

APPENDIX N

BIOLOGICAL AND WATER RESOURCES

This Appendix contains background material, which supplements the Biotic Communities, Threatened and Endangered Species, Wetlands, and Floodplains material contained in **Chapter 4, Affected Environment** and **Chapter 5, Environmental Consequences**. This appendix consists of the following sections:

- N.1 Biological Resources
- N.2 Wetlands
- N.3 Floodplains
- **Attachments N-1 through N-5**

N.1 BIOLOGICAL RESOURCES

The Airport is located in the central Corn Belt Plains Ecoregion.¹ This ecoregion is generally characterized by gently rolling topography, which is primarily used for food production for livestock. Mohlenbrock describes the general area around the Airport as part of the Northeastern Morainal Division, Morainal Section.² This Morainal Section is characterized by intermittent and perennial streams cutting through a thick mantle of wind-blown loess that have dissected the glacial till plain.

From the perspective of landscape ecology, the entire construction impact area has suffered significant habitat degradation and disruption.³ In general, the land at and surrounding the Airport is highly urbanized, with significant amounts of transportation-related infrastructure improvements, as well as commercial, industrial, retail, and residential land uses. The existing undeveloped lands have been reduced to small, isolated patches, the majority of which do not resemble the native landscape.

Mowed lawn, paved surfaces, and buildings occupy most of the secured airfield area. The major exceptions to these land uses are the South Detention Basin and undeveloped open space on the western side of the Airport properties. The west side contains several large earthen berms, scrub woodland, and wetland. The Airport properties have been disturbed to varying extents and contain little intact native vegetation. These lands are positioned adjacent to the airfield, occupying former industrial and residential areas, former nurseries, and some undeveloped areas.

¹ Ecoregions of the Upper Midwest States, Report No. EPA/600/3-88/037. J.M. Omernik and A.L. Gallant. U.S. Environmental Protection Agency, September 1988.

² Guide to the Vascular Flora of Illinois, R.H. Mohlenbrock, Southern Illinois University Press, 1986.

³ Landscape Ecology: Directions and Approaches, P.G. Risser and J.R. Karr and R.T.T. Forman, Special Publ. No. 2, Illinois Natural History Survey, Champaign, IL, 1984; Quantitative Methods in Landscape Ecology, M.G. Turner and R.H. Gardner, Springer-Verlag, New York, 1991.

The following sections describe the existing conditions of biological resources at Airport in greater detail.

N.1.1 Wetlands

Wetlands are important aquatic resources that can support a variety of ecological functions, including habitat for certain aquatic and terrestrial wildlife. Within the Airport boundaries, there are numerous wetlands and other areas of open water. Refer to **Section N.2, Wetlands**, for a depiction of the wetlands at the Airport.

Vegetation

The existing wetland plant communities are characterized by low plant diversity and are generally dominated by monocultures of native weedy colonizers such as cattail (*Typha* sp.) and non-indigenous, invasive species such as reed canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*), and common reed (*Phragmites australis*). Common buckthorn (*Rhamnus cathartica*), an upland non-indigenous woody shrub, is rapidly encroaching on wetland areas, drying them out and replacing the native wetland vegetation.

Only two wetlands (NW28 and SW15, see **Chapter 4, Affected Environment, Exhibits 4.4-2 and 4.4-3**) exhibited NARIs of greater than 20. The relatively large size of these areas (15.16 acres and 6.98 acres), compared with other wetland areas at the Airport, allows for development and protection of a more diverse plant community. However, these wetland areas are surrounded by intensive development consisting of runways/taxiways, roads, railways, graded areas, and landscaped grass areas.

Wildlife Habitat

The areas in and around the Airport properties generally have been modified from their natural condition and represent degraded habitat situations. In general, the highest quality habitat that sustains the largest diversity and population of animal species is found in the woodland areas, especially those woodland areas containing seasonally flooded wetlands located on the west side of the Airport property. These woodlands provide food, shelter, and water for many species of common wildlife, including coyotes, red foxes, raccoons, and cottontail rabbits. A breeding population of birds is present in the woodlands, which also contain seasonal ponds that may support reptiles and amphibians.

Wildlife and Wildlife Hazards

Under most conditions, a major value of wetlands and quality woodlands is the habitat value afforded wildlife species. In airport environments, however, this benefit is diminished because of the critical need to minimize hazards to public safety that can be posed by wildlife. The FAA recommends that when an airport expansion will involve wetlands, the wildlife hazards should be evaluated and minimized through a wildlife management plan.⁴

⁴ Hazardous Wildlife Attractants On or Near Airports, FAA Advisory Circular 150/5200-33A, Federal Aviation Administration, July 27, 2004.

In 1993, the U.S. Department of Agriculture (USDA) completed a biological survey of the Airport.⁵ The purpose of this survey was to identify the wildlife present on the Airport properties and methods available to control or discourage wildlife from using the Airport properties. This survey was conducted in accordance with the Animal Damage Control (ADC) program to reduce the potential adverse safety impacts that could occur by the presence of wildlife on the Airport and ultimately led to the creation of a Wildlife Hazard Management Plan (WHMP) for the Airport.⁶ The FAA Federal Aviation Regulations (FAR), Section 139.337, require the development, approval, and implementation of a WHMP for airports with identified wildlife hazard problems such as O'Hare. The O'Hare WHMP generally concluded that the Airport should prevent potential wildlife threats to aircraft by deterring the proliferation of wildlife and their habitats that may pose a potential threat (i.e., white-tailed deer, European starlings, house sparrows, red-winged blackbirds, pigeons, and ring-necked pheasants). As part of an active program to prevent birdstrikes, the USDA maintains staff at the Airport specifically for identifying and reducing potential wildlife hazards, with abatement techniques including vehicles, horns, shellcrackers, pyrotechnics, propane cannons, trapping, and repairing fencing as needed. It should be noted that wetland and water birds (gulls, waterfowl, and wading birds) accounted for nearly two-thirds of the recorded aircraft-bird strikes nationwide during a 3-year study period.⁷ At O'Hare, ring-billed gulls are not attracted to the wetlands on-site and Canada geese are attracted to the mowed areas of the Airport.

The most recent birdstrike data from the USDA at the Airport is included as **Attachment N-1** to this appendix.

N.1.2 Floodplains

There are floodplains associated with Willow and Higgins Creeks, Willow-Higgins Creek, Crystal Creek, and Bensenville Ditch. Refer to **Section N.3, Floodplains**, for a depiction of the floodplains as they existed prior to the 2004 completion of Structure 140 and the Touhy Avenue Detention Basin, and **Exhibit 4.4-4 in Chapter 4, Affected Environment**, for a depiction of the floodplains as they exist today, after Structure 140 and the Touhy Avenue Detention Basin became on-line and fully operational. The undeveloped floodplains of these streams provide limited natural storage of floodwaters, and they can also support riverine wildlife habitat. There are also some wetlands associated with certain reaches of the Airport floodplains. A more thorough discussion of Airport floodplains is contained in **Section 5.13, Floodplains**.

⁵ Biological Assessment, Environmental Assessment for Management of Hazards to Public Safety and Aircraft Caused by Wildlife at O'Hare International Airport, and Wildlife Hazard Management Plan for O'Hare International Airport, U.S. Department of Agriculture, 1993.

⁶ Biological Assessment, Environmental Assessment for Management of Hazards to Public Safety and Aircraft Caused by Wildlife at O'Hare International Airport, and Wildlife Hazard Management Plan for O'Hare International Airport, U.S. Department of Agriculture, 1993.

⁷ Hazardous Wildlife Attractants On or Near Airports, FAA Advisory Circular 150/5200-33A, Federal Aviation Administration, July 27, 2004.

N.1.3 Open Waters

Open waters on the Airport include the Willow-Higgins Creek and Bensenville Ditch. Riverine habitat types occur within the Willow-Higgins Creek, Bensenville Ditch, and Crystal Creek. However, the channelized character of these waterways reduces the quality of the habitat. The majority of the South Detention Basin is normally dry, except during and following storm events, although, standing water is regularly found in small pools near and within drainage canals in the detention basin.

N.1.3.1 Aquatic Habitat Evaluation

Major aquatic habitats located at the Airport were evaluated in terms of fish and macroinvertebrate communities in 1995.⁸ Fish were sampled using either a Coffelt backpack electroshocker, Model BP-4, with at least one person as netter or a 25-foot one-fifth inch mesh bag seines with 1/8 inch minnow seines as blocking nets. When the electroshocker was used, electrode time was recorded. The length of stream reach seined for fish was recorded when this sampling method was used. Macroinvertebrates were collected using kicknets and hand picking from rocks and debris. The amount of time spent collecting macroinvertebrates at each site was timed so data could be expressed as numbers per unit effort. The USEPA Rapid Bioassessment Protocol⁹ was used to evaluate sites examined during this survey. The Protocol is a cost effective method to perform biological assessments of biotic systems. Willow-Higgins Creek, Higgins Creek, Bensenville Ditch, Crystal Creek, and the South Detention Basin were surveyed.

The survey was repeated during 2002 at the same locations and with similar gear.¹⁰ The backpack electrofisher was a Smith-Root Model LR-24. The seine was a 25-foot one-quarter inch mesh seine.

Six sites within the boundaries of the Airport were sampled for fish and macroinvertebrates. These sites were:

- Site 1 - South Detention Basin
- Site 2 - Crystal Creek, sampling at the exposed outfall below South Detention Basin
- Site 3 - Higgins Creek, approximately one-fourth mile above its confluence with Willow Creek
- Site 4 - Wetlands on the Bensenville Ditch across from the U.S. Post Office
- Site 5 - Willow-Higgins Creek, approximately 800 yards below the confluence of Willow and Higgins Creeks

⁸ Evaluation of Aquatic Habitat, Chicago O'Hare International Airport, R.V. Anderson, Western Illinois University, 1995.

⁹ Rapid Bioassessment Protocols for Use in Streams and Rivers, Benthic Macroinvertebrates and Fish, U.S. Environmental Protection Agency, 1989.

¹⁰ Sample Collection, Identification and Quantification Data, M. Headrick, Montgomery Watson Harza, October-November, 2002.

- Site 6 - Bensenville Ditch, approximately one-half mile above the U.S. Post Office wetland

Fish greater than eight inches in length were counted, identified and released, all other fish and invertebrates were preserved in five percent buffered formalin and taken to the lab for identification. Organisms were counted and densities determined as number per unit effort.

The results of the macroinvertebrate sampling are presented in **Table N-1**. In 1995, the sampling reach on Higgins Creek had the most diverse macroinvertebrate community found at the Airport, with eight taxa collected. Fingernail clams, segmented worms, and midge larva were the most abundant organisms found in Higgins Creek. On Willow-Higgins Creek, there was a distinct lack of macroinvertebrates, despite clear flowing water. While the substrate ranged from soft silt to gravel and rock, it was covered with a bacterial/periphytic mat, indicative of upstream effluent discharges not related to the Airport.

TABLE N-1
RESULTS OF MACROINVERTEBRATE SAMPLING 1995 AND 2002

Taxa	Number of Individuals Collected												
	Site 1		Site 2		Site 3		Site 4		Site 5		Site 6		
	'95	'02	'95	'02	'95	'02	'95	'02	'95	'02	'95	'02	
Amphipoda (Scuds)									12				
Anisoptera (Dragonflies)				24		2							3
Coleoptera (Beetles)				2		5		1		1			3
Decapoda (Crayfish)						1							1
Diptera (True flies)		2		27		8		309		11		45	4
Ephemeroptera (Mayflies)						4				3			12
Gastropoda (Snails)				13		10		431		9		2	3
Hemiptera (True bugs)				12		2		1				2	301
Hirudinea (Leeches)								5					
Isopoda (Sow bugs)								1		1			4
Oligochaeta (Segmented worms)				3				228		22		142	6
Pelecypoda (Mussels)													1
Trichoptera (Caddis flies)													76
Turbellaria (Flatworms)													3
Zygoptera (Damselflies)						10		89					11

Sources: 1995 data: Evaluation of Aquatic Habitat, Chicago O'Hare International Airport. R.V. Anderson, Western Illinois University, 1995.
2002 data: Sample Collection, Identification and Quantification Data, M. Headrick, Montgomery Watson Harza, October-November, 2002.

Qualitative improvement over the 1995 survey was evident in 2002. The bacterial/periphytic mat was absent from Willow-Higgins Creek, and the substrate in Higgins and Willow-Higgins Creeks was sand and gravel with about 50 percent coverage of broad-leafed pondweed (*Potamogeton*). Midges, segmented worms, mussels and snails were still the most abundant taxa, but mayflies (ephemeroptera) were found in Crystal Creek, Higgins Creek, and the Bensenville Ditch wetland near the Post Office. Caddis flies (trichoptera) were found in Higgins and Willow-Higgins Creeks. Ephemeroptera and trichoptera, with the plecoptera (stoneflies), form the EPT taxa, which indicate good water quality. In Bensenville Ditch,

segmented worms had been replaced with flatworms, which also indicates improved water quality, as the flatworms are less tolerant of pollution.

Despite the improvements since 1995, the results of the bioassessment indicated that all of the sites examined were poor quality aquatic habitats, which had been modified by channelization, impacted by construction activity or changes in water quality. Evaluation of fish and macroinvertebrate components at each site is presented below and indicated all of the sites examined were moderately impaired or degraded.

Fish

In 1995, sites 1, 2, 4, and 6 produced no fish using either sample method. Water level fluctuation and water quality at Site 1 (South Detention Basin) probably prevented the development of permanent fish populations at this location. Sites 2 (Crystal Creek) and Site 4 (Wetlands on the Bensenville Ditch across from the U.S. Post Office) were very shallow, less than three inches deep in most places, with a substrate covered with organic debris or algae and thus not likely to support fish populations. Site 6 (Bensenville Ditch one-half mile above the U.S. Post Office wetland) had been channelized and disturbed by removal of riparian vegetation and past construction activity along the watercourse.

In 2002, Site 1 (South Detention Basin) held about an acre of water, and fish were collected. One bluegill (*Lepomis macrochirus*) and one green sunfish (*Lepomis cyanellus*) were observed at the shoreline, and three seine hauls yielded one bluntnose minnow (*Pimephales notatus*). Site 2 (Crystal Creek) was difficult to sample, as it was nearly dry and choked with vegetation. This site produced no fish in 1995 or 2002. Site 4 (Wetlands on the Bensenville Ditch across from the U.S. Post Office) produced a juvenile mosquitofish from the benthos sample in the wetland near the Post Office, and the benthos sample also contained a scale from a *Lepomis* fish. Site 6 (Bensenville Ditch one-half mile above the U.S. Post Office wetland) was difficult to sample because it held dense stands of common waterweed (*Elodea canadensis*), and the banks were thickly vegetated. Nevertheless, dip netting produced 1 adult and 19 juvenile mosquitofish (*Gambusia affinis*).

In 1995, two species of fish were collected from Site 3 (Higgins Creek) and seven species of fish were collected from Site 5 (Willow-Higgins Creek) (**Table N-2**). At Site 3, 26 fish in two species were collected from two 100 foot reaches of Higgins Creek using a seine and block nets. Both species, bluntnose minnow and white sucker, found during the Higgins Creek sampling, occur throughout Illinois in small streams. They have wide ecological tolerances and have been collected in a variety of habitats. In addition to the bluntnose minnow and white sucker, five other species were collected from Willow-Higgins Creek. Most of the 67 fish collected at Site 5 were found in or associated with debris along the banks of the stream. Fathead minnows and white suckers were the most abundant fish found. These two species, as well as the others found, occur in smaller low gradient streams and they are all tolerant of a wide range of environmental conditions. Goldfish collected were all wild type indicating they had been in the Willow Creek drainage for some time.

In 2002, six species of fish were collected from Site 3 (Higgins Creek), and six species of fish were collected from Site 5 (Willow-Higgins Creek) (Table N-2). At Site 3, 14 fish in six species were collected. At Site 5, 45 fish were collected from six species. In 2002, the Higgins Creek and Willow-Higgins Creek sampling efforts produced carp (*Cyprinus carpio*), goldfish (*Carrassius auratus*), creek chub (*Semotilus atromaculatus*), pearl dace (*Semotilus margarita*), common shiner (*Notropis cornutus*), white sucker (*Catostomus commersoni*), black bullhead (*Ictalurus melas*), and johnny darter (*Etheostoma nigrum*). Fish catches in 2002, like macroinvertebrate collections indicated improved habitat quality. The USEPA Rapid Bioassessment Protocol¹¹ rates fish species in relation to pollution, as either tolerant, intermediate, or intolerant. All fishes collected in 1995 were tolerant. Common shiner and johnny darter, which were collected in 2002 but not in 1995, are rated as intermediate. As intermediate fish are more sensitive to pollution than tolerant fish, their presence in 2002 indicates an improved water quality.

TABLE N-2
RESULTS OF FISH SAMPLING, 1995 AND 2002

Fish Species	Higgins Creek (Site 3)		Willow-Higgins Creek (Site 5)	
	1995	2002	1995	2002
Carp (<i>Cyprinus carpio</i>)			1	3
Goldfish (<i>Carrassius auratus</i>)			3	2
Bluntnose minnow (<i>Pimephales notatus</i>)	20		3	
Fathead minnow (<i>Pimephales promelas</i>)			27	
Creek chub (<i>Semotilus atromaculatus</i>)		2	10	
Pearl dace (<i>Semotilus margarita</i>)		5		28
Common shiner (<i>Notropis cornutus</i>)		3		7
White sucker (<i>Catostomus commersoni</i>)	6	1	22	4
Black bullhead (<i>Ictalurus melas</i>)		1		
Green sunfish (<i>Leponis cyanellus</i>)			1	
Johnny darter (<i>Etheostoma nigrum</i>)		2		1
TOTAL SPECIES	2	6	7	6
TOTAL FISH	26	14	67	45

Note: Sampling for fish also was done in South Detention Basin, Crystal Creek and Bensenville Ditch. However, no fish were found for sampling sites in these waters in 1995. Limited catches in 2002 are discussed in the text.

Sources: 1995 data: Evaluation of Aquatic Habitat, Chicago O'Hare International Airport. R.V. Anderson, Western Illinois University, 1995.
2002 data: Sample Collection, Identification and Quantification Data, M. Headrick, Montgomery Watson Harza, October-November, 2002.

Macroinvertebrates

A total of 28 invertebrate taxa were collected in 1995 at the sites sampled at the Airport (see Table N-3 for the results of the 1995 and 2002 sampling). The most abundant species were two endobenthic organisms, the pill clam (*Pisidium*) and the slug worm (*Tubifex tubifex*). Together these two species accounted for almost 50 percent of all individuals collected. Some macroinvertebrates were collected at all sites, although abundance was poor at some sites, notably at Site 1 (South Detention Basin). In 2002, *Tubifex* had been replaced by other oligochaetes, but they were also tolerant forms. On EPA's tolerance scale of 0 to 10, with 10

¹¹ Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers., Periphyton, Benthic Macroinvertebrates, and Fish, U.S. Environmental Protection Agency, Second Edition, 1999.

being the most tolerant, the most abundant taxa were oligochaetes and chironomidae, with tolerance ratings of 10 and 6, respectively.

Sampling efforts in standing water pools and connecting canals in the bottom of the Site 1 (South Detention Basin) during 1995 produced only two biting midge larvae. No other macroinvertebrates were collected, although some snail shells (*Helisoma* and *Physa*) were present along the margins of the pools. The basin had no vegetation and was still benthos-poor (52 individuals of five taxa) during 2002. Most of the sample was chironomid larvae, *Physa*, and *Trichocoryxa*, with tolerance ratings of 6, 8, and 5, respectively.

Thirty-four individuals in nine taxa were collected in 1995 at Site 2 (Crystal Creek). Damselfly nymphs (*Lestes*, tolerance = 9) were the most abundant organisms collected, followed by snails. Much of the stream bottom at this site was covered by filamentous blue-green algae, and algal mats were floating along the margins or in eddies of this stream. *Lestes* was still common in 2002, but most of the sample of 1,107 individuals of ten taxa was oligochaetes, chironomid larvae, and *Physa*.

Site 3 (Higgins Creek), had the most diverse macroinvertebrate community, with 14 taxa collected at this site in 1995. Fingernail clams, segmented worms, and midge larva were the most abundant organisms. The presence of flowing water and a substrate, which ranged from silt to coarse gravel, probably accounts for the wider range of organisms collect. Densities of most organisms collected, however, were not high, and fewer than ten individuals per taxa were collected with the exception of the pill clam (*Pisidium*) and slug worm (*Tubifex tubifex*). Very small oligochaetes and chironomids were numerically dominant in Higgins Creek during 2002, but most of the volume of the sample was the caddis fly *Hydropsyche* (tolerance = 4).

Site 4 (Wetlands on the Bensenville Ditch across from the U.S. Post Office) had six taxa in 1995 and eight taxa in 2002. Except for chironomid larvae and *Trichocoryxa* during 2002, none were abundant and all are typical of pond habitats with abundant aquatic macrophytes and high organic inputs.

Site 5 (Willow-Higgins Creek) contained clear flowing water during the 1995-sampling event. However, very few macroinvertebrates were collected in 1995. While the substrate ranged from soft silt to gravel and rock, it was covered by a bacterial/periphytic mat, which may have reflected the presence of an upstream wastewater effluent not related to the Airport. The mat was absent during 2002, and Sites 3 and 5 had sand and gravel bottoms with about 50 percent coverage of broad-leafed pondweed. The 2002 sample included 273 individuals of 12 taxa, including 94 chironomids, 28 *Hydropsyche*, and 15 *Ferrissia* (limpets, tolerance = 5.2).

In Site 6 (Bensenville Ditch) during 1995, over 50 percent of the organisms present were fingernail clams (*Pisidium* and *Musculium*). While there were several insect taxa present, most of the remaining organisms at this site were either segmented worms or snails. Fingernail clams were still common in 2002, but the most numerous organism was the flatworm *Hymanella* (tolerance = 4).

**TABLE N-3 (CONTINUED)
AQUATIC MACROINVERTEBRATE SAMPLING**

Taxa	Number of Individuals Collected											
	Site 1 S. Detention Basin		Site 2 Crystal Creek		Site 3 Higgins Creek		Site 5 Willow-Higgins Creek		Site 4 P.O. Wetland		Site 6 Bensenville Ditch	
	1995	2002	1995	2002	1995	2002	1995	2002	1995	2002	1995	2002
Ephemeroptera (mayflies)												
Siphonuridae												
Siphonurus				4						12		5
Baetidae												
Dipheter						3						
Hemiptera (true bugs)												
Notonectidae (back swimmers)												
Buena			1									
Corixidae (water boatman)												
Trichocorixa		12	1	1					2	301	1	
Trichoptera (caddis flies)												
Hydropsyche								76				
Coleoptera (beetles)												
Halipidae (crawling water)												
Halipus (adult)				1								1
Halipus (larvae)				1								
Dytiscidae (predaceous diving)												
Laccophilus (adult)			2	3								
Hydrophilidae (water scavenger)												
Berosus (larvae)					1						2	
Elmidae (riffle)											1	
Neelimis												
Stenelmis (adult)												1
Ptilodactylidae (toe-winged)												
Stenocolus											1	
Diptera (true flies)												
Simuliidae (black flies)												
Simulium											1	
Chironomidae (midges)		26	3	276	8	44	94	4	221	5		

**TABLE N-3 (CONTINUED)
AQUATIC MACROINVERTEBRATE SAMPLING**

Taxa	Number of Individuals Collected											
	Site 1 S. Detention Basin		Site 2 Crystal Creek		Site 3 Higgins Creek		Site 5 Willow-Higgins Creek		Site 4 P.O. Wetland		Site 6 Bensenville Ditch	
	1995	2002	1995	2002	1995	2002	1995	2002	1995	2002	1995	2002
Chironomini		1	4	33		3						
Heleidae (biting midges)												
Palomyia	2											
Stilobezia				15								
Tabanidae (horse flies)												
Chrysops			1									
Tabanus											1	
MOLLUSCA												
Gastropoda (snails)												
Physa		13	5	430		3		1			15	1
Ammicola											2	
Lymnaea			5						1			
Helisoma				1		6			1	1	3	2
Ferissia										15		
Pelecypoda (clams & mussels)												
Musculium												2
Pisidium						6		1				10
						49						66
												104
TOTAL TAXA	1	5	9	10	8	14	8	3	5	8	14	10
TOTAL ORGANISMS	2	52	32	1,107	106	271	273	9	14	562	123	283

Sources: 1995 data: Evaluation of Aquatic Habitat, Chicago O'Hare International Airport, R. V. Anderson, Western Illinois University, 1995.

2002 data: Sample Collection, Identification and Quantification Data, M. Headrick, Montgomery Watson Harza, October-November, 2002.

Willow-Higgins Creek: This stream displays many of the characteristics of a typical urban watercourse, and has been extensively channelized on and near the Airport property. The stream gradient is low and sediment deposition is evident in many areas. The substrate consists primarily of silt, although some gravel-bottomed areas exist. This stream receives treated effluent from the MWRDGC James C. Kirie Water Reclamation Plant, located northwest of the Airport, which comprises the majority of baseflow.

The Illinois Environmental Protection Agency (IEPA) is required to assess the extent to which various uses are being sustained in different water bodies. Aquatic life is one of those uses evaluated, with four possible "use support" levels assigned:

- Full use (highest)
- Full/Threatened
- Partial support/Fair
- Nonsupport/Poor (lowest)

The Des Plaines River, Willow-Higgins Creek, and Crystal Creek were given "fair" ratings by the IEPA in 1999. Water quality degradation in these water bodies is primarily due to urban surface runoff, municipal and industrial discharges, and to some extent channelization and flow regulation.¹²

An IEPA evaluation of Willow-Higgins Creek was completed in 1993 and resulted in the assignment of "partial support moderate impairment,"¹³ a rating that can be considered reflective of the degraded urban nature of the stream.

Willow-Higgins had earlier been rated a Class D stream, or "Limited Aquatic Resource", according to the IEPA's Biological Stream Classification System.¹⁴ Class D streams are in poor condition, have greatly reduced species diversity, and their benthic communities are dominated by pollution-tolerant species.

The IEPA collected macroinvertebrates in Willow-Higgins Creek as part of a 1983 survey. Macroinvertebrates have proven to be a very sensitive group of organisms and good biomonitors.^{15,16,17} To assess the health of aquatic ecosystems, various biotic indices have been developed using community structure and diversity of arthropods.^{18,19} Sampling results were converted into a Macroinvertebrate Biotic Index (MBI) for evaluation purposes. Species are

¹² Des Plaines River Watershed, Illinois Environmental Protection Agency, www.epa.state.il.us/water/water-quality/report-1999/factsheets/watershed-2.pdf

¹³ Illinois Water Quality Report 1992-1993., IEPA/WPC 94-160, Illinois Environmental Protection Agency, 1994.

¹⁴ An Intensive Survey of the Des Plaines River Basin from the Wisconsin State Line to Joliet, Illinois 1983-1984, IEPA/WPC 88-014, Illinois Environmental Protection Agency, 1988.

¹⁵ "A biological approach to water quality management." J.R. Chandler, *Water Pollution Control* 4 (1970):415-422.

¹⁶ Biological methods for the assessment of water quality, Special Technical Publication 528, American Society For Testing and Materials, December 1973.

¹⁷ Use of Arthropods to Evaluate Water Quality in Streams, W.L. Hilsenhoff, Tech. Bull. No. 100. Wisconsin Department of Natural Resources, 1977.

¹⁸ Using a Biotic Index to Evaluate Water Quality in Streams. W.L. Hilsenhoff, Tech. Bull. No. 132. Wisconsin Department of Natural Resources, 1982.

¹⁹ "An improved biotic index of organic stream pollution". W.L. Hilsenhoff, *The Great Lakes Entomologist* 20, no. 1 (1987):31-39.

assigned pollution tolerance values from 0 to 10 depending on their known susceptibility to pollution, with 0 the least tolerant to disturbance. The lower the MBI, the higher the presumed water quality. These technique and tolerance values have been adapted for use in Illinois.

The MBI calculated for Willow-Higgins Creek was 6.4, which is representative of streams having intermediate degrees of pollution or disturbance. A total of nine taxa were collected, chiefly from the *Turbellaria* and *Crustacea* groups.²⁰ **Table N-4** presents results of the IEPA's 1983-1984 macroinvertebrate sampling.

**TABLE N-4
MACROINVERTEBRATES COLLECTED BY THE ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY DURING THE DES PLAINES RIVER INTENSIVE SURVEY
1983-1984 WILLOW-HIGGINS CREEK**

Species	Number of Organisms
<i>Amphopoda Hyalella azteca</i>	1
<i>Coleptera Stenelmis vittipennis</i>	1
<i>Crustacea Isopoda Caecidotea intermedia</i>	18
<i>Diptera Chironomidae</i>	1
<i>Polypedilum illinoense Procladius sp.</i>	14
<i>Mollusca Ancyliidae Physa sp.</i>	3
<i>Odonata Anisoptera Sympetrum sp.</i>	1
<i>Oligochaeta Tubifex tubifex</i>	2
<i>Turbellaria</i>	69
Total number of organisms	110
Total number of taxa	9
Macroinvertebrate Biotic Index	6.4

Source: An Intensive Survey of the Des Plaines River Basin from the Wisconsin State Line to Joliet, Illinois 1983-1984, Illinois Environmental Protection Agency, IEPA/WPC 88-014, 1988.

Macroinvertebrate evaluations also took place as part of a 1995 study conducted at the Airport (**Table N-1**). During the same study, Willow-Higgins Creek was sampled for fish in the spring of 1995, approximately 0.5 miles below the confluence of Willow and Higgins Creeks and on Higgins Creek at a location one-quarter mile above the confluence. Fathead minnows and white suckers were the most abundant fish found below the confluence, while bluntnose minnows and white suckers were the only fish found upstream of the confluence. These species, and the others collected, are considered tolerant of a wide range of environmental conditions. During a similar survey in 2002, streambanks had been stabilized and the substrate was sand and gravel with aquatic vegetation. Common shiner and johnny darter, fishes of intermediate tolerance, were collected in addition to tolerant species. A summary of fish sampling results from Higgins and Willow-Higgins Creeks is presented in **Table N-2**.

²⁰ An Intensive Survey of the Des Plaines River Basin from the Wisconsin State Line to Joliet, Illinois 1983-1984, Illinois Environmental Protection Agency, IEPA/WPC 88-014, 1988.

Bensenville Ditch: Bensenville Ditch is the headwaters for Silver Creek. This stream has been significantly altered along its course through the Airport properties. It is highly channelized and often displays eroded sideslopes. Its principal function is transporting urban stormwater runoff.

The low gradient and silt substrates of the Ditch are not conducive to the maintenance of a high quality benthic community. Water quality conditions and other habitat factors limit the potential of this stream to support a viable fish population. Fish populations present are likely to be represented by common, pollution-tolerant species.

In the 1995 sampling program, no fish were obtained from Bensenville Ditch sampling points. Macroinvertebrate sampling revealed communities typical of low quality aquatic habitats, with most of the species tolerant of degraded conditions (see **Table N-1**). In the 2002 sampling program, *Elodea* covered most of the bottom and supported *turbellaria* in addition to tolerant benthos.

Crystal Creek: This watercourse consists of a straightened drainage ditch that flows from the South Detention Basin. No historical information is available regarding macroinvertebrates. Fish sampling in 1995 yielded no specimens, and examination of the watercourse revealed shallow depths and a substrate covered with organic debris and filamentous blue-green algae.

Benthic sampling yielded 34 individuals collected over a 100-meter stream section. Damselfly nymphs were the most abundant organism collected, followed by snails. These species are tolerant of a wide range of environmental conditions. This, along with the lack of other aquatic species, indicates poor aquatic environmental conditions. Sampling during 2002 was limited by no discharge from the detention basin. Tolerant forms were collected from a small pool just above Mannheim Road.

South Detention Basin: South Detention Basin is an artificial structure constructed and managed for the specific purposes of stormwater storage and water quality management. Accordingly, its value as a biotic resource is minimal. This detention basin receives large volumes of runoff from runways, taxiways, and other Airport facilities. The South Detention Basin is normally dry and is deliberately drained to maintain low levels between storm events in order to maximize its stormwater storage capacity, and to limit the basin's attractiveness to waterfowl. The bottom of South Detention Basin does not contain water during non-storm periods; it is inundated only during and following runoff events.

As shown on **Table N-1**, the unsuitable biological conditions of the South Detention Basin were documented through biological sampling conducted in April 1995.²¹ No fish were obtained using either electroshocking or seining techniques. Sampling for benthic invertebrates in standing water pools and connecting channels in the bottom of South Detention Basin produced only two biting midge larvae. No other macroinvertebrates were collected, although some small snail shells (*Helisoma* and *Physa*) were located along the margin of the pool. In October 2002, only three fish were collected, and benthos was sparse.

²¹ Evaluation of Aquatic Habitat, Chicago O'Hare International Airport, R.B. Anderson, Western Illinois University, 1995.

Summary and Conclusions

Based on USEPA Rapid Bioassessment methods, the overall macroinvertebrate and fish community at the sites sampled at the Airport appeared typical of low quality aquatic habitats in northeastern Illinois. No unusual or extraordinary species of fish or macroinvertebrates were found during the survey and most of the species found are tolerant and may be present in degraded habitats. Although less tolerant fish and benthos collected in 2002 indicated improvement in habitat quality, most of the organisms were still tolerant forms. No endangered species of fish or invertebrates were collected during this survey.

N.1.4 Botanical Resources

The extant vegetation communities on Airport properties are represented by several distinct community types, most of which do not represent native conditions (see **Exhibit 5.10-1 in Section 5.10, Biotic Communities**).

Impervious surfaces and mowed lawn dominate the majority of the AOA. Lawn areas are periodically mowed to deter wildlife usage and to deter high vegetation growth that would interfere with Airport operations and airfield safety.

The least "managed" vegetation community within the secured airfield is found in the west side of the Airport. This area occupies approximately 300 acres and contains several different plant communities.

The west side of the Airport contains both nursery grown woody species left over from a previous nursery operation and natural woody vegetation. Most of the overstory trees are represented by cottonwood (*Populus deltoides*), green ash (*Fraxinus pennsylvanica subintegerrima*), box elder (*Acer negundo*), silver maple (*A. saccharinum*), and American elm (*Ulmus americana*). Large planted crack willows (*Salix fragilis*) occur within several of the delineated wetlands.

Past studies at the Airport revealed a patch of early fen sedge (*Carex crawei*). At the time of discovery in 1994, the fen sedge was a state threatened species. Since that time the early fen sedge has been removed from the state threatened and endangered list and is no longer considered threatened or endangered. In addition, in 1998 a portion of the fen sedge community on Airport property was voluntarily relocated, to the Chicago Botanic Gardens.

Some areas of the west side of the Airport have been disturbed to include soil stockpiles and a noise berm. Several large soil and construction debris stockpiles and noise abatement berms have been placed in the area. The vegetation on the stockpiles is generally seeded grass species to prevent soil erosion. There are also invasive alien species established in similar patches. None of the plant species identified are threatened or endangered.

N.1.4.1 Quality of Upland Plant Communities

Several old fields/meadows occur between the scrub woodlands and wetlands on the west side of the Airport properties. These fields are relatively uniform in nature and contain common vegetation. The matrix varies slightly from field to field, but it usually contains species such as Kentucky bluegrass (*Poa pratensis*), Hungarian brome (*Bromus inermis*), fescues (*Festuca sp.*),

Queen Anne's lace (*Daucus carota*), and sweet clovers (*Melilotus sp.*). Some native goldenrods (*Solidago altissima*, *S. rigida*, *S. graminifolia*), scattered prairie dock (*Silphium terebithenaceum*), and wild bergamot (*Monarda fistulosa*) occur but they generally do not form a significant portion of the community. The fields that are not mowed are becoming overgrown with woody vegetation, including gray dogwood (*Cornus racemosa*), common buckthorn (*Rhamnus cathartica*), honeysuckle (*Lonicera sp.*), and tree saplings. There are old fields in several other locations outside the secured airfield.

These unmowed, non-wooded areas represent fallow agricultural land or old pasture. An exception can be found in two small areas east of Mannheim Road, which contain a higher proportion of native prairie species. The first area bounded by Interstate 294, Mannheim Road, and Irving Park Road contains an assemblage of native upland prairie species such as big bluestem (*Andropogon gerardi*), switch grass (*Panicum virgatum*), rattlesnake master (*Eryngium yuccifolium*), prairie blazing star (*Liatris pycnostachya*), and rigid goldenrod (*Solidago rigida*), among others. This area was probably grazed by livestock in the past, but soil disturbance has been minimal. Native species diversity is not substantial, but this area does contain the highest concentration of upland prairie species observed within the Airport properties. One other small area dominated by upland prairie species occurs in the area south of the Joint Action Water Agency's (JAWA) storage reservoirs. A large stand of prairie blazing star and prairie dock dominate here. Combined, these two areas total less than one acre.

N.1.4.2 Quality of Wetland Plant Communities

The overall vegetative diversity of the wetlands is low because of historic and ongoing disturbances, invasion by non-native species, and shade from the development of an overstory of trees. **Table N-5** provides a tabular listing of the grasses, forbs, shrubs, and trees encountered in the wetlands during the 2000 Delineation.

Four general wetland community types occur on Airport properties, including Palustrine Emergent, Palustrine Forested, Palustrine Scrub-shrub and Palustrine Open Water. Wetland characteristics vary according to their landscape position, major water sources, and other factors. Willow-Higgins Creek and the upper portions of Bensenville Ditch contain some riverine plant types, but they have been delineated as Waters of the United States due to the relative lack of hydrophytic vegetation. The South Detention Basin, which is an artificial basin, has not been assigned a cover type, since it usually lacks predictable vegetation cover and does not function as a wetland nor is it considered non-wetland Waters of the United States (WUS) by the USACE.

