.</p>	<p>No impacts from construction are expected due to no overlap with the Proposed Action.</p> <p>Operationally, the Exploration Park Phase 1 EA expected 2,555 average daily trips would be generated once Exploration Park was fully developed. The widening of SCW would provide additional capacity.</p> <p>Specific to waste water, Exploration Park Phase 1 was connected to the KSC sewage system. Based on projects, waste water demand was expected to be 18,000 GPD (68,137 LPD). Long-term impacts to waste water are expected as additional personnel are added.</p>
Firefly Aerospace Manufacturing Facility	<p>Construct a 180,000 ft<sup>2</sup> (16,723 m<sup>2</sup>) factory in Exploration Park capable of producing 24 Alpha vehicles per year.</p> <p>The manufacturing facility was previously addressed in a 2008 NASA EA, and subsequently issued a REC.</p> <p>A construction start date has not been announced.</p>	No construction information is available; however, impacts associated with construction would be temporary and would not overlap with the Proposed Action.

**Table 4-1 Past, Present, and Reasonably Foreseeable Actions Considered**

Project	Project Description	Cumulative Impacts Analysis
FPL Solar Energy Center	<p>Construct a 74.5-MW solar photovoltaic facility on a 504-acre (204 ha) area that would maximize the use of existing infrastructure and assist KSC with their goal to increase on-site generation of renewable energy. The proposed facility would be north of the Proposed Action.</p> <p>No impact to minor impacts to the 13 resources analyzed would occur from implementation of this project. The USFWS issued an opinion in December 2018 noting the project, “is not likely to jeopardize the continued existence of the eastern indigo snake or the Florida scrub-jay and will not result in destruction or adverse modification of designated critical habitat.” In addition, FPL intends to purchase federal mitigation bank credits from a private commercial wetland mitigation bank to compensate for any loss of wetlands.</p> <p>Construction of the site is underway.</p>	<p>The FPL Solar Energy Center project and the Proposed Action would result in unavoidable impacts to wetlands and wetland vegetation. These impacts would be mitigated through compensation. In addition, BMPs would be implemented as part of the Proposed Action to minimize erosion and sedimentation during construction activities, and all necessary permits would be obtained before commencement of any construction activities. Therefore, no significant cumulative impacts would occur.</p>
FPL Saturn Electric Distribution Substation	<p>Construct a new electric distribution substation on a 4-acre (1.6-ha) site just south of the existing C-5 substation along the west side of Kennedy Parkway and adjacent to an existing transmission line. The C-5 substation serves LC-39.</p> <p>A REC was completed in April 2020.</p>	<p>Impacts from construction would be temporary in duration, and construction and operation activities would not overlap with the Proposed Action.</p>
Galaxy Way and Space Commerce Way Intersection Improvements	<p>Provide a dedicated visitor entrance to the KSC VC off of SCW and intersection improvements for public access and to accommodate transportation of Blue Origin’s New Glenn rocket from the manufacturing facility to LC-11 and LC-36.</p>	<p>Impacts from construction were temporary in duration and would not overlap with the Proposed Action.</p> <p>Operationally, any impacts to transportation from implementation of the Proposed Action would be offset by the new, four-lane road.</p>
Gateway to Space Exhibit	<p>Design and construct a new Gateway to Space Exhibit at the northwest side of the KSC VC and south of NASA Parkway West.</p> <p>No impacts to minor impacts to the 11 resources analyzed would occur from implementation of this project.</p> <p>Design and permitting is expected to be completed by March 2021 and construction is expected to be completed in 2021.</p>	<p>Impacts from construction would be temporary and would not overlap with the Proposed Action.</p>

**Table 4-1 Past, Present, and Reasonably Foreseeable Actions Considered**

Project	Project Description	Cumulative Impacts Analysis
MINWR Visitor Complex	<p>Replace the existing Visitor Complex at Merritt Island National Wildlife Refuge (MINWR) with a new, 8,100-ft<sup>2</sup> (753-m<sup>2</sup>) Community Conservation Education Center, interactive outdoor exhibits, and road and parking infrastructure.</p> <p>No significant impacts to 10 resources analyzed would occur from implementation of this project.</p> <p>Construction is expected to begin in 2021.</p>	<p>Impacts from construction would be temporary and would not overlap in time and space with the Proposed Action.</p> <p>Operationally, any impacts associated with increased visitors would not result in a potential for a cumulative impact due to the geographical distance between the MINWR Visitor Complex and the Proposed Action.</p>
OneWeb – Manufacturing Facility at Exploration Park	<p>Construct a 100,000-ft<sup>2</sup> (9,290-m<sup>2</sup>) satellite spacecraft integration facility at Exploration Park to support various federal and private commercial aerospace missions.</p> <p>The facility was fully operational in 2018.</p>	<p>Impacts from construction were temporary, and do not overlap with the Proposed Action.</p> <p>Operationally, any direct or indirect impacts are considered as part of this EA since the manufacturing facility has been operational since 2018.</p>
Shuttle Landing Facility (SLF) Blocks 2 through 6 Development	<p>This 15,000-foot (4.6-km) long runway is one of the longest in the world. Presently, the FAA is evaluating Space Florida’s proposal to operate a commercial space reentry site. If approved, Space Florida would support up to 17 reentries over a 5-year period (i.e., 2021 through 2025).</p> <p>NASA is currently assessing the potential environmental impacts associated with the design, construction, and build-out of the SLF Developable Land Blocks 2 through 6 at Cape Canaveral Spaceport. The proposed action would develop and construct infrastructure, including facilities and utilities at SLF, to support the Horizontal Take-Off and Landing capabilities for orbital and suborbital launch vehicles and services.</p> <p>The EA considered potential impacts to fish and wildlife; plants; floodplains; historical, architectural, archeological, and cultural resources; water quality; and wetlands. Specific to this EA, unavoidable impacts to floodplains and wetlands would occur.</p>	<p>The SLF project and the Proposed Action would result in unavoidable impacts to wetlands. These impacts would be mitigated through compensation. In addition, BMPs would be implemented as part of the Proposed Action to minimize erosion and sedimentation during construction activities, and all necessary permits would be obtained before commencement of any construction activities. Therefore, no significant cumulative impacts would occur.</p> <p>Operationally, any impacts would not result in a potential for a cumulative impact due to the geographical distance between the SLF and the Proposed Action.</p>
Space Coast Trail	<p>Construct a multi-use trail from Parrish Park at the entrance to the MINWR to Parking Area No. 1 within the CANA and following Kennedy Parkway from Beach Road (CR 402) to US 1.</p>	<p>Presently, design is expected to occur in FY 2022 and no construction date has been identified.</p> <p>Operationally, approximately 66 percent of the</p>