**TABLE N-5
PLANT SPECIES IDENTIFIED IN WETLANDS DURING 2000 CHICAGO
O'HARE INTERNATIONAL AIRPORT WETLAND DELINEATION**

Common Name	Scientific Name
Velvetleaf	<i>Abutilon theophrasti</i>
Yarrow	<i>Achillea millefolium</i>
Quack grass	<i>Agropyron repens</i>
Redtop	<i>Agrostis alba</i>
Rayless aster	<i>Aster brachyactis</i>
Common orach	<i>Atriplex patula</i>
Three-seeded mercury	<i>Acalypha rhomboidea</i>
Box elder	<i>Acer negundo</i>
Silver maple	<i>Acer Saccharinum</i>
Sweet flag	<i>Acorus calamus</i>
Tall agrimony	<i>Agrimonia gryposepala</i>
Creeping bent	<i>Agrostis alba palustris</i>
Common water plantain	<i>Alisma subcordatum</i>
Common ragweed	<i>Ambrosia artemisiifolia elatior</i>
Giant ragweed	<i>Ambrosia trifida</i>
Big bluestem grass	<i>Andropogon gerardii</i>
Indian hemp	<i>Apocynum cannabinum</i>
Indian hemp	<i>Apocynum sibiricum</i>
Swamp milkweed	<i>Asclepias incarnata</i>
Common milkweed	<i>Asclepias syriaca</i>
Whorled milkweed	<i>Asclepias verticillata</i>
Heath aster	<i>Aster ericoides</i>
New England aster	<i>Aster novae-angliae</i>
Hairy aster	<i>Aster pilosus</i>
Panicled aster	<i>Aster simplex</i>
Yellow rocket	<i>Barbarea vulgaris</i>
Hungarian brome	<i>Bromus inermis</i>
Nodding bur marigold	<i>Bidens cernua</i>
Swamp tickseed	<i>Bidens comosa</i>
Purple-stemmed tickseed	<i>Bidens connata</i>
Common beggar's ticks	<i>Bidens frondosa</i>
Bur marigold	<i>Bidens polylepis</i>
Tall begger's ticks	<i>Bidens vulgata</i>
False aster	<i>Boltonia latisquama recongnita</i>
Side-oats grama	<i>Bouteloua curtipendula</i>
Musk thistle	<i>Carduus nutans</i>
Hardy catalpa	<i>Catalpa speciosa</i>
Lamb's quarter	<i>Chenopodium album</i>
Oak-leaved goosefoot	<i>Chenopodium glaucum</i>
Ox-eyed daisy	<i>Chrysanthemum leucanthemum pinnatifidum</i>
Chicory	<i>Cichorium intybus</i>
Field thistle	<i>Cirsium arvens</i>
Bull thistle	<i>Cirsium vulgare</i>
Field bindweed	<i>Convolvulus arvensis</i>
Blue joint grass	<i>Calamargotis canadensis</i>
False fox sedge	<i>Carex annectens</i>
Wet sedge	<i>Carex aquatilis altior</i>

TABLE N-5 (CONTINUED)
PLANT SPECIES IDENTIFIED IN WETLANDS DURING 2000
CHICAGO O'HARE INTERNATIONAL AIRPORT WETLAND DELINEATION

Common Name	Scientific Name
Field sedge	<i>Carex brevior</i>
Dark-scaled fen sedge	<i>Carex buxbaumii</i>
Early fen sedge	<i>Carex crawei</i>
Crested sedge	<i>Carex cristatella</i>
Fescue sedge	<i>Carex festucacea</i>
Frank's sedge	<i>Carex frankii</i>
Pale field sedge	<i>Carex granularis</i>
Lake sedge	<i>Carex lacustris</i>
Woolly sedge	<i>Carex lanuginosa</i>
Soft sedge	<i>Carex stipata</i>
Meadow sedge	<i>Carex stricta</i>
Pointed fen sedge	<i>Carex suberecta</i>
Running prairie sedge	<i>Carex tetanica</i>
Tufted marsh sedge	<i>Carex tribuloides</i>
Hairy-fruited sedge	<i>Carex trichocarpa</i>
Fox sedge	<i>Carex vulpinoidea</i>
Water hemlock	<i>Cicuta maculata</i>
Common wood reed	<i>Cinna arundinacea</i>
Hedge bindweed	<i>Convolvulus sepium</i>
Pale dogwood	<i>Cornus obliqua</i>
Gray dogwood	<i>Cornus racemosa</i>
Red-osier dogwood	<i>Cornus stolonifera</i>
Downy hawthorn	<i>Crataegus mollis</i>
Common dodder	<i>Cuscuta gronovii</i>
Knotweed dodder	<i>Cuscuta polygonorum</i>
Red-rooted sedge	<i>Cyperus erythrorhizos</i>
Chufa	<i>Cyperus esculentus</i>
Common shoreline	<i>Cyper strigosus</i>
Wild carrot	<i>Daucus carota</i>
Cut-leaved teasel	<i>Dipsacus laciniatus</i>
Common teasel	<i>Dipsacus sylvestris</i>
Russian olive	<i>Elaeagnus angustifolia</i>
Barnyard grass	<i>Echinochloa crusgalli</i>
Needle spike rush	<i>Eleocharis acicularis</i>
Red-footed spike rush	<i>Eleocharis calva</i>
Flat-stemmed spike rush	<i>Eleocharis compressa</i>
Blunt spike rush	<i>Eleocharis obtusa</i>
Creeping spike rush	<i>Eleocharis palustris major</i>
Common marsh spike rush	<i>Eleocharis smallii</i>
Canada wild rye	<i>Elymus canadensis</i>
Virginia wild rye	<i>Elymus virginicus</i>
Cinnamon willow herb	<i>Epilobium coloratum</i>
Horsetail	<i>Equisetum arvense</i>
Firewood	<i>Erechtites hieracifolia</i>
Annual fleabane	<i>Erigeron annuus</i>
Horseweed	<i>Erigeron canadensis</i>
Marsh fleabane	<i>Erigeron philadelphicus</i>

TABLE N-5 (CONTINUED)
PLANT SPECIES IDENTIFIED IN WETLANDS DURING 2000
CHICAGO O'HARE INTERNATIONAL AIRPORT WETLAND DELINEATION

Common Name	Scientific Name
Tall boneset	<i>Eupatorium altissimum</i>
Common boneset	<i>Eupatorium perfoliatum</i>
Late boneset	<i>Eupatorium serotinum</i>
Meadow fescue	<i>Festuca elatior</i>
Wild strawberry	<i>Fragaria virginiana</i>
Green ash	<i>Fraxinus pennsylvanica subintegerrima</i>
Ground ivy	<i>Glechoma hederacea</i>
White avens	<i>Geum canadense</i>
Rough avens	<i>Geum laciniatum trichocarpum</i>
Honey locust	<i>Gleditsia triacanthos</i>
Fowl manna grass	<i>Glyceria striata</i>
Garden sunflower	<i>Helianthus annuus</i>
Orange day lily	<i>Hemerocallis fulva</i>
Flower-of-an-hour	<i>Hibiscus trionum</i>
Squirrel-tail grass	<i>Hordeum jubatum</i>
Sneezeweed	<i>Helenium autumnale</i>
Sawtooth sunflower	<i>Helianthus grosseserratus</i>
Orange jewel weed	<i>Inpatiens capernsis</i>
Blue flag	<i>Iris virginica shrevei</i>
Dudley's rush	<i>Juncus dudleyi</i>
Joint rush	<i>Juncus nodosus</i>
Torrey's rush	<i>Juncus torreyi</i>
Burning bush	<i>Kochia scoparia</i>
Salt-meadow grass	<i>Leptochloa fascicularis</i>
Perennial rye grass	<i>Lolium perenne</i>
Amur honeysuckle	<i>Lonicera maackii</i>
Tartarian honeysuckle	<i>Lonicera tatarica</i>
Moneywort	<i>Lysimachia nummularia</i>
Purple loosestrife	<i>Lythrum salicaria</i>
Wild lettuce	<i>Lactuca canadensis</i>
Rice cut grass	<i>Leersia oryzoides</i>
Small duckweed	<i>Lemna minor</i>
Prairie blazing star	<i>Liatris pycnostachya</i>
False loosestrife	<i>Ludwigia polycarpa</i>
Common waterhorehound	<i>Lycopus americanus</i>
Winged loosestrife	<i>Lythrum alatum</i>
Black medick	<i>Medicago lupulina</i>
White sweet clover	<i>Melilotus alba</i>
Yellow sweet clover	<i>Melilotus officinalis</i>
White mulberry	<i>Morus alba</i>
Wild mint	<i>Mentha arvensis villosa</i>
Monkey flower	<i>Mimulus ringens</i>
Catnip	<i>Nepeta cataria</i>
Common evening primrose	<i>Oenothera biennis</i>
Common wood sorrel	<i>Oxalis stricta</i>
Wild parsnip	<i>Pastinaca sativa</i>
Timothy	<i>Phleum pratense</i>
English plantain	<i>Plantago lanceolata</i>
Common plantain	<i>Plantago major</i>

TABLE N-5 (CONTINUED)
PLANT SPECIES IDENTIFIED IN WETLANDS DURING 2000
CHICAGO O'HARE INTERNATIONAL AIRPORT WETLAND DELINEATION

Common Name	Scientific Name
Canada blue grass	<i>Poa Compressa</i>
Kentucky blue grass	<i>Poa pratensis</i>
Common knotweed	<i>Polygonum aviculare</i>
Lady's thumb	<i>Polygonum persicaria</i>
White poplar	<i>Populus alba</i>
Old witch grass	<i>Panicum capillare</i>
Knee grass	<i>Panicum dichotomiflorum</i>
Common wooly panic grass	<i>Panicum implicatum</i>
Switch grass	<i>Panicum virgatum</i>
Thicket creeper	<i>Parthenocissus inserta</i>
Virginia creeper	<i>Parthenocissus quinquefolia</i>
Ditch stoncrop	<i>Penthorum sedoides</i>
Reed canary grass	<i>Phalaris arundinacea</i>
Common reed	<i>Phragmites communis berlandieri</i>
False dragonhead	<i>Physostegia virginiana</i>
Clearweed	<i>Pilea pumila</i>
Red-stalked plantain	<i>Plantago rugelii</i>
Water knotweed	<i>Polygonum amphibium stipulaceum</i>
Water heartsease	<i>Polygonum cocineum</i>
Heartsease	<i>Polygonum lapathifolium</i>
Pennsylvania knotweed	<i>Polygonum pennsylvanicum laevigatum</i>
Smartweed	<i>Polygonum punctatum</i>
Bushy knotweed	<i>Polygonum ramosissimum</i>
Cottonwood poplar	<i>Populus deltoides</i>
Quaking aspen	<i>Populus tremloides</i>
Norway cinquefoil	<i>Potentilla norvegica</i>
Common cinquefoil	<i>Potentilla simplex</i>
Self heal	<i>Prunella vulgaris lanceolata</i>
Choke cherry	<i>Prunus virginiana</i>
Common mountain mint	<i>Pycnanthemum virginianum</i>
Common buckthorn	<i>Rhamnus cathartica</i>
Glossy buckthorn	<i>Rhamnus frangula</i>
Multiflora rose	<i>Rosa multiflora</i>
Curly dock	<i>Rumex crispus</i>
Bristly buttercup	<i>Ranunculus pensylvanicus</i>
Cursed buttercup	<i>Ranunculus sceleratus</i>
Yellow coneflower	<i>Ratibida pinnata</i>
Poison ivy	<i>Rhus radicans</i>
Wild black currant	<i>Ribes americanum</i>
Marsh cress	<i>Rorippa islandica fernaldiana</i>
Illinois rose	<i>Rosa setigera</i>
Black raspberry	<i>Rubus occidentalis</i>
Black-eyed susan	<i>Rudbeckia hirta</i>
Pale dock	<i>Rumex altissimus</i>
Great water dock	<i>Rumex orbiculatus</i>
White willow	<i>Salix alba</i>
Crack willow	<i>Salix fragilis</i>
Giant foxtail	<i>Setaria faberii</i>
Yellow foxtail	<i>Setaria glauca</i>

TABLE N-5 (CONTINUED)
PLANT SPECIES IDENTIFIED IN WETLANDS DURING 2000
CHICAGO O'HARE INTERNATIONAL AIRPORT WETLAND DELINEATION

Common Name	Scientific Name
Green foxtail	<i>Setaria viridis</i>
Hedge mustard	<i>Sisymbrium officinale</i>
Horse nettle	<i>Solanum carolinense</i>
Bittersweet nightshade	<i>Solanum dulcamara</i>
Seaside goldenrod	<i>Solidago sempervirens</i>
Field sow thistle	<i>Sonchus arvensis</i>
Spiny sow thistle	<i>Sonchus asper</i>
Common sow thistle	<i>Sonchus uliginosus</i>
Salt spurrey	<i>Spergularia maedia</i>
Common arrowhead	<i>Sagittaria latifolia</i>
Peach-leaved willow	<i>Salix amygdaloides</i>
Sandbar willow	<i>Salix interior</i>
Black willow	<i>Salix nigra</i>
Heart-leaved willow	<i>Salix rigida</i>
Elderberry	<i>Sambucus canadensis</i>
Hard-stemmed bulrush	<i>Scirpus acutus</i>
Chairmaker's rush	<i>Scirpus americanus</i>
Dark green rush	<i>Scirpus atrovirens</i>
Wool grass	<i>Scirpus cyperinus</i>
River bulrush	<i>Scirpus fluviatilis</i>
Red bulrush	<i>Scirpus lineatus</i>
Great bulrush	<i>Scirpus validus creber</i>
Mad-dog skullcap	<i>Scutellaria lateriflora</i>
Compass plant	<i>Silphium lacinatedum</i>
Prairie dock	<i>Silphium terebinthinaceum</i>
Water parsnip	<i>Sium suave</i>
Tall goldenrod	<i>Solidago altissima</i>
Late goldenrod	<i>Solidago gigantea</i>
Grass-leaved goldenrod	<i>Solidago graminifolia media</i>
Grass-leaved goldenrod	<i>Solidago graminifolia nuttallii</i>
Riddell's goldenrod	<i>Solidago riddellii</i>
Stiff goldenrod	<i>Solidago rigida</i>
Common burr reed	<i>Sparganium eurycarpum</i>
Prairie cord grass	<i>Spartina pectinata</i>
Common dandelion	<i>Taraxacum officinale</i>
Red clover	<i>Trifolium pratense</i>
White clover	<i>Trifolium repens</i>
Narrow-leaved cat-tail	<i>Typha angustifolia</i>
Wood sedge	<i>Teucrium canadense</i>
Early meadow rue	<i>Thalictrum dioicum</i>
Broad-leaved cat-tail	<i>Typha latifolia</i>
Siberian elm	<i>Ulmus pumila</i>
American elm	<i>Ulmus americana</i>
Slippery elm	<i>Ulmus rubra</i>
Tall nettle	<i>Urtica procera</i>
Common mullein	<i>Verbascum thapsus</i>
Bird's eye	<i>Veronica persica</i>
European highbush cranberry	<i>Viburnum opulus</i>
Blue vervain	<i>Verbena hastata</i>

**TABLE N-5 (CONTINUED)
PLANT SPECIES IDENTIFIED IN WETLANDS DURING 2000
CHICAGO O'HARE INTERNATIONAL AIRPORT WETLAND DELINEATION**

Common Name	Scientific Name
Hoary vervain	<i>Verbena stricta</i>
White vervain	<i>Verbena urticifolia</i>
Common ironweed	<i>Veronia fasciculata</i>
Pursland speedwell	<i>Veronica peregrina</i>
Nannyberry	<i>Viburnum lentago</i>
Common blue violet	<i>Viola papilionacea</i>
Riverbank grape	<i>Vitis riparia</i>
Cocklebur	<i>Xanthium strumarium</i>
Golden alexanders	<i>Zizia aurea</i>

Source: Chicago O'Hare International Airport, Delineation of Wetland and Floodplains Areas, Harza Environmental Services, February 2000.

Several of the wetlands support native vegetation. Wetland NW28 (see **Chapter 4, Affected Environment, Exhibit 4.4-2 and 4.4-3**) has a NARI of 27, the highest rating of all of the Airport wetlands. Although past development activities have disturbed this wetland, it still contains many native species. The central area of the wetland contains an excavated ditch, which appears to pond two and a half to three feet of water in the spring. This area is wooded, containing silver maple, crack willow, green ash, and American elm. Ditch stoneweed (*Penthorum sedoides*) occurs in the seasonally flooded areas. Another area contains a stand of sandbar willow, with lake sedge (*Carex lacustris*), water parsnip (*Sium suave*), and cut-leaved waterhorehound (*Lycopus americanus*). The soils are relatively undisturbed in the central areas and exhibit characteristics of organic material accumulation. The non-wooded outer fringes are old-field areas that have been colonized by hydrophytic vegetation. New England aster (*Aster novae-angliae*), grass-leaved goldenrod (*Solidago graminifolia*), and sneezeweed (*Helenium autumnale*) occur along the northern, wet prairie fringe.

No fens or remnant sedge meadows were encountered during the fieldwork. Several wetlands contain pockets of native wetland species, but substantial native communities are limited. The wooded portions of wetland SW15 have understory species, such as clearweed (*Pilea pumula*), rice cut grass (*Leersia oryzoides*), wood reed (*Cinna arundinacea*), cut-leaved waterhorehound, and oval crested sedge (*Carex cristatella*). Wetland SW106 contains stands of bulrushes (*Scirpus acutus* and *S. validus creber*). Wetlands SE61 and SE63 contain stands of blue joint grass (*Calamagrostis canadensis*). Wetland SE72 has a small wet prairie fringe that contains hard-stemmed bulrush, winged loosestrife (*Lythrum alatum*), prairie cord grass (*Spartina pectinata*), and ironweed (*Vernonia fasciculata*). However, these stands of native plants in the various wetlands represent only a small portion of the overall flora of the wetland areas.

N.1.5 Wildlife Resources

The Airport properties are almost entirely urbanized. The existing undeveloped lands around the Airport have been reduced to small, isolated habitat patches, the majority of which are partially landscaped and do not resemble the original condition of the area. These disturbances limit its quality for habitat-sensitive species, especially those species that require large areas of

habitat for nesting. The habitat patches consist largely of poor quality woodlands, meadows, and degraded streams, which provide limited urban wildlife habitat and attraction for an array of wildlife species for both nesting and migratory stopover areas. Furthermore, the USDA instituted a quarantine for the remaining woody trees due to the sighting of the Asian Longhorned Beetle in the area. The O'Hare Airport infestation was found on November 28, 2000. The infestation is adjacent to an incinerator operated by the City of Chicago Bureau of Forestry, and likely started from infected tree debris brought to the site from off-Airport properties. During December 2000, 23 infested trees were removed, with an additional 220 surrounding host trees removed as a precautionary measure. The quarantine was established in September 2001 and is about nine square miles. The USDA maintains a website regarding the Airport infestation, from which this information was obtained.²² The quarantine boundaries are:

The area in DuPage and Cook Counties bounded on the west from the intersection of Supreme Drive and Thomas Drive in the Village of Bensenville, south on Thomas Drive to its end, then on a line southwest to Church Road, continuing south on Church Road to Jefferson Street; bounded on the south from the intersection of Jefferson Street and Church Road, east on Church Road to the Cook and DuPage County Line, continuing east on a line through the Chicago, Milwaukee, St. Paul and Pacific Railroad Yards to the intersection of Waveland Avenue and Centrella Street in the Village of Franklin Park, continuing east on Waveland Avenue to Mannheim Road in the Village of Franklin Park; on the east from the intersection of Waveland Avenue and Mannheim Road in the Village of Franklin Park, north on Mannheim Road to Interstate 190, west along Interstate 190 to Bessie Coleman Drive, continuing north on Bessie Coleman Drive to a point in line with Runway 27 Right of O'Hare International Airport; on the north from a point on Bessie Coleman Drive in line with Runway 27 Right, west following Runway 27 Right on the grounds of O'Hare International Airport to its end, continuing west on a line parallel with the runway past the Cook and DuPage County line until the line intersects York Road, north on York Road to Supreme Drive, west on Supreme Drive to Thomas Drive in the Village of Bensenville.²³

Wildlife species that are known to breed in the Airport area are mostly common, highly adaptive species that survive reasonably well in an urban environment and are managed to reduce aircraft/wildlife conflicts. The creeks, wooded areas, wetlands, and open spaces at the Airport attract wildlife such as deer, coyotes, raccoons, rodents, raptors, and resident waterfowl. Deer have been removed from the AOA and are only found outside of the security fence. Basic habitat elements (food, water, and shelter) are available in sufficient quantities to support wildlife populations. The Airport properties are also located within a major flyway and several bird species use the Airport properties as a resting area during migration.

²² The USDA website can be viewed at: www.na.fs.fed.us/spfo/alb/maps/Chicago/ohare.htm

²³ The USDA website can be viewed at: www.na.fs.fed.us/spfo/alb/maps/Chicago/ohare.htm

N.1.5.1 Control of Wildlife Hazards

In 1992-1993, the *O'Hare International Airport Biological Assessment*²⁴ was completed by the USDA in coordination with the Animal Damage Control (ADC) program.²⁵ The biological assessment was a detailed study of wildlife at the Airport and evaluation of factors contributing to wildlife hazards. The Airport is attractive to wildlife because it provides basic habitat elements such as food, water, and shelter, but wildlife can interfere with Airport and aircraft operations, and may cause safety hazards. Man-made conditions that contribute to wildlife-related concerns include:

- Mowed grassy areas that provide feeding areas for ducks, geese, and raptors
- Wildlife feeding by employees and the general public
- Structures used for nesting
- Runways and lights which serve to warm wildlife during cold weather

After completing the biological assessment and evaluating wildlife hazards, the USDA prepared a *Wildlife Hazard Management Plan (WHMP)* for O'Hare in order to determine those wildlife species present on the airport property and the hazards posed to aircraft safety.²⁶ The City has since updated the WHMP in July 2002,²⁷ which is included as **Attachment N-5** to this appendix. The WHMP addresses both wildlife-related problems associated with the AOA and available control alternatives to resolve these impacts and problems. The implementation of these control alternatives is the ultimate responsibility of the City of Chicago as the managing authority over the airport properties. The AOA includes the physical grounds of the airport within the perimeter fence and the airspace utilized by aircraft during take-offs and landings.

The WHMP concluded that the Airport should prevent potential wildlife threats to aircraft by deterring the reproduction of wildlife and limiting the number and location of attractive habitats. Because awareness of wildlife hazards and strikes is important to accurately assess the problems and species responsible, the USDA maintains staff at the Airport specifically for identifying potential wildlife hazards.

The majority of wildlife hazards at the Airport involve bird strikes (others include raccoons, squirrels, foxes, and other small mammals), but only a very small percentage of the operations at the Airport were involved in bird strikes. Through calendar year 2000-2001, there were 322 avian bird strikes of approximately 30 different species (species identification is often not possible) reported by the USDA.²⁸ See **Attachment N-1** for a history of wildlife strike data at the

²⁴ Biological Assessment, Environmental Assessment for Management of Hazards to Public Safety and Aircraft Caused by Wildlife at O'Hare International Airport, and Wildlife Hazard Management Plan for O'Hare International Airport, U.S. Department of Agriculture, 1993.

²⁵ Animal Damage Control Act of March 2, 1931, 7 U.S.C. §426; Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988, Public Law 100-202, Wildlife Hazard Management Plan, Chicago-O'Hare International Airport, 1992.

²⁶ Environmental Assessment for the Management of Hazards to Public Safety and Aircraft Caused by Wildlife at O'Hare International Airport, United States Department of Agriculture, 1993.

²⁷ Wildlife Hazard Management Plan, U.S. Department of Agriculture, Animal and Plant Health Inspection Service Wildlife Services, July 26, 2002 (included as **Attachment N-5**).

²⁸ Bird Strike Documentation at O'Hare International Airport, D. Arends, U.S. Department of Agriculture Animal and Plant Health Inspection Services, O'Hare International Airport, data received by email January 6, 2003.

Airport). Based on operational data from the Airport, this is an average of one bird strike for every 4,098 aircraft operations. A majority of these bird strikes caused no damage to aircraft, but the occasional damage to commercial aircraft included wing dents, random penetrations, fuselage dents, and engine ingestions. Ingestions either required fan blade replacement or total replacement of the engine.

The WHMP includes several wildlife abatement techniques to discourage wildlife attraction. Control methods used by the airport for bird and mammal populations are shown in Table N-6.

**TABLE N-6
CONTROL METHODS USED BY THE AIRPORT FOR BIRD AND MAMMAL
POPULATIONS AT O'HARE**

Species	Habitat Modification	Aversive Tactic	Population Management
BIRDS			
Gulls and Terns <ul style="list-style-type: none"> • Ring-billed Gull • Herring Gull • Bonaparte's Gull • Caspian Tern 	<ul style="list-style-type: none"> • Physical barriers • Habitat management 	<ul style="list-style-type: none"> • Non-chemical: Electronic distress sounds Gas exploders Pyrotechnics Effigies/scarecrows • Chemical: Repellents 	<ul style="list-style-type: none"> • Lethal: Non-chemical: Shooting Egg-shaking/addling/nest destruction • Chemical: Avitrol
Raptors <ul style="list-style-type: none"> • Hawks • Falcons • Owls 	<ul style="list-style-type: none"> • Habitat Management 	<ul style="list-style-type: none"> • Non-chemical: Gas exploders Pyrotechnics Effigies/scarecrows Lights Water spray devices 	<ul style="list-style-type: none"> • Non-lethal: Non-chemical: Pole traps • Lethal: Non-chemical: Pole traps Shooting Nest destruction
Blackbirds <ul style="list-style-type: none"> • European Starling • Red-winged Blackbird • Common Grackle • Brown-headed Cowbird • American Crow 	<ul style="list-style-type: none"> • Physical barriers • Habitat management 	<ul style="list-style-type: none"> • Non-chemical: Electronic distress sounds Gas exploders Pyrotechnics Effigies/scarecrows Lights Water spray devices 	<ul style="list-style-type: none"> • Lethal: Non-chemical: Trapping Shooting Nest destruction • Chemical: Avitrol
Waterfowl <ul style="list-style-type: none"> • Canada Goose • Mallard • Other Migratory Waterfowl 	<ul style="list-style-type: none"> • Physical barriers • Habitat management 	<ul style="list-style-type: none"> • Non-chemical: Electronic distress sounds Gas exploders Pyrotechnics Effigies/scarecrows • Chemical: Repellents 	<ul style="list-style-type: none"> • Lethal: Non-chemical: Shooting Egg-shaking/addling/nest destruction
Non-regulated <ul style="list-style-type: none"> • Pigeons • English Sparrows 	<ul style="list-style-type: none"> • Physical barriers • Habitat management 	<ul style="list-style-type: none"> • Non-chemical: Electronic distress sounds Gas exploders Pyrotechnics Effigies/scarecrows Water spray devices • Chemical: Repellents 	<ul style="list-style-type: none"> • Lethal: Non-chemical: Trapping Shooting Nest destruction • Chemical: Avitrol DRC-1339

**TABLE N-6 (CONTINUED)
CONTROL METHODS USED BY THE AIRPORT FOR BIRD AND MAMMAL
POPULATIONS**

Species	Habitat Modification	Aversive Tactic	Population Management
MAMMALS			
Ungulates <ul style="list-style-type: none"> White-tailed deer 	<ul style="list-style-type: none"> Physical barriers Habitat management 	<ul style="list-style-type: none"> Non-chemical: Electronic distress sounds Gas exploders and pyrotechnics Effigies/scarecrows 	<ul style="list-style-type: none"> Lethal: Non-chemical: Shooting
Predators <ul style="list-style-type: none"> Coyote Red Fox 	<ul style="list-style-type: none"> Physical barriers Habitat management 	<ul style="list-style-type: none"> Non-chemical: Gas exploders Pyrotechnics 	<ul style="list-style-type: none"> Lethal: Non-chemical: Leghold traps Snares Shooting Chemical: Toxicants
Rodents <ul style="list-style-type: none"> Voles Deer Mice House Mice Norway Rats Ground Squirrels Woodchucks 	<ul style="list-style-type: none"> Physical barriers Habitat management 	None	<ul style="list-style-type: none"> Non-lethal: Cage traps Lethal: Non-chemical: Quick-kill traps Cage traps Chemical: Toxicants
Rodents <ul style="list-style-type: none"> Beavers 	<ul style="list-style-type: none"> Physical barriers Habitat management 	None	<ul style="list-style-type: none"> Non-lethal: Non-chemical: Leghold traps Cage/suitcase traps Snares Lethal: Non-chemical: Leghold traps Quick-kill traps Snares Shooting
Other <ul style="list-style-type: none"> Raccoons Striped Skunks 	<ul style="list-style-type: none"> Physical barriers Habitat management 	None	<ul style="list-style-type: none"> Non-lethal: Non-chemical: Leghold traps Cage/suitcase traps Snares Lethal: Non-chemical: Leghold traps Quick-kill traps Cage traps Snares Shooting

Source: Wildlife Hazard Management Plan, Chicago O'Hare International Airport, USDA, July 2002.

N.1.5.2 Birds

A total of 70 species of birds have been observed using the Airport area on a seasonal or temporary basis. The majority of the nesting species are common, urban species that occupy "edge" habitat. The Airport properties do not contain any large plots of forested wetland or upland that would be capable of supporting area-sensitive birds during the breeding season.

The small, disconnected wetland areas that occur on the Airport properties provide little in the way of nesting habitat, except for the most common waterfowl and other wetland dependent species. No large marsh complexes or rare wetland communities were found. Mallard, Canada goose, and red-winged blackbird are the most frequent nesting species. Spotted sandpiper, killdeer, and yellow warbler are also known to nest in these areas. The wetlands at the U.S. Postal Service Mail Processing Facility provide shallow pond/mud flat areas, which are some of the most consistently used waterfowl and shorebird habitat at the Airport, particularly for foraging and resting. Twenty species of shorebirds were documented using this area in 1993 (see **Table N-7** at the end of this section).

The South Detention Basin is managed so as to limit its attractiveness to waterfowl. The sideslopes are very steep and gravelly to prevent a vegetated riparian edge from developing. Low water conditions confine the water to the ditches on the basin bottom and the deep depression near the outlet. Despite the limited habitat value, mallards and killdeer were observed on the basin floor during the field survey work.

Wading bird habitat occurs primarily within the Willow-Higgins Creek and Bensenville Ditch. Great blue heron were observed in these areas during the summer and early fall of 1999. The steep banks and minimal emergent vegetation along these streams limit foraging habitat.

The poor vegetation structure and history of site disturbance severely limits nesting habitat for migratory songbirds. The lack of adjacent habitat outside of the remnant patches limits the quality of the songbird habitat, even for urban birds.²⁹ The habitat at the Airport is not significant for these birds, and a large amount of better quality habitat is located in areas surrounding the Airport.

Unmowed meadows near Higgins Road provide some nesting habitat for grassland species, such as eastern meadowlark and bobolink and foraging habitat for birds of prey. Red-tailed hawk and kestrel are known to nest on the Airport. Both of these species were commonly seen during the field survey work. **Table N-7** summarizes the results of the 1993 Illinois Natural History Survey and 2001 observations at the Airport properties made by Harza Engineering during a wetland and floodplain inspection.

Additionally, most of these birds are listed under the Migratory Bird Treaty Act of 1918 (MBTA). This MBTA, which is administered by the U.S. Fish and Wildlife Service (USFWS), proposed to put an end to the commercial trade in birds and their feathers that, by the early years of the 20th century, had wreaked havoc on the populations of many native bird species.

²⁹ "The Demographic Significance of 'Sink' Populations." R.W. Howe, G.J. Davis, and V. Mosca. *Biological Conservation* 57 (1991):239-255.

**TABLE N-7
AVAILABLE BIRD DATA AND STATUS**

Observed Species	Illinois Natural History	
	Survey(a)	Listed Under the Migratory Bird Treaty Act
American coot	X	X
American crow	X	X
American golden-plover	X	X
American goldfinch	X	X
American kestrel	X	X
American robin	X	X
American wigeon	X	X
Baird's sandpiper	X	X
Barn swallow	X	X
Black-bellied plover	X	X
Black-crowned night-heron(SE)	X	X
Blue jay	X	X
Blue-winged teal	X	X
Brown-headed cowbird	X	X
Canada goose	X	X
Cedar waxwing	X	X
Chimney swift	X	X
Common grackle	X	X
Common yellowthroat	X	X
Downy woodpecker	X	X
Dunlin	X	X
Eastern kingbird	X	X
Eastern meadowlark	X	X
European starling	X	
Great blue heron	X	X
Great egret	X	X
Greater yellowlegs	X	X
Hooded merganser	X	X
Horned lark	X	X
House finch	X	X
House sparrow	X	
House wren	X	X
Indigo bunting	X	X
Killdeer	X	X
Least sandpiper	X	X
Lesser yellowlegs	X	X
Little Blue Heron(SE)		X
Long-billed dowitcher	X	X
Mallard	X	X
Mourning dove	X	X
Northern cardinal	X	X
Northern flicker	X	X
Northern oriole	X	X
Northern pintail	X	X

**TABLE N-7 (CONTINUED)
AVAILABLE BIRD DATA AND STATUS**

Observed Species	Illinois Natural History Survey(a)	Listed Under the Migratory Bird Treaty Act
Pectoral sandpiper	X	X
Pied-billed grebe(ST)	X	X
Purple martin	X	X
Red-eyed vireo	X	X
Red-shoulder hawk(ST)		X
Red-tail hawk	X	X
Red-winged blackbird	X	X
Ring-billed gull	X	X
Rock dove	X	
Rough-winged swallow	X	X
Ruddy turnstone	X	X
Sanderling	X	X
Savannah sparrow	X	X
Semipalmated plover	X	X
Semipalmated sandpiper	X	X
Short-billed dowitcher	X	X
Solitary sandpiper	X	X
Song sparrow	X	X
Spotted sandpiper	X	X
Stilt sandpiper	X	X
Upland sandpiper(SE)		X
Warbling vireo	X	X
White-rumped sandpiper	X	X
Wilson's phalarope(SE)	X	X
Wood duck	X	X
Yellow warbler	X	X

Notes: (a) Unpublished data, Illinois Breeding Bird Atlas Project, 1986-1993. Illinois Natural History Survey.
(SE) State Endangered
(ST) State Threatened
X = Observed

The Migratory Bird Treaty Act (MBTA) decreed that all migratory birds and their parts (including eggs, nests, and feathers) were fully protected. There were a total of 67 identified species of birds protected by the MBTA that have been observed at the Airport as shown in Table N-7).

N.1.5.3 Mammals

The presence of several mammal species on the Airport was confirmed during field observations. The presence of several other mammal species is highly probable. The virtual lack of hard mast (i.e., edible nut) producing trees, such as hickories, walnuts, and oaks, limits the potential population for various squirrels, although they do occur. White-footed mice (*Peromyscus leucopus*), deer mice (*Peromyscus maniculatus*), meadow voles (*Microtus pennsylvanicus*), and masked shrews (*Blarina brevicauda*) are likely present in stable numbers in the woodlands and unmowed grassy areas. During the summer, Indiana bats (*Myotis sodalis*) primarily roost under the exfoliating bark of suitable roost trees. Although there is suitable

habitat within the wooded areas on the Airport, Indiana bats are not likely present at the Airport due to isolation and lack of connectivity of the on-site wooded areas with larger forested areas, such as the Des Plaines River Forest Preserve.

Raccoon (*Procyon lotor*) tracks were commonly seen along the drainage ways and wetlands. White-tailed deer (*Odocoileus virginianus*) and their activity, including scrapes and rubs, was observed outside of the secured Airport property. Evidence of eastern cottontail rabbits (*Sylvilagus floridanus*) was seen throughout the study area, especially in the areas with brushy meadows and young woodland.

Limited usage of the area by the aquatic mammals muskrat (*Ondatra zibethica*) and beaver (*Castor canadensis*) was confirmed. Historic and current beaver activity was observed in Willow-Higgins Creek. The lack of emergent wetlands with semi-permanent water reduces the potential muskrat population. Food sources for muskrats (emergent vegetation) and beaver (woody vegetation) are limited along the channelized sections of streams because of steep banks and the infestations of purple loosestrife. Willow-Higgins Creek and Bensenville Ditch provide the most consistent habitat for both of these aquatic mammals within the project area. Wetlands SW5, SW106, and SE60 contain emergent marsh components that could support some muskrats during years when precipitation is normal or above normal.

Striped skunk (*Mephitis mephitis*), opossum (*Didelphis marsupialis*), and groundhog (*Marmota monax*) would be expected to have stable populations throughout the area. These species are known to adapt well to urban conditions.

Carnivores/omnivores such as coyote (*Canis latrans*), red fox (*Vulpes vulpes*), and gray fox (*Urocyon cinereoargenteus*) have been confirmed at the Airport in past studies.³⁰ The coyote population has been increasing throughout the Chicago region and the Airport properties have experienced a similar trend. Adequate habitat for red fox exists within the semi-wooded areas with brushy meadows. It is also possible that feral dogs are present at the Airport.

In general, the west woods and City of Chicago Department of Streets and Sanitation Bureau of Forestry areas on the west side, and to a lesser degree the Willow-Higgins Creek area, provide the best terrestrial mammal habitat on Airport properties. The west side of the Airport has the largest and most complex habitat, despite its disturbed nature. The woodlands and grassy borders provide cover, food, and water for both prey and predator species. The forestry area at the southwest corner of the Airport lands provides similar habitat structure. Both areas provide wildlife travel lanes to access other parts of the Airport properties. The USDA has documented the travel corridors for several mammals, including foxes and skunks.³¹

³⁰ Wildlife Hazard Management Plan of O'Hare International Airport, U.S. Department of Agriculture Columbia, MO. 1993.

³¹ Biological Assessment, Environmental Assessment for Management of Hazards to Public Safety and Aircraft Caused by Wildlife at O'Hare International Airport, and Wildlife Hazard Management Plan for O'Hare International Airport, U.S. Department of Agriculture, 1993.

N.1.5.4 Reptiles and Amphibians

No organized studies of the herpetofauna (amphibians and reptiles) are available for the Airport properties. The following summarizes the available information and field observations made during the biological surveys in 1999.

No rare species or critical habitat for any rare species was observed in the area. The degraded nature of the majority of wetlands and uplands limits the suitability of the existing habitat. Generally, wetlands SW8, SW15, and NW28, and the excavated ditch north of Willow-Higgins Creek, provide the most probable amphibian-breeding habitat on the Airport (refer to **Exhibits 4.4-2** and **4.4-3**). Those areas that contain adequate spring moisture and vegetative structure and do not receive direct stormwater runoff from roadways would be the most likely habitat for amphibians. The presence of painted turtles (*Chrysemys picta*) and snapping turtles (*Chelydra serpentina serpentina*) has been confirmed by the USDA. Populations of rare reptiles are unlikely due to limited suitable habitat for these species and limited dispersal possibilities from adjacent areas.

Table N-8 presents a list of mammals, reptiles, and amphibians actually observed or having a high possibility of existing at the Airport.³² None, except for the Indiana Bat, are state or Federally listed threatened or endangered species.

N.1.5.5 Threatened and Endangered Species

This section identifies the presence of Federal threatened or endangered species that may be present on the Airport and describes the critical habitat or habitat of these species. The term "threatened" is applied when populations are low enough that it appears likely that if no protection is offered, the species will become endangered, i.e., threatened with extinction. The term "endangered" is used if the entire species is in danger of extinction. Critical habitat is the habitat determined by the Secretary of the Interior, in consultation with state agencies, to be necessary to support the various life stages of the species. In addition, the State of Illinois uses its own authority to protect species that are threatened or endangered within the state, under the Illinois Endangered Species Protection Act (ESPA). The Illinois ESPA prohibits any person from taking or otherwise possessing a species listed as endangered, requires that damage of adverse affects to any endangered species be minimized, and directs public agencies to consult with the Illinois Department of Natural Resources (IDNR) when their actions will jeopardize threatened or endangered species or their habitat. This section also identifies any state listed threatened or endangered species and describes their corresponding habitats. **Attachment N-2** includes all relevant correspondence from IDNR and USFWS regarding the determination of potential threatened and endangered species in the vicinity of the Airport.