**Table 4-1 Past, Present, and Reasonably Foreseeable Actions Considered**

Project	Project Description	Cumulative Impacts Analysis
	<p>Adverse effects are expected to be minimal or negligible, and mitigation for unavoidable wetland impacts would occur within the refuge and result in no net loss of wetland function.</p> <p>Design is funded for FY 2022.</p>	<p>lands and waters within the MINWR are owned by NASA for KSC. However, the closest portion of the trail is approximately 8.3 miles (12.9 km) north of the proposed action area. Therefore, no potential for cumulative impacts exists.</p>
<p>SpaceX Hangar X Construction on Roberts Road</p>	<p>Construction and operation of a SpaceX Operations Area for booster and fairing processing and storage, and a launch and landing control center on a 67-acre (27-ha) site west of SR 3 on Roberts Road and A Avenue. The operations area would include a control center, a 133,000-ft<sup>2</sup> (12,356-m<sup>2</sup>) hangar, and a display of historic space vehicles.</p> <p>No significant impacts to 14 resources analyzed and no effect on historic properties would occur from implementation of this project.</p> <p>A construction start date has not been announced.</p>	<p>Impacts from construction would be temporary and would not overlap with the Proposed Action.</p> <p>Operationally, impacts are considered short in duration and would not result in a potential for a cumulative impact due to being geographically remote from the Proposed Action.</p>
<p>Visitor Complex Access Road</p>	<p>Provide a new four-lane, dedicated visitor entrance to the southwest corner of the existing KSC VC parking lot to SCW. Construction would also include the necessary stormwater treatment facilities and multi-use utility corridors.</p> <p>Roadway was completed in 2019.</p>	<p>Impacts from construction were temporary in duration and activities do not overlap with the Proposed Action.</p> <p>Operationally, the widening of SCW would improve transportation on KSC. Therefore, no adverse cumulative impacts would occur.</p>
<p>Vulcan Centaur Program Modifications at LC-41</p>	<p>Modify LC-41, the Vertical Integration Facility, and the Solid Motor Assembly and Readiness Facility and operate the Vulcan Centaur Program.</p> <p>No significant impacts to 16 resources analyzed and no effect on historic properties would occur from implementation of this project.</p> <p>The first planned launch of the Vulcan Centaur Launch Vehicle is expected for 2021.</p>	<p>Impacts from construction would be temporary and would not overlap with the Proposed Action.</p> <p>Impacts from launch operations are considered short in duration and would not result in a potential for a cumulative impact due to the geographical distance between LC-41 and the Proposed Action.</p>

Sources: 45th SW, 2019; Atkinson, 2019; Dean, 2018; FAA, 2017; FAA, 2020; FDOT et al., 2019; Foust, 2019; Gaedcke, 2020; Kelly, 2019; Kraum, 2014; KSC, 2020b; NASA 2008; NASA, 2018a; NASA, 2018b; NASA, 2018c; Space Florida, 2020; Space Florida, 2021; SpaceX and NASA, 2018; USFWS, 2019; and Waymer, 2019.

## 5.0 PREPARERS, CONTRIBUTORS, AND CONTACTS

The individuals who provided details, data, or analyses and who prepared this document are listed in Table 7-1. The table provides information concerning which section(s) each person was involved in writing or assembling.

**Table 5-1 List of Individuals Who Prepared This Document**

<b>Preparers</b>	<b>Affiliation</b>	<b>Professional Title</b>	<b>Contribution</b>
Bukata, B.J., MS, PWS, AA	Jones Edmunds	Senior Scientist	Biological Resources, Data and Text
Coveney-Craig, Laura, MS, AA	Jones Edmunds	Project Scientist	Biological Resources
Koller, Rich, PE, LEED AP	Jones Edmunds	Managing Director	QA/QC Document Review
Toth, Doug, PE	Jones Edmunds	Senior Consultant	Utilities
Mike Clark, PE	Jones Edmunds	Senior Engineer	Utilities
Berry, Stephen	LG2 Environmental Solutions	Vice President of Operations	Cumulative Impacts, QA/QC Document Review
Everson, Chrystal	LG2 Environmental Solutions	Senior NEPA Lead	Cumulative Impacts, QA/QC Document Review
Puckett, Wendy	LG2 Environmental Solutions	Cultural Resource Manager Team Lead	Cultural Resources
Schmid, Joe	Jones Edmunds	Department Manager, Technical Communications	Document Review
Vaseen, Nancy	Jones Edmunds	Technical Editor	Document Review
Valletta, Priyanka	BRPH Architects- Engineers	Project Manager	Document Review
Dankert, Don	NASA/KSC	KSC NEPA Program Manager	Document Review
Brooks, James	NASA/KSC	KSC NEPA Coordinator	Document Review
Ryba, Jeanne	NASA/KSC	Cultural Resource Manager	Cultural Resources Review
Eggert, Pete	Space Florida	Director, Environmental Health and Safety	Document Review
Robertson, Ryan	Space Florida	Manager of Commercial Space	Document Review
Szabo, Steve, PE	Space Florida	Spaceport Development Program Manager	Document Review
Bontrager, Mark	Space Florida	Vice President, Spaceport Operations	Document Review



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Appendix 1    KSC Record of Environmental Consideration (REC) for  
Proposed Action Boundary



# Avoid Verbal Orders

TO: Space Florida/Pete Eggert

DATE: 11/24/2020

FROM: SI-E3/Environmental Management Branch

SUBJECT: KSC Record of Environmental Consideration (REC)

REC #: 11255

## 1. PROJECT INFORMATION

**Project Title:** Exploration Park Property Expansion

**Project Lead:** Pete Eggert, Space Florida, [REDACTED]

**Project No.:** SPFL 02-24-2020 (REV A)

### Project Description:

Expansion of property at Exploration Park (north of SLSL/M6-1025) to support development and construction of Astronaut Training Complex.

11/24/2020 Update - Map submitted earlier in support of REC 19407 was preliminary. Proposed development area has been shifted slightly to west and expanded.