Previous studies at the Airport suggest the potential for use of the Airport properties by several state or Federally listed threatened or endangered species. The 1984 Final Environmental Impact Statement identified two state endangered species and one Federally endangered

³² Chicago O'Hare International Airport Environmental Assessment for the Airport Layout Plan Update Wetland Delineation Report, Hey and Associates, Inc., January 1995.

species.³³ These were the upland sandpiper and the marsh hawk (both of which are included on the Illinois list of endangered species), and the Indiana bat (both a Federally and state listed endangered species).

³³ Final Environmental Impact Statement for Chicago O'Hare International Airport, Federal Aviation Administration, 1984.

**TABLE N-8
OBSERVED AND POTENTIALLY EXISTENT (a) MAMMALS, REPTILES, AND
AMPHIBIANS**

Mammals	Scientific Name
Beaver	<i>Castor canadensis</i>
Coyote	<i>Canis latrans</i>
Deer mouse	<i>Peromyscus maniculatus</i>
Eastern cottontail	<i>Sylvilagus floridanus</i>
Eastern mole(a)	<i>Scalopus aquaticus</i>
Fox squirrel	<i>Sciurus niger</i>
Gray fox	<i>Urocyon ciecargenteus</i>
Gray squirrel	<i>Sciurus carolinensis</i>
Hoary bat	<i>Lasiurus cinereus</i>
House mouse	<i>Mus musculus</i>
Indiana Bat(a)	<i>Myotis sodalis</i>
Long-tailed weasel(a)	<i>Mustela frenata</i>
Masked shrew	<i>Sorex cinereus</i>
Meadow vole	<i>Microtus pennsylvanicus</i>
Mink(a)	<i>Mustela vison</i>
Muskrat	<i>Ondatra zibethicus</i>
Norway rat	<i>Rattus norvegicus</i>
Raccoon	<i>Procyon lotor</i>
Red fox	<i>Vulpes vulpes</i>
Short-tailed shrew(a)	<i>Blarina brevicauda</i>
Striped skunk	<i>Mephitis mephitis</i>
Thirteen-lined ground squirrel(a)	<i>Citellus tridecemlineatus</i>
Virginia opossum	<i>Didelphis virginiana</i>
White-footed mouse	<i>Peromyscus leucopus</i>
White-tailed deer	<i>Odocoileus virginianus</i>
Woodchuck	<i>Marmota monax</i>
Reptiles	
Eastern garter snake(a)	<i>Thamnophis sirtalis</i>
Plains garter snake	<i>Thamnophis radix radix</i>
Snapping turtle(a)	<i>Chelydra serpentina</i>
Western painted turtle	<i>Chrysemys picta</i>
Amphibians	
American toad	<i>Bufo americanus</i>
Northern leopard frog(a)	<i>Rana pipiens</i>
Western chorus frog	<i>Pseudacris t. triseriata</i>

Notes: (a) Denotes potentially existent species based on presence of adequate available habitat according to Hey & Associates, Inc. All other species actually observed by U.S. Department of Agriculture Wildlife Biologist, 1992-1993.

Sources: Wetland Delineation Report, Hey & Associates, Inc, January 5, 1995. Environmental Assessment, United States Department of Agriculture Animal and Plant Health Inspection Service Animal Damage Control, Edwin R. Hartin – State Director USDA-APHIS-ADC, 1992.

The evaluation of plants and wildlife currently found at the Airport was made on the basis of:

- A 1993 Illinois Natural History Survey
- 2001 observations at the Airport made by Harza Engineering during a wetland and floodplain delineation

A biological survey of the Airport property was conducted during the summer and fall of 1999 by Harza for the World Gateway Program Environmental Assessment. The USFWS stated at that time that no Federally-endangered or threatened species occurred in the immediate vicinity of O'Hare Airport.³⁴ IDNR also stated at that time that they had no record of state listed threatened or endangered species on the Airport.³⁵

Information contained in the World Gateway Program (WGP) Environmental Assessment (EA) was reviewed and documentation from the USDA could not be confirmed or obtained.³⁶ Therefore, as part of this new effort, the USFWS and the IDNR were contacted to determine if their databases contained any records of threatened or endangered species on the Airport properties.

Recent correspondence with the USFWS indicates that the eastern prairie white fringed orchid (*Platanthera leucophaea*) is located in proximity to the airport, but not on the Airport property. In addition, the eastern massasauga (*Sistrurus catenatus*), a candidate species for Federal listing under the Endangered Species Act, is in the vicinity of the proposed project area.³⁷

Recent correspondence with the IDNR states that the Natural Heritage Database identified a known occurrence of the state listed small sundrops (*Oenothera perennis*) on the east side of the Des Plaines River. In addition, the IDNR also referenced the presence of the Federally listed eastern prairie white fringed orchid (*Platanthera leucophaea*) in the Schillar Woods Prairie near the Airport.³⁸

As a result of these Agency letters (included in this appendix), surveys were conducted for the eastern prairie white fringed orchid (July 1-10, 2003),³⁹ small sundrops (June 24 – July 11, 2003),⁴⁰ and the eastern massasauga (June 23 – July 11, 2003),⁴¹ to determine if these species were present on Airport property.

No individuals of the above listed species were encountered during the survey period. The reports were submitted to the IDNR and USFWS on August 11, 2003⁴² for their review and

³⁴ Letter from John Rogner, USFWS, to John Chitty, Harza Engineering Company, September 21, 1999.

³⁵ Letter from Heather Hostetler, IDNR, to John Chitty, Harza Engineering Company, September 28, 1999. See also the USFWS letter on the Draft EIS, March 28, 2005.

³⁶ Note to File from FAA, November 30, 2004.

³⁷ Letter from John Rogner, USFWS, to Peter Mulvaney, Montgomery Watson Harza, December 23, 2002.

³⁸ Letter from Heather Ryan, IDNR, to Peter Mulvaney, Montgomery Watson Harza, January 6, 2003.

³⁹ Chicago O'Hare International Airport, Eastern Prairie Fringed Orchid Threatened and Endangered Species Survey, Montgomery Watson Harza. August 1, 2003.

⁴⁰ Chicago O'Hare International Airport, Small Sundrops Threatened and Endangered Species Survey, Montgomery Watson Harza, August 1, 2003.

⁴¹ Chicago O'Hare International Airport, Eastern Massasauga Threatened and Endangered Species Survey, Montgomery Watson Harza, August 1, 2003.

⁴² Transmittal letters to Steve Hamer, IDNR, and Mike Redmer, USFWS, from Peter Mulvaney, Montgomery Watson Harza, August 11, 2003.

concurrence. The IDNR has concurred, based on this survey, that none of these three species are present, at this time, at the Airport.⁴³ The USFWS has also concurred with these assessments.⁴⁴ Additionally, IDNR has stated that their sign off is in effect until October 2006, at which time a new sign off request would potentially be required.⁴⁵

On-Airport Animal Species

The cumulative list of state listed birds observed at the Airport properties changes from year to year, as additional sightings are made and as the state Threatened/Endangered list changes. The great egret, formerly listed as threatened, is no longer listed; it is quite widespread in northern Illinois and a regular visitor to the Airport wetlands. Similarly, the long-eared owl, recorded by the USDA, has been removed from the list. On the other hand, sightings in 2001 of little blue heron and red-shouldered hawk have added to the list of observed state listed species (see **Table N-7**).

No Federal threatened or endangered species have been observed on the Airport property since 1989.

There have been sightings of adult upland sandpipers in the north and west airfields as recently as 2001.⁴⁶ However, no nest sites have been observed.

The 1984 Environmental Impact Statement noted the potential presence of the Indiana Bat, which is both a state and Federally listed endangered species.⁴⁷ In addition, two state listed endangered species, the upland sandpiper and northern harrier (formerly called the marsh hawk), were both observed in 1984 and the upland sandpiper was observed again in 2001. Habitat requirements of these and other threatened and endangered birds are discussed below.

No other state or Federally listed threatened or endangered mammals, reptiles, or amphibians are known to breed at the Airport.

The following sections discuss the Federal and state listed species and their habitats that have been identified at the Airport.

Vegetation

No threatened or endangered species of vegetation listed by USFWS or IDNR have been found on Airport property. Although a patch of early fen sedge (*Carex crawei*), a state threatened wetland species, was found during a 1994 survey,⁴⁸ the species has been delisted by the state

⁴³ Letter from Steve Hamer, IDNR, to John Chitty, Montgomery Watson Harza, October 22, 2003.

⁴⁴ Letter from John Rogner, USFWS, to John Chitty, Montgomery Watson Harza, March 16, 2004. See also the USFWS letter on the Draft EIS, March 28, 2005.

⁴⁵ Letter from Steve Hamer, IDNR, to Michael Boland, City of Chicago Department of Aviation, O'Hare Modernization Program Office, June 20, 2005.

⁴⁶ Personal observations of Red-Shouldered Hawk and Upland Sandpiper by Peter Ames, ornithologist, Harza Engineering. Spring 2001.

⁴⁷ Final Environmental Impact Statement for Chicago O'Hare International Airport, Federal Aviation Administration, 1984.

⁴⁸ Chicago O'Hare International Airport Draft Environmental Assessment for the Airport Layout Plan Update Wetland Delineation Report, Hey and Associates, Inc., January 1995.

since that time. Furthermore, a portion of the sedge stand was relocated to the Chicago Botanic Gardens in 1998 as a condition of a regulatory permit.

The eastern prairie white fringed orchid (*Platanthera leucophaea*), a Federally threatened species, has not been identified on Airport property but the USFWS has identified it as being in the vicinity of the Airport.⁴⁹ This orchid has dwindled in numbers for many reasons. It requires an undisturbed prairie habitat, is threatened by aggressive non-native species and has been over-collected because of its beauty.

A survey was conducted between July 1 and 10, 2003, during the flowering period of the orchid, to determine if the orchid is present on Airport property.⁵⁰ No orchid species, including the eastern prairie white fringed orchid, were encountered within the survey area. The IDNR has concurred, based on this survey, that the eastern prairie white fringed orchid is not present, at this time at the Airport.⁵¹ The USFWS has also concurred with this assessment.⁵²

In addition to the eastern prairie white fringed orchid, the IDNR indicated that small sundrops (*Oenothera perennis*) may also be present on Airport property. A survey was conducted between June 24 and July 11, 2003, during the flowering period of the sundrop, to determine if it is present on Airport property.⁵³ No small sundrops were encountered within the survey area. The IDNR has concurred, based on this survey, that the small sundrops is not present, at this time at the Airport.⁵⁴ The USFWS has concurred with this assessment.⁵⁵

Birds⁵⁶

The cumulative list of Federal- and state-listed birds observed at the Airport properties changes from year to year, as additional sightings are made and as the threatened and endangered lists change. The following sections describe the threatened and endangered bird species observed at the Airport since 1989. **Table N-7** provides a more detailed description of the bird species observed at the Airport.

The 2001 survey by Harza identified three state-listed threatened and endangered species at the Airport, including the upland sandpiper, the red-shouldered hawk, and the little blue heron. Several other species of state-listed birds have been identified in studies at the Airport since 1989, as indicated in **Table 5.11-1** in **Section 5.11, Threatened and Endangered Species**. None of these species has been observed nesting or breeding at the Airport. Because the Airport property contains wetlands, open water, and unmowed meadows, as well as limited forested areas, various species of birds may use the Airport for food and shelter on a seasonal or temporary basis. However, the fragmentary nature and poor quality of the habitat available on

⁴⁹ Letter from John Rogner, USFWS, to Peter Mulvaney, Montgomery Watson Harza. December 23, 2002.

⁵⁰ Chicago O'Hare International Airport, Eastern Prairie Fringed Orchid Threatened and Endangered Species Survey, Montgomery Watson Harza, August 1, 2003.

⁵¹ Letter from Steve Hamer, IDNR, to John Chitty, Montgomery Watson Harza, October 22, 2003.

⁵² Letter from John Rogner, USFWS, to John Chitty, Montgomery Watson Harza, March 16, 2004.

⁵³ Chicago O'Hare International Airport, Small Sundrops Threatened and Endangered Species Survey, Montgomery Watson Harza, August 1, 2003.

⁵⁴ Letter from Steve Hamer, IDNR, to John Chitty, Montgomery Watson Harza, October 22, 2003.

⁵⁵ Letter from John Rogner, USFWS, to John Chitty, Montgomery Watson Harza, March 16, 2004.

⁵⁶ A Field Guide to the Birds: A Completely New Guide to All the Birds of Eastern and Central North America (Peterson Field Guides), 4th Edition, R.T. Peterson, Houghton Mifflin Co., Boston, Massachusetts, 1980.

the Airport property may be unsuitable for breeding, nesting, or the long-term residence of sensitive species.

The USFWS and the IDNR have been contacted to determine if their records contained any observations of threatened or endangered species at the Airport. The USFWS did not indicate any avian species of concern in the proposed project area.⁵⁷

Black-crowned Night Heron (*Nycticorax nycticorax*), State Endangered

This species is distributed worldwide in the temperate and subtropical zones. It nests in the lower levels of mixed heron rookeries and is an aggressive omnivore, taking the eggs and young of other herons, as well as fish, frogs, and aquatic invertebrates. A substantial colony of Night Herons (reported to number more than 300 nests) is located approximately 25 miles southeast of the Airport in the Lake Calumet wetlands. The individual observed at the Airport may be a resident of the Lake Calumet wetlands since no Night Heron nests have been observed at the Airport.

Little Blue Heron (*Egretta caerulea*), State Endangered

An adult of this species was seen, apparently for the first time at O'Hare, during the 2001 field survey. The nearest known breeding site of the species is in St. Claire County, IL, and there are no heron rookeries on the Airport. Like many other herons, Little Blue adults and young disperse widely after the breeding period, including to the north, and this probably accounts for the O'Hare sighting.

Red-shouldered Hawk (*Buteo lineatus*) State Threatened

An adult red-shouldered hawk was observed in 2001.⁵⁸ This raptor prefers substantial stands of mixed hardwood forest for nesting and hunting. It would not be expected to nest in the sort of small, isolated, woodland patches found at O'Hare. In all probability the bird was a transient.

Upland Sandpiper (*Bartramia longicauda*), State Endangered

This is the only threatened or endangered species believed to potentially breed on Airport land, however no actual nest sites have been observed. There have been sightings of adult upland sandpipers in the north and west airfields as recently as 2001.^{59, 60}

The upland sandpiper is an unusual shorebird, the subject of taxonomic controversy for many years. Its plover-like appearance and preference for drier habitats led many specialists to place it in the family Charadriidae, but recent studies have shown it to belong in the Scolopacidae. The species is widespread in the grasslands of the United States and Canada. It appears to prefer short-grass prairie, but feeds and nests in a variety of other habitat types, from cropped pasture to tall-grass prairie.

⁵⁷ Letter from John Rogner, USFWS, to Peter Mulvaney, Montgomery Watson Harza, December 23, 2002.

⁵⁸ Personal observations of Red-Shouldered Hawk and Upland Sandpiper by Peter Ames, ornithologist, Harza Engineering, Spring 2001.

⁵⁹ Personal observations of Red-Shouldered Hawk and Upland Sandpiper by Peter Ames, ornithologist, Harza Engineering, Spring 2001.

⁶⁰ Telephone conversation with Lawrence Schafer, U.S. Department of Agriculture, June 21, 2001.

Wilson's Phalarope (*Phalaropus tricolor*), State Endangered

Hey and Associates reported this small shorebird at O'Hare, presumably in one of the ponds or lagoons.⁶¹ Phalaropes feed on insects or crustaceans taken on or near the surface of fresh or salt water, but this species also spends considerable time on land. Wilson's Phalarope breeds from Sub-arctic Canada south to southern Wisconsin and southern Michigan (rarely), and migrates to western South America for the winter. Sightings at O'Hare certainly represent migrant birds.

Pied-billed Grebe (*Podilymbus podiceps*), State Threatened

This small grebe inhabits shallow freshwater wetlands with emergent aquatic plants. It requires open water in which to pursue fish and aquatic insects. Although not considered a strong flier, it moves easily between ponds several miles apart and travels large distances on migration. Its presence at O'Hare probably represents normal migration or post-breeding dispersal.

Mammals

No state or Federal threatened or endangered species were observed during the 1999 surveys conducted for the Environmental Assessment for the World Gateway Program and other Capital Improvement Projects. The majority of the Airport property does not provide the necessary habitat features required to sustain mammals other than the common species typically found in urban settings. The landscape has been highly altered by past and present development, and disrupted by Airport operations. Although wetlands are attractive to many mammalian species, the Airport wetlands are not characterized by the diverse native plant communities necessary to support most mammals. Furthermore, the limited acreage of relatively natural habitat is scattered along the Airport's periphery, making it less valuable to mammals, which require more consolidated acreage.

A 1984 EIS identified the potential for the presence of the Indiana bat, a Federal and state endangered species, at the Airport,⁶² but this species has not been observed in any recent surveys. The Indiana bat is known to live in the Great Lakes region during the spring and summer months. This species favors nests in hollow trees, especially in floodplain forests. Because the Airport contains no mature forest, and existing forested areas are both disturbed and highly fragmented, there is little suitable habitat for the Indiana bat on the Airport property. A large amount of higher quality habitat for the bat is located in areas to the east and west of the Airport in forest preserves and parks.

The USFWS and the IDNR have been contacted to determine if their records contained any observations of threatened or endangered species at the Airport. The USFWS did not indicate any Mammalian species of concern in the proposed project area.⁶³ The IDNR continually reviews and updates their database.⁶⁴

⁶¹ Chicago O'Hare International Airport Environmental Assessment for the Airport Layout Plan Update Wetland Delineation Report, Hey and Associates, Inc., January 1995.

⁶² Final Environmental Impact Statement, Chicago O'Hare International Airport, Federal Aviation Administration, May 1984.

⁶³ Letter from John Rogner, USFWS, to Peter Mulvaney, Montgomery Watson Harza, December 23, 2002.

⁶⁴ The IDNR Database is continually reviewed and updated (Source: Telephone conversation between Peter Mulvaney, Montgomery Watson Harza and Sara Hassert, Landrum & Brown, October 16, 2003).

Reptiles and Amphibians

No state- or Federally-listed threatened or endangered reptile or amphibian species were observed during natural resource studies. The Airport is highly disturbed from past and current development. The low NARI ratings and limited number of habitat acreage that is scattered in small parcels throughout the Airport property make the habitat less attractive to reptiles and amphibians.

The USFWS has indicated that the eastern massasauga, a candidate for Federal listing under the Endangered Species Act and listed in the State of Illinois as a state endangered species, is known to exist adjacent to the proposed project area.⁶⁵ A survey was conducted between June 23 and July 10, 2003, to determine if the eastern massasauga is present on Airport property.⁶⁶ No massasaugas were observed nor were signs or evidence of their presence found. The IDNR has concurred, based on this survey, that the eastern massasauga is not present, at this time at the Airport.⁶⁷ The USFWS has concurred with this assessment.⁶⁸

Fish

No state- or Federally-listed threatened or endangered fish species were observed during the field investigations conducted as part of this EIS.

The USFWS and the IDNR have been contacted to determine if their records contained any observations of threatened or endangered species at the Airport. The USFWS did not indicate any fish species of concern in the proposed project area.⁶⁹ The IDNR continually reviews and updates their database.⁷⁰

Macroinvertebrates

No state- or Federally-listed threatened or endangered invertebrate species were observed during the field investigations conducted as part of this EIS.

The USFWS and the IDNR have been contacted to determine if their records contained any observations of threatened or endangered species at the Airport. The USFWS did not indicate any macroinvertebrate species of concern in the proposed project area.⁷¹ The IDNR continually reviews and updates their database.⁷²

⁶⁵ Letter from John Rogner, USFWS, to Peter Mulvaney, Montgomery Watson Harza, December 23, 2002.

⁶⁶ Chicago O'Hare International Airport, Eastern Massasauga Threatened and Endangered Species Survey, Montgomery Watson Harza, August 1, 2003.

⁶⁷ Letter from Steve Hamer, IDNR, to John Chitty, Montgomery Watson Harza, October 22, 2003.

⁶⁸ Letter from John Rogner, USFWS, to John Chitty, Montgomery Watson Harza, March 16, 2004.

⁶⁹ Letter from John Rogner, USFWS, to Peter Mulvaney, Montgomery Watson Harza, December 23, 2002.

⁷⁰ The IDNR Database is continually reviewed and updated (Source: Telephone conversation between Peter Mulvaney, Montgomery Watson Harza and Sara Hassert, Landrum & Brown, October 16, 2003).

⁷¹ Letter from John Rogner, USFWS, to Peter Mulvaney, Montgomery Watson Harza, December 23, 2002.

⁷² The IDNR Database is continually reviewed and updated (Source: Telephone conversation between Peter Mulvaney, Montgomery Watson Harza and Sara Hassert, Landrum & Brown, October 16, 2003).

N.2 WETLANDS

The current definition of wetlands accepted by the U.S. Army Corps of Engineers (USACE) and the U.S. Environmental Protection Agency (USEPA) is:

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.⁷³

The definition of wetlands is further refined by the application of vegetative, pedologic (soil), and hydrologic criteria; all three criteria must be met in order for an area to be classified as a jurisdictional wetland by the USACE.

Official identification of a wetland is based principally on the information submitted in a formal wetland delineation report that documents the scientific procedures used to determine whether an area is a wetland. Field visits by the USACE confirm the accuracy of a delineation performed by other parties, and upon confirmation, the field-delineated boundaries become the official wetland boundaries for regulatory purposes. The February 2000 Wetlands Delineation Report ("2000 Delineation")⁷⁴ prepared by Harza,⁷⁵ was submitted to the USACE who indicated its acceptance of the report on February 18, 2000. This report, along with a field visit and review of historic information, was the basis for the jurisdictional determination requested by the Chicago Department of Aviation (DOA) in response to the 2001 Solid Waste Agency of Northern Cook County (SWANCC) U.S. Supreme Court decision regarding isolated wetlands. The Supreme Court decision altered the authority of the USACE regarding wetlands that do not have a hydrologic connection to Waters of the United States (WUS) (i.e. isolated wetlands). On October 6, 2001, the USACE filed the most recent wetland jurisdictional determination for O'Hare. In a letter dated October 28, 2002, the USACE lists the wetlands that are currently under the jurisdiction of the USACE. These letters are included in this as **Attachment N-3**.

N.2.1 Existing Data Sources

Several sources of information about wetlands on Airport property existed prior to the 2000 Delineation and were used to provide baseline data. These sources, described in this section, include: National Wetland Inventory (NWI) maps, Natural Resource Conservation Service (NRCS) Inventories, previous NEPA documents, and the 1995 Hey & Associates Wetland Delineation. In addition, information about local hydrology, soils, geology, floodplains, and wildlife habitats is described in this section.

⁷³ Wetland Delineation Manual. Technical Report 4-87-1. U.S. Army Corps of Engineers, Environmental Laboratory. 1987.

⁷⁴ Chicago O'Hare International Airport, Delineation of Wetland and Floodplains Areas, Harza Environmental Services, February 2000.

⁷⁵ Note: Harza [CCT] is currently known as Montgomery Watson Harza and was previously known as Harza Environmental Services and Harza Engineering Company at different times in the past.

National Wetland Inventory (NWI)

During the 1980s, the U.S. Fish and Wildlife Service developed the National Wetland Inventory using a classification system that defined wetlands according to vegetation, soils, and frequency of flooding.⁷⁶ The NWI map, developed from 1:58,000 scale 1981 aerial photos of Airport lands, showed approximately 40 wetlands, virtually all of which were classified as “palustrine” (see **Exhibit 3 in Attachment N-4, Delineation of Wetland and Floodplain Areas Report**). The palustrine system includes all non-tidal wetlands dominated by trees, shrubs, and perennial emergent vegetation, such as cattail and bulrush. The palustrine category is representative of the vegetated wetlands traditionally known by such names as marshes, swamps, sloughs, bogs, fens, and potholes.

Natural Resources Conservation Service (NRCS) Wetland Inventory

During the 1980s, the NRCS, formerly known as the Soil Conservation Service (SCS), conducted a wetland inventory that resulted in the designation of wetland areas for Federal agricultural objectives. It was based solely on published data, including soils information and NWI maps. The results of the NRCS inventory were reviewed prior to field delineations.

Hey & Associates Wetland Delineation 1995

Hey & Associates, Inc. conducted a wetland delineation of Airport properties in 1994.⁷⁷ This delineation included properties outside of the secured airfield. The wetland delineation was performed during spring and fall of 1994, in accordance with the 1987 USACE Wetland Delineation Manual. Hey & Associates also calculated vegetative quality using the Natural Areas Rating Index (NARI) developed by Swink and Wilhelm.⁷⁸ The wetland delineation report was submitted to the USACE for review in February 1995. Although the USACE did not respond in writing to the jurisdictionality of the 1995 wetland delineation, the USACE did accept the wetland delineation as jurisdictional in subsequent permitting activities.

Previous Environmental Assessments

An EIS was prepared for the Airport in 1984 to assess the impacts of: construction of a new Terminal 1; apron development and expansion of various concourses; relocation and construction of commuter and international terminal facilities; construction of general aviation and cargo complex facilities; construction of a people-mover system; extension of Runways 9L/27R and 14R/32L and attendant taxiways; construction of holding pads and a taxiway bridge over the main access road; relocation of crash, fire, and rescue facilities and the U.S. Post Office; expansion of the heating and refrigeration plant; aircraft fueling system modifications; southeast service site expansion; noise/visual earth berm construction; Lockheed Air Terminal

⁷⁶ Classification of Wetlands and Deepwater Habitats of the United States. L. M. Cowardin, V. Carter, F. C. Golet, and E.T. LaRoe. December 1979. (Prepared for Office of Biological Services, Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C. 20240.)

⁷⁷ Wetland Delineation Report, Hey & Associates, Inc., January 5, 1995.

⁷⁸ Plants of the Chicago Region, F. Swink and G. Wilhelm, The Morton Arboretum, Lisle, IL., 1979.

Maintenance Building relocation; and relocation or replacement of various military facilities.⁷⁹ The EIS referenced two large areas of standing water in the wooded western portion of the Airport. No other wetlands were identified in the 1984 EIS.

In 1991, a wetland delineation was conducted in the southern portion of the Airport property owned by the U.S. Postal Service (USPS) for the construction of a new facility. The field survey revealed 7.8 acres of jurisdictional wetlands within the USPS property. To mitigate the loss of those wetlands due to post office expansion, an eight-acre wetland was created in the Bensenville Ditch along Irving Park Road.⁸⁰

In June 2002, the FAA issued a Finding of No Significant Impact/Record of Decision (FONSI/ROD) for the Final Environmental Assessment for the World Gateway Program and Other Capital Improvement Projects.⁸¹ Copies of the Final EA were sent to the USEPA and the USACE, who did not have comment regarding wetlands. In sum, these projects proposed major alterations to the airfield, the FONSI/ROD considered the best available information and analysis, much of which is used in this EIS.

Hydrology

Prior to the field delineation of wetlands, the U.S. Geological Survey's Hydrologic Atlases were consulted to better understand the hydrologic conditions present at the Airport.⁸² The atlases and the Hey & Associates 1995 wetland delineation report were also reviewed.⁸³ Current topography of the Airport lands was reviewed by CCT to identify depressional areas that might seasonally pond water.

There was little information available describing the hydrology of the on-Airport wetlands and the original hydrology of the Airport properties has been significantly changed due to the urbanization that has occurred in the Airport watersheds. On the basis of field observations during spring and fall of 1999, it can be concluded that the majority of the wetlands at the Airport derive their hydrology from localized runoff, poor drainage, and ponding. Shallow groundwater and periodic inundation from adjacent streams are also likely sources of water for some of the wetlands. Because urbanization has modified most of the original soils on the Airport, soil compaction has increased surface runoff and has limited infiltration to the shallow groundwater. The current hydrology of most of the wetlands is defined by perched water tables created by the compacted and virtually impenetrable surface soils.

The watershed area for Willow-Higgins Creek is 19.5 square miles; watershed development upstream of the Airport consists of residential, industrial, and commercial property.

⁷⁹ Final Environmental Impact Statement for Chicago O'Hare International Airport., Federal Aviation Administration. 1984.

⁸⁰ Draft Wetland Mitigation Plan for the United States Postal Service O'Hare Mail Processing Center, Knight Architects Engineers and Planners, Inc. and Hey & Associates, Inc., January 3, 1991.

⁸¹ Final Environmental Assessment for the World Gateway Program and Other Capital Improvement Projects, Federal Aviation Administration, June 2002.

⁸² Floods in the Arlington Heights, Elmhurst, Park Ridge, and River Forest Quadrangles, Hydrologic Investigations 67, 68, 85, and 106, U.S. Geological Survey, Washington D.C. 1963, 1964, 1966.

⁸³ Wetland Delineation Report, Hey & Associates, Inc., January 5, 1995.

Downstream from the Airport, the development within the watershed consists of industrial, commercial, residential, and some open areas.

The Bensenville Ditch watershed has a drainage area totaling approximately 12 square miles. It is an urbanized stream that has been rerouted several times on the Airport lands. Downstream from the Airport, Bensenville Ditch is known as Silver Creek. Development upstream of the Airport consists of industrial and commercial development with some residential areas. Downstream of the Airport, development consists of industrial, commercial, residential, and some open spaces.

The South Detention Basin is approximately 105 acres in size and lies at the headwaters of Crystal Creek in the southeast quadrant of the Airport. It is a normally dry basin created for stormwater management and holds water only after precipitation events. Stormwater is conveyed to and treated at the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) Stickney plant or, if free of pollutants, it can be discharged to the Des Plaines River.

The Airport properties lie completely within the Des Plaines River watershed and are comprised of three major subwatersheds, Willow-Higgins Creek, Bensenville Ditch and Crystal Creek. The deep drainage channels that were excavated many years ago in the Bensenville Ditch and the Willow-Higgins Creek watersheds have increased the efficiency of water transport to and from the Airport. Runoff from much of the airfield flows into the South Detention Basin and Crystal Creek, which has a total watershed area of approximately five-square miles. The remainder of the Crystal Creek watershed not on Airport property consists of industrial, commercial, and residential development.

The hydrology of the airfield is engineered to promote the efficient transport of water away from paved areas and to discourage wetland plant growth and wildlife usage. Within the airfield, numerous shallow drainage swales or ditches have been specifically designed and constructed to limit surface ponding. These paved and developed areas have been designed to minimize standing water and divert surface water off-site.

Soils

Detailed soil maps are available from the Natural Resource Conservation Service (NRCS) for most of northeastern Illinois. They are especially useful in wetland surveys because they map areas containing hydric soils. Unfortunately, the detailed soil maps that resulted from the combined soil survey of DuPage and Cook Counties⁸⁴ only include the DuPage County portion of the Airport (see **Exhibit 2 in Attachment N-4, Delineation of Wetland and Floodplain Areas Report**). Soils on the Cook County portion of the Airport were not identified by the NRCS. The Airport was already heavily developed by 1979 and was considered "urban land." Based on the available information, the soil resources of the Airport prior to development include:

- Well-drained Morley and Varna soils
- Moderately well-drained Markham soils
- Somewhat poorly-drained Elliott and Beecher soils

⁸⁴ Soils Survey of DuPage and Part of Cook Counties, Illinois, D.R. Mapes, U.S. Government Printing Office, 1979.

- Poorly-drained Ashkum and Drummer soils (hydric soil⁸⁵)
- Small areas of very poorly drained Muskego and Houghton mucks (hydric soil⁸⁶)

Geology

The Airport lies on the summit of the Park Ridge end moraine, which is a vestige of the latest ice age, the Wisconsin glaciation.⁸⁷ The moraine was formed from an overthickening of glacial till deposited at the edge of the icesheet, as it remained stationary for a long period of time. The glacial landscape in the area is termed the Wheaton Morainal Country, and is comprised of what is called "swell and swale" morainal topography.⁸⁸ Most of the original drainage pattern on the Park Ridge moraine was poorly defined. However, there were three small drainageways that flowed into the Des Plaines River that are now known as Willow-Higgins Creek, Crystal Creek, and Bensenville Ditch.

Melting glacial ice deposited the Wadsworth Till member of the Wedron Formation, a poorly sorted mixture of sand, silt, and clay.⁸⁹ After the landscape stabilized, and following the end of glaciation, modern soils developed within different parent materials. Localized depressions gradually filled the surface of the moraine in the area that is now the Airport. In addition, some of the larger depressions, which ponded water continuously, became filled with silts, clays, and organic accumulations of muck and peat.

N.2.2 Airport Wetland History

The Chicago metropolitan area was once comprised of prairies, meadows, forests, and wetlands. As this area developed, most of the native vegetation was displaced or destroyed. At and around the Airport, land was initially cleared for agricultural and residential purposes and, later, for commercial and industrial purposes. Over the years, Airport development combined with poor drainage conditions may have contributed to the formation or modification of some of the wetlands currently observed at the Airport.

N.2.2.1 Wetland Delineation History

A field survey was conducted by Harza Engineering Company (Harza) in 1999. The study updated a 1995 wetland delineation of the Airport properties, which included areas outside of the secured airfield.⁹⁰ The final delineation report⁹¹ was produced in February 2000, and is included as **Attachment N-4**. The USACE reviewed the wetland delineation and concurred

⁸⁵ National Technical Committee for Hydric Soils, *Hydric Soils of the United States*, U.S. Government Printing Office, 1991.

⁸⁶ National Technical Committee for Hydric Soils, *Hydric Soils of the United States*, U.S. Government Printing Office, 1991.

⁸⁷ Summary of the Geology of the Chicago Region, H.B. Willman. Illinois State Geological Survey, Circ. 460, 1971.

⁸⁸ Physiographic Divisions of Illinois, M.M. Leighton, G.E. Ekblaw, and C.L. Horberb., Illinois State Geological Survey., Rept. Inv. 129, 1949.

⁸⁹ Pleistocene Stratigraphy of Illinois., H.B. Willman and J.C. Frye, Illinois State geological Survey, Bull. 94. 1970.

⁹⁰ Chicago O'Hare International Airport, Draft Delineation of Wetland and Floodplains Areas, Harza Environmental Services, November 1999.

⁹¹ Chicago O'Hare International Airport, Delineation of Wetland and Floodplains Areas, Harza Environmental Services, February 2000.

with the final wetland boundaries as of February 18, 2000. A copy of the USACE concurrence letter also is included in **Attachment N-3**.

In July 2001 the DOA requested that the USACE review the jurisdictional status of the wetlands at the Airport in accordance with the Supreme Court decision regarding SWANCC.⁹² In the SWANCC decision, the Supreme Court held that the USACE had exceeded its CWA regulatory authority in asserting jurisdiction over isolated intrastate non-navigable ponds based on the Migratory Bird Rule. SWANCC eliminated the USACE jurisdiction, under the CWA, over isolated waters that are intrastate and non-navigable, where the sole basis for asserting CWA jurisdiction is the actual or potential use of the waters as habitat for migratory birds that cross State lines in their migrations. These "isolated" wetlands are no longer jurisdictional under Section 404 of the CWA, but are provided protection under Executive Order 11990 – Protection of Wetlands, and various state laws. The remaining isolated wetlands at O'Hare are jurisdictional under Section 404.

The USACE's review, as set forth in a jurisdictional determination letter, dated October 6, 2001, is included in the report. This letter identifies the wetlands on Airport property that remain under the jurisdiction of the USACE following the issuance of the SWANCC decision. Those wetlands not identified in the letter are termed isolated wetlands, and not under the jurisdiction of the USACE. In accordance with Executive Order 11990, the FAA will require the City to provide appropriate mitigation for both isolated and jurisdictional wetlands.

Field Survey Methods

The wetland delineation update was performed during spring, summer and fall of 1999, prior to the Federal SWANCC decision, in accordance with the 1987 USACE Wetland Delineation Manual. The secured Airport property and adjacent areas outside of the secured airfield were investigated to reevaluate the wetland areas delineated in 1995.⁹³ The plant species within and around any apparent or suspected wetland areas were identified as to genus, species, and wetland/upland characteristics. If wetland species (i.e., species identified as facultative wet and/or obligate wetland) comprised 50 percent or more of the vegetative cover, the wetlands were further investigated for field indicators of hydric soil and hydrology. If all three required wetland criteria were met, the wetland boundaries were delineated, and the characteristics of vegetation, soils, and hydrology were documented. In addition, methods to delineate wetland boundaries in areas with disturbed conditions (i.e., in those areas where one or more of the delineation criteria [vegetative, pedologic, and hydrologic] are not readily discernable) were used as recommended in USACE methodology.

The vegetation quality rating, using the Natural Areas Rating Index (NARI),⁹⁴ for each previously identified wetland was reevaluated, and ratings were assigned to the new wetlands. Each wetland plant species of the Chicago metropolitan area is given a numerical rating under the NARI system, reflecting the range of specific ecological conditions necessary for the survival

⁹² Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, 121 S. Ct. 675. 2001. The Supreme Court held that the Clean Water Act does not provide jurisdiction over isolated intrastate wetlands.

⁹³ Wetland Delineation Report, Hey & Associates, Inc., January 5, 1995.

⁹⁴ Plants of the Chicago Region, F. Swink and G. Wilhelm, The Morton Arboretum, Lisle, IL., 1979.

of that plant species. A native plant species with a narrow range of ecological requirements is given a high rating, while a non-native, commonplace plant species carries a low rating. The individual ratings are combined to determine a "natural area" index. An area with a NARI of 35 or above is considered to be of "natural area quality" in the Chicago metropolitan area. When a NARI in the mid-20s is assigned, this indicates an area of above average quality in which many native plant species are present. An area with a NARI less than 15 indicates a high degree of disturbance and few native species.

N.2.2.2 Wetland Delineation and Waters of the United States

Approximately 128 acres of wetlands were found on the Airport during the 1999 wetland delineation.⁹⁵ The Airport also contains approximately 8.1 miles of intermittent open/flowing waterways, including parts of Willow Creek, Higgins Creek, Willow-Higgins Creek, Crystal Creek, and Bensenville Ditch. In addition, a review by the USACE of the ditches located on Airport property resulted in a jurisdictional determination letter dated October 28, 2002 identifying 2.4 miles of drainage ways as WUS.⁹⁶ These WUS account for 26.0 acres of jurisdictional resources. In addition, there are approximately 1.0 acres of WUS within the potential acquisition area (Bensenville Ditch) but no wetlands. **Table N-9** summarizes the results of the delineation. **Tables N-10** and **N-11** summarize the jurisdictional and isolated wetland areas by cover type. **Table N-12** summarizes the vegetative cover type for the Airfield. The full delineation report should be consulted for a more detailed discussion.⁹⁷ **Table N-13** lists the Jurisdictional Wetlands⁹⁸ and **Table N-14** lists the Isolated Wetlands. **Exhibits 4.4-2** and **4.4-3**, in **Chapter 4, Affected Environment**, show the final wetlands delineation for the North and South Airfields, respectively.

⁹⁵ Several changes have occurred since the last wetland report: Nine isolated wetlands, totaling 4.8 acres have been filled under different airport programs. Mitigation for these wetlands was provided. Permitted changes to wetlands include Wetland NE19 (0.95 acres) which is being mitigated onsite (1.5 acres). The Balmoral Avenue project impacted 1.15 acres and has been mitigated through a wetland bank. Wetland SW96A has been modified via a privately held permit. Finally, isolated (i.e., non-jurisdictional) wetlands NE12, NE17 and NE18 have been filled by a private enterprise. All these changes are reflected on the **Exhibits 4.4-2** and **4.4-3**.

⁹⁶ Letter from Keith Wozniak, USACE, to James Considine, City of Chicago Department of Aviation, October 28, 2002.

⁹⁷ Chicago O'Hare International Airport, Delineation of Wetland and Floodplains Areas, Harza Environmental Services, February 2000.

⁹⁸ Letter from Keith Wozniak, USACE, to Jim Considine, City of Chicago Department of Aviation, Re: Jurisdictional Determination on Wetlands and Waters of the U.S. October 6, 2001.

**TABLE N-9
WETLAND SUMMARY**

Wetland Size (acres)	Number of Jurisdictional Wetlands	Total Acreage of Jurisdictional Wetlands	Number of Isolated Wetlands	Total Acreage of Isolated Wetlands
0-0.99	27	11.2	72	17.9
1-1.99	2	2.5	4	5.5
>= 2	8	58.2	9	32.9
Total	37	71.9 (a)	85	56.3 (b)

Notes: (a) Total acreage of jurisdictional wetlands reported in the Conceptual Wetlands Mitigation Plan, included in the City of Chicago Department of Aviation Individual Permit Application to USACE is 78.1 acres.

(b) Total acreage of isolated wetlands reported in the Conceptual Wetlands Mitigation Plan, included in the City of Chicago Department of Aviation Individual Permit Application to USACE is 50.1 acres.

Sources: Letter from Keith Wozniak, USACE, to Jim Considine, City of Chicago Department of Aviation, Re: Jurisdictional Determination on Wetlands and Waters of the U.S, October 6, 2001; Chicago O'Hare International Airport, Delineation of Wetland and Floodplains Areas, Harza Environmental Services, February 2000.

Table N-10 summarizes the jurisdictional wetlands by cover type; while Table N-11 summarizes the non-jurisdictional wetlands by cover type as determined by the February 2000 Wetland Delineation by Harza Engineering. Table N-12 indicates the vegetative cover types as indicated by aerial photography and field verification.⁹⁹

**TABLE N-10
JURISDICTIONAL WETLAND(a) AREAS BY COVER TYPE**

Cover Type	Total
Palustrine Emergent(b)	67.3
Palustrine Forested(c)	0.0
Palustrine Scrub-shrub(b)	4.6
Palustrine Open Water(b)	0.0
Waters of the United States(d)	55,600 linear feet

Notes: (a) Letter from Keith Wozniak, USACE, to Jim Considine, City of Chicago Department of Aviation, Re: Jurisdictional Determination on Wetlands and Waters of the U.S., October 6, 2001.

(b) Chicago O'Hare International Airport, Delineation of Wetland and Floodplains Areas, Harza Environmental Services, February 2000. Updated by MWH, 2004.

(c) Approximately 4.6 acres of these wetlands were described by Harza as forested wetlands. However, the USACE has indicated that these wetlands do not meet their criteria for forested wetlands and these wetlands have been classified as scrub-shrub for purposes of analysis.

(d) Letter from Keith Wozniak, USACE, to James Considine, City of Chicago Department of Aviation, Re: Jurisdictional Determination on Ditches, October 28, 2002.

⁹⁹ Classification of Wetlands and Deepwater Habitats of the United States, L.M. Cowardin, V. Carter, F.C. Golet, and E.T. LaRoe, 1979.

**TABLE N-11
ISOLATED WETLAND AREAS BY COVER TYPE**

Cover Type	Total Acreage
Palustrine Emergent	37.6
Palustrine Forested(a)	0.0
Palustrine Scrub-shrub	18.4
Palustrine Open Water	0.24

Notes: (a) Approximately 17.14 acres of these wetlands were described by Harza as forested wetlands. However, the USACE has indicated that these wetlands do not meet their criteria for forested wetlands and these wetlands have been classified as scrub-shrub for purposes of analysis.

Sources: Letter from Keith Wozniak, USACE, to Jim Considine, City of Chicago Department of Aviation, Re: Jurisdictional Determination on Wetlands and Waters of the U.S, October 6, 2001; Chicago O'Hare International Airport, Delineation of Wetland and Floodplains Areas, Harza Environmental Services, February 2000. Updated by MWH, 2004.

**TABLE N-12
COVER TYPES OF THE AIRFIELD**

Cover Type	Total Acreage
Forested	188
Mowed	2,553
Scrub-shrub	618
Unmowed	669
Impervious	2,776
Total	6,804

Source: Crawford, Murphy, and Tilly, Inc. [TPC] analysis, September 2004. GIS Layers, Montgomery Watson Harza, January 2003.

**TABLE N-13
JURISDICTIONAL WETLANDS**

Wetland ID (1999) Wetland Delineation	NARI	Wetland Acreage
NE1	12	0.02
NE10	9	0.09
NE14	16	0.82
NE15	15	2.36
NE19 – mitigation(b)	4	0.95
NE40(a)	5	0.09
NE41	7	0.49
NE5	7	0.21
NE52(a)	12	0.67
NE53(a)	5	0.47
NE55(a)	12	0.30
NE58	14	2.96
NE6	13	0.25
NE8	7	0.03
NE9	13	0.27
NW26	11	0.21
NW28	27	15.16
NW29	17	3.74
NW37A	13	1.24
NW37B	7	0.08
NW50(a)	12	1.22
SE63	11	0.06
SE64	9	0.34
SE65	1	0.03
SW105	13	4.02
SW107B	13	0.56
SW120	19	14.60
SW121	16	10.20
SW130	14	0.73
SW137	12	0.16
SW2	14	0.64
SW24	11	0.88
SW25	10	0.64
SW5	16	5.14
SW83	13	0.89
SW96	5	0.97
SW96A	14	0.37
Jurisdictional:		71.9 (c)

Notes: (a) Identified in World Gateway Program EA as being impacted/mitigation identified.

(b) NE 19 has permitted impacts (0.9). Off-site mitigation has been provided in Vernon Hills.

(c) Total acreage of jurisdictional wetlands reported in the Conceptual Wetlands Mitigation Plan, included in the City of Chicago Department of Aviation Individual Permit Application to USACE is 78.1 acres.

Source: Letter from Keith Wozniak, USACE, to Jim Considine, City of Chicago Department of Aviation, Re: Jurisdictional Determination on Wetlands and Waters of the U.S., October 6, 2001.

**TABLE N-14
ISOLATED WETLANDS (a)**

Wetland ID (1999)			Wetland ID (1999)		
Wetland Delineation	NARI	Wetland Acreage	Wetland Delineation	NARI	Wetland Acreage
NE11(b)	12	0.25	SW11	17	2.07
NE12(b, d)	12	0.70	SW12	15	0.40
NE17(b, d)	12	0.31	SW13	9	0.18
NE18(d)	16	0.14	SW131(c)	14	0.40
NE2	12	0.03	SW132(c)	8	0.28
NE20(c)	2	0.22	SW133(c)	2	0.01
NE60	4	0.13	SW134(c)	3	0.02
NE65	6	0.15	SW138(c)	8	0.01
NE66	7	0.02	SW14	9	0.05
NE7	3	0.06	SW144(c)	6	0.03
NW1	4	0.02	SW145(c)	5	0.03
NW2(b, c)	12	0.05	SW15	22	6.98
NW27		0.03	SW16	13	0.09
NW3		0.11	SW17	8	0.23
NW30	11	0.16	SW18	6	0.25
NW31	12	0.24	SW19	6	0.06
NW32	12	0.45	SW20	7	0.34
NW33	8	0.16	SW21	12	2.51
NW34	9	0.30	SW22	17	0.57
NW35	8	0.05	SW23	12	0.94
NW36	11	0.05	SW28	12	0.20
NW39	4	0.02	SW29	8	0.03
NW52(c)	16	0.58	SW3	6	0.24
NW54	9	0.06	SW31	12	0.86
SE1	6	0.12	SW32	9	0.36
SE2	6	0.08	SW33	18	3.36
SE3	7	0.36	SW34	12	0.19
SE55(b, c)	3	0.36	SW35	16	1.04
SE60	18	1.67	SW4	15	3.73
SE61	12	0.04	SW6	9	0.29
SE62	7	0.82	SW7	9	0.37
SE71	12	0.30	SW8	18	6.97
SE72	18	2.18	SW80(c)	9	0.10
SE73	14	0.33	SW81(c)	13	1.57
SE74(b)	5	0.63	SW82(c)	6	0.28
SE75	16	1.21	SW84(c)	10	0.57
SE79	9	0.17	SW85(c)	7	0.30
SW1	8	0.18	SW9	19	2.83
SW10	9	0.11	SW90	5	0.33
SW100	6	0.48	SW91	4	0.21
SW101	6	0.17	SW92	6	0.19
SW106	17	2.28	SW93	10	0.12
SW107A	13	0.86	Isolated		56.3(e)

Notes: (a) Isolated wetlands determined to be non-jurisdictional in consideration of the SWANCC decision.

(b) Identified in World Gateway Program EA as being impacted/mitigation identified.

(c) Isolated wetland filled by City, no mitigation provided.

(d) Privately filled.

(e) Total acreage of isolated wetlands reported in the Conceptual Wetlands Mitigation Plan, included in the City of Chicago Department of Aviation Individual Permit Application to USACE is 50.1 acres.

Source: Letter from Keith Wozniak, USACE, to Jim Considine, City of Chicago Department of Aviation, Re: Jurisdictional Determination on Wetlands and Waters of the U.S., October 6, 2001.

Table N-15 summarizes the jurisdictional/non-jurisdictional wetlands and WUS located within the construction impact area.

**TABLE N-15
WETLANDS AND WATERS OF THE U.S. WITHIN THE CONSTRUCTION IMPACT
AREA**

Type of Wetland or Water of the U.S.	Total Acreage
On-Airport, non-jurisdictional (isolated) wetlands (a)	56.3 (e)
On-Airport, jurisdictional wetlands (b)	71.9 (f)
On-Airport Waters of the U.S.(c)	26.0
Acquisition area wetlands and Waters of the U.S.(d)	1.0
Total acreage of jurisdictional wetlands and Waters of the U.S	155.2
Notes: (a) Wetlands that are not jurisdictional under Section 404 of the CWA, but are covered under Executive Order 11990 and FAA Orders 5050.4 and 1050.1.	
(b) Isolated wetlands under the jurisdiction of Section 404 of the CWA.	
(c) Creeks and streams (i.e., Willow-Higgins Creek).	
(d) Isolated wetlands; wetlands that are jurisdictional under Section 404 of the CWA and Waters of the U.S.	
(e) Total acreage of isolated wetlands reported in the Conceptual Wetlands Mitigation Plan, included in the City of Chicago Department of Aviation Individual Permit Application to USACE is 50.1 acres	
(f) Total acreage of jurisdictional wetlands reported in the Conceptual Wetlands Mitigation Plan, included in the City of Chicago Department of Aviation Individual Permit Application to USACE is 78.1 acres.	
Source: Chicago O'Hare International Airport Delineation of Wetland and Floodplain areas, Harza Environmental Services, February 2000. Chicago O'Hare International Airport Acquisition Area Survey, MHW [CCT], May 13, 2004.	

On-Airport wetlands and waterways have been affected by past human disturbance, which primarily includes clearing, grading and development. The impacts of past disturbance range from modification of plant communities to creation of wetland areas, which primarily was caused by man-made grading changes that blocked original drainage ways or created isolated depressions.

The wetland environment of the Airport consists of many small, individual areas that provide few wetland functions. As indicated in **Table N-16**, which provides a summary of the results of the wetland delineation, 99 of the 122 on-Airport wetlands are less than one acre in size and are scattered throughout the less developed portions of the Airport. Wetland areas over two acres in size (17 wetlands) are generally located on the undeveloped west side of the Airport. Of the 122 wetlands, six are between one and two acres in size. All of the wetlands at the Airport are of the Palustrine type, which refers to their marshy characteristics.¹⁰⁰

¹⁰⁰ Classification of Wetlands and Deepwater Habitats of the United States, L.M. Cowardin, V. Carter, F.C. Golet, and E.T. LaRoe, 1979.

TABLE N-16
SUMMARY OF ON-AIRPORT DELINEATED WETLANDS

Size of Wetland (acres)	Number of Wetlands in Each Size Class	Total Wetland Acreage by Size Class	Number of Wetlands in Each Size Class as a Percentage of Total Number of Wetlands	Wetland Acreage in Each Size Class As a Percentage of Total Wetland Acreage
0-0.99	99	29	81%	23%
1-1.99	6	8	5%	6%
≥2	17	91	14%	71%
TOTAL	122	128	100%	100%

Source: Chicago O'Hare International Airport Delineation of Wetland and Floodplain Areas, Harza Environmental Services, February 2000.

The existing wetlands provide habitat for wildlife species common to the area and the limited, short-term shallow depressional storage of stormwater. Wildlife habitat, especially for birds, presents a unique safety concern with regard to aircraft operations.¹⁰¹ The stormwater storage function is limited because the majority of the Airport wetlands are isolated, with only a few being located adjacent to streams where the floodwater storage function can be beneficial. In addition, because the majority of wetland areas are hydrologically isolated, only limited water quality benefits are realized.

The on-Airport wetlands are generally characterized by low native plant species diversity and richness, with only two of the larger wetland areas exhibiting NARIs greater than 20. Several non-native plant species found in the Chicago metropolitan area also are found at the Airport; for example, common buckthorn and purple loosestrife are fast spreading, invasive species that push out and replace native species. The NARI system is useful in documenting this trend of plant community degradation occurring in the Chicago metropolitan area. The majority of the approximate 105 acres of palustrine emergent cover type (82 percent of the total wetland area) is composed of cattail, common reed, or purple loosestrife (see **Section N.1, Biological Resources**). These plants are invasive species, which tend to form monocultures, forcing out other plant types resulting in lower community diversity. **Table N-17** summarizes the wetland areas by standard cover types.

¹⁰¹ Hazardous Wildlife Attractants On or Near Airports, FAA Advisory Circular 150/5200-33A, Federal Aviation Administration, July 27, 2004.

**TABLE N-17
ON-AIRPORT WETLAND AREAS BY COVER TYPE**

Cover Type	Total Acreage
Palustrine Emergent	104.9
Palustrine Forested(a)	0.0
Palustrine Scrub-Shrub	23.0
Palustrine Open Water	0.24
TOTAL	128.2
Notes: (a) Approximately 21.7 acres of these wetlands were described by Harza as forested wetlands. However, the USACE has indicated that these wetlands do not meet their criteria for forested wetlands and these wetlands have been classified as scrub-shrub for purposes of analysis.	
Source: Chicago O'Hare International Airport Delineation of Wetland and Floodplain Areas, Harza Environmental Services, February 2000.	

The on-Airport wetlands can be described as many small, individual sites providing relatively few wetland functions relative to water quality, stormwater and flood storage, and wildlife habitat. Most of the observed soils at the Airport property have been disturbed by earthmoving activities during the development of the Airport facilities over time. The Airport's wetlands have minimal value for floodwater storage, due to their lack of size and depth, but do provide limited shallow depressional storage of stormwater and snowmelt runoff. Contributing to the low quality of on-Airport wetland habitat is poor water quality contributed to by the components of stormwater and the flashiness of flows during certain periods of the year. The major wildlife habitats at the Airport include upland woods, wet woods, herbaceous wetlands, mowed lawn, unmowed meadows, and perennial and intermittent streams. The vegetated areas in and around the Airport generally have been modified from their original condition and represent artificial situations, such as mowed grassy surfaces or second growth stands of trees. In general, the highest quality habitat is provided by the woodlands that contain seasonally saturated wetlands. The water quality benefits of the wetlands, including sediment deposition and nutrient removal, are highly localized and limited in extent, and therefore, have little appreciable effect on surface water quality.

FAA Policy Regarding Non-Jurisdictional/Isolated Wetlands

In March of 2001 the litigation (unrelated to the Airport) between SWANCC and USACE resulted in a Supreme Court decision that amends the definition of jurisdictional wetlands. Due to this ruling, many isolated wetlands on Airport property are no longer under the jurisdiction of the USACE. The October 6, 2001, jurisdictional determination (JD) by USACE indicated that there are 71.9 acres of jurisdictional wetlands on Airport property (**Table N-13**). This JD left 56.3 acres of non-jurisdictional "isolated" wetlands remaining on Airport Property (**Table N-14**).

The FAA policy for these isolated, non-regulated wetlands will follow Executive Order 11990 and NEPA (i.e., the non-regulated wetlands will be evaluated in a manner similar to those that are regulated). Prior to this FAA policy, the City of Chicago Department of Aviation had filled 4.59 acres of these non-jurisdictional "isolated" wetlands (identified on **Table N-13**, and **Exhibits 4.4-2** and **4.4-3**, of **Chapter 4, Affected Environment**).

N.2.2.3 Wetland Functions

Small (less than one acre), hydrologically isolated wetlands dominate the wetland distribution on the Airport. Of the 122 wetland areas delineated, covering approximately 128 acres, only 23 wetlands are greater than one acre in size. Generally, the subject wetlands have relatively low functional value for water quality, stormwater and flood storage, and wildlife habitat. This is because the wetlands reflect all the urban stresses that could be anticipated, given the intensive land use associated with an international airport surrounded by urban residential, commercial, and industrial land use. The wetland functional assessment is found in the February 2000 Chicago O'Hare International Airport Delineation of Wetland and Floodplain Areas prepared by Harza Engineering (see **Attachment N-4, Delineation of Wetland and Floodplain Areas Report**).

Water Quality

Wetlands can have important filtering capabilities for intercepting surface water runoff. As runoff water passes through the wetlands, the wetlands retain excess nutrients and pollutants and reduce sediment transport. The Airport wetlands do provide some water quality benefits, including sediment deposition and nutrient removal. However, since most of the wetlands are isolated from surface waterbodies, their water quality benefits are highly localized with little appreciable effect on stream quality. Man-made structures provide most current water quality benefits at the Airport. For example, the South Detention Basin is specifically designed to improve surface water quality and provide stormwater management by diverting stormwater contaminated by deicing fluids to the MWRDGC water treatment plant at Stickney. Existing, planned, and proposed detention basins (North Winter, South Winter, Overflow, Structure 140, and Touhy Avenue Detention Basins) in the north airfield were designed to provide similar functions.

Storm and Floodwater Storage

The Airport wetlands have limited value for shallow depressional storage of stormwater and snowmelt runoff. As such, they provide a detention function by reducing peak storm flows. However, since few of the wetlands are located adjacent to streams, they offer minimal benefit for overbank flood storage.

N.2.3 Airport Wetland Filling History

The DOA has committed to compensatory mitigation for impacts associated with ongoing and recently completed projects at the Airport. Recent permits obtained by the DOA for wetland filling at the Airport and the associated wetland mitigation commitments (under Section 404 of CWA, administered by the USACE) are summarized in **Table N-18** below.

**TABLE N-18
RECENT PERMITS FOR WETLANDS FILLING AT O'HARE**

Project Name/Description	Permit Year	Permit Number	Status
O'Hare Express North: Tenant project; 1.15-acre impact to Wetlands NE12, NE17, and NE18 fro industrial development.	1998	199800351(a)	Following <i>SWANCC v. USACE</i> , these wetlands were determined to be isolated by the USACE. The FAA assumed regulatory jurisdiction through the EA process (EO 11990). Correspondence between the FAA, DOA, and tenant set mitigation at 1:1. The project is complete and mitigation was provided.
Balmoral Avenue Extension: DOA project; 0.9-acre impact to wetlands for roadway improvements.	2001	200000945	Project complete and mitigation was provided per permit and FONSI conditions.
Willow-Higgins Flood Control Basin (Structure 140): DOA project; 0.9-acre impact to Wetlands NE19 for flood control project.	2000	200001159	Project complete and mitigation was provided in Vernon Hills.
Runway Protection Zone (4R): Filling of Wetlands NW40 and NW41 for FAA certification.	2001	200100251	This permit was withdrawn and the work was not completed. No impacts or mitigation ratios were determined.
Note: (a) Permit submitted previous to <i>SWANCC v. USACE</i> .			
Source: E-mail from Peter Mulvaney, Montgomery Watson Harza to Sara Hassert, Landrum & Brown, October 16, 2003.			

N.3 FLOODPLAINS

N.3.1 Introduction

Executive Order 11988, *Floodplain Management*, defines floodplains as:

the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year.

This area, which is also called the base floodplain, is the area that would be inundated by the floodwaters of a 100-year flood event. A floodway is defined as the area of the floodplain that should be reserved (kept free of obstructions) to allow floodwaters to move downstream.¹⁰²

Floodplains store water during storm events and help dissipate energy associated with floodwaters. According to Executive Order 11988, if an agency has determined to, or proposes to, conduct, support, or allow an action to be located in a floodplain, the agency shall consider alternatives to avoid adverse effects and incompatible development in the floodplains.

O'Hare is drained by three streams, which generally flow from west to east into the Des Plaines River: Willow-Higgins Creek, Crystal Creek, and Bensenville Ditch. These watersheds have minimal topographical relief and relatively uniform gradients. The floodplains on-Airport are associated with Willow-Higgins Creek on the North Airfield and Crystal Creek and Bensenville Ditch on the South Airfield. The floodplains as they existed before the 2004 completion of Structure 140 and the Touhy Avenue Detention Basin¹⁰³ at the Airport are depicted in **Exhibits N-1 and N-3**, and as they currently exist in **Exhibits N-2 and N-4**.

N.3.2 Regulatory Information

The Federal Emergency Management Agency (FEMA) is the Federal government agency charged with floodplain management. FEMA coordinates with the Illinois Department of Natural Resources, Office of Water Resources (IDNR-OWR) on the designation of floodplain and floodway boundaries within the State of Illinois. IDNR-OWR also regulates development within the floodway and, through an administrative process, concurs with the latest FEMA map revisions. The IDNR-OWR criteria for floodplain delineation are more stringent than the minimum requirements of the National Flood Insurance Program as administered by FEMA.¹⁰⁴ The most recent guidance from IDNR-OWR was used for the determination of the existing 100-year floodplains and floodways at the Airport.

In assessing existing floodway and floodplain boundaries, IDNR-OWR requires use of the "best available information," which it often possesses in its own records and databases. IDNR-OWR information was used for Crystal Creek and Bensenville Ditch. For Willow-Higgins Creek, a

¹⁰² Flood Hazard Mapping, Federal Emergency Management Agency, Website, http://www.fema.gov/fhm/fq_fld01.shtm, November 3, 2004.

¹⁰³ TR20/WSP2, Existing Conditions, Willow-Higgins Reservoir, Both Reservoirs (CD), CTE Engineers, March 27, 2001.

¹⁰⁴ 17 IAC 3708, Floodway Construction in Northeastern Illinois.

detailed study was recently performed on behalf of the Airport by Consoer Townsend Envirodyne Engineers (CTE) for North Airfield drainage improvements. This updated study was utilized to determine the 100-year floodplain for Willow-Higgins Creek.¹⁰⁵ A recent submittal to FEMA has requested a Conditional Letter of Map Revision (CLOMR) to show the extent of flooding in the event of a 100-year storm. The 100-year floodplain limits are included in **Exhibit 4.4-4** as existing conditions for Willow-Higgins Creek.

N.3.3 Influence of the Construction of Structure 140 and the Touhy Avenue Detention Basin on the Existing Floodplains

Increases in stormwater runoff due to the increases in the amount of impervious surface located on the Airport may influence floodplain sizes. However, Structure 140 (which became operational in 2004 and referred to as the Summer Basin in its primary stage), channel improvements to Willow-Higgins Creek, and the Touhy Avenue Detention Basin are recent North Airfield improvements that have worked together to reduce the 100-year floodplain on the Airport. The primary function of Structure 140 is to reduce flood levels on Willow-Higgins Creek. Water from the upstream watershed is diverted into Structure 140 where it is stored until the storm passes and then pumped back to the Willow-Higgins Creek. Structure 140 was constructed in two phases. Phase 1 (Summer Basin) had a storage volume of 153 acre-feet. As part of this phase, stormwater in the Summer Basin drained back to the North Airfield Stormwater Pump Station. Phase 2 (Structure 140) construction expanded the volume to 1,152 acre-feet and significantly deepened the basin. The basin now includes a new pump station that can discharge water directly to Willow-Higgins Creek. The proposed design also included improvement, by rechanneling and relocating 930 linear feet, of the Willow-Higgins Creek channel to accommodate connection to Structure 140. The Touhy Avenue Detention Basin, which began construction in 2002 and was completed in 2004, has a capacity of approximately 700 acre-feet. It was designed to be an addition to "Cell 2" of the MWRDGC facility immediately north of the project site. The Touhy Avenue Detention Basin is a dry basin that fills with water during major storms. The water is then drained and returned to Willow-Higgins Creek no more than 10 days after storms.

N.3.3.1 Existing Conditions/Watershed Models and Results

The existing 100-year storm floodplains and floodways for the Airport areas of the three watersheds are described below.

N.3.3.2 Willow-Higgins Creek Watershed (North Airfield)

The Natural Resources Conservation Service (NRCS) developed the Willow-Higgins Creek hydrologic and hydraulic models (TR-20 and WSP-2, respectively) for its Lower Des Plaines Tributaries Study (LDPT).¹⁰⁶ The WSP-2 model is a hydraulic model developed by the USDA

¹⁰⁵ O'Hare Modernization Program, Final Draft, CTE, December 15, 2002; Email with digital CADD files from Matt Cooper, CTE, to Amy Hanson, Landrum & Brown, February 14, 2003.

¹⁰⁶ Lower Des Plaines Tributaries Watershed, Cook, DuPage and Lake Counties, Illinois. U.S. Department of Agriculture Soil Conservation Service. 1987. (The U.S.D.A. Soil Conservation Service is now named USDA Natural Resource Conservation Service.)

and NRCS for riverine analysis that can reflect development within the watershed. The WSP-2 model was used to determine the flow regime within the 100-year floodplain under normal and storm event conditions. The TR-20 model is a hydrologic model developed by the USDA and the NRCS that determines flood hydrographs by predicting water elevations at different locations along streams during varying flow conditions. In the North Airfield Drainage and Pollution Control Study,¹⁰⁷ these models were updated to evaluate existing floodplain conditions. The enhanced WSP-2 model included data from recent field surveys of hydraulic conditions in the watershed, including improvements to existing culverts, new culverts, channel realignments, and channel improvements. The TR-20 hydrologic model was also updated to reflect Airport storm sewer improvements under construction. The precipitation data in the TR-20 model was updated using the heavy rainfall frequency distribution data for the northeast Illinois region, Bulletin 70, developed by the National Weather Service. Consoer, Townsend, Envirodyne Engineers, Inc. (CTE) used this updated model to evaluate the floodplain impacts of the planned basins and storm sewer improvements. The floodplain limits on Airport property were then determined using existing contour mapping, construction of the proposed Touhy Avenue Detention Basin and Structure 140, and the updated NRCS models.

The limits of the Airport areas in the Willow-Higgins Creek 100-year floodplain (prior to the completion of Structure 140 and the Touhy Avenue Detention Basin) are shown in **Exhibit N-1**. It covered 636 acres of Airport property. The floodplain extended up to 1,800 feet from the Creek's banks from the south near Runway 14L and on the north to the embankment of the Northwest Tollway. The old Wolf Road service road crossed the floodplain, and approximately 800 linear feet of the road was within the 100-year floodplain with a maximum depth of water of approximately one foot based on the updated model. The Willow-Higgins floodplain encroached on Runway 14L and Taxiway N, parallel to Runway 4L-22R, and limited their safe use during flooding. The floodplain also covered portions of the former military site in the northeast quadrant of the Airport. Based on the updated model, flooding on the Airport from a 100-year storm event also could have resulted in up to three feet of standing water in the area of existing automobile parking lots. Immediately east of the military site, downstream along the floodplain, additional Airport property was impacted by the floodplain.

After the addition of the Touhy Avenue Detention Basin and the completion of Structure 140, the Willow-Higgins floodplain had a reduced impact on the North Airfield portion of the Airport.¹⁰⁸ As shown in **Exhibit N-2**, the 100-year floodplain now recedes from all Aircraft Operating Areas (AOA), including Runway 14L and Taxiway N, leaving approximately 116.1 acres of Airport property within the floodplain. The former military property is now no longer within the floodplain after the construction of the Touhy Avenue Detention Basin and Structure 140. The Touhy Avenue Detention Basin and Structure 140 are capable of storing a combined 1,852 acre-feet of floodwater.

These major drainage improvements on the North Airfield provide improved water quality and flood control benefits for the Airport and surrounding communities. **Exhibit N-4** shows the

¹⁰⁷ Chicago O'Hare International Airport, North Airfield Drainage and Pollution Control Study, Consoer Townsend & Associates, 1993.

¹⁰⁸ Final Environmental Assessment for Proposed Touhy Avenue Detention Basin, City of Chicago, July 20, 2001.

reduction in the floodplain area along Willow-Higgins Creek, downstream of the Airport with the construction of the Touhy Avenue Detention Basin and Structure 140.

N.3.3.3 Crystal Creek Watershed (South Airfield)

IDOT-OWR developed the most recent Crystal Creek hydrologic model (HEC-1) and hydraulic model (HEC-2)¹⁰⁹ for its *Strategic Planning Study for Flood Control for the Villages of Franklin Park and Schiller Park, March 1991*. This report studied the flooding problems in Franklin Park and Schiller Park and created the current regulatory floodplain model for existing conditions between the affected villages and the start of the creek at the South Detention Basin's outfall. Stormwater runoff for the southeast portion of the Airport, including all of the central terminal buildings and the airside portions of the South Cargo Area, drains to the South Detention Basin, a man-made detention basin, via a system of underground storm sewers and overland sheet flow through drainage swales. Stormwater flowing into the South Detention Basin goes through one of six oil/water separators prior to entering the basin. The stormwater then discharges into the Airport's 36-inch sanitary sewer that flows to the MWRDGC via the Bryn Mawr Avenue interceptor, then to the Upper Des Plaines Interceptor 12-A for treatment at the MWRDGC Stickney plant. When the Upper Des Plaines Interceptor 12-A carries more than 4.5 feet out of its 6.0-foot maximum depth of flow, an automatic control prevents the South Detention Basin pump station from discharging the water through this conduit to the MWRDGC.

The South Detention Basin, with improvements recently constructed, is designed to handle a 14.2-year storm event. Storm events over the 14.2-year storm event level have the potential to create a rapid rise in the South Detention Basin's water level, which could exceed the basin's capacity.¹¹⁰ If the water level in the basin becomes too high, water is discharged directly into Crystal Creek through a small spillway at the south side of the South Detention Basin, which then flows into the Des Plaines River. However, this only occurs when the basin is filled to near capacity. Since 1995, there have been no discharges from the South Detention Basin into Crystal Creek. All stormwater has been discharged into the MWRDGC sanitary sewer system for treatment. More detailed information on the South Airfield drainage is included in **Section 5.7, Water Quality**, as well as **Appendix K, Water Quality**. The existing limits of the Crystal Creek floodplain within the Airport are minimal and are shown in **Exhibit N-3**. The floodplain covers approximately 6.3 acres of Airport property and extends only into undeveloped grassed areas in a narrow strip directly adjacent to the existing creek banks. The existing 100-year floodplain for Crystal Creek does not impact existing facilities of the Airport. Due to the South Detention Basin, floodplain area on Crystal Creek below the South Detention Basin is limited and is mostly the result of overland flow of stormwater (see **Exhibits 5.7-2** and **5.7-3** for a view of the watershed and the drainage basins).

¹⁰⁹ Strategic Planning Study For Flood Control, Crystal Creek, Villages of Franklin Park and Schiller Park, Illinois, Illinois Department of Transportation, Department of Water Resources, March 1991.

¹¹⁰ O'Hare International Airport, South Airfield Drainage Improvements, Project Description, EarthTech, February 2001.

N.3.3.4 Bensenville Ditch Watershed (South Airfield)

The HEC-1 and HEC-2 models provided by the IDNR (previously IDOT-OWR), completed in 1992, reflect the latest improvement projects for the Bensenville Ditch.¹¹¹ The improvements include floodplain mitigation measures constructed for the U.S. Postal Service facility¹¹² and channel improvements upstream of the Airport. Airport areas in the Bensenville Ditch 100-year floodplain are shown in **Exhibit N-3**. It covers approximately 98.5 acres of Airport property. The floodplain does not impact any Airport facilities. The floodplain consists of undeveloped grassy areas and the recently developed floodplain storage areas that are part of the U.S. Postal Service facility. Because the postal facility construction modified the floodplain, mitigation was provided for drainage and floodplain impacts at that time.

¹¹¹ Bensenville Ditch Floodway Construction Permit Applications, Illinois Department of Natural Resources, Department of Water Resources, May 1992.

¹¹² Final Site Environmental Assessment United States Postal Service, Facilities Service Center, 606 North Mail Processing Center, Chicago O'Hare International Airport, The Benham Group, August 1989.

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Chicago
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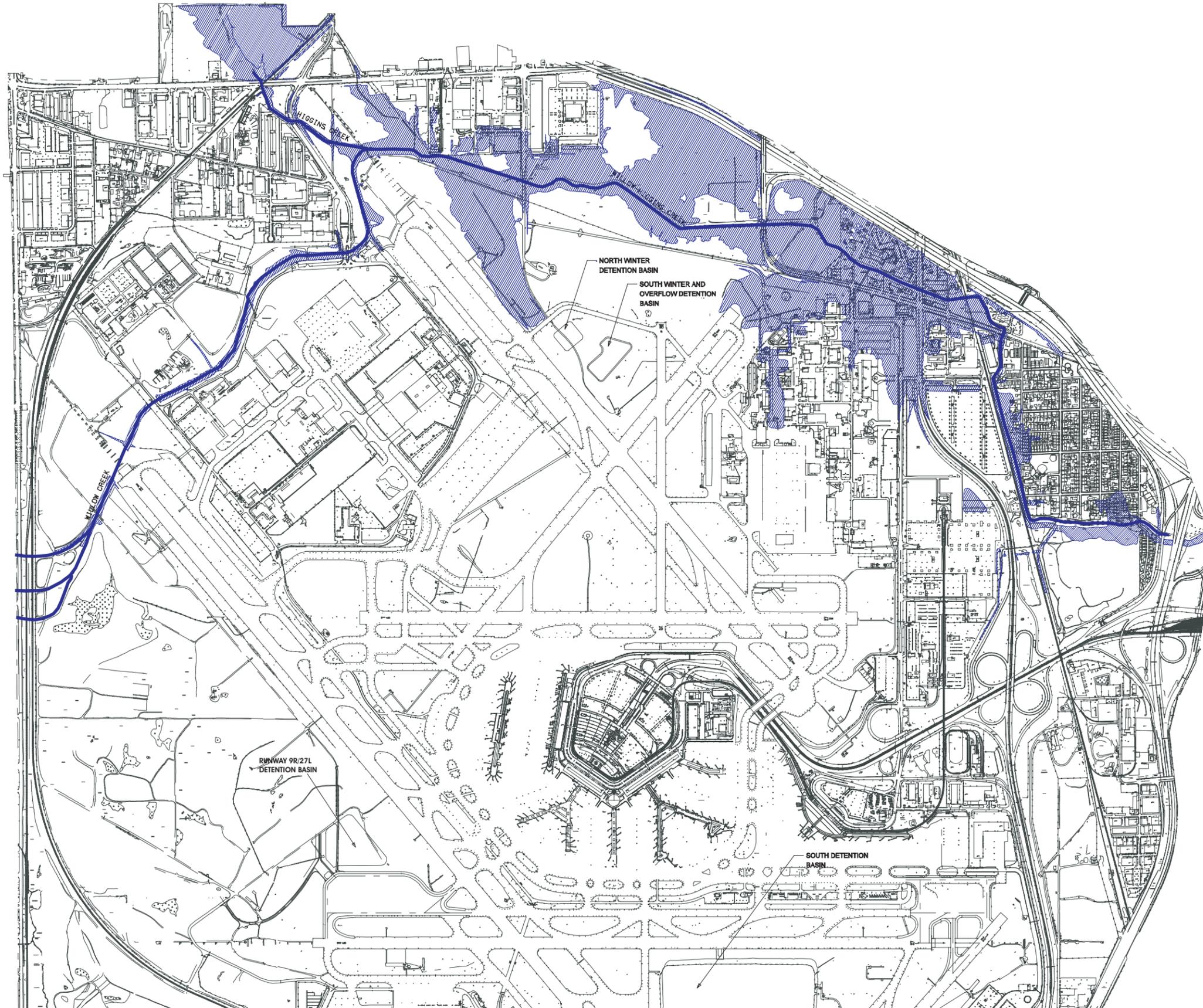
**O'Hare Modernization
Environmental Impact Statement**

-  Floodplains
-  Waters of the United States (W.U.S.)