**EPB Reviewer:** LPH

**Facility No.:** North of M6-1025/SLSL

## 2. NEPA DETERMINATIONS

a. Categorical Exclusions per 14 CFR Part 1216.304(d)

e. Centerwide EIS

b. Environmental Assessment (EA) Required

f. AF Project on KSC/813

c. Environmental Impact Statement (EIS) Required

g. NASA Project on CCAFS/813

d. Existing FONSI or ROD

## 3. ENVIRONMENTAL REQUIREMENTS

a. Non-Permit Requirements

YES

NO

b. Permit Requirements

YES

NO

\*\*\*\*\*ORIGINAL REC ISSUED 02/26/2020\*\*\*\*\*  
\*\*\*\*\*REC UPDATED 11/24/2020 Section 106 Consultation and archaeological survey required, Updated POC information, Revised T&E species and vegetation burning statements\*\*\*\*\*

2.b.1. ENVIRONMENTAL ASSESSMENT (EA): This project cannot be categorically excluded (CATEX) from further NEPA review based on information provided with the Environmental Checklist. The project proponent must develop an Environmental Assessment (EA) for development of the Astronaut Training Complex at KSC, in accordance with KDP-P-1726. For additional information, please contact Don Dankert of the NASA Environmental Management Branch (SI-E3, [REDACTED])

3.a.1. SOLID WASTE MANAGEMENT UNIT (SWMU) SITES: The proposed project location is adjacent to and may overlap the boundary of SWMU #095, GSA Seized Property. This area is being investigated by the NASA Remediation Group under Remediation Project Manager (RPM) (Ryan O'Meara, SI-E2, [REDACTED]) A Land Use Control Implementation Plan (LUCIP) has been prepared for the SWMU. These controls are necessary to prohibit residential exposure to groundwater present at the site. All workers involved in subsurface/dewatering work must be notified (HAZCOM) of the potential for contamination present and it is recommended that an Industrial Hygienist be consulted for determination of required personal protective equipment (PPE). If any well point dewatering is necessary at these sites, contact the RPM for guidance on proper management of dewatering effluent. Contact your company's Safety and Health Office or NEMCON Industrial Hygiene (IH) for recommendations on personal protective equipment (PPE). NEMCON IH can be contacted at [REDACTED] or at KSC-DL-EnvHealth/[REDACTED] Contact the NASA RPM for further guidance regarding handling of groundwater at this location.

The proposed project site is not within LUCIP boundary.

This project may also include work within the boundary of SWMU #097 Agricultural Sheds (Shed 2). This site been deemed a No Further Action site and therefore this project may proceed as proposed. There is no knowledge of any existing environmental contamination at this location.



## Avoid Verbal Orders

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**REC #: 11255**

This includes covering the materials and storing them on an impermeable surface for protection against precipitation and prevention of soil contamination. Guidelines for disposal of items at the KSC Class III Landfill are outlined in Kennedy NASA Procedural Requirements (KNPR 8500.1, Chapter 14). Contact Zach Hall (SI-E2, [REDACTED]) for the current version of these requirements.

3.a.5. STORAGE TANKS: The NASA Environmental Assurance Branch (SI-E2) considers Space Florida or their tenant to be the responsible party to ensure regulatory compliance associated with the proposed installation of the petroleum storage tank system or any petroleum storage tank systems in accordance with the requirements of Florida Administrative Codes 62-761 and 62-762. Due to the size of the petroleum storage tank it will be required to be registered with the State of Florida. The Florida Department of Environmental Protection (FDEP) has contracted the responsibility to ensure registered storage tank compliance in Brevard County to Brevard County Natural Resource Management Department (BCNRMD).

3.a.6. SPILL PREVENTION, CONTROL, AND COUNTERMEASURES (SPCC) PLAN: Owners or operators of a facility that produces, stores, or consumes oil or petroleum products in amounts of 1,320 gallons or greater, and could potentially discharge oil in quantities that may be harmful, are required by the U. S. Environmental Protection Agency to prepare a spill prevention, control, and countermeasures (SPCC) plan. An SPCC plan documents the procedures for the prevention, response, control, and reporting of spills of oil to navigable waters or adjoining shoreline. This plan serves as a guide for personnel and organizations responsible for ensuring that all measures are taken to prevent and contain spills and leaks of oil in accordance with Chapter 40, Code of Federal Regulations (CFR) Part 112. Fuel transfers from the storage tank to mobile refuelers would also require spill prevention procedures and countermeasures, such as spill kits, to be available during fuel transfers. In most cases, a professional engineer is required to prepare and/or amend an SPCC plan. Space Florida or tenant is responsible for the development of their SPCC Plan.

3.a.7. THREATENED AND ENDANGERED/PROTECTED SPECIES: Development of the proposed Astronaut Training Complex site has the potential to impact protected or threatened and endangered wildlife species including the Eastern indigo snake, Florida Scrub-jay, and the gopher tortoise, and in the case of the gopher tortoise, the burrows must be identified and avoided if possible. If identified burrows are within the area of construction, relocation of animal in question will be required. Relocation of gopher tortoises requires a Florida Fish and Wildlife Conservation Commission permit. Additional information on gopher tortoise permits can be found at <http://myfwc.com/license/wildlife/gopher-tortoise-permits/>.

A biological survey will be required to identify potential impacts to habitat within the two weeks immediately preceding start of site work. A biological survey will be required to identify potential impacts to habitat within the two weeks immediately preceding start of site work. After the survey has been performed and if gopher tortoise burrows are observed please contact James Brooks (SI-E3, [REDACTED]).

Please see the Standard Protection Measures for the Indigo Snake provided with this REC. If any indigo snakes are observed, halt all work until the snake has left the area and please inform James of the sighting. Do not harm or harass the snakes.

3.a.8. SCRUB COMPENSATION: This project may also result in the clearing of areas identified as scrub-jay habitat. Per the KSC scrub-jay Biological Opinion (permit) with the USFWS, the impact may require mitigation to offset scrub habitat loss. Mitigation activities must be coordinated through the NASA EMB (Don Dankert, SI-E3, [REDACTED]) and be completed within one year of construction start.

## Avoid Verbal Orders

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**SUBJECT: KSC Record of Environmental Consideration (REC)**

**REC #: 11255**

3.a.9. EXTERIOR LIGHTING: The installation/modification and use of any lighting that is visible from the exterior of a facility or structure must be in compliance with the requirements in the KSC Exterior Lighting Guidelines in Chapter 24 of KNPR 8500.1 Rev. E, and requirements of the US Fish and Wildlife Service Biological Opinion for KSC regarding dark skies and artificial lighting. Submit the manufacturers cut sheet data and spectral power distribution graphs for the actual lighting to be installed for review by the NASA Environmental Management Branch (EMB). Safety and hazardous operations can apply for a waiver to allow for use of non-compliant lighting; however, justification must be provided to the EMB. Development of a lighting operations manual (LOM) that meets these criteria is required for all new structures or facilities. Please contact Don Dankert (SI-E3, [REDACTED]) for additional information, and for guidance on development of a LOM or for a copy of the referenced documents.

3.a.10. HISTORICAL AREA: The Historic and Archaeological Site Location Predictive Model for KSC prepared in May 2009 reported a historic area containing four structures adjacent and east of Range Road just north of the AOS Manufacturing Facility (M6-1020). In the event that any historical, archaeological, or cultural artifacts or human remains are unearthed, cease all activities at the site and contact the KSC Cultural Resources Manager, immediately. For more information, contact Jeanne Ryba (SI-E3, [REDACTED])

11/24/2020 Update: An archaeological survey and Section 106 consultation is required for the proposed expansion of Exploration Park. No Archaeological Resources Protection Act (ARPA) permit is necessary to conduct survey however all laws regarding ARPA must be followed.

3.a.11. EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMPs): Precautions must be made to eliminate or reduce to the greatest extent possible any discharge of sediments outside established project boundaries. This can be accomplished by initiating proactive erosion control BMPs. Installation and maintenance of appropriate erosion/sediment control devices (such as wattles, turbidity screens, silt fences, inlet protectors, floating turbidity booms, etc.) must be completed prior to initial land disturbance where the possibility of sediment discharge could impact surrounding stormwater conveyances and other surface waters. The BMPs must be maintained so they remain functional until such time that the newly exposed soils are stabilized with sod or natural vegetation.

3.a.12. CONCRETE WASHOUT: Water used to rinse out concrete trucks and other equipment used for concrete work must not be allowed to discharge to surface waters. Concrete washout water shall be diverted to a settling pond where suspended material will settle out and the water can percolate into the ground. Contact Doug Durham (SI-E2, [REDACTED]) with any question on this requirement. Remove and dispose of hardened concrete waste consistent with your handling of other construction wastes. After drying/settling, the residue may be disposed of at the Diverted Aggregate Reclamation and Collection Yard (DARCY); and the ground restored. Clean, unstained, unpainted concrete residue is accepted at the DARCY without any sampling and analysis. Contact Zach Hall (SI-E2, [REDACTED]) with any questions on this requirement.

3.a.13. RECYCLING: The contractor must make every practical effort to reclaim and segregate materials that have the ability to be recycled. All reclaimed concrete (see Item 3.a.14) must be segregated from other wastes and transported to the KSC Landfill (L7-0071) on Schwartz Road. All reclaimed scrap metal, not being recycled by contractor outside of KSC, must be transported to the Reutilization, Recycling and Marketing Facility (RRMF) with a KSC Form 7-49. Please turn these items and the KSC Form 7-49 in to RRMF personnel to ensure the proper disposition of the materials prior to leaving the recycling area. For any other information regarding materials that can be recycled or other general information regarding recycling policies at KSC, please contact the Environmental Management Branch (Annie Williams, SI-E3, [REDACTED])

## Avoid Verbal Orders

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**SUBJECT: KSC Record of Environmental Consideration (REC)**

**REC #: 11255**

3.a.14. CONCRETE RECYCLING/DISPOSAL: Clean, unstained, unpainted concrete is accepted at the Diverted Aggregate Reclamation and Collection Yard (DARCY) without any sampling and analysis. Painted concrete must have PCB and Total Metals analyses (limited to Pb, Cd, and Cr) performed to determine whether it will be accepted at the DARCY for reuse. The results of the analysis must show metal concentrations below the residential cleanup level (Pb = 400 ppm, Cd = 82 ppm, Cr = 210 ppm) and PCB levels below 0.5 ppm. If no testing is done or if PCB and/or Total Metals concentrations are above residential cleanup levels, coated concrete goes to the landfill as construction/demolition debris. When feasible, painted concrete should be segregated from unpainted concrete for placement in the DARCY. No oil-stained concrete will be accepted at the DARCY. Due to the potential for PCB contamination, all removed concrete associated with oil-containing electrical equipment must be disposed through the KSC Waste Management Office as regulated PCB waste. To coordinate or for more information, contact Zach Hall (SI- [REDACTED]).

3.a.15. GREEN PURCHASING/SUSTAINABLE ACQUISITION: Federal agencies and their contractors are required to purchase products made from recycled or recovered materials and other environmentally preferable products whenever possible. The Green Compilation Tool found at <https://sftool.gov/greenprocurement> provides information and useful links and tools to identify applicable green/sustainable acquisition requirements for products and services (Ref. FAR subpart 23.1 and NPR 8530.1). A Request for Waiver Form (KSC 28-825 NS) must be submitted when a product or service meets the green/sustainable requirements but is not procured. Please contact Annie Williams (SI-E3, [REDACTED]) with any questions on this requirement.

3.b.1. EXCAVATION PERMIT: A KSC Excavation Permit will be required for any digging proposed by this project. Please contact the Utility Locate/Excavation Permit Request Customer Helpline at [REDACTED] or go to website at <http://epr.ksc.nasa.gov/Home/> for an underground utility scan and dig permit. NOTE: If a trench or pit is to be left open all day or overnight, the trench/pit must be checked for trapped animals at the beginning and end of each work shift. If an animal is observed trapped, contact Becky Bolt (NEM-022, [REDACTED]) or the Duty Office ([REDACTED]) email [REDACTED] to arrange removal/release. Do not handle the animal(s).

3.b.2. ENVIRONMENTAL RESOURCE PERMIT (ERP) - STORMWATER: An ERP stormwater permit will be required for changes (increase or decrease) in ground cover, stormwater flow patterns, or impervious area. Space Florida shall prepare all permit applications and pay any application fees. The NASA Environmental Assurance Branch (EAB) will sign the permit application as the landowner if legally required. Space Florida shall submit courtesy copies of all applications to the NASA EAB within five (5) working days after submission to the SJRWMD. Space Florida shall submit courtesy copies of the permit to the NASA EAB within five (5) working days after receipt from the SJRWMD and shall ensure that all operations, activities, equipment, and facilities are in full compliance with all permit conditions. Space Florida shall maintain copies of all records required to demonstrate compliance with the permit onsite and make them available for review by NASA upon request. No work can be performed until the permit process is completed. Please contact Doug Durham (SI-E2, [REDACTED]) for more information.