**Existing Floodplain
North Airfield**

► Exhibit N-1





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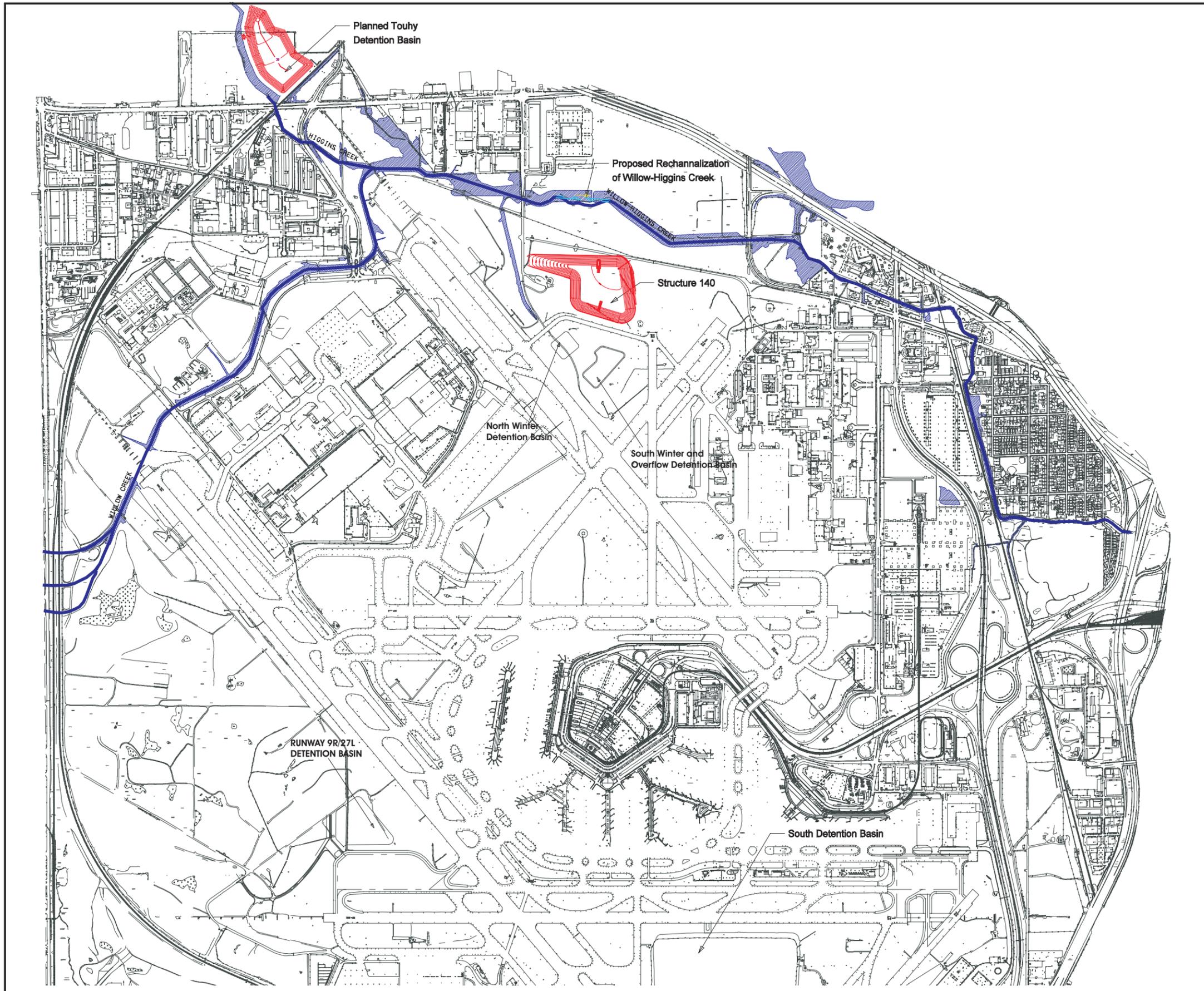
**O'Hare Modernization
Environmental Impact Statement**

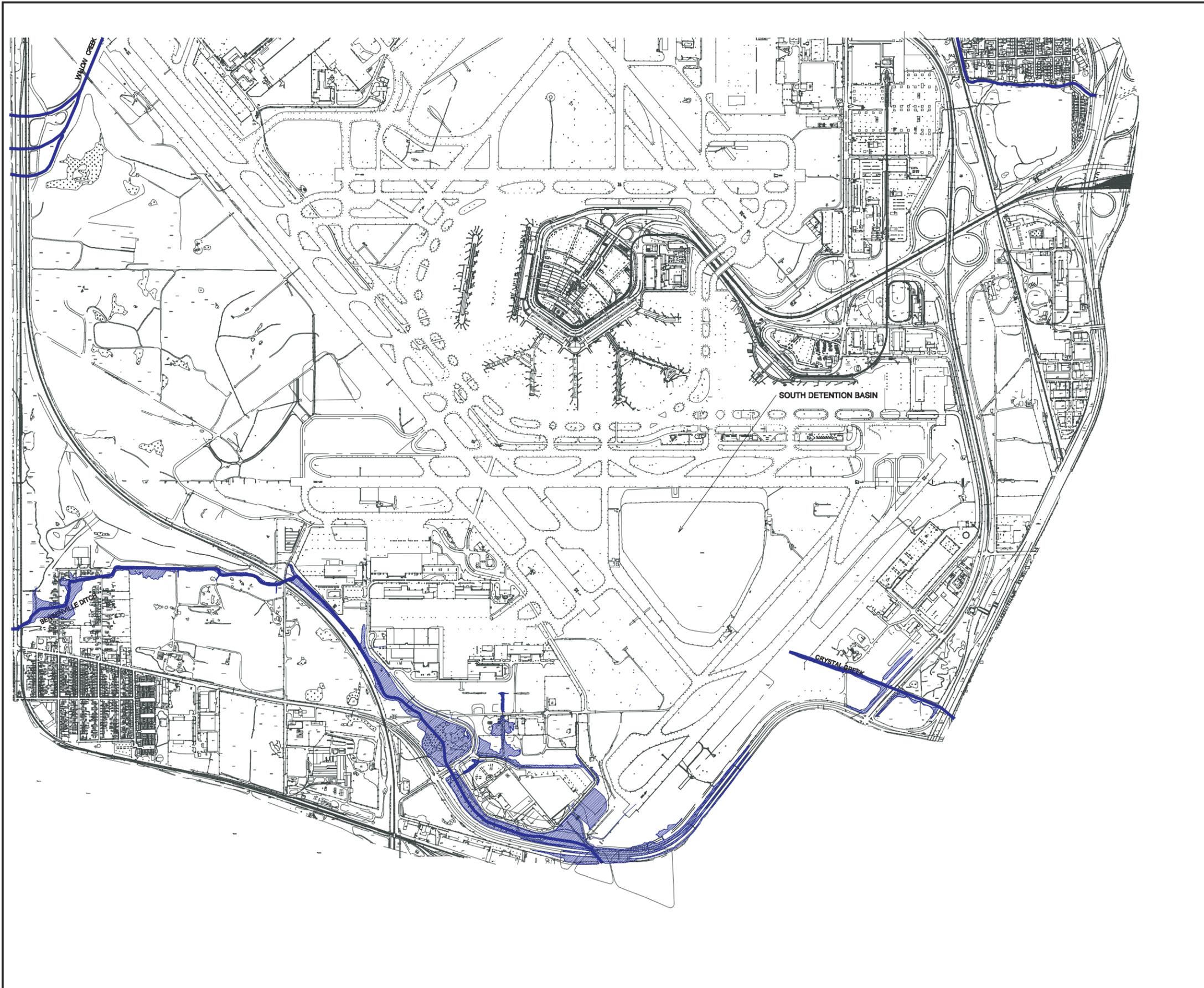
-  Floodplains
-  Waters of the United States (W.U.S.)
-  Touhy Detention Basin and Structure 140



**North Airfield Floodplain
with Structure 140 and
Touhy Detention Basin**

► Exhibit N-2





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**O'Hare Modernization
Environmental Impact Statement**

-  Floodplains
-  Waters of the United States (W.U.S.)



**Existing Floodplain
South Airfield**

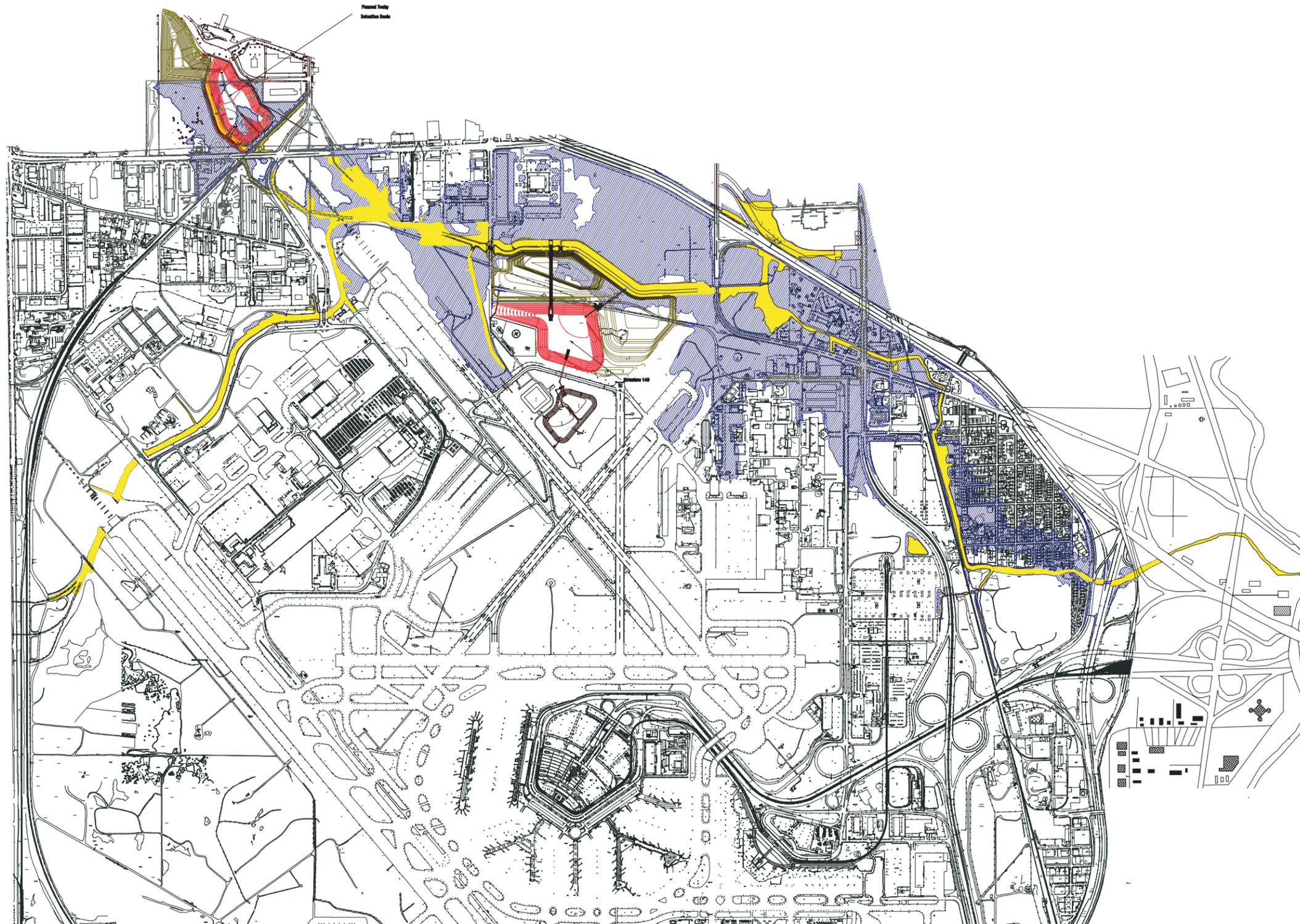
► Exhibit N-3



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International
Airport

**O'Hare Modernization
Environmental Impact Statement**

-  Floodplain with Structure 140 and Touhy Detention Basin
-  Floodplains
-  Touhy Detention Basin and Structure 140



**Downstream Floodplain Effects of
Structure 140 and Touhy Detention
Basin on Willow-Higgins Creek**

► Exhibit N-4

**ATTACHMENT N-1
WILDLIFE STRIKE DATA AT O'HARE
INTERNATIONAL AIRPORT**

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**ATTACHMENT TABLE N.1-1
WILDLIFE STRIKE DATA AT O'HARE INTERNATIONAL AIRPORT**

Year	Species	Number of Strikes
1992	American Crow	1
	Domestic Dog	1
	Ducks, Geese, Swans	1
	European Starling	1
	Gulls	5
	Owls	1
	Peregrine Falcon	1
	Red-Winged Blackbird	1
	Rock Dove	1
	Snowy Owl	1
	Sparrows	3
	Unknown Bird	38
1992 Total		55

ATTACHMENT TABLE N.1-1 (CONTINUED)
WILDLIFE STRIKE DATA AT O'HARE INTERNATIONAL AIRPORT

Year	Species	Number of Strikes
1993	American Crow	2
	American Kestrel	10
	Barn Swallow	2
	Blackbirds	1
	Bonapartes Gull	2
	Canada Goose	3
	Chimney Swift	1
	Common Nighthawk	2
	Coyote	1
	Ducks	1
	Ducks, Geese, Swans	1
	Eastern Meadowlark	1
	European Starling	5
	Gulls	21
	Hawks	1
	Herring Gull	4
	Long-Eared Owl	1
	Mallard	6
	Meadowlark	1
	Mourning Dove	2
	Opossum	2
	Peregrine Falcon	1
	Raccoon	1
	Red-Tailed Hawk	3
	Red-Winged Blackbird	1
	Ring-Billed Gull	11
	Rock Dove	1
	Savannah Sparrow	1
	Snowy Owl	2
	Sparrows	3
	Swallows	1
	Unknown Bird	38
White-Tailed Deer	1	
Woodchuck	2	
1993 Total		136

ATTACHMENT TABLE N.1-1 (CONTINUED)
WILDLIFE STRIKE DATA AT O'HARE INTERNATIONAL AIRPORT

Year	Species	Number of Strikes
1994	American Robin	1
	Blackbirds	2
	Canada Goose	6
	Coyote	2
	Ducks	4
	Ducks, Geese, Swans	1
	European Starling	4
	Geese	2
	Great Blue Heron	2
	Gulls	5
	Hawks	1
	Horned Lark	1
	Killdeer	1
	Mallard	3
	Mourning Dove	1
	Peregrine Falcon	1
	Red-Tailed Hawk	1
	Red-Winged Blackbird	1
	Rock Dove	2
	Sparrows	2
Unknown Bird	39	
1994 Total		82

ATTACHMENT TABLE N.1-1 (CONTINUED)
WILDLIFE STRIKE DATA AT O'HARE INTERNATIONAL AIRPORT

Year	Species	Number of Strikes
1995	American Crow	2
	American Kestrel	7
	Barn Swallow	1
	Blackbirds	3
	Canada Goose	3
	Coyote	4
	Eastern Meadowlark	2
	European Starling	3
	Falcons	1
	Geese	1
	Gulls	5
	Hawks	1
	Mallard	4
	Mourning Dove	1
	Muskrat	1
	Opossum	1
	Peregrine Falcon	1
	Red-Tailed Hawk	12
	Red-Winged Blackbird	1
	Ring-Billed Gull	6
	Rock Dove	4
	Short-Eared Owl	3
	Sparrows	2
Striped Skunk	1	
Unknown Bird	36	
Woodchuck	2	
Yellow-Bellied Sapsucker	1	
1995 Total		109

ATTACHMENT TABLE N.1-1 (CONTINUED)
WILDLIFE STRIKE DATA AT O'HARE INTERNATIONAL AIRPORT

Year	Species	Number of Strikes
1996	American Crow	1
	American Golden-Plover	1
	American Kestrel	10
	American Robin	1
	Barn Swallow	1
	Black-Bellied Plover	1
	Blackbirds	1
	Canada Goose	2
	Coyote	1
	Ducks	2
	Eastern Meadowlark	2
	European Starling	4
	Great Blue Heron	2
	Gulls	4
	Hawks	2
	Killdeer	1
	Long-Eared Owl	1
	Mallard	2
	Mourning Dove	4
	Peregrine Falcon	1
	Red-Tailed Hawk	8
	Ring-Billed Gull	9
	Rock Dove	6
	Rough-Legged Hawk	4
	Savannah Sparrow	1
	Short-Eared Owl	5
	Snowy Owl	2
	Sparrows	2
	Striped Skunk	3
	Unknown Bird	37
1996 Total		121

**ATTACHMENT TABLE N.1-1 (CONTINUED)
WILDLIFE STRIKE DATA AT O'HARE INTERNATIONAL AIRPORT**

Year	Species	Number of Strikes
1997	American Crow	1
	American Kestrel	5
	Barn Swallow	1
	Blackbirds	1
	Bonapartes Gull	1
	Canada Goose	1
	Common Nighthawk	1
	Coyote	2
	Ducks, Geese, Swans	1
	Eastern Cotton Tail Rabbit	1
	European Starling	5
	Great Blue Heron	2
	Hawks	1
	Mourning Dove	2
	Red-Tailed Hawk	7
	Ring-Billed Gull	9
	Short-Eared Owl	1
	Snow Bunting	1
	Striped Skunk	1
	Unknown Bird	43
Woodchuck	1	
1997 Total		88

ATTACHMENT TABLE N.1-1 (CONTINUED)
WILDLIFE STRIKE DATA AT O'HARE INTERNATIONAL AIRPORT

Year	Species	Number of Strikes
1998	American Coot	1
	American Crow	2
	American Golden-Plover	1
	American Kestrel	4
	Barn Swallow	1
	Blackbirds	1
	Canada Goose	2
	Cedar Waxwing	1
	Common Nighthawk	1
	Ducks, Geese, Swans	1
	European Starling	3
	Gulls	3
	Hawks	1
	Mallard	3
	Meadowlark	1
	Mourning Dove	1
	Peregrine Falcon	1
	Red-Tailed Hawk	13
	Ring-Billed Gull	10
	Rock Dove	1
Snow Bunting	1	
Unknown Bird	42	
1998 Total		95

**ATTACHMENT TABLE N.1-1 (CONTINUED)
WILDLIFE STRIKE DATA AT O'HARE INTERNATIONAL AIRPORT**

Year	Species	Number of Strikes
1999	American Kestrel	2
	Bats	1
	Canada Goose	3
	Coyote	2
	Gray Catbird	1
	Gulls	2
	Hawks	2
	Herring Gull	1
	House Sparrow	1
	Mallard	1
	Mourning Dove	1
	Osprey	1
	Peregrine Falcon	1
	Red-Tailed Hawk	9
	Ring-Billed Gull	1
	Rock Dove	2
	Rough-Legged Hawk	1
	Snow Bunting	1
	Sparrows	2
Striped Skunk	1	
Unknown Bird	119	
1999 Total		155

**ATTACHMENT TABLE N.1-1 (CONTINUED)
WILDLIFE STRIKE DATA AT O'HARE INTERNATIONAL AIRPORT**

Year	Species	Number of Strikes
2000	American Crow	1
	American Kestrel	9
	Barn Swallow	1
	Canada Goose	2
	Chimney Swift	1
	Common Nighthawk	1
	Coyote	1
	Ducks	1
	Ducks, Geese, Swans	1
	Eastern Cotton Tail Rabbit	1
	Eastern Meadowlark	2
	European Starling	2
	Gulls	1
	Killdeer	1
	Mourning Dove	1
	Northern Mockingbird	1
	Peregrine Falcon	1
	Raccoon	1
	Red-Tailed Hawk	9
	Ring-Billed Gull	4
	Rock Dove	2
	Short-Eared Owl	2
	Snowy Owl	1
	Striped Skunk	2
	Turtles	1
	Unknown Bird	122
Wrens	1	
2000 Total		173

ATTACHMENT TABLE N.1-1 (CONTINUED)
WILDLIFE STRIKE DATA AT O'HARE INTERNATIONAL AIRPORT

Year	Species	Number of Strikes
2001	American Kestrel	1
	Barn Swallow	1
	Blackbirds	2
	Canada Goose	1
	Coyote	2
	Eastern Meadowlark	2
	European Starling	3
	Geese	1
	Grasshopper Sparrow	1
	Great Blue Heron	1
	Gulls	3
	Hawks	1
	Herring Gull	1
	Killdeer	1
	Mallard	1
	Peregrine Falcon	1
	Red-Tailed Hawk	3
	Red-Winged Blackbird	1
	Ring-Billed Gull	9
	Rock Dove	5
Snowy Owl	1	
Sparrows	1	
Striped Skunk	2	
Unknown Bird	111	
2001 Total		156

ATTACHMENT TABLE N.1-1 (CONTINUED)
WILDLIFE STRIKE DATA AT O'HARE INTERNATIONAL AIRPORT

Year	Species	Number of Strikes
2002	American Kestrel	2
	American Woodcock	1
	Canada Goose	1
	Common Nighthawk	1
	Coyote	1
	Ducks	1
	Ducks, Geese, Swans	1
	Eastern Cotton Tail Rabbit	1
	European Starling	2
	Geese	1
	Gulls	2
	Hawks	1
	Ibises	1
	Northern Shoveler	1
	Peregrine Falcon	2
	Red-Tailed Hawk	2
	Ring-Billed Gull	3
	Rock Dove	1
	Sparrows	3
	Unknown Bird	76
Wood Duck	1	
2002 Total		105
GRAND TOTAL		1,275

Source: Bird Strike Documentation at O'Hare International Airport, D. Arends, U.S. Department of Agriculture Animal and Plant Inspection Services, O'Hare International Airport. Data received by email January 6, 2003.

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ATTACHMENT N-2 IDNR AND USFWS CORRESPONDENCE

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chicago Illinois Field Office
1000 Hart Road - Suite 180
Barrington, Illinois 60010
847-381-2253 Fax 847-381-2285

FWS/AES-CIFO

September 21, 1999

John P. Chitty
Harza Engineering Company
233 South Wacker Drive
Chicago, Illinois 60606-6392

Dear Mr. Chitty:

This is in response to your letter dated August 17, 1999, requesting information on endangered or threatened species at the O'Hare Airport, Cook County, Illinois.

Based on the information provided in the submittal and a review of our records, we do not believe that any federally endangered or threatened species occur in the immediate vicinity of the site. Based on the information provided, it does not appear that the project is likely to adversely affect such species. This precludes the need for further action on the project site as required under the Endangered Species Act of 1973, as amended. Should project modifications or new information indicate that endangered or threatened species may be affected and the proposed project is authorized, funded, or carried out by a federal agency, then consultation with the Service should be initiated by the federal action agency.

If you have any questions, please contact Ms. Louise Clemency, at 847/381-2253, ext. 215.

Sincerely,


John D. Rogner
Field Supervisor



Illinois
Department of
Natural Resources

<http://dnr.state.il.us>

524 South Second Street • Springfield, Illinois 62701-1787

George H. Ryan, Governor • Brent Manning, Director

September 28, 1999

John P. Chitty
Harza Engineering Company
233 South Wacker Drive
Chicago, IL 60606-6392

Re: Information Request, Cook and DuPage Counties

Dear Mr. Chitty:

I have reviewed the Natural Heritage Database for the presence of endangered and threatened species, Illinois Natural Area Inventory (INAI) sites, and dedicated Illinois Nature Preserves near the project site located in Cook County and DuPage Counties. According to the Database, there are no known occurrences of the above mentioned resources in the immediate vicinity of the project site.

Please be aware that the Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of significant features in any part of Illinois. The reports only summarize the existing information regarding the natural features or locations in question known to the Division of Natural Heritage at the time of the inquiry. This response should not be regarded as a final statement on the site being considered, nor should it be a substitute for field surveys required for environmental assessments.

If you have any questions or need additional information, please do not hesitate to contact me at 217-785-5500.

Sincerely,

Heather C. Hostetler
Environmental Database Specialist
Division of Resource Review and Coordination

Printed on recycled and recyclable stock

**United States Department of the Interior**

FISH AND WILDLIFE SERVICE
Chicago Ecological Services Field Office
1250 South Grove Avenue, Suite 103
Barrington, Illinois 60010
Phone: (847) 381-2253 Fax: (847) 381-2285

IN REPLY REFER TO:
FWS/AES-CIFO/T237

December 23, 2002

Mr. Peter Mulvaney
Montgomery Watson Harza
Sears Tower
233 South Wacker Drive, Suite 900
Chicago, Illinois 60606

Dear Mr. Mulvaney:

This responds to your letter dated November 20, 2002 requesting information on endangered or threatened species occurring on or near the proposed runway expansion, referred to as O'Hare Modernization Program (OMP), located at T41N, R11E, Sections 25, 35, 36, T41N, R12E, Sections 30, 31, 32, 33, 34, T40N, R11E, Sections 1, 2, 11, 12, 13, 14, T40N, R12E, Sections 3, 4, 5, 6, 7, 8, 9, 10, 17, 18, 19, 20 and 21 in the Townships of Maine, Addison and Laydea, Cook and Dupage Counties, Illinois as depicted on the map you enclosed. We believe the applicant for this project to be FAA/DOA.

Please note, the proposed sites as depicted on your map lie directly adjacent to a known habitat location for the federally threatened eastern prairie white fringed orchid (*Platanthera leucophoea*). This threatened plant species inhabits wet prairies of the Midwest. If any prairie remnants are found within the project area, we request that searches for this species be conducted between June 28 and July 11, as this is when the orchid typically flowers and is most identifiable. If any eastern prairie white fringed orchids are found, this office should be notified immediately.

Please note that the proposed site lies directly adjacent to the habitat of the eastern massasauga (*Sistrurus catenatus*) a candidate for Federal listing under the Endangered Species Act. The eastern massasauga is known from both historic and recent records in the vicinity of the proposed project area. The eastern massasauga is listed as a state endangered species by the Illinois Department of Natural Resources. Although candidate species do not receive Federal protection, we recommend considering their conservation now to help retain flexibility should the

Mr. Peter Mulvaney

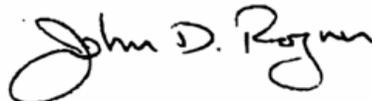
2

species be listed and receive protection under the Endangered Species Act. In northeast Illinois, the eastern massasauga most often occurs in shrubby or grassy habitats in floodplains and riparian corridors similar to the one in which this project will take place. We therefore suggest that the applicant conduct pre-construction surveys of the area to determine if individuals of this species are present. In addition, when work commences, the applicant should be prepared for the possibility that individual massasaugas could be disturbed or uncovered by earth moving, or bankwork. Because the massasauga is a venomous species, a person familiar with it (and qualified to handle it) should be present when work takes place. Attempts should be made to carefully capture and move any such individuals a short distance (50 meters or less) away from the construction activity, and to suitable habitat. This office should also be informed if any massasauga is encountered either before or after the proposed project commences. Please note that because the eastern massasauga is listed as a State endangered species, the Illinois Department of Natural Resources should be contacted.

This letter only addresses federally listed species: the Illinois Department of Natural Resources should be contacted for information on State-listed species. Any impacts to wetlands or waters of the United States may require a permit from the U.S. Army Corps of Engineers. This letter does not preclude separate evaluation and comment by the U.S. Fish and Wildlife Service on wetland impacts proposed for section 404, Clean Water Act authorization.

If you have any questions, please contact Ms. Karla Kramer at 847/381-2253 ext. 230, or Ms. Kristy Mielcarek at 847/381-2253 ext. 227.

Sincerely,



John D. Rogner
Field Supervisor

cc: ACOE, Jaimee Hammit and Karon Marzec (Applicant: FAA/DOA)

TOTAL P.03



Illinois
Department of
Natural Resources

<http://dnr.state.il.us>

One Natural Resources Way • Springfield, Illinois 62702-1271

George H. Ryan, Governor • Brent Manning, Director

January 6, 2003

Peter Mulvaney
Montgomery Watson Harza
18th Floor
175 West Jackson Boulevard
Chicago, IL 60604

Re: Information Request

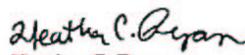
Dear Mr. Mulvaney:

I have reviewed the Natural Heritage Database for the presence of endangered and threatened species, Illinois Natural Area Inventory (INAI) sites, and dedicated Illinois Nature Preserves within the project area you provided. According to the Database, there is a known occurrence of the state-listed Small sundrops (*Oenothera perennis*) in the southeast quarter of Section 10, Township 40 North, Range 12 East. Additionally, just outside the project boundary in the west half of Section 14, Township 40 North, Range 12 East there is an INAI site with a listed species. Schiller Woods Prairie INAI site supports the state and federally-listed Eastern prairie fringed orchid (*Platanthera leucophaea*).

Please be aware that the Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of significant features in any part of Illinois. The reports only summarize the existing information regarding the natural features or locations in question known to the Division of Natural Heritage at the time of the inquiry. This response should not be regarded as a final statement on the site being considered, nor should it be a substitute for field surveys required for environmental assessments.

If you have any questions or need additional information, please do not hesitate to contact me at 217-785-5500.

Sincerely,


Heather C. Ryan
GIS Program Manager
Division of Resource Review & Coordination

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**Illinois Department of
Natural Resources**

One Natural Resources Way • Springfield, Illinois 62702-1271
<http://dnr.state.il.us>

Rod R. Blagojevich, Governor

Joel Brunsvold, Director

October 22, 2003

Mr. John Chitty
Principal Environmental Scientist
MHW Americas, Inc.
175 West Jackson Blvd.
Chicago, Illinois 60640

RE: O'Hare Modernization
Program
O'Hare International Airport
Survey for T&E Species
Report

Dear Mr. Chitty:

Thank you for sending the TES Survey Reports for our review. The Illinois Department of Natural Resources (IDNR) has reviewed the above referenced project report and concurs that the three listed species are probably not present at this time due to the lack of habitat as indicated in the report.

Even though habitat does not exist at this time things can change over a period of time. Since this project is several years away, we would recommend surveys again before construction commences, to assure all efforts have been made to avoid impacts to these species.

Thank you for the opportunity to comment on this environmental document. If you have any questions on the above, please contact me at 217-785-5500.

Sincerely,

Steve Hamer
Transportation Review Program Manager
Division of Resource Review and Coordination
Office of Realty & Environmental Planning

cc: file

Printed on recycled and recyclable paper



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chicago Ecological Services Field Office
1250 South Grove Avenue, Suite 103
Barrington, Illinois 60010
Phone: (847) 381-2253 Fax: (847) 381-2285

IN REPLY REFER TO:
FWS/AES-CIFO/4-0077

March 16, 2004

Mr. John Chitty
Montgomery Watson Harza
175 West Jackson Boulevard
Chicago, Illinois 60604

Dear Mr. Chitty:

This responds to your letter dated September 29, 2003 seeking concurrence on surveys conducted for the eastern prairie fringed orchid (*Platanthera leucophaea*) and the eastern massasauga (*Sistrurus catenatus*).

We are pleased with the survey results that were submitted to our office. Additionally, we are pleased with the survey protocols. Again, we thank you for the opportunity to review the survey protocols and results, and concur with your conclusion that the eastern prairie fringed orchid and eastern massasauga are not present.

If you have any questions, please contact Mr. Shawn Cirton at 847/381-2253, ext. 236.

Sincerely,

A handwritten signature in black ink that reads "Karl D. Rogner".

John D. Rogner
Field Supervisor

cc: MWH, Mulvaney



**Illinois Department of
Natural Resources**

One Natural Resources Way • Springfield, Illinois 62702-1271
<http://dnr.state.il.us>

Rod R. Blagojevich, Governor

Joel Brunsvoild, Director

June 20, 2005

Mr. Michael Boland
First Deputy Director
O'Hare Modernization Program
8755 W. Higgins Road, Suite 710
Chicago, Illinois 60631

RE: O'Hare International
Airport
Expansion and Modernization
City of Chicago

Dear Mr. Boland:

The Illinois Department of Natural Resources has reviewed the project referenced above for threatened and endangered species for state listed plants and animals. This review was conducted and signed off in October of 2003. This sign off is good for three years if construction is started within that time period. A new sign off request would be needed only if construction is delayed until October of 2006.

If you have any questions on the above, please contact me at 217-785-5500.

Sincerely,

Steve Hamer
Transportation Review Program
Division of Natural Resource Review and Coordination

Printed on recycled and recyclable paper

ATTACHMENT N-3 USACE WETLAND CORRESPONDENCE

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DEPARTMENT OF THE ARMY
CHICAGO DISTRICT, CORPS OF ENGINEERS
111 NORTH CANAL STREET
CHICAGO, ILLINOIS 60606-7206

OCT 06 2001

REPLY TO
ATTENTION OF:

Construction-Operations Division
Regulatory Branch
200000231

SUBJECT: Request for Jurisdictional Determination on Wetlands and Waters of the United States at O'Hare International Airport Located in Chicago, Cook County, Illinois.

City of Chicago Department of Aviation
Attn: James Considine
P.O. Box 66142
Chicago 60666

Dear Mr. Considine:

This is in response to your December 22, 1999 request that the U.S. Army Corps of Engineers complete a jurisdictional determination for the above-referenced site. The subject project has been assigned number 200000231. Please reference this number in all future correspondence concerning this project.

Following a review of the U.S. Fish and Wildlife Service National Wetland Inventory, U.S. Geological Survey Hydrologic Atlas, U.S.D.A Natural Resources Conservation Service Soil Survey for Cook County, your wetland delineation report dated November 1999 for the subject site, prepared by Harza Engineering, and a site visit conducted by Kathy Chernich of my staff on July 26, 2001, this office has determined that the subject property contains "waters of the United States" due to the following:

The following list of delineated wetlands have been determined to be jurisdictional:

- a. NE1, NE5, NE6, NE8, NE9, NE10, NE14, NE15, NE19, NE40, NE41, NE52, NE53, NE55, NE58;
- b. NW26, NW28, NW29, NW37a (waters of the United States and adjacent wetland), NW37b, NW50;
- c. SE63, SE64, and SE65; and
- d. SW2, SW5, SW24, SW25, SW63, SW96, SW96A, SW106, SW120, SW121, SW130, SW137, SW107b.

Enclosed, please find the basis for the Corps' jurisdiction for the subject property.

This determination covers only O'Hare International Airport property as depicted in the "November 1999, "Delineation of Wetland and Floodplain Areas", prepared by Harza Engineering. This determination is valid for 5 years from the date of this letter.

This letter is considered an approved jurisdictional determination for your subject site. If you object to this determination, you may appeal, according to 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and a Request for Appeal (RFA) form. If you request to appeal the above determination, you must submit a completed RFA form within 60 days of the date on this letter to the Great Lakes/Ohio River Division Office at the following address:

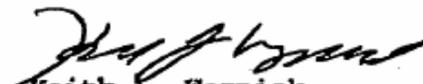
Ms. Suzanne Chubb, Division Review Officer
Great Lakes and Ohio River Division
CELRD-CM-0
550 Main Street
Cincinnati, OH 45201-1159
Phone: 513-684-7261

If you concur with the determination in this letter, submittal of the RFA form to the Division office is not necessary.

Pursuant to Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers regulates the discharge of dredged or fill material into waters of the United States, including wetlands. A Department of the Army permit is required for any proposed work involving the discharge of dredged or fill material within the jurisdiction of this office. To initiate the permit process, please submit a joint permit application form along with detailed plans of the proposed work. Information concerning our program, including the application form and an application checklist, can be found at and downloaded from our website at <http://www.lrc.usace.army.mil/co-r>.

If you have any questions, please contact Kathy Chernich of my staff by telephone at (312) 353-6400, extension 4039, or email at kathy.g.chernich@usace.army.mil.

Sincerely,


Keith L. Wozniak
Chief, West Section
Regulatory Branch

Enclosures

Copy Furnished w/out Enclosure:

U.S. Fish and Wildlife Service (Rogner)
Illinois Department of Natural Resources (Schanzle)
Illinois Department of Natural Resources/OWR (Jereb)
Illinois Environmental Protection Agency (Yurdin)
Harza Engineering (Chitty)

U.S. Army Corps of Engineers
Chicago District

Basis of Jurisdiction

Project number 200000231

___ The subject parcel contains navigable "Waters of the U.S." pursuant to 33 CFR 328.3 (a) (1). The Federal jurisdiction falls within the area up to the ordinary highwater mark of the existing waterbody.

X The subject parcel contains interstate "Waters of the U.S." pursuant to 33 CFR 328.3 (a) (2). The Federal jurisdiction falls within the area up to the ordinary highwater mark of the existing waterbody.

X The subject parcel contains tributaries to navigable or interstate "Waters of the U.S." pursuant to 33 CFR 328.3 (a) (5).

The Federal jurisdiction falls within the area up to the ordinary highwater mark of the existing waterbody.

X The subject parcel contains wetlands that are bordering, contiguous, or neighboring other interstate "Waters of the U.S.", pursuant to 33 CFR 328.3 (a) (7). The wetland areas are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions.

___ The subject parcel contains intrastate "Waters of the U.S." The area in question is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. According to 33 CFR 328.3 (a) (3) the use, degradation or destruction of the intrastate body of water could affect interstate commerce, and is subject to Federal jurisdiction, for the following reasons:

___The subject area is used to irrigate crops sold in interstate commerce.

___The subject area is or could be used by interstate or foreign travelers for recreational or other purposes.

___The subject area is used or could be used to collect fish or shellfish that could be taken and sold in interstate or foreign commerce.

___The subject area is used or could be used for industrial purpose by industries in interstate commerce.



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
CHICAGO DISTRICT, CORPS OF ENGINEERS
111 NORTH CANAL STREET
CHICAGO, ILLINOIS 60606-7206

OCT 28 2002

Technical Services Division
Regulatory Branch
200000231

SUBJECT: Request for Jurisdictional Determination on Ditches at
O'Hare International Airport Located in Chicago, Cook County,
Illinois

City of Chicago Department of Aviation
Attn: James Considine
P.O Box 66142
Chicago, Illinois 60666

Dear Mr. Considine:

This is in response to your December 22, 1999 request that the U.S. Army Corps of Engineers complete a jurisdictional determination for the above-referenced site. The subject project has been assigned number 200000231; which is the same Corps number utilized for the previous determination made on wetlands. Please reference this number in all future correspondence concerning this project.

Following a review of the U.S. Fish and Wildlife Service National Wetland Inventory, U.S. Geological Survey Hydrologic Atlas, USDA Natural Resources Conservation Service Soil Survey for Cook County, the information submitted to this office and prepared by MWH, the information you submitted to this office on and a site visit conducted by Kathy Chernich of my staff on July 24, 2002, this office has determined that the subject property contains "waters of the United States". This office has determined that the ditches that are jurisdictional have predated the construction of O'Hare Airport and have been modified as a result of on-going construction activities. The ditches have been identified on the U.S.G.S. Elmhurst Quadrangle Map, dated 1928 (photo revised 1946) and on the U.S.G.S. Arlington Heights Quadrangle Map, dated 1953.

The following ditches have been determined to be jurisdictional:

a. Ditch #4, Ditch #7, Ditch #8, Ditch #10, Ditch #11, Ditch #13, Ditch #17, Ditch #18, and Ditch #19.

-2-

The following ditches have been determined to be non-jurisdictional:

a. Ditch #1, Ditch #2, Ditch #3, Ditch #5, Ditch #6, Ditch #9, Ditch #12, Ditch #14, Ditch #15, and Ditch #16.

Although this determination provides a notification of the presence of waters of the U.S., this determination does not finalize the wetland boundary. In the event application is submitted for work within jurisdictional areas, a wetland delineation and a wetland survey will need to be prepared and submitted to this office.

The jurisdiction determination decision document for the subject property is enclosed. This determination covers only your project as depicted in the information submitted on July 31, 2002, prepared by MWH.

This letter is considered an approved jurisdictional determination for your subject site. If you object to this determination, you may appeal, according to 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and a Request for Appeal (RFA) form. If you request to appeal the above determination, you must submit a completed RFA form within 60 days of the date on this letter to the Great Lakes/Ohio River Division Office at the following address:

Ms. Suzanne Chubb, Division Review Officer
Great Lakes and Ohio River Division
CELRD-CM-O
550 Main Street
Cincinnati, OH 45201-1159
Phone: 513-684-7261

If you concur with the determination in this letter, submittal of the RFA form to the Division office is not necessary.