3.b.3. ENVIRONMENTAL RESOURCE PERMIT (ERP) and ACOE Permit: Wetland permits from the St. Johns River Water Management District (SJRWMD) and US Army Corp of Engineers (ACOE) may be required for the proposed development of the Astronaut Training Complex. Space Florida shall prepare all permit applications and pay any application fees. Application forms with supporting material such as maps and engineering drawings must be submitted to the EMB (Jeff Collins, SI-E3, [REDACTED]) for review and NASA signature as the landowner if legally required. Space Florida shall submit courtesy copies of all applications to the NASA EAB within five (5) working days after submission to the SJRWMD and ACOE. Space Florida shall submit courtesy copies of the permit to the NASA EAB within five (5) working days after receipt from the SJRWMD and ACOE, and shall ensure that all operations, activities, equipment, and facilities are in full compliance with all permit conditions. Space Florida shall maintain copies of all records required to demonstrate compliance with the permit onsite and make them available for review by NASA upon request. No work can be performed until the permit process is completed.

## Avoid Verbal Orders

**TO: Space Florida/Pete Eggert**

**DATE: 11/24/2020**

**FROM: SI-E3/Environmental Management Branch**

**SUBJECT: KSC Record of Environmental Consideration (REC)**

**REC #: 11255**

3.b.4. FDEP NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) CONSTRUCTION ACTIVITY PERMIT: This project may require an NPDES Phase II construction permit. If 1 acre or more of land will be disturbed, a NPDES Construction Activity Permit from the Florida Department of Environmental Protection (FDEP) is required under F.A.C. 62-621.300(4), Notice of Intent to Use Generic Permit for Stormwater Discharge from Large (If over 5 Acres) and Small (1 Acre To 5 Acres) Construction Activities. [http://www.dep.state.fl.us/water/stormwater/npdes/forms/cgp\\_noi.pdf](http://www.dep.state.fl.us/water/stormwater/npdes/forms/cgp_noi.pdf). This includes construction activity which will disturb less than one acre of land area that is part of a larger common plan of development that will ultimately disturb equal to or greater than one acre of land. Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site. A condition of this permit is to provide a Stormwater Pollution Prevention Plan (SWPPP) detailing erosion and turbidity controls for the site. Information on completing the permit application and development of the SWPPP can be obtained by contacting Doug Durham (SI-E2, [REDACTED]).

3.b.5. DEWATERING: Construction dewatering is exempted from permitting under conditions of Rule 40C-2.051 (7) providing the conditions of exemption are met including: limiting withdrawal methods, limiting withdrawal to less than 300,000 gpd and limiting withdrawal to 30 days. Additional limitations are placed on discharge of produced water to prevent harm to the environment. If conditions of the exemption cannot be met, a construction dewatering general permit is required from SJRWMD using Form 40C-2.900(12). No dewatering may begin until 10 days after submittal of the complete form. If the dewatering activity does not qualify for a general permit by rule under Rule 40C-2.042(9), F.A.C., you must complete and submit a SJRWMD application for an individual Consumptive Use Permit pursuant to Rule 40C-2.041, F.A.C. Approval of the application must be obtained before starting the dewatering activity. If produced water discharge will reach surface waters, an FDEP permit may be required under Rule 62-621.300-2. Contact Doug Durham (SI-E2, [REDACTED]) with questions related to these requirements.

3.b.6. WATER RESOURCE PERMITTING (Domestic Wastewater): Proposed activities may require a permit from FDEP for the alteration or installation of utilities for transport of domestic wastewater. The organization responsible for the work will ensure that best engineering practices, codes, specifications and standards are followed. Additional flow to the sanitary sewer system will require coordination and approval from the KSC domestic wastewater collection/transmission system operator and the Cape Canaveral Air Force Station domestic wastewater treatment plant operator. Upgrades to the KSC and Cape Canaveral Air Force Station (CCAFS) infrastructure, beyond the Space Florida domestic wastewater collection/transmission system, may be required for connection to the KSC sanitary sewer system. These upgrades may include increasing the ability of the KSC domestic wastewater collection/transmission system to transmit, store, and equalize the flow to the CCAFS plant.

Space Florida shall obtain all required environmental permits, prepare application, and pay application fees. The proposed connection to the wastewater collection and transmission system must be coordinated with the KSC wastewater system operator. The NASA EAB will sign permit application as landowner or utility system owner if legally required. Contact Doug Durham (SI-E2, [REDACTED]) for assistance. Space Florida shall submit courtesy copies of all applications to the NASA EAB within five (5) working days after submission to FDEP. and shall submit courtesy copies of the permit to the NASA EAB within five(5) working days after receipt from FDEP.

3.b.7. INDUSTRIAL WASTEWATER: The proposed project may generate industrial wastewater. State of Florida regulations define industrial wastewater as any wastewater that is not classified as domestic wastewater. An Industrial Wastewater Permit may be required for discharge. The initiating organization or contractor shall follow FDEP's Guide to Permitting Wastewater Facilities or Activities under Chapter 62-620 when preparing the application package and submit the draft application package (five copies) to the NASA Environmental Assurance Branch (EAB) for review and comment. The designs, site plans, specifications, drawings, documents, or forms required by FAC 62-620 must be signed and sealed by a P.E. registered in the state of Florida. Permit applications must be submitted to FDEP from NASA EAB at least 180 days before a discharge occurs and at least 90 days prior to commencing construction. Contact Doug Durham (SI-E2, [REDACTED]) for additional assistance.

## Avoid Verbal Orders

**TO: Space Florida/Pete Eggert**

**DATE: 11/24/2020**

**FROM: SI-E3/Environmental Management Branch**

**SUBJECT: KSC Record of Environmental Consideration (REC)**

**REC #: 11255**

3.b.8. WATER RESOURCE PERMITTING (Potable Water): The proposed project may require a permit for the alteration or installation of utilities for transport of potable or FIREX water. Any work done will be per standards and criteria set forth in the permit requirements, and not jeopardize the health and safety of personnel due to effects of the construction/modification on the KSC potable water system (i.e. disinfection and verification prior to use). Upgrades to the KSC infrastructure, may be required for connection of the proposed Astronaut Training Complex to the KSC water system.

Space Florida shall obtain all required environmental permits, prepare application, and pay application fees. The proposed connection to the potable water system must be coordinated with the KSC public water system operator. The NASA EAB will sign permit applications as landowner or utility system owner if legally required contact Doug Durham (SI-E2, [REDACTED] for assistance. Space Florida shall submit courtesy copies of all applications to the NASA EAB within five (5) working days after submission to FDEP. Space Florida shall submit courtesy copies of the permit to the NASA EAB within five (5) working days after receipt from FDEP, and ensure that all operations, activities, equipment, and facilities are in full compliance with all permit conditions. Space Florida shall maintain copies of all records required to demonstrate compliance with the permit onsite and make them available for review by NASA upon request.

3.b.9. TRANSFORMERS/GENERATORS: The temporary operation of portable generators during construction is allowed and is not considered a stationary source of air emissions. New generators proposed for permanent use at the facility, and associated air emissions must be reviewed for determination of construction permit and RICE (Reciprocating Internal Combustion Engine) NESHAP (National Emission Standards for Hazardous Air Pollutants) requirements. If a new transformer or generator using a volume of oil equal to or greater than 55 gallons is to be installed, it is subject to SPCC rules.

3.b.10. AIR EMISSIONS (Paint VOCs): Based on the coatings to be applied, this project may emit Volatile Organic Compounds (VOCs) and Hazardous Air Pollutants (HAPs) during painting activities. The emissions are fugitive in nature and no air permitting is required. Contact the Environmental Assurance Branch (Zach Hall, SI-E2, [REDACTED] if you have any questions.

3.b.11. ON-SITE BURNING OF CLEARED VEGETATIVE MATERIAL (Only Approved Method Is Air Curtain Burn): Every effort must be made to deliver land-clearing debris to the appropriate disposal area. Combustible vegetative material may be burned within the confines of KSC after obtaining a Burn Permit issued by the KSC Fire Inspector. Burning shall be in accordance with conditions required in the burn permit, as well as, all requirements for conducting an air curtain burn. As such, contractors that clear and burn or solely burn vegetative material must accomplish the following:

As a standard from the Tri-Agency Prescribed Burn agreement, no burns will be conducted:

18 hours prior to a Static Test Fire, Wet Dress Rehearsal, or similar major milestone supporting any of our launching mission partners

24 Hours prior to a launch on Kennedy Space Center or CCAFS

Notify KSC Spaceport Integration (Eric Haberle [Desk [REDACTED] / Cell [REDACTED] or Greg Gaddis [Desk [REDACTED] / Cell [REDACTED] three business-days ahead of planned burn for a review of possible operational impacts.

After the site is prepared for burning, notify Tom Penn (US Fish and Wildlife Service, (321) [REDACTED] of the proposed air curtain burning.

Contact the Florida State Division of Forestry Cocoa Field Office ((321) [REDACTED] to notify them of the planned burning of land clearing debris and schedule an inspection to ensure the setbacks, piles, and equipment are set up properly. The Cocoa Office will send inspection paperwork to the Division of Forestry Orlando District Field Unit who will issue a valid burn control number.

Call the Orlando Unit ([REDACTED] every day before burning to receive a Burn Authorization Number.

Call the KSC Duty Office at [REDACTED] for a Burn Permit a minimum of 48 hours prior to the burn and daily prior to ignition of burns to ensure there are no spaceport operations planned that require burn constraints. The KSC Fire Inspector will schedule an onsite visit for the day you get the Burn Authorization Number.

## Avoid Verbal Orders

**TO: Space Florida/Pete Eggert**

**DATE: 11/24/2020**

**FROM: SI-E3/Environmental Management Branch**

**SUBJECT: KSC Record of Environmental Consideration (REC)**

**REC #: 11255**

No other environmental issues were identified based upon the information provided in the KSC Environmental Checklist. This Record of Environmental Consideration (REC) does not relinquish the project lead from obtaining and complying with any other internal NASA permits or directives necessary to ensure all organizations potentially impacted by this project are notified and concur with the proposed project.

Due to potential changes in regulations, permit requirements and environmental conditions, statements in this REC are valid for 6 months, and subject to review after this period. It is the responsibility of the project lead to submit current project information for a REC update prior to project commencement if REC is older than 6 months; and also to notify the Environmental Management Branch (SI-E3) if the scope of the project changes at any time after the REC is issued.

P. Eggert/Space Florida

cc:

J. Ryba/SI-E3

J. Collins/SI-E3

D. Durham/SI-E2

R. O'Meara/SI-E2

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**4. Upon evaluation of the subject project, the above determinations have been made and identified. Contact the Environmental Management Branch (SI-E3) at [REDACTED] for re-evaluation should there be any modifications to the scope of work.**



**Jeffrey Collins**

**11/24/2020 15:18**

**Date**

Appendix 2 BRPH Exploration Park North; Preliminary Site Evaluation Report. October 2020.  
Report to Space Florida





Board of Architecture License No. AA C000149  
Certificate of Authorization – Engineering 1439

Prepared for:  
**Space Florida**

[Redacted]  
[Redacted]

Prepared by:  
**BRPH Architects-Engineers, Inc.**

[Redacted]  
[Redacted]

# Exploration Park North: Preliminary Site Evaluation

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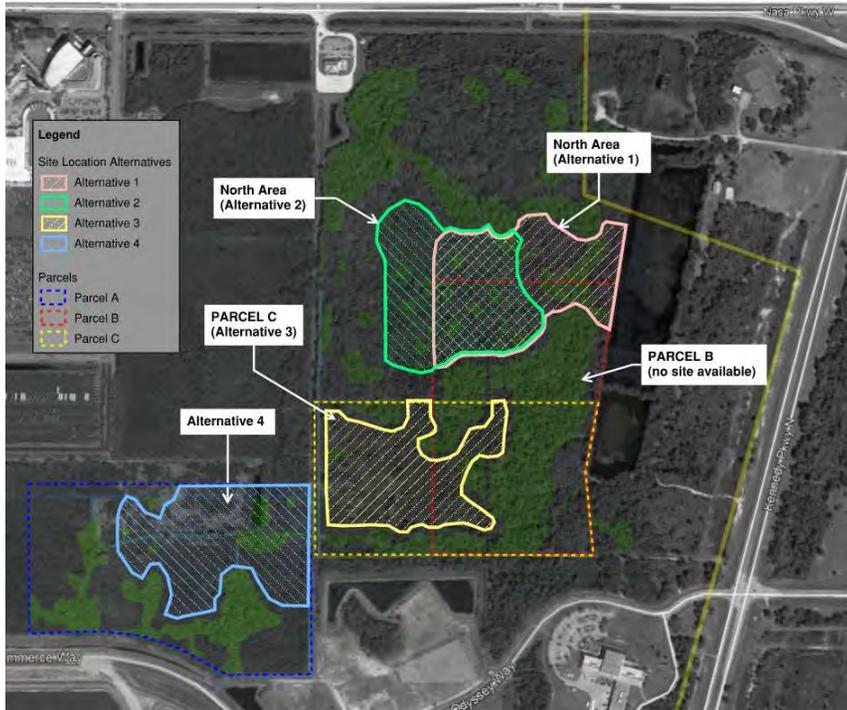
## Executive Summary

NASA and Space Florida are considering locations to the north of the existing Exploration Park Phase I to provide a site for a future customer. The customer plans to build a facility to provide commercial astronaut training to private users, in addition to onsite accommodations for astronaut trainees. Three pre-identified parcels (roughly 35-40 acres each) to the north of the Exploration Park Phase I and the surrounding areas were presented as candidate parcels for evaluation. Land cover and wetlands, floodplains and topography, listed species, proximity to utilities and access, and readily developable area to support the customer's program were considered in the analysis.