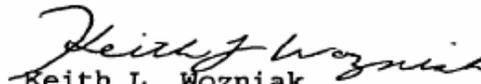
This determination has been conducted to identify the limits of the Corps Clean Water Act jurisdiction for the particular site identified in this request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service prior to starting work.

-3-

Pursuant to Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers regulates the discharge of dredged or fill material into waters of the United States, including wetlands. A Department of the Army permit is required for any proposed work involving the discharge of dredged or fill material within the jurisdiction of this office. To initiate the permit process, please submit a joint permit application form along with detailed plans of the proposed work. Information concerning our program, including the application form and an application checklist, can be found at and downloaded from our website:
<http://www.lrc.usace.army.mil/co-r>.

If you have any questions, please contact Kathy Chernich of my staff by telephone at (312) 353-6400, extension 4039, or email at kathy.g.chernich@usace.army.mil.

Sincerely,


Keith L. Wozniak
Chief, West Section
Regulatory Branch

Enclosures

Copy Furnished w/out Enclosure:

Montgomery Watson Harza (Chitty)

Ditches Under Review
 O'Hare Modernization Program
 Table 5

Corps Reviewed Ditches					
Ditch Number (Corp Letter)	Jurisdictional	Linear Feet	Bank to Bank (feet)#	Acre	Comment
1	No	Basin	NA	NA	South Detention
2	No	2,614.0	15	0.9	"forked Ditch"
3	No	2,981.0	15	1.0	
5	No	1,416.0	10	0.3	
6	No	2,431.0	20	1.1	Around SD 2
9	No	1,606.0	8	0.3	
12	No	1,312.0	15	0.5	Rental Car
14	No	996.0	10	0.2	
15	No	1,191.0	8	0.2	Road ditch
16	No	3,310.0	8	0.6	
17	Yes	3,854.0	10	0.9	Post Office Drainage
4	Yes	2,981.0	15	1.0	14R dead drainage
7	Yes	-	-	-	Hinsdale- Already WUS
8	Yes	-	-	-	Post 1- Already WUS
10	Yes	1,860.0	10	0.4	Military Site
11	Yes	660.0	10	0.2	Second arm of 10
13	Yes	1,986.0	15	0.7	East of Mannheim
18	Yes	1,400.0	5	0.2	Division/Cemetery
19	Yes	-	-	-	Post Office Drainage (WUS)
Total Jurisdictional		12,741.0		3.3	
Total Non-Jurisdictional		17,857		5.2	
Total		30,598.0		8.5	

Bank to Bank requirement as discussed with USCOE August 14, 2002

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Ditches Under Review
O'Hare Modernization Program
Table 5

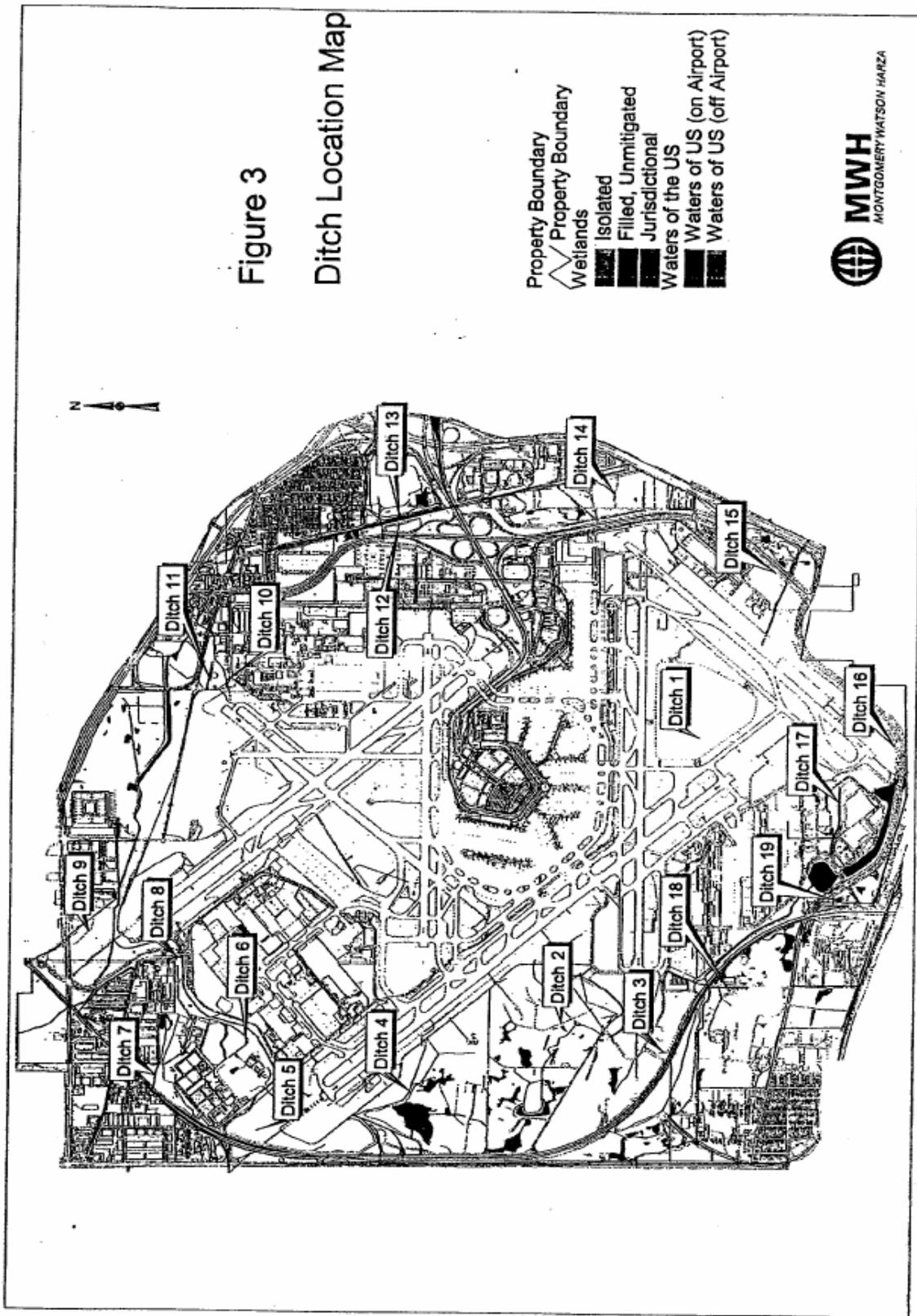
Waters of the US			
Water Body	Linear Feet	Bank to Bank# (feet)	Acres
Willow	12,946	30	8.9
Higgins	2,211	30	1.5
Willow-Higgins	9,778	35	7.9
Bensenville	6,980	18	2.9
Hinsdale - same as ditch #4 and 8	2,497	10	0.6
Crystal	2,487	25	1.4
Unnamed Willow-Higgins Creek Tributary	2,199	15	0.8
Post Office Drainage	3,794	18	1.6
Jurisdictional Ditches	12,741	varied	3.3
Total WUS	55,633		28.84

Basins	
Basins	Area
South Detention Basin (Ditch1)	NA
9R Basin	NA
Rental Car Basin(s)	NA

Conversions	
feet per mile	5,280
sq feet per acre	43,560

Bank to Bank requirement as discussed with USCOE August 14, 2002

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**ATTACHMENT N-4
DELINEATION OF WETLAND AND FLOODPLAIN
AREAS REPORT**

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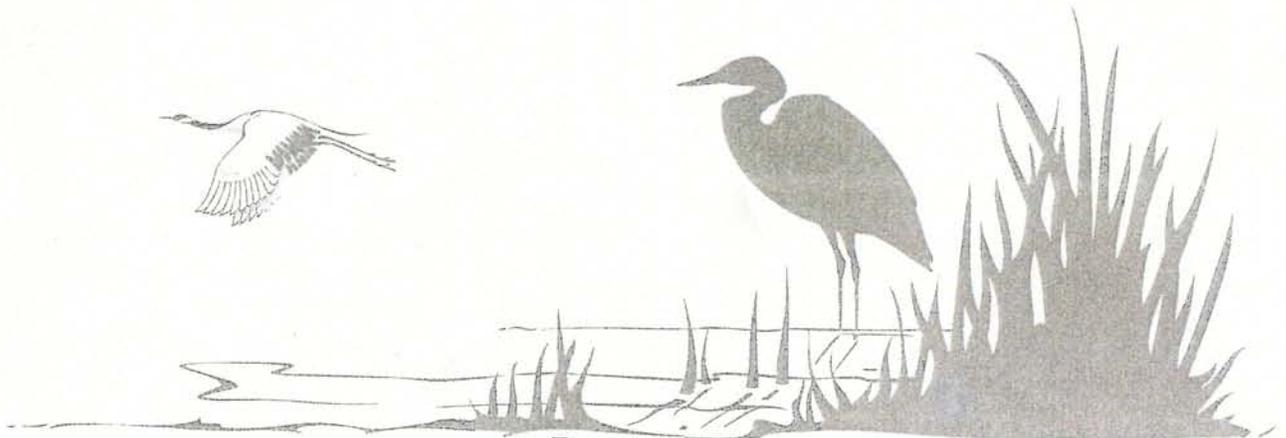
DELINEATION OF WETLAND AND FLOODPLAIN AREAS

CHICAGO O'HARE INTERNATIONAL AIRPORT



Prepared For

**City of Chicago
Department of Aviation**



By

Harza Environmental Services Inc.

February, 2000

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CHICAGO O'HARE INTERNATIONAL AIRPORT

WETLANDS DELINEATION REPORT

Prepared by

HARZA Engineering Company

February, 2000

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LIST OF EXHIBITS

- Exhibit 1: Project Study Area
- Exhibit 2: Soil Map
- Exhibit 3: National Wetland Inventory Map
- Exhibit 4: NRXS Wetland Map
- Exhibit 5: Wetland And Floodplain Areas

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CHICAGO O'HARE INTERNATIONAL AIRPORT**WETLAND AND FLOODPLAIN DELINEATION REPORT****1. INTRODUCTION**

This report documents the wetland studies involved in the update of the 1995 delineation of jurisdictional wetlands and Waters of the United States (WUS) on property owned by the City of Chicago at and around O'Hare International Airport¹. The objective of these studies is to confirm and update the 1995 wetland delineation and to document changes in the jurisdictional character of wetland and WUS areas on the airport property. These studies also include and present the delineation of the latest floodplain for the airport property.

The airport and associated properties are located in the far northwestern portion of the city of Chicago and encompass approximately 7,200 acres (Exhibit 1), which includes land areas inside and outside the air operations security fence. These properties include all or portions of Sections 4, 5, 6, 7, 8, 9, 16, 17 and 18 of Township 40N, Range 12E; Sections 31 and 32 of Township 41N, Range 12E; Section 36 of Township 41N, Range 11E; and Sections 1, 12 and 13 of Township 40N, Range 11E. The properties are comprised of upland and wetland areas consisting of mowed areas adjacent to and between runaways; concrete holding pads; runaways, taxiways, and snow dumps; vacant, grassy, brushy and wooded areas; and open waters.

2. EXISTING DATA

Prior to the field studies, existing available information on the hydrology, soils and wetlands of the properties was reviewed, as well as the 1995 field delineation, to focus the initial investigation. Bi-annual field inspections have been conducted of the existing wetland and floodplain areas since 1997, to monitor and document changes in these areas. Information collected during the inspections was also reviewed and included in the information base utilized for the fieldwork involved in the wetland delineation update. The field investigation then concentrated on those areas identified in the 1995 delineation and other areas with the greatest probability of containing wetland conditions and WUS areas.

¹ Hey and Associates. 1995. Chicago O'Hare International Airport - Wetland Delineation Report

2.1 Hydrology

The U.S. Geological Survey's Hydrologic Atlases were consulted to better understand the hydrologic conditions present at the properties². The floodplain maps and hydraulic profiles for the Lower Des Plaines Tributaries Watershed Study³ also were reviewed. Current topography for the properties also was reviewed to identify depressions that might seasonally pond water.

2.2 Soils

Soil maps were obtained from the Natural Resources Conservation Service. They are the result of the soil survey of DuPage and Cook Counties⁴; however, the soil survey is only available for that part of the airport in DuPage County (Exhibit 2). Still, by using available soil maps, other geologic and topographic information, and field observations, reasonable conclusions were reached about the soil conditions.

Consideration was given to atypical soil conditions of many areas on the O'Hare property resulting from past clearing and grading. Although the original soil profile no longer exists, characteristics typical of hydric (wetland) soils have developed where these soils have been saturated for prolonged periods.

On the properties were well-drained soils (Morley and Varna); moderately well drained soil (Markham); somewhat poorly drained soils (Elliott and Beecher); poorly drained soils (Ashkum and Drummer); and small areas of very poorly drained soils (Muskego and Houghton). Of these soils, Ashkum, Drummer, Muskego, and Houghton are included on the list of hydric soils⁵. Hydric soils are important because they are indicators, along with hydrophytic vegetation and wetland hydrology conditions, used to classify an area as a wetland.

² U.S. Geological Survey. 1963, 1964, 1966. Floods in the Arlington Heights, Elmhurst, Park Ridge, and River Forest Quadrangles. Hydrologic Investigations 67, 68, 85, and 106. Washington D.C.

³ Soil Conservation Service, U.S. Department of Agriculture. 1987. Lower Des Plaines Tributaries Watershed Floodplain Information Maps and Profiles. Washington, D.C.

⁴ Mapes, D.R. 1979. Soil Survey of DuPage and Part of Cook Counties, Illinois. Washington, D.C., U.S. Government Printing Office.

⁵ National Technical Committee for Hydric Soils. 1991. Hydric Soils of the United States. Washington, D.C., U.S. Soil Conservation Service.

2.3 National Wetland Inventory (NWI)

The National Wetland Inventory maps⁶ of the airport properties show approximately 40 wetlands (Exhibit 3). These maps were based on aerial photography, with less than 15 percent of the mapped areas being field checked. Nevertheless, these maps were useful in directing field efforts to areas likely to contain wetlands.

2.4 NRCS Wetland Inventory

During the 1980s, the NRCS conducted a wetland inventory that resulted in the designation of wetland areas for federal agricultural objectives⁷. It was based solely on published data, including soils information and NWI maps. No field verification was conducted. The results of that inventory were carefully reviewed. The NRCS Inventory source information consists of aerial photography, which for purposes of this report has been transferred into graphical format (Exhibit 4).

2.5 Periodic Wetland And Floodplain Investigations

Since the 1995 wetland delineation, both wetland and floodplain areas have been inspected twice a year, in the spring and in the fall. Data collected and changing conditions of wetland and floodplain areas were utilized in the update of the wetland delineation.

3. WETLAND DELINEATION METHODOLOGY

3.1 Field Procedures

Field investigations of the airport property were conducted during June, July and August, 1999. Weather conditions were typical of summer conditions in northeastern Illinois, although relatively dry. Wetland delineations were performed in accordance with the U.S. Army Corps of Engineers (Corps) routine on-site determination method.⁸. In addition, methods to delineate jurisdictional areas in atypical situations were used to

⁶ U.S. Fish and Wildlife Service. National Wetland Inventory. Arlington Heights, Elmhurst, Park Ridge, and River Forest Quadrangles. Washington D.C.

⁷ Natural Resources Conservation Service. 1988. [Wetland Inventory Maps of Cook and DuPage Counties, Illinois]. Palatine and St. Charles, IL, Natural Resources Conservation Service (formerly Soil Conservation Service (SCS)).

⁸ Corps of Engineers, Environmental Laboratory. 1987. Wetland Delineation Manual. Technical Report Y-87-1. Vicksburg, Miss., Waterways Experiment Station.

determine boundaries in areas of disturbed conditions where one or more of the three criteria defining jurisdictional areas (soils, vegetation, and hydrology) were sufficiently disturbed to consider the site "atypical" under the Corps methods.

All areas of the airport were traversed and all wetland and WUS areas identified in the 1995 wetland delineation and other areas with apparent or suspected wetlands identified during past bi-annual inspections were investigated. Field indicators of wetland vegetation, hydric soil and hydrology were confirmed if necessary through several routine on-site sample points. Wetland boundaries of previously delineated wetland areas were confirmed and boundaries of new wetland areas were delineated. Areas that were previously identified as wetlands and no longer were observed to have field indicators of wetland vegetation, hydric soil, and/or hydrology have been removed from the list of jurisdictional wetlands in Table 2 and are now considered as non-wetland areas. A qualitative assessment of wetland quality was also estimated for each wetland. All information is documented on routine on-site delineation forms contained in Appendix A, Volume II of this report.

3.2 Wetland Criteria

Field indicators of hydric soil include reoximorphic features, such as depleted matrix, typified by greyed and low chroma colors⁹ and by iron and manganese masses and concentrations. These factors were verified for wetland identification in the 1995 wetland delineation and confirmed for the delineation of new wetland areas. Soil classification was accomplished through the use of handheld three-quarter inch soil sampling tubes or bucket auger.

Field indicators of hydrology include visual observation or of soil inundation or saturation during the growing season, oxidized channels associated with living roots and rhizomes, watermarks, drift lines, waterborne sediment deposits, water-stained leaves, surface scoured area, and wetland drainage patterns. Ample evidence indicates that within the areas delineated as wetlands, the water table is within 12 inches of the soil surface for at least two weeks during the growing season.

⁹ Macbeth Divisions of Kollmorgen Instruments Corporation. 1994. Munsell Soil Color Charts.

The plant taxonomic nomenclature of Swink and Willhelm¹⁰ is used in this report. Approximately 80 percent of the plant species present were identified in the field. While a more complete plant list would have been compiled if the all the surveys had been conducted from several site visits throughout the growing season, but the delineated wetlands would remain the same.

The U.S. Fish and Wildlife Service has developed categories and probabilities for plant species likely to be found in wetlands (Table 1). The indicator categories in Table 1 were used in this delineation. The percentage figures in the right-hand column of Table 1 give the estimated probability that a species will occur in a wetland. Frequently, the indicator symbols include a "+" or "-" to indicate on which side of the wetness spectrum a species might be found.

Indicator Category	Symbol	Probability of Wetland Occurrence
Obligate Wetland	OBL	>= 99%
Facultative Wetland	FACW	>= 67% to < 99%
Facultative	FAC	>= 23% to < 67%
Facultative Upland	FACU	>= 1% to < 33%
Obligate Upland	UPL	< 1 %

Relative quality ratings of the wetlands were calculated using the Natural Areas Rating Index (NARI), developed by Swink and Wilhelm. The NARI assessment method assigns each plant species a rating that reflects the fundamental conservatism the particular species exhibits for its natural habitat. A native species that exhibits specific adaptations to a narrow range of habitat conditions is given a high rating. Conversely, a non-native ubiquitous species that exhibits adaptations to a broad range of environmental variables is assigned a low rating. An area with a NARI of 35 or greater is considered to be of "natural area quality" in the Chicago metropolitan region. When a NARI in the mid-20s is assigned, this indicates an area of above average quality in which many native plant species are present. NARIs less than 15 indicate areas with a high degree of disturbance and few native species.

¹⁰ Swink, F. and G. Willhelm. 1979. Plants of the Chicago Region. Lisle, Illinois. The Morton Arboretum.

¹¹ Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBS-79-31, U.S. Fish and Wildlife Service, Office of Biological Service, Washington, D.C.

4. DELINEATION RESULTS

Approximately 128 acres of wetlands were found in 122 sites on the airport property. Also, approximately 20 acres of jurisdictional Waters of the United States are located at the airport, including parts of Bensenville Ditch, Crystal Creek, Higgins Creek, Willow Creek and Willow-Higgins Creek.

The delineation wetlands and other jurisdictional areas are mapped on a 1 inch = 800 feet scale, airport layout map (Exhibit 5). The Routine Wetland Determination, data forms (1987 Corps of Engineers, Wetland Delineation Manual), for the wetland and upland areas appear in Volume II, Appendix A of this report. These data forms provide information on the vegetative, hydrologic, and soil characteristics for all possible wetland sites that were investigated by Harza's personnel.

Table 2 summarizes the delineation results. The jurisdictional site numbers and names used in these tables are keyed to the layout map presented as Exhibit 5. The O'Hare land area was broken down into four quadrants: NW, NE, SW and SE. The letters of each quadrant replace the letter portion of each wetland identifiers from the 1995 Delineation Report to provide a quick location reference for the wetlands. However, the number portions of the wetland identifiers remain the same in most situations. The north-south divider for the quadrants was defined as north and south I-190 as if it was extended east to west across the O'Hare property to just south of Willow Creek. The east-west divider was defined as from Wolf Road south to just east of the wetland areas adjacent to the U.S. post office area. Table 3 is a key to the cover-type classification used to describe the sites of wetlands.

In the process of renaming the wetlands using the quadrant section as the text name and keeping the original jurisdictional numbers, there were several cases of duplication. To resolve this problem, the 1999 wetland delineation name was given the first available number in the quadrant. In Table 2, column one represents the 1995 wetland delineation names, and column two represents the 1999-wetland delineation names. The asterisk "*" identifies wetlands that the original site number of the wetland was changed to prevent duplication.

Table 2. Delineated Wetlands, O'Hare International Airport

Old Name (1995) Wetland Delineation Sites	Renamed (1999) Wetland Delineation Sites	Approximate Acreage	NARI	Cover Type
MA143	(REMOVED)			
MA51	(REMOVED)			
WL1	(REMOVED)			
WL21	(REMOVED)			
WL3	(REMOVED)			
WL4	(REMOVED)			
(NEW)	NE1	0.02	12	PFO1C
WL10	NE10	0.09	9	PFO1C
(NEW)	NE11	0.25	12	PEMCs
WL12	NE12	0.70	12	PEMCd
WL14	NE14	0.82	16	PEMC
WL15	NE15	2.36	15	PEMCd
WL17	NE17	0.31	12	PEMCd
WL18	NE18	0.14	16	PEMCd
WL19	NE19	0.95	4	PEMC
WL2	NE2	0.03	12	PEMCd
WL20	NE20	0.22	2	PEMCx
H40	NE40	0.09	5	PEMCs
H41	NE41	0.49	7	PEMC
WL5	NE5	0.21	7	PFO1C
H52	NE52	0.67	12	PEMCs
H53	NE53	0.47	5	PEMF
H55	NE55	0.30	12	PEMCs
H58	NE58	2.96	14	PFO1C
WL6	NE6	0.25	13	PEMC
H60	NE60	0.13	4	PFO1C
H65	NE65	0.15	6	Pss1Cd
H66	NE66	0.02	7	PFO1C
WL7	NE7	0.06	3	PFO1C
WL8	NE8	0.03	7	PFO1Cd
WL9	NE9	0.27	13	PEMC
(NEW)	NW1	0.02	4	PFO1C
(NEW)	NW2	0.05	12	PEMCx
V26	NW26	0.21	11	PFO1C
V27	NW27	0.03	7	PFO1C
V28	NW28	15.16	27	PEMCd
V29	NW29	3.74	17	PEMCd
V30	NW30	0.16	11	PEMW
H31	NW3	0.11	8	PEMCs
V31	NW31	0.24	12	PEMCd
V32	NW32	0.45	12	PEMW
H33	NW33	0.16	8	PEMC

Table 2. Delineated Wetlands, O'Hare International Airport

Old Name (1995) Wetland Delineation Sites	Renamed (1999) Wetland Delineation Sites	Approximate Acreage	NARI	Cover Type
H34	NW34	0.30	9	PEMC
H35	NW35	0.05	8	PEMC
H36	NW36	0.05	11	PEMC
H37a	NW37A	1.24	13	PEMC
H37b	NW37B	0.08	7	PF01C
H39	NW39	0.02	4	PEMCs
MA50	NW50	1.22	12	PEMCd
MA52	NW52	0.58	16	PEMC
MA54	NW54	0.06	9	PEMCd
MA1	SE1	0.12	6	PEMC
MA2	SE2	0.08	6	PEMC
(NEW)	SE3	0.36	7	PEMCd
MA55	SE55	0.36	3	PEMCs
MA60	SE60	1.67	18	PEMC
MA61	SE61	0.04	12	PEMC
MA62	SE62	0.82	7	PEMCd
MA63	SE63	0.06	11	PEMCd/PFOCd
MA64	SE64	0.34	9	PF01Cd
MA65	SE65	0.03	1	PSS1Cx
H71	SE71	0.30	12	PF01C
H72	SE72	2.18	18	PEMCs
H73	SE73	0.33	14	PEMCs
H74	SE74	0.63	5	PF01C
H75	SE75	1.21	16	PEMC/PF01C
H79	SE79	0.17	9	PEMC
H1	SW1	0.18	8	PEMCs
H10	SW10	0.11	9	PSS1C
H100	SW100	0.48	6	PEMcf
H101	SW101	0.17	6	PF01C
H105	SW105	4.02	13	PEMd/PF01C/PEMC
H106	SW106	2.28	17	PEMCPOWHx/PEMWx
H107	SW107A	0.86	13	PEMC
(NEW)	SW107B	0.56	13	PEMC
H11	SW11	2.07	17	PEMF
H12	SW12	0.40	15	PEMCs
MA120	SW120	14.60	19	PEMJ
MA121	SW121	10.20	16	PEMJ
H13	SW13	0.18	9	PSS1C
MA130	SW130	0.73	14	PEMCd
MA131	SW131	0.40	14	PEMCd
MA132	SW132	0.28	8	PFO1Cd
MA133	SW133	0.01	2	PFO1Cx
MA134	SW134	0.02	3	PFO1Cd

Table 2. Delineated Wetlands, O'Hare International Airport

Old Name (1995) Wetland Delineation Sites	Renamed (1999) Wetland Delineation Sites	Approximate Acreage	NARI	Cover Type
MA137	SW137	0.16	12	PEMCd
MA138	SW138	0.01	8	PEMCd
H14	SW14	0.05	9	PSS1C
MA144	SW144	0.03	6	P/fO1Cd
MA145	SW145	0.03	5	PEMCx
V15	SW15	6.98	22	PF01Cd/PEMC
V16	SW16	0.09	13	PFO1C
H17	SW17	0.23	8	PSS1C
H18	SW18	0.25	6	PF01C
H19	SW19	0.06	6	PEMCs
H2	SW2	0.64	14	PEMCs
MA14	SW20*	0.34	7	PEMCs
MA5	SW21*	2.51	12	PEMCd
MA6	SW22*	0.57	17	PF01C
V1	SW23*	0.94	12	PEMC
V10	SW24*	0.88	11	PEMC/PFO1C
V11	SW25*	0.64	10	PFO1Cd
MA12	SW28*	0.20	12	PEMCs
MA13	SW29*	0.03	8	PSS1
H3	SW3	0.24	6	POWx
(NEW)	SW31	0.86	12	PEMCd
(NEW)	SW32	0.36	9	PEMCd
V13	SW33*	3.36	18	PFO1Cd/PEMC
(NEW)	SW34	0.19	12	PSS1C
(NEW)	SW35	1.04	16	PEMW
MA4	SW4	3.73	15	PEMC
H5	SW5	5.14	16	PEMCs
H6	SW6	0.29	9	PEMCs
H7	SW7	0.37	9	PF01C
H8	SW8	6.97	18	PF01C
MA80	SW80	0.10	9	PEMCd
MA81	SW81	1.57	13	PEMC
MA82	SW82	0.28	6	PEMC
MA83	SW83	0.89	13	PEMCd
MA84	SW84	0.57	10	PEMCd
MA85	SW85	0.30	7	PEMCd
H9	SW9	2.83	19	PEMF
H90	SW90	0.33	5	PSS1
H91	SW91	0.21	4	PF01C
H92	SW92	0.19	6	PEMCd
H93	SW93	0.12	10	PEMCd

Old Name (1995) Wetland Delineation Sites	Renamed (1999) Wetland Delineation Sites	Approximate Acreage	NARI	Cover Type
H96	SW96	0.97	5	PEMC
H96a	SW96A	0.37	14	PEMC
	Total 122	128.09		

* Indicates new number was given to the wetland to prevent duplication in the renaming process

Palustrine Emergent Class – PEM	
PEMC	Seasonally flooded
PEMCF	Seasonally flooded, farmed
PEMCS	Seasonally flooded, spoil
PEMCX	Seasonally flooded, excavated
PEMCD	Seasonally flooded, partially drained/ditched
PEMF	Semipermanently flooded
PEMFS	Semipermanently flooded, spoil
PEMD	Partially drained/ditch
PEMJ	Intermittently flooded
PEMW	Intermittently flooded/temporary
PEMWd	Intermittently flooded/temporary, partially drained ditch
PEMWx	Intermittently flooded/temporary, excavated
Palustrine Forested, Broad-Leaved Deciduous Class –PFO1	
PFO1C	Seasonally flooded
PFO1Cd	Seasonally flooded, partially drained/ditched
PFO1Cx	Seasonally flooded, excavated
PFO1F	Semipermanently flooded
Palustrine Scrub – Shrub - PSS	
PSS1C	Broad-leaved deciduous, seasonally flooded
PPSS1Cd	Broad-leaved deciduous, seasonally flooded, partially drained/ditched
PSS1Cs	Broad-leaved deciduous, seasonally flooded, spoil
PSS1Cx	Broad-leaved deciduous, seasonally flooded, excavated
Palustrine Open Water Class – POW	
POWx	Excavated
POWHx	Permanently flooded, excavated

5. SUMMARY ASSESSMENT OF SITE WETLANDS

5.1 OVERVIEW

The aquatic ecology of the O'Hare properties can be characterized as many small, individual sites having relatively low water quality, stormwater and flood storage, and wildlife habitat. The wetlands reflect the urban stresses that could be anticipated from such intensive land use.

5.1.1 Soils

Most of the observed soils on the airport property have been disturbed. Those undisturbed soils that were observed are located in areas on the southwest side of the airfield and those operated by the Department of Forestry. The majority of the soils are the product of some type of earthmoving activity and are, for the most part, Entisols. The disturbed soils within the wetland areas are either Endoaquents or Epiaquents. A large number of Entisols have developed due to the removal of the upper part of the soil, likely during earthmoving activities, and subsequent subsoil exposure.

5.1.2 Wildlife Habitat

Wildlife habitat occurs at the airport in several distinct habitat types. The major habitats include upland woods, wet woods, herbaceous wetland, mowed lawn, unmowed meadows, and perennial streams. The areas in and around the airport generally have been modified from their original condition and represent artificial situations or second growth stands of trees. In general, the highest quality habitat is the woodlands located on the west side of the airport, especially those woodlands containing seasonally flooded wetlands. These woodlands provide food, shelter and water for many species of common wildlife including, coyotes, red foxes, raccoons, and cottontail rabbits. A breeding population of birds is present in the woodlands, which also contain seasonal ponds that most likely produce amphibians such as spring peepers, chorus frogs, American toad, and salamanders.

5.1.3 Storm and Floodwater Storage

The O'Hare's wetlands have value for shallow depression storage of stormwater and snowmelt runoff. However, since few of the wetlands are located adjacent to streams,

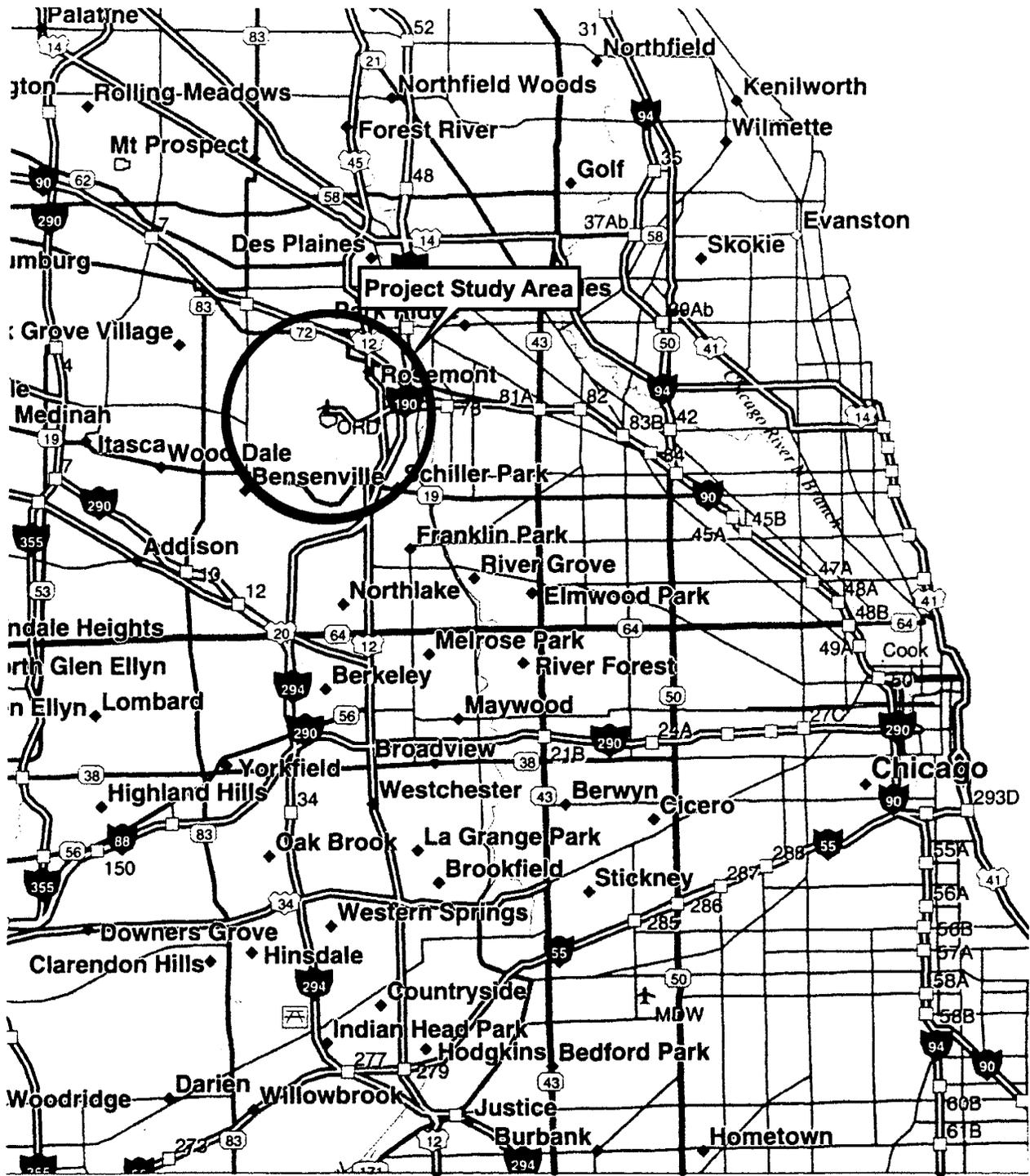
they offer little in the way of floodwater storage benefit. The Waters of the United States are used for flood storage and conveyance.

5.1.4 Vegetation

The plant communities are generally not well organized and are often dominated by weedy colonizers such as reed canary grass (*Phalaris arundinacea*) and cattail (*Typha spp.*).

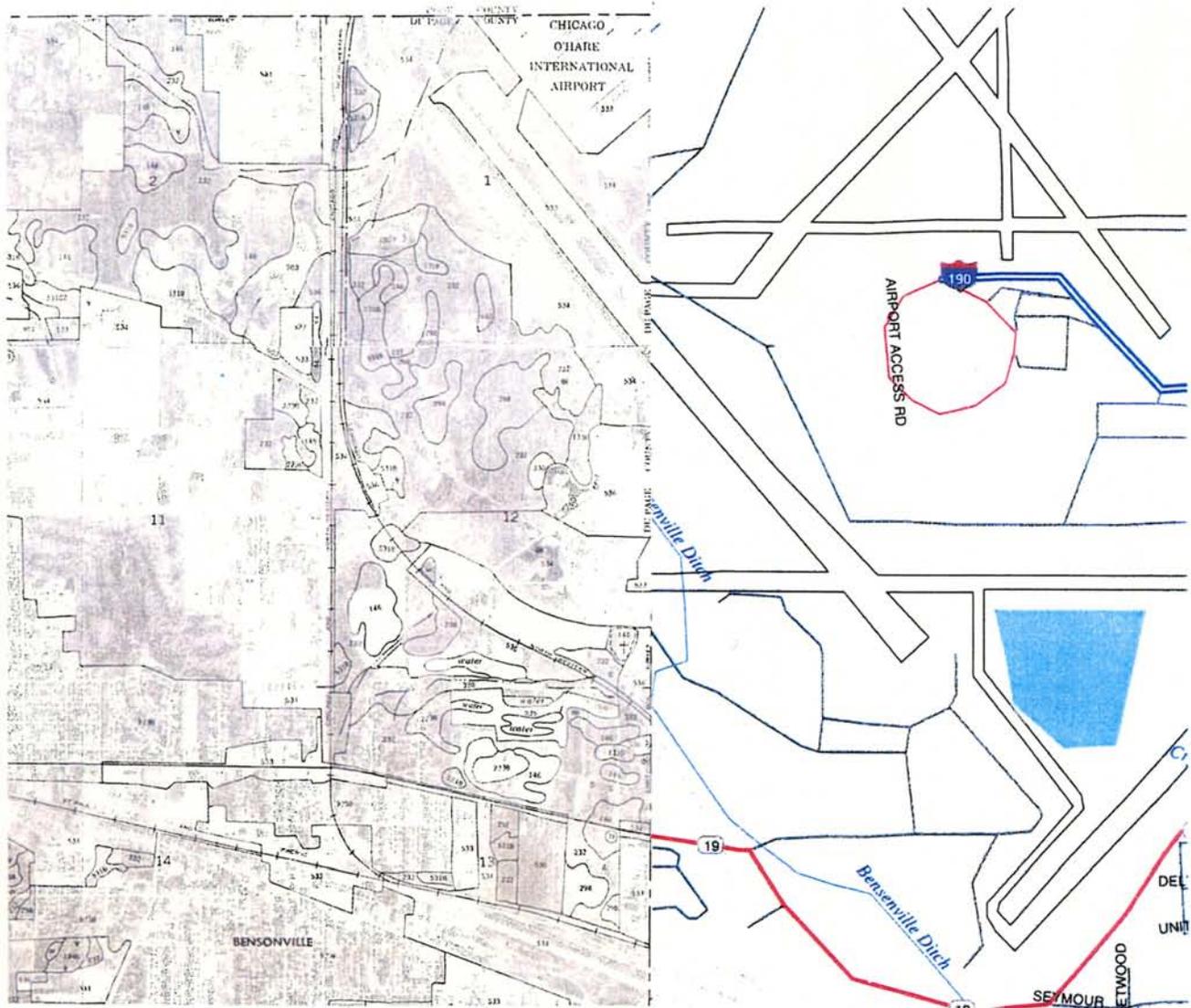
5.1.5 Water Quality

The aquatic landscapes do provide some water quality benefits, including sediment deposition and nutrient removal. The vast majority, however, are disconnected, off-line. Therefore, their water quality benefits are highly localized and have little appreciable effect on surface water quality. The grass swales are continually mowed, which limits their value for water quality. South detention pond, however, is specifically designed and operated for water quality and stormwater management purposes.