Four alternative site locations/development areas were identified to support the program. Alternatives 1 and 2 are located north and northwest of Parcel B respectively, while Alternatives 3 and 4 utilize Parcel C and A respectively (see Summary Exhibit 1). While the pre-identified parcel boundaries may have tracts that are viable for development, the area to the north presents greater development potential and fewer environmental impacts. These options have also been evaluated to address visibility and security restrictions. The ranked comparison of each area with respect to the elements evaluated is summarized below (see Summary Exhibit 3). Based on site constraints and the customer's envisioned facility program, BRPH recommends Alternative 2 as the optimal site to focus the proposed development, with auxiliary and future support areas in the Alternative 3 and 4 areas.

To accommodate future development and supporting site access roads and auxiliary structures, the customer proposes the following approximately 60-acre parcel for land transfer and NEPA analysis (see Summary Exhibit 2). This concept is a hybrid of several development scenarios and accommodates the program requirements not only of the initial phase, but also provides space for buffers and future expansion, reduces environmental impacts and development costs, and meets the customer's long-term objectives.

EXPLORATION PARK NORTH: PRELIMINARY SITE EVALUATION



Summary Exhibit 1: Alternative Areas Evaluated



Summary Exhibit 2: Proposed Parcel and Conceptual Layout

Category Weight	Land Cover		Wetlands		Floodplains		Listed Species		Topography (Fill Cost)		Soils		Security		Utilities & Access		Developable Area		Weighted Avg
	1	3	2	5	2	2	1	3	2	2	3	2	3						
North Area Alternative 2	4	Most Desirable	4	2.5 ac	5	Least impact	5	N/A	4	\$1.8 M	3	C/D	3	Least Desirable	2		5	16.5 ac	3.9
PARCEL C (Alternative 3)	2		5	0.3 ac	1	Most impact	5	N/A	3	\$2.0 M	3	C/D	5		4		2	13 ac	3.5
PARCEL A (Alternative 4)	3		2	1.3 ac	3		5	N/A	2	\$2.1 M	4	B/D	5	Most Desirable	5	Most Accessible	3	15.4 ac	3.5
North Area Alternative 1	3		2	2.6 ac	4		5	N/A	3	\$2.0 M	3	C/D	4		1	Least Accessible	5	16.6 ac	3.4
PARCEL B	1	Least Desirable	1	6.3 ac	2		5	N/A	1	\$2.3 M	3	C/D	4		3		1	7.5 ac	2.3

Summary Exhibit 3: Development Alternative Rankings

## EXPLORATION PARK NORTH ENVIRONMENTAL ASSESSMENT PRELIMINARY SITE EVALUATION

NASA and Space Florida are considering locations to the north of the existing Exploration Park Phase I to provide a site for a future customer. The customer plans to build a facility to provide commercial astronaut training to private users, in addition to onsite accommodations for astronaut trainees.

NASA has identified three potential parcels (approx. 35 to 40-ac each) as candidates for this development. The BRPH team has been tasked to evaluate the development potential for the proposed facilities in this area with the aim of defining the approximate limits of the proposed parcel. Adjacent areas outside of the three pre-identified parcels were also investigated to identify the best potential alternative to minimize environmental impacts and development costs.

### 1.0 PROJECT DESCRIPTION

The proposed facilities include an Astronaut Training Facility, Astronaut Accommodations, and Auxiliary and Support Facilities. The customer also plans to provide a reception area located outside of the proposed parcel, within the previously graded Exploration Park Phase I area, as well as a covered parking area adjacent to this reception facility equipped with a 1MW solar farm via roof panels. Future phases of the program may include additional training or accommodations facilities. To host this program, the selected parcel requires at least 40 acres, with at least 15 contiguous acres available for development of buildings, internal roads, and parking facilities for each phase of development. The three pre-identified potential parcels are located north of Space Commerce Way and Odyssey Way in Exploration Park (see Figure 1).