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Source: Soil Survey of DuPage and Part of Cook County, Illinois. NRCS.

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Source: Natural Resource Conservation Service Wetland Inventory Maps of Cook and DuPage Counties.

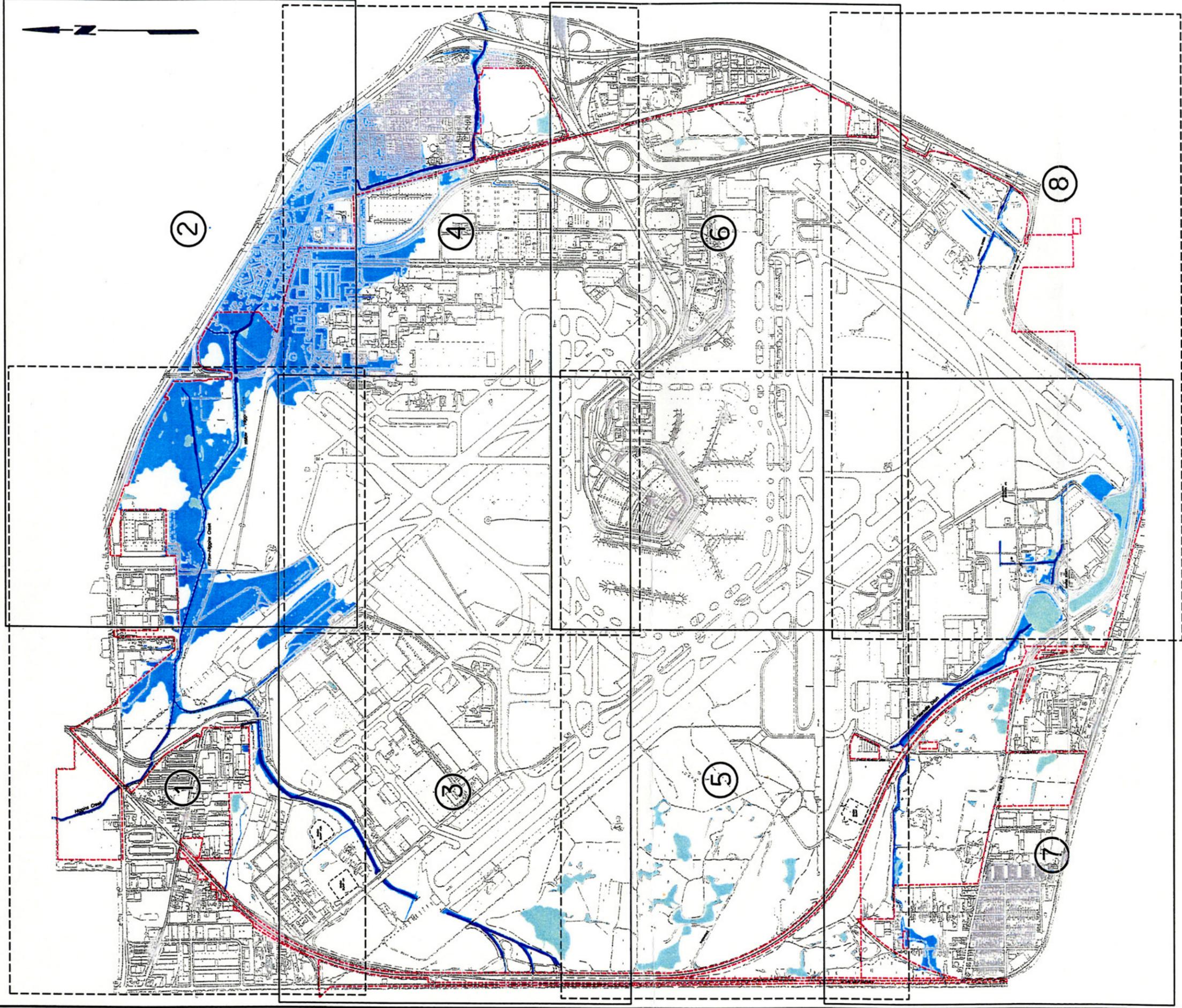
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HARZA ENGINEERING COMPANY
WATER & ENVIRONMENT

NRCS WETLAND MAP
O'HARE INTERNATIONAL AIRPORT WETLAND DELINEATION
City of Chicago, Illinois

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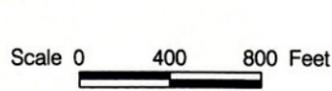
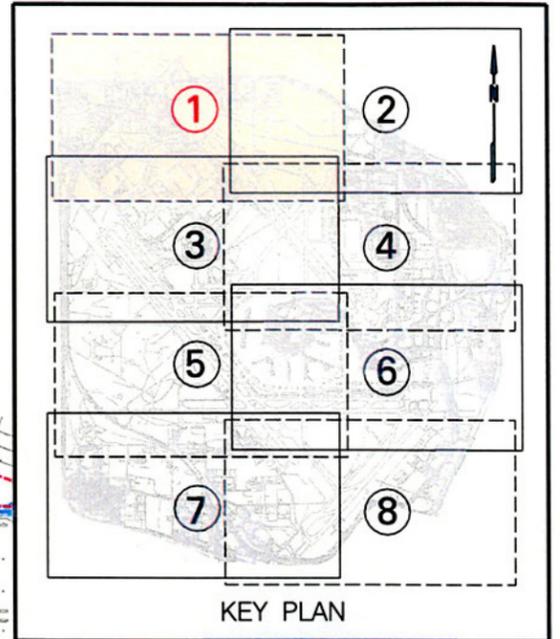
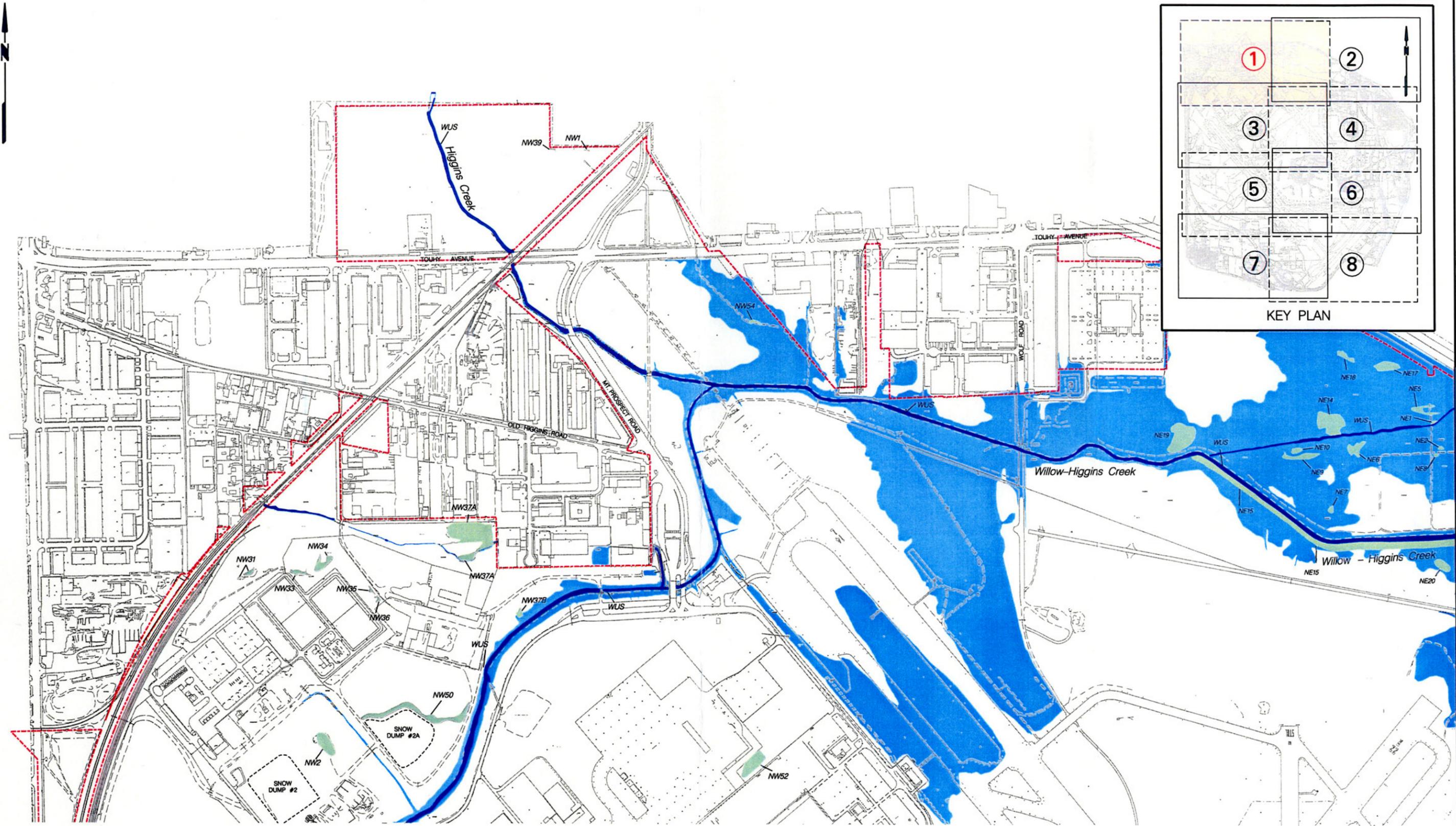
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- LEGEND:
- Wetland
 - 100 - Year Flood Area
 - Waters of the United States (WUS)
 - Property Boundary

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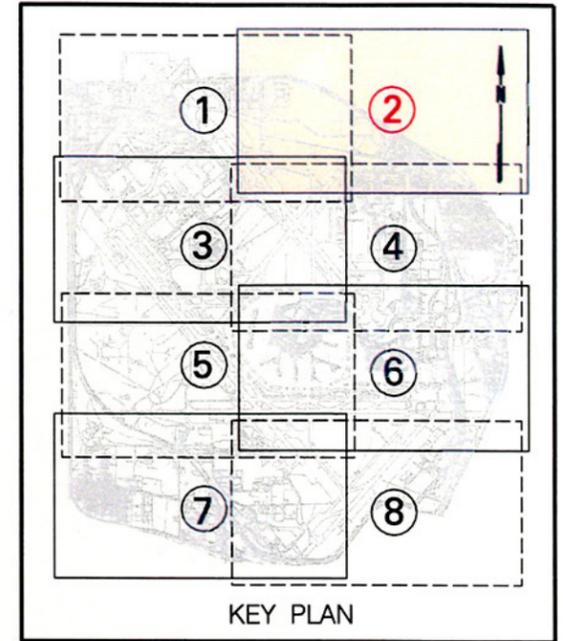
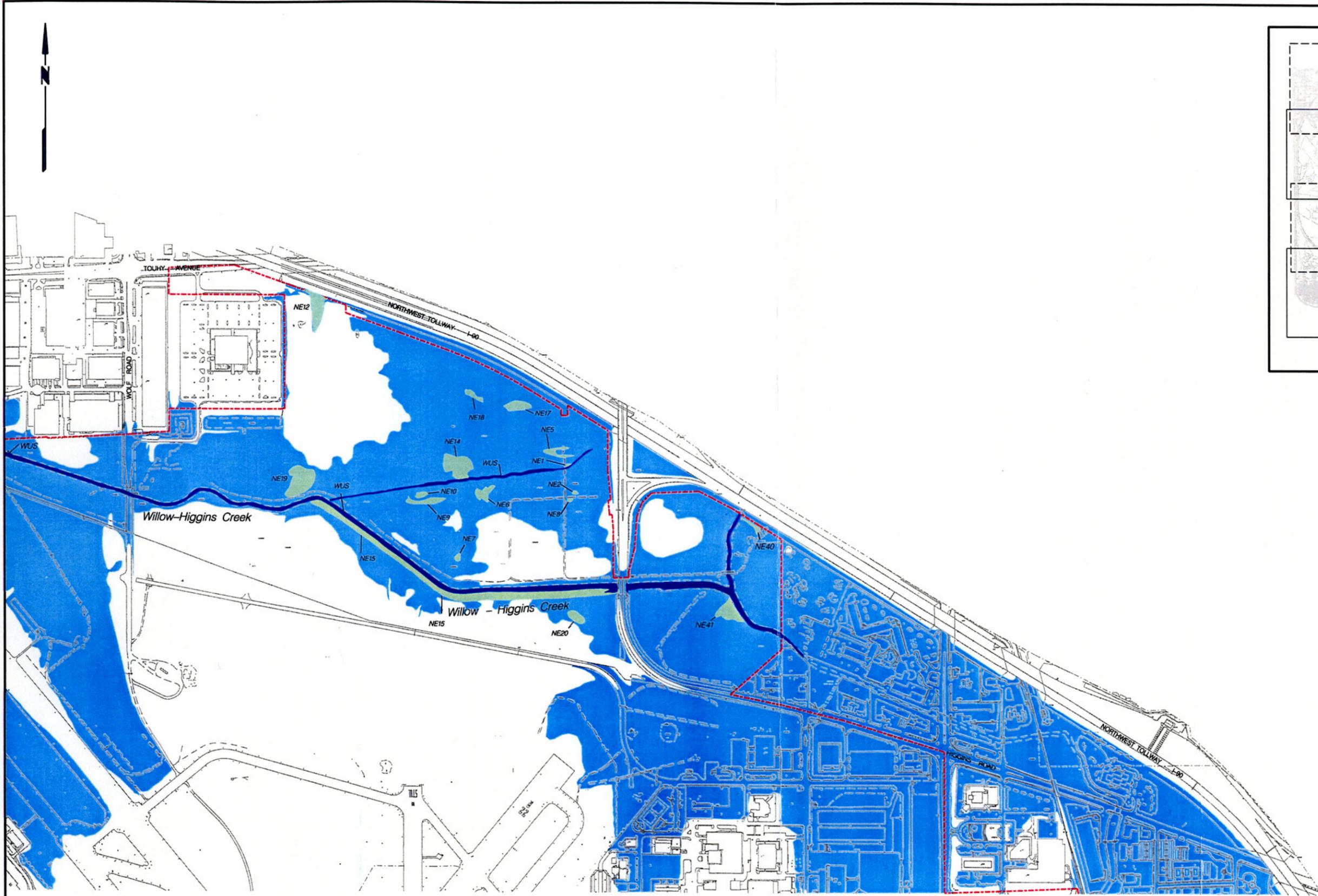
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- LEGEND:
- Wetland
 - 100 - Year Flood Area
 - Waters of the United States (WUS)
 - Property Boundary

HARZA ENGINEERING COMPANY
WATER & ENVIRONMENT

WETLAND AND FLOODPLAIN AREAS
O'HARE INTERNATIONAL AIRPORT WETLAND DELINEATION
City of Chicago, Illinois



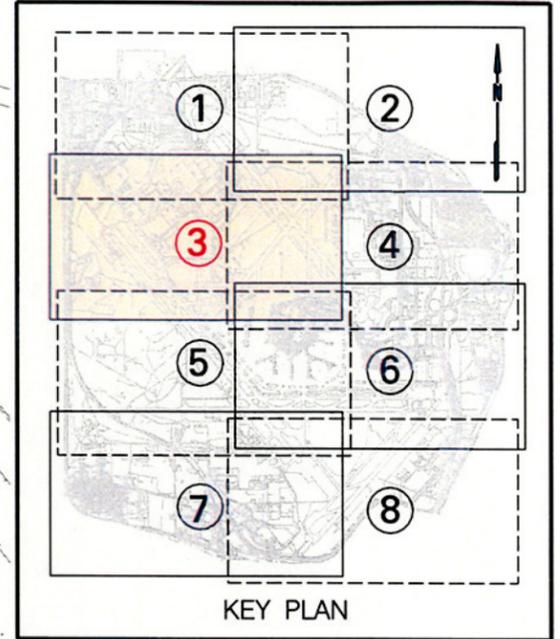
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LEGEND:

- Wetland
- 100 - Year Flood Area
- Waters of the United States (WUS)
- Property Boundary

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WETLAND AND FLOODPLAIN AREAS
O'HARE INTERNATIONAL AIRPORT WETLAND DELINEATION
City of Chicago, Illinois

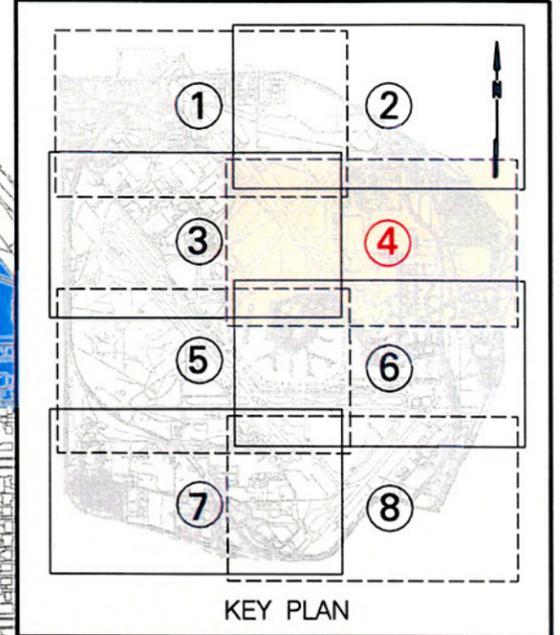
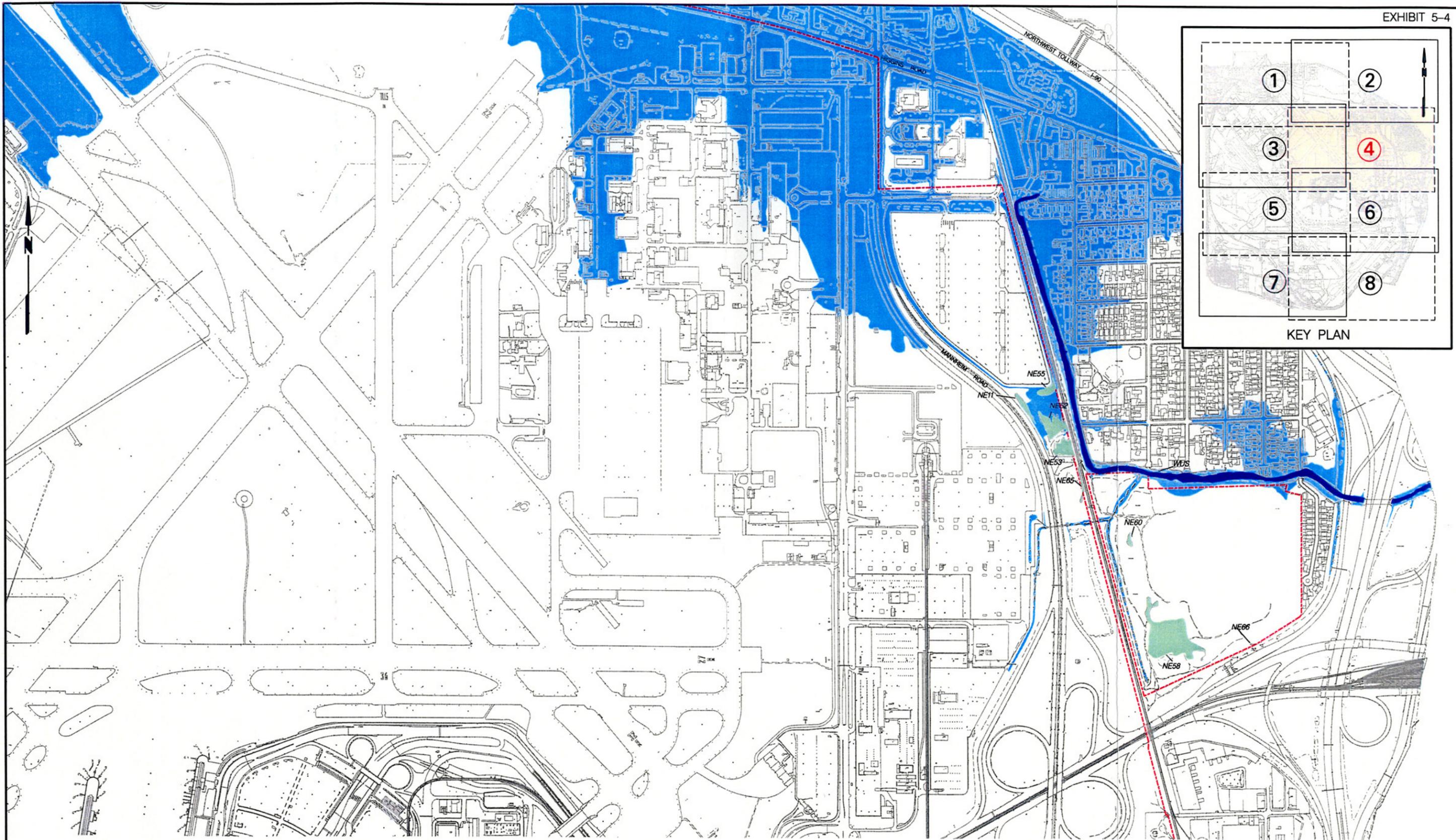


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- LEGEND:
- Wetland
 - 100 - Year Flood Area
 - Property Boundary
 - Waters of the United States (WUS)

HARZA ENGINEERING COMPANY
WATER & ENVIRONMENT

WETLAND AND FLOODPLAIN AREAS
O'HARE INTERNATIONAL AIRPORT WETLAND DELINEATION
City of Chicago, Illinois



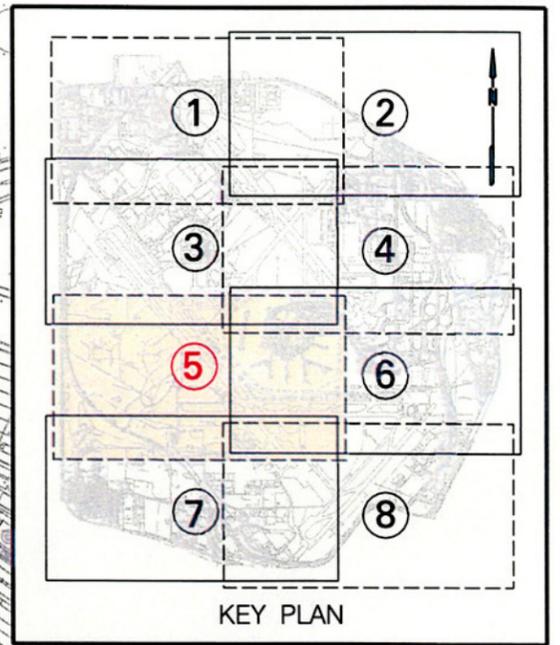
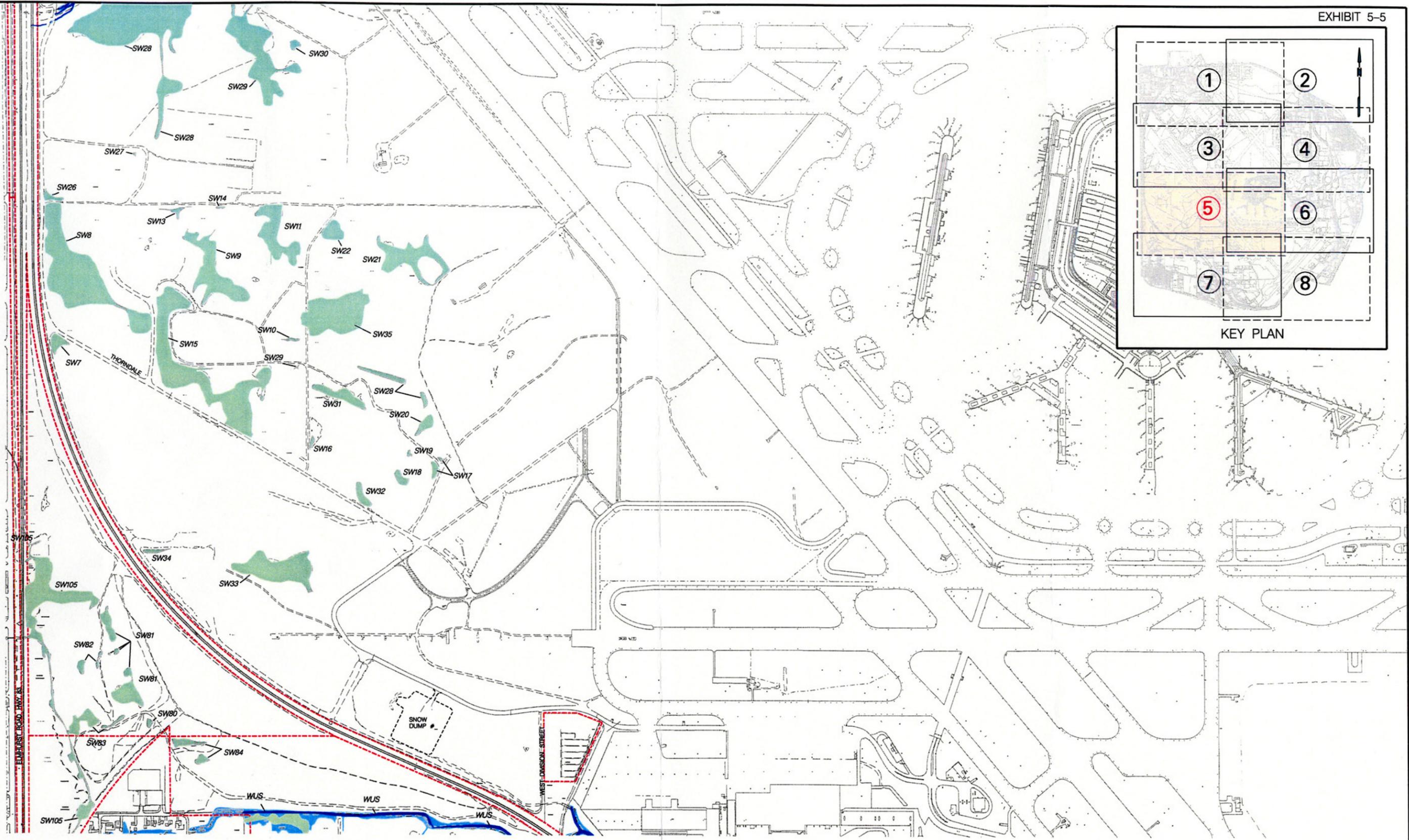
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LEGEND:

- Wetland
- Waters of the United States (WUS)
- 100 - Year Flood Area
- Property Boundary

HARZA ENGINEERING COMPANY
WATER & ENVIRONMENT

WETLAND AND FLOODPLAIN AREAS
O'HARE INTERNATIONAL AIRPORT WETLAND DELINEATION
City of Chicago, Illinois



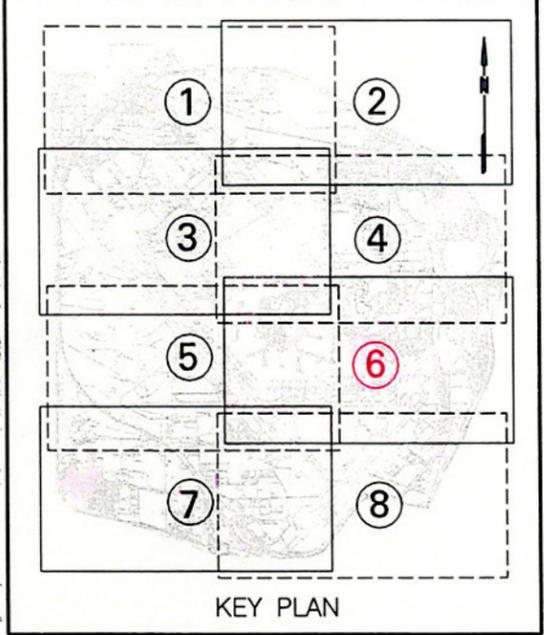
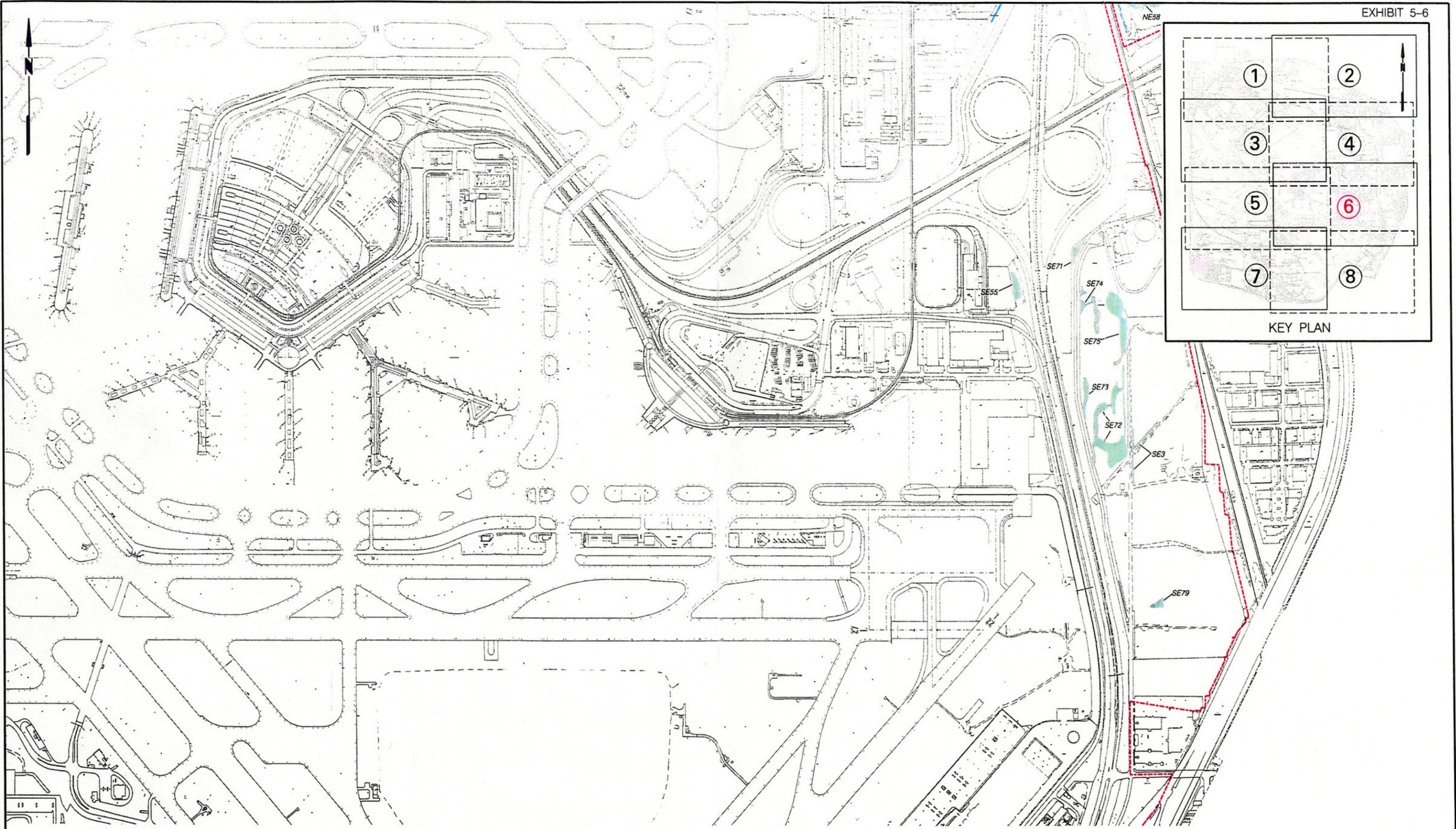
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LEGEND:

-  Wetland
-  100 - Year Flood Area
-  Waters of the United States (WUS)
-  Property Boundary

HARZA ENGINEERING COMPANY
WATER & ENVIRONMENT

WETLAND AND FLOODPLAIN AREAS
O'HARE INTERNATIONAL AIRPORT WETLAND DELINEATION
City of Chicago, Illinois



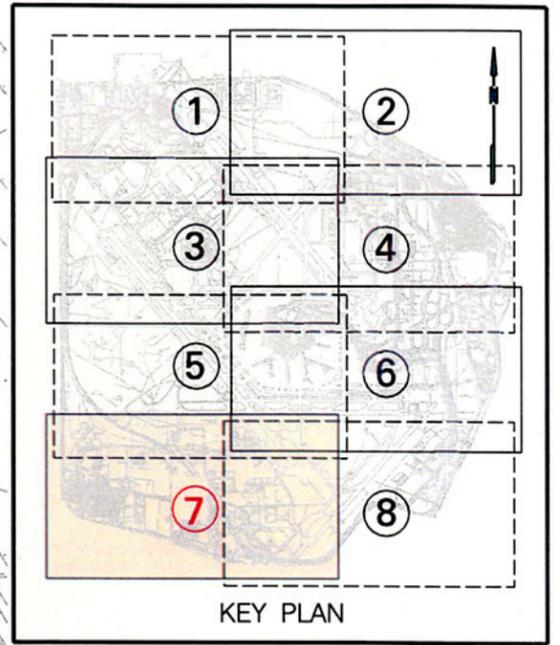
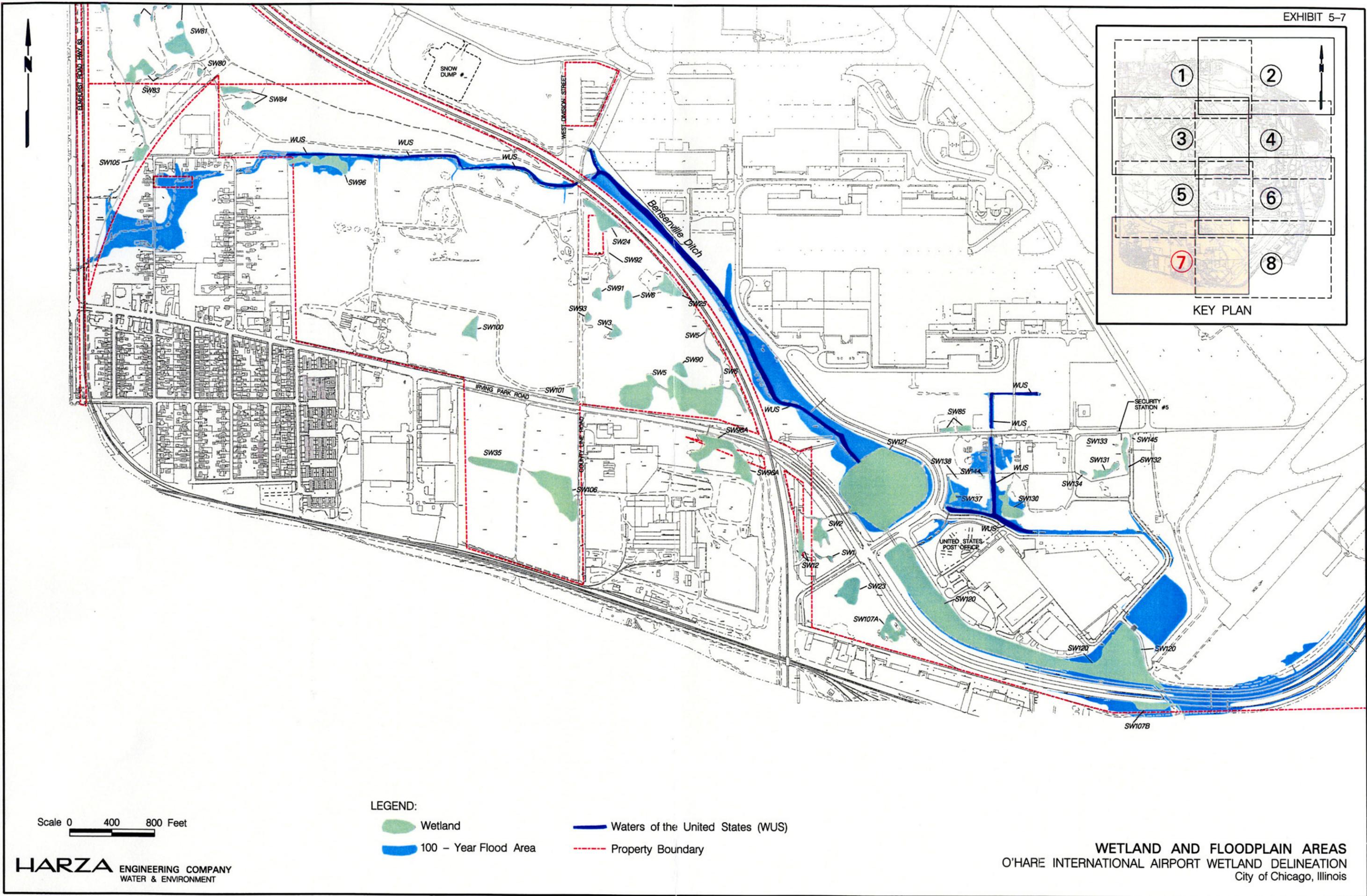
LEGEND:

-  Wetland
-  100 - Year Flood Area
-  Waters of the United States (WUS)
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Scale 0 400 800 Feet

HARZA ENGINEERING COMPANY
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WETLAND AND FLOODPLAIN AREAS
O'HARE INTERNATIONAL AIRPORT WETLAND DELINEATION
City of Chicago, Illinois



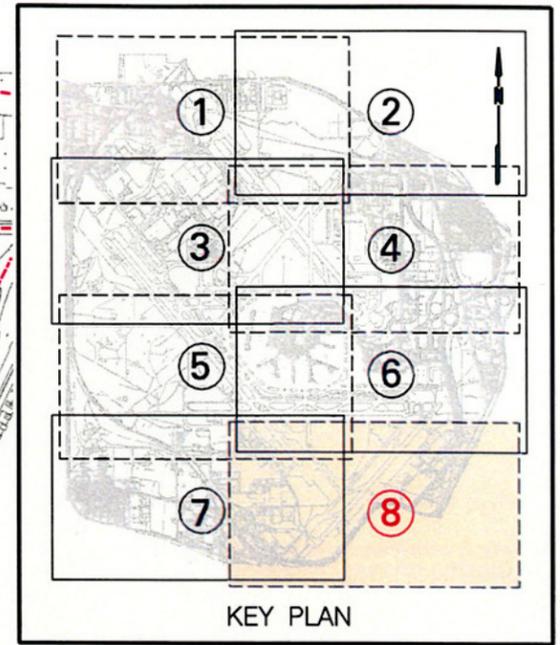
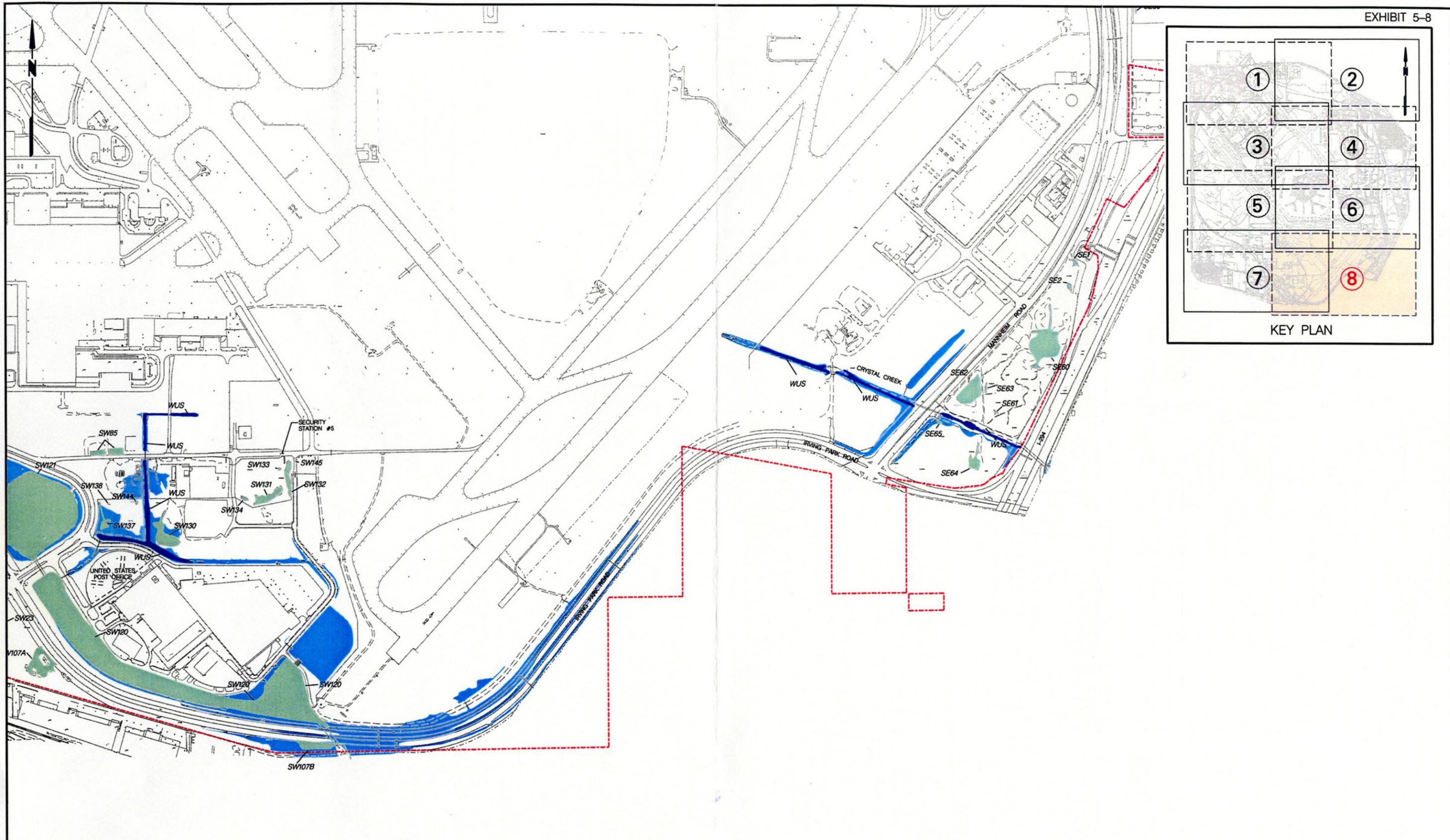
LEGEND:

- Wetland
- 100 - Year Flood Area
- Waters of the United States (WUS)
- Property Boundary

Scale 0 400 800 Feet

HARZA ENGINEERING COMPANY
WATER & ENVIRONMENT

WETLAND AND FLOODPLAIN AREAS
O'HARE INTERNATIONAL AIRPORT WETLAND DELINEATION
City of Chicago, Illinois



Scale 0 400 800 Feet

- LEGEND:
- Wetland
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 - Property Boundary

HARZA ENGINEERING COMPANY
WATER & ENVIRONMENT

WETLAND AND FLOODPLAIN AREAS
O'HARE INTERNATIONAL AIRPORT WETLAND DELINEATION
City of Chicago, Illinois



DEPARTMENT OF THE ARMY
CHICAGO DISTRICT, CORPS OF ENGINEERS
111 NORTH CANAL STREET
CHICAGO, ILLINOIS 60606-7206

FEB 18 2000

REPLY TO
ATTENTION OF:

Construction-Operations Division
Regulatory Branch
200000231

SUBJECT: Request for Delineation Confirmation on Revised Wetland Delineation for O'Hare International Airport Located in Chicago, Cook County, Illinois.