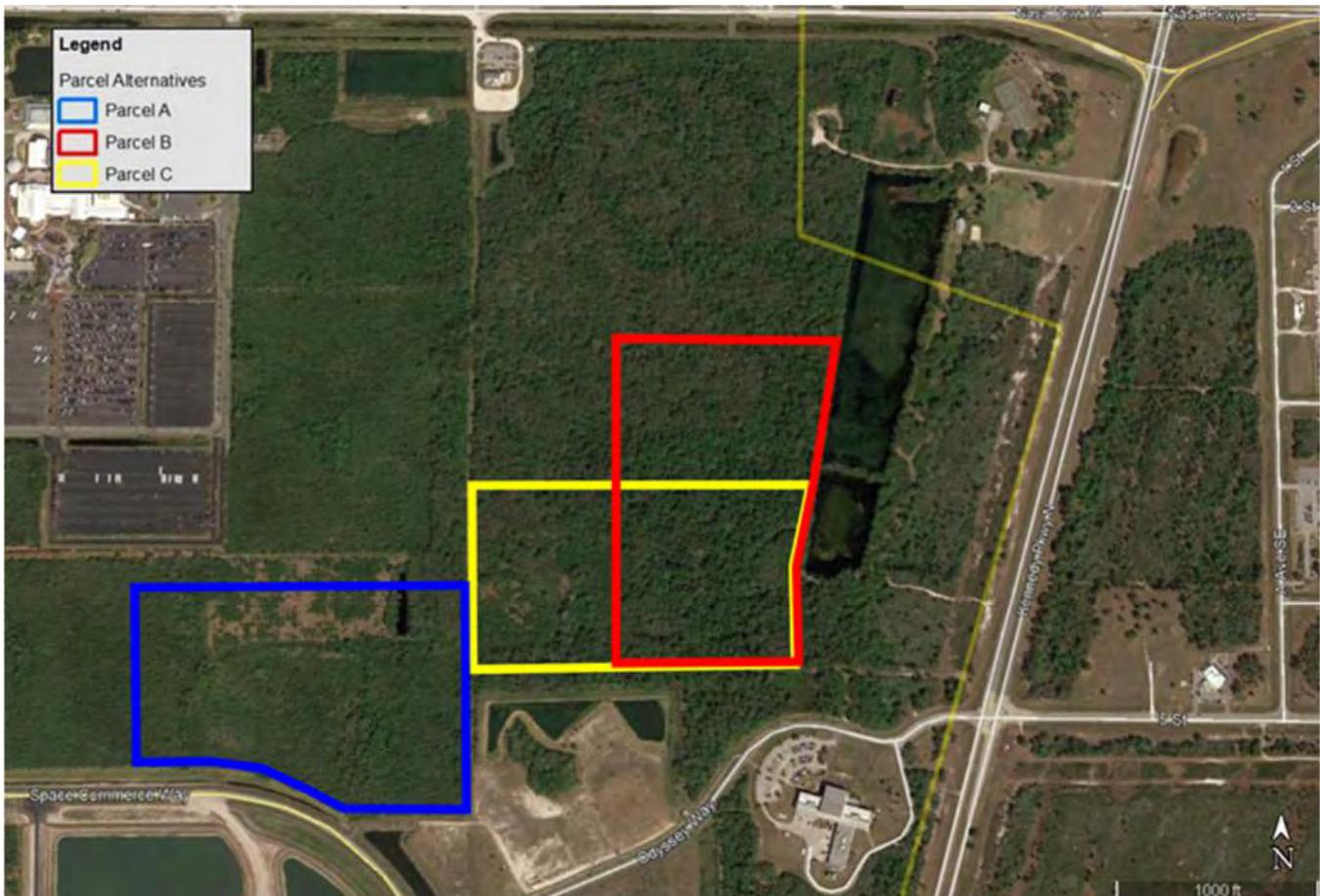


Figure 1: Area and Parcel Areas of Interest

## 2.0 EXISTING SITE CONDITIONS

### 2.1 LAND COVER

In mid-June 2020, Jones Edmunds scientists conducted a preliminary site assessment to evaluate, characterize, and estimate the limits of upland and wetland vegetation communities in the three pre-identified parcels. In addition, the potential occurrence or presence of suitable habitat for listed wildlife species at each of the three parcels was assessed. The onsite vegetative communities within the project vicinity (to include the three parcels and additional area to the north) were categorized using the 1999 Florida Land Use, Cover, and Classification System (FLUCCS) developed by the Florida Department of Transportation. Results of this assessment are provided below and in Section 2.6.

Parcel	Parcel Acreage	Wetland Acreage and Surface Water Acreage	Upland Acreage
A	38	11	27
B	40	20	20
C	37	14	23

Table 2-1: Upland and Wetland Acreage Summary

#### 2.1.1 Parcel A

Parcel A is former citrus grove and is now dominated by very large and dense Brazilian pepper, an exotic invasive shrub. Parcel A is composed of one upland community, one surface water community, and one wetland community (Figure 2). Each onsite community is described below.



Figure 2: Wetland and Surface Water Map

### Uplands

Of the approximately 38-acre site, the non-highlighted uplands characterized as Abandoned Citrus Groves (FLUCCS Code 2210) comprise approximately 27- acres (Figure 2, Table 2-1). The Abandoned Citrus Grove community consists of previously cleared areas that were planted with citrus. This low-quality community is dominated by varying densities of Brazilian pepper (*Schinus terebinthifolius*) and guinea grass (*Panicum maximum*). Scattered native species include sabal palm (*Sabal palmetto*), beautyberry (*Callicarpa Americana*), wild coffee (*Psychotria nervosa*), shortleaf wild coffee (*Psychotria sulzneri*), marlberry (*Ardisia escallonioides*), and caesarweed (*Urena lobata*). The upland communities exhibit no indication of hydrology near the surface and soils lack hydric indicators within 6 inches of the soil surface.

### Surface Waters

The Surface Water community (FLUCCS Code 5100) comprises approximately 1-acre (Figure 2, Table 2-1) and consists of upland cut canals and ditches that were dug to drain the land for citrus production. Vegetation is dominated by herbaceous species such as bluestem (*Andropogon glomeratus* and *virginicus*), arrowhead (*Sagittaria latifolia*), marsh pennywort (*Hydrocotyl umbellata*), and cattail (*Typha* sp.). These features drain the parcel to the west and then south under Space Commerce Way via a large north/south canal.

### Wetlands

On-site wetlands are characterized as Exotic Wetland Hardwoods (FLUCCS Code 6190) and comprise approximately 10-acres (Figure 2, Table 2-1). This vegetation community is very low quality because it is dominated by Brazilian pepper with little to no native species present. Native species observed in these wetlands include scattered saltbush (*Baccharis halimifolia*), Carolina willow (*Salix caroliniana*), wax myrtle (*Myrica cerifera*), dayflower (*Commelina diffusa*), bluestem (*Andropogon* sp.), and marsh pennywort (*Hydrocotyl umbellata*). Surface water is present within the lower elevations, with hydric soils that support inundation at or above the surface for extended periods.

#### 2.1.2 Parcel B

Parcel B is composed of one upland community and one wetland community (Figure 2). Each onsite community is described below.

### Uplands

Of the approximately 40-acre site, uplands characterized as Temperate Hardwood (FLUCCS Code 4250) comprise approximately 20-acres (Figure 2, Table 2-1). The Temperate Hardwood community is medium to high quality and dominated by cabbage palm, live oak (*Quercus virginiana*), laurel oak (*Q. laurifolia*), myrsine (*Myrsine guianensis*), strawberry guava (*Psidium cattleianum*), wild coffee (*Psychotria* spp.), beautyberry (*Callicarpa americana*), wild coffee (*Psychotria nervosa*), shortleaf wild coffee (*Psychotria sulzneri*), marlberry (*Ardisia escallonioides*), and caesarweed. There is lower quality upland habitat in the southwest region of the parcel that was former citrus grove and is dominated by the same Parcel A species.

### Wetlands

On-site wetlands are characterized as Mixed Wetland Hardwoods (FLUCCS Code 6170) and comprise approximately 20-acres (Figure 2, Table 2-1). These medium to high quality wetlands are dominated by red maple (*Acer rubrum*), sabal palm, American elm (*Ulmus americana*), laurel oak, buttonbush (*Cephalanthus occidentalis*), Brazilian pepper, saltbush (*Baccharis glomerulifolia*), swamp dogwood (*Cornus foemina*), sword fern (*Blechnum serrulatum*), Virginia chain fern (*Woodwardia virginica*), poison

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