City of Chicago Department of Aviation
Attn: James Considine
P.O Box 66142
Chicago 60666

Dear Mr. Considine:

This is in response to your request that the Corps of Engineers confirm the revised wetland delineation for O'Hare International Airport.

A representative of this office and representatives of the Department of Aviation inspected the site on December 13, 1999. The revised wetland delineation had "removed" wetlands which had been previously confirmed by Mark Matusiak of this office, and the report had added additional areas where jurisdiction remained in question. Our December 13th site inspection of the additional areas has determined the following:

- a) areas SE3 and NE11 were once part of larger wetland systems and have been determined by this office to be jurisdictional.
- b) the two locations encompassing area SW85 have been determined to be jurisdictional wetland because they are isolated depressions not directly related to the road and drainage ditch system.
- c) areas SE 4 and SE 80 are not jurisdictional wetlands because they have been determined to be part of a road and drainage ditch system.
- d) all remaining areas designated as wetlands and waters of the U.S. disclosed in the "Draft, Delineation of Wetland and Floodplain Areas" wetland delineation, dated November 1999, and prepared by Harza Engineering, have been confirmed by this office to be jurisdictional.

A copy of the final wetland delineation report referencing all Corps approved revisions as well as all Corps previously approved jurisdictional areas shall be submitted to this office so that we may keep your file updated.

Pursuant to Section 404 of the Clean Water Act, the Corps of Engineers regulates the discharge of dredged or fill material into waters of the United States, including wetlands. A Department of the Army permit would be required for any work that would impact jurisdictional areas. To initiate the permit process, please submit a joint permit application form along with detailed plans of your proposed work. Information concerning our program, including the application form and an application checklist, can be found at and downloaded from our website at www.lrc.usace.army.mil/co-r.

If you have any questions, please contact Ms. Kathy G. Chernich of my staff by telephone at (312) 353-6428, extension 4039.

Sincerely,



Leesa A. Beal
Chief, Permit Section
Regulatory Branch

MITCHELL A. ISOE
Chief, Regulatory Branch

Copy Furnished:

Harza Engineering (Chitty)



DEPARTMENT OF THE ARMY
CHICAGO DISTRICT, CORPS OF ENGINEERS
111 NORTH CANAL STREET
CHICAGO, ILLINOIS 60606-7208

OCT 06 2001

REPLY TO
ATTENTION OF:

Construction-Operations Division
Regulatory Branch
200000231

SUBJECT: Request for Jurisdictional Determination on Wetlands and Waters of the United States at O'Hare International Airport Located in Chicago, Cook County, Illinois.

City of Chicago Department of Aviation
Attn: James Considine
P.O Box 66142
Chicago 60666

Dear Mr. Considine:

This is in response to your December 22, 1999 request that the U.S. Army Corps of Engineers complete a jurisdictional determination for the above-referenced site. The subject project has been assigned number 200000231. Please reference this number in all future correspondence concerning this project.

Following a review of the U.S. Fish and Wildlife Service National Wetland Inventory, U.S. Geological Survey Hydrologic Atlas, U.S.D.A Natural Resources Conservation Service Soil Survey for Cook County, your wetland delineation report dated November 1999 for the subject site, prepared by Harza Engineering, and a site visit conducted by Kathy Chernich of my staff on July 26, 2001, this office has determined that the subject property contains "waters of the United States" due to the following:

The following list of delineated wetlands have been determined to be jurisdictional:

- a. NE1, NE5, NE6, NE8, NE9, NE10, NE14, NE15, NE19, NE40, NE41, NE52, NE53, NE55, NE58;
- b. NW26, NW28, NW29, NW37a (waters of the United States and adjacent wetland), NW37b, NW50;
- c. SE63, SE64, and SE65; and
- d. SW2, SW5, SW24, SW25, SW83, SW96, SW96A, SW105, SW120, SW121, SW130, SW137, SW107b.

Enclosed, please find the basis for the Corps' jurisdiction for the subject property.

This determination covers only O'Hare International Airport property as depicted in the "November 1999, "Delineation of Wetland and Floodplain Areas", prepared by Harza Engineering. This determination is valid for 5 years from the date of this letter.

This letter is considered an approved jurisdictional determination for your subject site. If you object to this determination, you may appeal, according to 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and a Request for Appeal (RFA) form. If you request to appeal the above determination, you must submit a completed RFA form within 60 days of the date on this letter to the Great Lakes/Ohio River Division Office at the following address:

Ms. Suzanne Chubb, Division Review Officer
Great Lakes and Ohio River Division
CELRD-CM-O
550 Main Street
Cincinnati, OH 45201-1159
Phone: 513-684-7261

If you concur with the determination in this letter, submittal of the RFA form to the Division office is not necessary.

Pursuant to Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers regulates the discharge of dredged or fill material into waters of the United States, including wetlands. A Department of the Army permit is required for any proposed work involving the discharge of dredged or fill material within the jurisdiction of this office. To initiate the permit process, please submit a joint permit application form along with detailed plans of the proposed work. Information concerning our program, including the application form and an application checklist, can be found at and downloaded from our website at <http://www.lrc.usace.army.mil/co-r>.

If you have any questions, please contact Kathy Chernich of my staff by telephone at (312) 353-6400, extension 4039, or email at kathy.g.chernich@usace.army.mil.

Sincerely,


Keith L. Wozniak
Chief, West Section
Regulatory Branch

Enclosures

Copy Furnished w/out Enclosure:

U.S. Fish and Wildlife Service (Rogner)
Illinois Department of Natural Resources (Schanzle)
Illinois Department of Natural Resources/OWR (Jereb)
Illinois Environmental Protection Agency (Yurdin)
Harza Engineering (Chitty)

U.S. Army Corps of Engineers
Chicago District

Basis of Jurisdiction

Project number 200000231

 The subject parcel contains navigable "Waters of the U.S." pursuant to 33 CFR 328.3 (a)(1). The Federal jurisdiction falls within the area up to the ordinary highwater mark of the existing waterbody.

 X The subject parcel contains interstate "Waters of the U.S." pursuant to 33 CFR 328.3 (a)(2). The Federal jurisdiction falls within the area up to the ordinary highwater mark of the existing waterbody.

 X The subject parcel contains tributaries to navigable or interstate "Waters of the U.S." pursuant to 33 CFR 328.3 (a)(5).

The Federal jurisdiction falls within the area up to the ordinary highwater mark of the existing waterbody.

 X The subject parcel contains wetlands that are bordering, contiguous, or neighboring other interstate "Waters of the U.S.", pursuant to 33 CFR 328.3 (a)(7). The wetland areas are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions.

 The subject parcel contains intrastate "Waters of the U.S." The area in question is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. According to 33 CFR 328.3 (a)(3) the use, degradation or destruction of the intrastate body of water could affect interstate commerce, and is subject to Federal jurisdiction, for the following reasons:

 The subject area is used to irrigate crops sold in interstate commerce.

 The subject area is or could be used by interstate or foreign travelers for recreational or other purposes.

 The subject area is used or could be used to collect fish or shellfish that could be taken and sold in interstate or foreign commerce.

 The subject area is used or could be used for industrial purpose by industries in interstate commerce.

**ATTACHMENT N-5
WILDLIFE HAZARD MANAGEMENT PLAN –
O'HARE INTERNATIONAL AIRPORT
(JULY 2002)**

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CHAPTER - 337 WILDLIFE HAZARD MANAGEMENT

Definitions

The following is a list of terms used in Chapter 337:

Birds means all animals that have flight capability.

Wildlife means all other animals besides birds; i.e. deer, coyotes, raccoons, rabbits, etc.

Wildlife/Birds means a combination of the two above. Each category of animal has a particular set of hazards associated with them.

USDA APHIS WS means United States Department of Agriculture, Animal Plant Health Inspection Service, Wildlife Services.

Airport Animal Control Measures

Every effort will continue to be made to make Chicago O'Hare International Airport unattractive to wildlife/ birds. The preventive measures and controls at O'Hare that exists or are regulated include:

1. Periodic airfield maintenance procedures are designed to reduce the formation of animal attracting tall grasses, trees, plants, etc.
2. The feeding of birds at O'Hare and in the adjacent landside areas of the airport is strictly prohibited.
3. The man-made drainage ponds, North Basins, South Detention, (Formerly Lake O'Hare) and the 9R retention basin are regularly monitored. Measures are being taken to discourage animal presence. Vehicles patrolling these areas have the capability to use audio alarm and distress bird call recordings in addition to bird cannons and hand launched pyro-technic devices.
4. The airport conducts regular wildlife/bird patrols. This is an ongoing program that takes place on all shifts at the direction of the AAO Duty Supervisor.
5. The airport takes immediate measures whenever wildlife/birds are detected or reported.
6. An inspection of the Commercial Vehicle Staging Area is conducted a minimum of three (3) times a day on a seasonal basis.

Chicago O'Hare International Airport has completed a removal program for deer on the AOA. This program, with the approval of both State and Local authorities, has been reviewed and accepted by the FAA Great Lakes Regional Office. The removal/extermination program has now moved into the maintenance stage.

Original Date: October 15, 1988
Revision Date: June 26, 2002

12 JUL 02
FAA Approval: Incia Halpin

Bird Control and Reduction Procedures

Under the direction of AAO, the USDA APHIS WS wildlife biologist is responsible for developing and implementing airport wildlife/bird control measures. The AAO Section is responsible for the implementation of the bird hazard warning system. The following is a program that contributes to wildlife/bird hazard control.

Supervision and Responsibilities

Supervision of wildlife/bird hazard control is the responsibility of the AAO Section assigned to the day-to-day operations and safety of the AOA. It is the responsibility of the AAO Supervisor to inspect the movement area (M.A.) each day for signs of wildlife/bird habitation. If such signs are detected, that information shall be given to either the Wildlife Coordinator or the USDA APHIS WS wildlife biologist for further control measures. The AAO Supervisor will report areas that might be attractive to wildlife/birds, and take steps to eliminate the problem areas.

Equipment and Procedures

Equipment utilized at Chicago O'Hare International Airport:

Propane Cannons:

The automatic gas cannon is a static device which is positioned to frighten birds and is available at O'Hare.

Pyro-Technic Devices

The AAO Section has received training from the USDA APHIS WS personnel in the safe handling and use of pyro-technic devices. These devices are used to harass both resident and migratory species of wildlife/birds. Generally a modified small caliber pistol launches either a small explosive charge or loud screaming charge 100-200 feet from the launch point. These devices are especially useful in making the AOA an undesirable place to roost or nest.

Original Date: October 15, 1988
Revision Date: September 23, 2001

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FAA Approval: Mica Halpin

Wildlife/Bird Hazard Warning Procedures

Wildlife Hazard Reduction:

1. In instances when wildlife does become a hazardous problem, O'Hare has obtained the proper permits from State and Federal authorities to harass and if necessary, trap, shoot, euthanize, or translocate any wildlife that poses a threat to public safety on the airport.
2. All airport personnel who observe any of the following, should contact the AAO Office.
 - a. A potential hazard created by wildlife/birds on or adjacent to the airport.
 - b. Areas that are being created on or near the airport which will attract large numbers of wildlife/birds.
 - c. Dead birds or animals on runways and/or taxiways.
3. Whenever AAO Personnel become aware of a wildlife hazard on the airport, by observation, notification by the ATCT or a Pilot Report (PIREP), an AAO Supervisor will respond and using audio deterrents, cracker shells or live ammunition, disperse the hazard from the airport .

Original Date: October 15, 1988
Revision Date: September 23, 2001

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FAA Approval: Incia Halpin

Communication:

1. Wildlife/bird hazard conditions are disseminated in the following manners: ATIS Advisory, Local NOTAMs and Distant NOTAMs.
 - a. ATIS Advisories are disseminated at the discretion of the O'Hare ATCT.
 - b. Local NOTAMs are field condition reports via CRT and phone message, i.e. "Bird hazard in effect for the entire airfield, caution is advised".
 - c. Distant NOTAMs are published in the Airport Facility Directory, i.e. "Pyrotechnics and bird cannons in use for bird control", "Birds on and in the vicinity of the airport", etc.

Wildlife/Bird Patrols:

At the direction of the AAO Duty Supervisor and in accordance with set procedures, a wildlife/bird patrol will be accomplished on all shifts. When hazardous wildlife/bird conditions are observed on the AOA, an AAO Supervisor shall do the following:

1. Take actions (if safe & appropriate) to mitigate the hazard and ensure that the flow of the aircraft is uninterrupted.
2. If a hazard cannot be corrected and the potential for a runway incursion exists, the ATCT should be notified by the most expedient and appropriate method possible.
3. All other routine sightings and wildlife/bird control operations should be recorded on the proper forms and called into the AAO Office to be entered into the wildlife log.

While it may be impossible to eliminate all wildlife/birds from the airport at all times, every reasonable effort will be made to ensure that they are kept to a minimum. Any bird is a potential hazard. AAO Supervisors will be kept informed of the potential hazards created by wildlife/birds. Collected data will be used to determine the best control methods for the airport.

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Revision Date: September 23, 2001

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FAA Approval: *Jocia Halpin*

WILDLIFE HAZARD MANAGEMENT PLAN

O'Hare International Airport
Chicago, Illinois

Prepared by:

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
WILDLIFE SERVICES

Original Date: October 1993
Revision Date: July 3, 2002

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Dicia Halpin
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Exhibit 20

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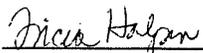
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LIST OF ACRONYMS

AC	<i>Advisory Circular</i>
ADC	<i>Animal Damage Control</i>
AGL	<i>Above Ground Level</i>
AO	<i>Airport Operations</i>
AOA	<i>Airport Operations Area</i>
AOS	<i>Airport Operations Supervisor</i>
ATCT	<i>Air Traffic Control Tower</i>
ATIS	<i>Automated Terminal Information Service</i>
AWC	<i>Airport Wildlife Coordinator</i>
CFR	<i>Code of Federal Regulations</i>
FAA	<i>Federal Aviation Administration</i>
FAR	<i>Federal Aviation Regulations</i>
FOD	<i>Foreign Object Debris/Damage</i>
IDNR	<i>Illinois Department of Natural Resources</i>
MA	<i>Methyl Anthranilate</i>
ORD	<i>O'Hare International Airport</i>
MOU	<i>Memorandum Of Understanding</i>
NOTAM	<i>Notice To Airmen</i>
USFWS	<i>U. S. Fish and Wildlife Services</i>
WB	<i>Wildlife Biologist</i>
WHMIS	<i>Wildlife Hazard Management Information System</i>
WHMP	<i>Wildlife Hazard Management Plan</i>
WS	<i>Wildlife Services</i>

1.0 INTRODUCTION

1.1 Overview

Wildlife hazard management plans (WHMPs) address the responsibilities, policies, and procedures necessary to reduce wildlife hazards at airports. Recognizing the potential hazards wildlife pose to aircraft and human lives, the Federal Aviation Administration (FAA) requires, in CFR 14 - PART 139.337 (Wildlife Hazard Management) (Appendix A) that:

Each certificate holder (holder of the airport operating certificate) shall provide for the conduct of an ecological study, acceptable to the Administrator (FAA), when any of the following events occur on or near the airport:

- (1) An air carrier aircraft experiences a multiple bird strike or engine ingestion.*
- (2) An air carrier aircraft experiences a damaging collision with wildlife other than birds.*
- (3) Wildlife of a size or in numbers capable of causing an event described in paragraph (a) (1) or (2) of this section is observed to have access to any airport flight pattern or movement area.*

CFR 14 - Part 139.337 further states that:

When the Administrator determines that a wildlife hazard management plan is needed, the certificate holder shall formulate and implement a plan using the ecological study as a basis.

The WHMP must include seven required components. Each of these components is sequentially represented as a separate chapter in this document. These required categories are as follows:

- 1) The persons who have the authority and responsibility for implementing the plan.
- 2) Priorities for needed habitat modification and changes in land use identified in the ecological study, with target dates for completion.
- 3) Requirements for and, where applicable, copies of local, state, and Federal wildlife control permits.
- 4) Identification of resources to be provided by the certificate holder for implementation of the plan.
- 5) Procedures to be followed during air carrier operations, including at least-
 - (i) assignment of personnel responsibilities for implementing the procedures;
 - (ii) conduct of physical inspections of the movement area and other areas critical to wildlife hazard management sufficiently in advance of air carrier operations to allow time for wildlife controls to be effective;
 - (iii) wildlife control measures; and
 - (iv) communication between the wildlife control personnel and any air traffic control tower in operation at the airport.
- 6) Periodic evaluation and review of the wildlife hazard management plan for-
 - (i) Effectiveness in dealing with the wildlife hazard; and
 - (ii) Indications that the existence of the wildlife hazard, as previously described in the ecological study, should be reevaluated.
- 7) A training program to provide airport personnel with the knowledge and skills needed to carry out the wildlife hazard management plan required by (d) of this section.

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In addition to the requirements stated above, CFR Title 14 FAR part 139.337(f) outlines procedures and personnel responsibilities for notification regarding new or immediate hazards and describes the rapid response procedures for addressing new or immediate wildlife hazards. Section (f) is extremely important because it allows the WHMP to be promptly modified and updated to address new situations or changing circumstances. To augment compliance with CFR Title 14 FAR part 139.337(e), the FAA issued Certalert No. 97-09 (Appendix B) to provide guidance to airports in developing their plans. This Certalert contains a sample outline that was followed in the development of this plan.

1.2 Problem Species

Birds are most commonly associated with this type of damage at O'Hare International Airport (ORD). There are many types of birds which frequent the airport and the surrounding area. The most common groups include: blackbirds (which includes crows) gulls, raptors, and waterfowl..

Large mammals are much less frequent at ORD because the perimeter fence excludes most earthbound species. On occasion, however, individual animals have gained entry to the airport through open gates, breaches, or simply by climbing over the fence. Large mammals reported at ORD include coyotes and deer.

1.3 Purpose and Scope

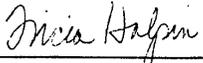
An airport's main objective is to ensure that its facilities provide for the safe and expeditious conduct of all aircraft operations. Left uncontrolled, wildlife at an airport can jeopardize the safe operation of any aircraft.

Wildlife have caused extensive damage to an aircraft when struck at high speeds. The most obvious threat is the loss of power due to the ingestion of wildlife into an engine. Along with engine power loss, structural damage can be caused by wildlife striking any portion of a moving aircraft posing threats to human health and safety.

The FAA recommends that all certified airports, experiencing wildlife hazards (defined in 14 FAR Part 139), develop and implement a WHMP. In accordance with these regulations, Chicago's O'Hare International Airport (ORD) contracted with USDA-Animal and Plant Health Inspection Service-Wildlife Services (WS), to assist with the development and implementation of this Plan.

Wildlife species of concern and their various management/control options will be addressed in general terms. This will allow ORD personnel to make informed decisions on courses of action to alleviate specific wildlife threats identified at the airport. WS may provide more detailed recommendations as wildlife problems are identified on the airfield.

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2.0 AUTHORITY

FAR 139.337(e)(1) The persons who have authority and responsibility for implementing the WHMP.

2.1 Overview

The Deputy Commissioner of Operations at ORD will have ultimate responsibility for the implementation of the WHMP at the airport. Responsibilities for individual sections of the WHMP may be delegated to various departments within the airport system. Clear communication among airport personnel is essential for the WHMP to succeed. Personnel shall inform the Airport Wildlife Coordinator of progress, recommendations, and resource needs of the wildlife hazard management program. The Deputy Commissioner of Operations will ensure that the WHMP, and any possible amendments, are approved by the FAA and comply with Federal, State, and local laws and regulations.

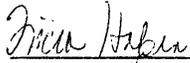
Airport departments which should be involved include:

- Airport Operations(AO)** - usually the first responders to reported wildlife hazards on the airfield;
- Trades** - may be asked to provide assistance with building/maintaining equipment and devices used in wildlife control;
- Security** - present on the perimeter of the airfield at all times and should be cognizant of potential wildlife hazards and attractants;
- Planning** - should coordinate building/construction activities to minimize attractiveness to wildlife;
- Finance** - should be familiar with the need for equipment and supplies to most effectively address potential wildlife hazards; and
- Airport Tenants** - all airport tenants shall coordinate wildlife control activities at their facilities through the Airport Wildlife Coordinator (see Section 2.2.3).

Outside agencies with potential involvement:

- USDA/WS** - provides technical assistance to airports experiencing wildlife hazards, or may be contracted to provide full time direct control assistance;
- US Fish and Wildlife Service (USFWS)** - responsible for issuing federal depredation permits and resolving issues with threatened or endangered species; and
- Illinois Department of Natural Resources (IDNR)** - issues state nuisance animal removal permits.

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2.2 Persons Responsible for Implementing the WHMP

2.2.1 Deputy Commissioner of Operations

The Deputy Commissioner of Operations shall be responsible for:

- 1) establishing a Wildlife Hazard Working Group for ORD;
- 2) supervising, coordinating, and monitoring wildlife control activities as outlined in the WHMP;
- 3) updating the WHMP as necessary;
- 4) disseminating information and assignments through the Wildlife Hazard Working Group;
- 5) pre-approving and coordinating landscape changes, before they are made, with the Wildlife Biologist and Airport Wildlife Coordinator to ensure proposed changes do not present a wildlife attractant; and
- 6) providing public relations support for wildlife control activities as necessary.

2.2.2 WS Wildlife Biologist (WB)

While WS is under contract with the City of Chicago to provide assistance at ORD, the role of the WB stationed at ORD will be to:

- 1) identify and communicate, with AO, wildlife attractants that pose a significant safety threat on the aircraft operations area (AOA);
- 2) coordinate a runway closure with AO, if necessary, in order to quickly address an immediate wildlife threat;
- 3) request the Air Traffic Control Tower (ATCT) advise pilots on ATISS of increased wildlife activity;
- 4) provide public relations support for wildlife control activities as necessary;
- 5) monitor airport facilities and tenants to identify potential wildlife-related concerns;
- 6) keep a log of known wildlife strikes and control actions, forwarding appropriate reports to FAA, as necessary;
- 7) work with AO and Trades to implement habitat modifications efforts to reduce wildlife attractants at the airport;
- 8) provide a review of plans involving potential land use or structures/facilities changes to proactively identify potential wildlife attractant conflicts and make recommendations to alleviate the potential conflict;
- 9) conduct regular physical inspections of the AOA to monitor for potential wildlife activity;
- 10) haze wildlife from critical areas when appropriate;
- 11) notify the ATCT of eminent wildlife hazards;
- 12) obtain required permits from appropriate federal or state agencies to manage wildlife on the AOA;

- 13) provide training of airport personnel in safe handling and proper use of wildlife dispersal methods and equipment; and
- 14) order wildlife harassment supplies (i.e., pyrotechnics) for airport personnel use, as funds allow.

2.2.3 Airport Wildlife Coordinator (AWC)

The AWC shall be a City employee under the supervision of the Deputy Commissioner of Operations. The role of the AWC shall be to:

- 1) serve as a liaison between the WS and the Deputy Commissioner of Operations on wildlife-related issues;
- 2) coordinate the issuance of Notices to Airmen (NOTAM) concerning eminent wildlife hazards on the airfield;
- 3) make wildlife strike report form FAA Form 5200-7 (Appendix E) readily available to airport personnel, and encourage submission of the forms to the appropriate governmental agencies or to the WB;
- 4) assist in the development and maintenance of a database (see section 7.3) to monitor wildlife control efforts at ORD;
- 5) maintain an inventory of wildlife control equipment (i.e., pyrotechnics); and
- 6) communicate with the WB regarding the issuance and maintenance of wildlife control permits, including providing data requirements for reporting purposes required by the issuing agency for the permit.

2.2.4 Airport Operations

AO personnel will serve as the *first line of defense* against wildlife activity because of the amount of time collectively spent on the AOA. Personnel shall be made clear of the importance of wildlife management and their role at the airport. As the *first line of defense* they shall:

- 1) directly assist with wildlife control activities at ORD where possible including:
 - a) monitoring wildlife activity,
 - b) using pyrotechnics and vehicles to harass wildlife from the airfield, and
 - c) informing the AWC and WB of wildlife activity on the airfield;
- 2) assist in the maintenance of records in the Weekly Wildlife Activity Report (Appendix G) and the database developed by the AWC of wildlife activity, or lack thereof, and actions taken to move wildlife;
- 3) log all known wildlife strikes on FAA Form 5200-7 (Appendix E) and forward the forms to the AWC or WB;
- 4) notify the AWC, WB and ACTC of known wildlife hazards;
- 5) insure that wildlife-attracting refuse does not accumulate in turf and detention ponds on the airfield by coordinating trash and debris removal through the proper channels: and

- 6) monitor the perimeter fence for potential access points by wildlife, particularly mammals (i.e., coyotes and white-tailed deer).

2.2.5 Planning and Trades

The role of Planning and Trades shall be to:

- 1) review designs of new structures/facilities with the WB during the planning stages for input on designs that may minimize wildlife attractants;
- 2) provide assistance with building/maintaining equipment and devices that may be used in wildlife control;
- 3) involve the WB with land use planning and mitigation efforts;
- 4) maintain tarmac, turf and detention ponds to ensure that water flows, minimizing pooling affects and the accumulation of refuse on the airfield;
- 5) assist with habitat modifications addressed in the WHMP, such as vegetation and perimeter fence maintenance; and
- 6) provide rodent-proofing of buildings, dumpsters and other refuse containers to the extent feasible.

2.2.6 Security

Security personnel should be informed of the importance of managing wildlife in and around airports. Their presence on the AOA can extend the management efforts at ORD.

The role of Security shall be to:

- 1) inform the AWC and/or WB of wildlife, including birds, mammals and rodents, found in or around buildings; and
- 2) monitor security and access gate areas prior to opening insuring that no wildlife may gain access to the AOA. In the event an animal does pass through an access gate, the WB will be notified immediately.

2.2.7 Federal Aviation Administration (FAA)

Responsibilities of the FAA under this WHMP, shall be to:

- 1) assist ORD in reviewing proposed land use changes, construction plans and mitigation projects for potential wildlife hazards to aircraft; and
- 2) review changes to the WHMP.

3.0 HABITAT MANAGEMENT

FAR 139.337(e)(2) Priorities for needed habitat modification and changes in land use with target dates for completion.

3.1 Overview

Habitat management provides the most effective long-term remedial measure for reducing wildlife hazards on or near airports. Habitat management includes the physical removal, exclusion, or manipulation of areas that are attractive to wildlife. The ultimate goal is to make the environment fairly uniform and unattractive to the species that are considered the greatest hazards to aviation. Habitat modifications will be monitored carefully to ensure that they reduce wildlife hazards and do not create attractants for new wildlife. Table 1 lists a series of habitat and non-habitat based action items and priorities, including target dates for completion, where appropriate.

Table 1. Management priorities for projects to reduce wildlife hazards at Chicago Midway Airport are listed, along with the target dates for completion and date that each project was completed. Note that some of the projects may have already been implemented or completed, but because they require a continued effort (e.g., sediment/vegetation removal from detention ponds), they are listed as "ongoing".

ORD WILDLIFE MANAGEMENT PROJECTS	TARGET DATE	DATE COMPLETED
Maintain a zero-tolerance wildlife control program on airfield		Ongoing
Develop and maintain a Wildlife Hazard Management Plan	Spring 2002	
Train employees in the safe and effective application wildlife dispersal measures	Annually	
Stock and maintain wildlife control supplies		Ongoing
Maintain raptor trapping program		Ongoing
Monitor/Maintain wildlife-proof fencing around airfield as needed		Ongoing
Clear and maintain detention ponds throughout airfield to enhance drainage		Ongoing
Evaluate potential wildlife hazards associated with new construction		Ongoing
Grade or fill tire ruts on infield caused by construction equipment		Daily

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ORD WILDLIFE MANAGEMENT PROJECTS	TARGET DATE	DATE COMPLETED
Evaluate potential ground covers that are unattractive to wildlife		Ongoing
Maintain updated migratory bird depredation permits		Annually
Maintain a computerized record keeping system for wildlife strikes and hazing efforts		Ongoing
Designate an Airport Wildlife Coordinator for ORD	Spring 2002	

3.2 Attractants

3.2.1 General Zone and Critical Zone

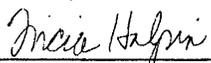
The *General Zone* for ORD is defined as the area within a five-mile radius of the runway centerlines. Wildlife attractants in this area could potentially impact air traffic safety operating out of ORD, particularly those attractants that lie within the approach and departure patterns. The objective of this WHMP is to actively reduce attractive wildlife habitat on property under the control of the City of Chicago, while working cooperatively with adjacent property owners to discourage land-use practices that might increase wildlife hazards.

The area within a 10,000-foot radius of the runway centerline is delineated as the *Critical Zone*. Control efforts will be primarily concentrated within this area is where arriving and departing aircraft are typically operating at or below 500 feet above ground level (AGL), an altitude that also corresponds with the most bird activity. Approximately 75% of all civil bird-aircraft strikes occur within the *Critical Zone*.

3.2.2 Edge Removal

Edges are places where different habitats meet and are often most attractive to wildlife because biological needs can typically be met in these relatively small areas. ORD has minimized this habitat by removing all tall vegetation and maintaining a uniform grass height.

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3.2.3 Airport Building Projects

The WB should participate in the initial phases of all airport building projects to avoid an inadvertent increase in wildlife hazards resulting from architectural or landscape changes.

3.2.4 Non-airport Land-use Projects

Whenever reasonable, the WB will be included in land-use decisions and landscape changes to avoid inadvertent wildlife hazards to aircraft. FAA Inspectors at the Great Lakes Region Headquarters in Des Plaines, IL (see Chapter 9) will provide technical guidance to ORD in addressing land-use compatibility issues. WS, as per a Memorandum of Understanding between FAA and Wildlife Services (Appendix G), will provide technical and/or operational assistance in addressing issues or concerns associated with the proposed project or land-use change. Proposed projects that will likely increase bird numbers (see Appendix C: FAA Advisory Circular 150/5200-33- Hazardous Wildlife Attractants on or near Airports) within flight zones will be discouraged. Mitigation measures will be identified to maintain wildlife populations at safe levels. Incompatible land uses may include reservoirs, parks, wetlands, and wildlife refuges/sanctuaries. Land-use changes will be monitored for compatibility by working with the local planning authorities.

3.3 Water Management

3.3.1 Overview

ORD has several detention ponds and drainage ditches that attract a moderate number of birds and mammals throughout the year, especially during the spring/winter when migratory waterfowl pass through the area. Open water on ORD will be covered with wire grid, drained wherever possible, and monitored closely to ensure hazardous species are not drawn to these sites. Ephemeral water (i.e., temporary ponds) will be monitored by the AWC and WB with actions taken if they begin to attract wildlife. Water sources outside of ORD property, but within the critical area, will be monitored. Local agencies and landowners will be contacted for the purpose of requesting their assistance and cooperation to help deter hazardous wildlife from the airport.

3.3.2 Temporary Detention Ponds

Detention ponds are the only significant water sources on ORD. Ponds are appropriately sloped and lined so that water does not pool and leaves the airfield in a reasonably short amount of time. Ponds that attract hazardous wildlife may be covered, in whole or part, using a wire grid system or other barrier (e.g., polyester netting).

During the wetter winter and spring months, small depressions (tire ruts) created by vehicles operating within the infield areas fill up with water for short periods of time and can attract dabbling ducks and gulls. Where ruts are found, ORD maintenance should fill and/or grade the damaged area. In areas where there are larger pools, the land should be filled or graded such that water consistently drains into detention ponds.

3.4 Vegetation Management

3.4.1 Overview

Vegetation manipulation is a key long-term element in deterring wildlife from airfields. The goal of vegetation management at ORD is to maintain plant communities that are least likely to attract the greatest numbers of wildlife, while being aesthetically pleasing to the flying public. In most cases a monotypic grass environment will be unattractive to the greatest number of species. However, certain modifications may result in unwittingly attracting some species, e.g., short grass is attractive to flocking birds such as blackbirds, Canada geese, and gulls while deterring coyotes, raccoons, and upland birds. All manipulations will be monitored to verify that all vegetation management results with the desired effects.

ORD predominantly consists of short grass habitats with approximately 140 acres of heavily wooded/shrub areas.

3.4.2 Grass Management

Other than paved areas, grass will be the primary cover inside the perimeter security fence. FAA Certalert No. 98-05 advises that "airport operators should ensure that grass species and other varieties of plants attractive to hazardous wildlife are not used on the airport". In addition, grasses that produce large seeds and are known to be attractive to wildlife will be avoided when planting new areas.

3.4.2.1 Grass type

The type of grass used within the perimeter fence and between the runways should produce small or no seeds, but still be able to generate new growth or re-seed itself to provide a thick, monotypic stand and prevent erosion. The selected ground cover should withstand drought, flooding and other normal climatic conditions, and be somewhat unpalatable to grazing animals, such as Canada geese and ducks. The grasses should also harbor relatively few insects and rodents that may attract hawks, owls, starlings and other hazardous wildlife species.

3.4.2.2 Grass height

Grass height throughout the airfield will be maintained at a height of 3 - 6 inches. Grass height will be maintained throughout the year, with the first mowing activities beginning when the infield is firm enough to allow equipment access and the grass is sufficiently long to merit cutting.

3.4.2.3 Mowing

Mowing attracts several species of birds and mammals because it exposes food sources, such as rodents, insects, and seeds. To the extent feasible, mowing operations shall be conducted at night. If cutting is being conducted during the day and birds are attracted to activity, the mowing will stop until the birds have been successfully hazed from the area.

3.4.3 Ornamental Landscaping

It is recognized that landscaping at the airport can affect tourism, business, and the overall impression of the ORD vicinity to visitors. Therefore, landscaping needs to be aesthetically pleasing. It must, however, coincide with the airport's greater responsibility of air safety. The planting of trees and bushes that offer hunting perches, roosting and loafing sites, nesting cover, and food for birds and other wildlife will be avoided. Ornamental trees and bushes used to enhance airport aesthetics will be kept to a minimum, selecting varieties that are less attractive to wildlife. Species which produce edible fruits, nuts, or berries will not be used on ORD property. ORD personnel will monitor ornamental trees to prevent communal roosting by birds, thinning, topping or netting the trees, if necessary.

3.4.4 Woodland/shrub

There are roughly 140 acres of woodland/shrub habitat along the western border of the AOA. This area serves as a buffer between the airport and adjacent business areas, and is a potential attractant for wildlife species. Therefore, a buffer of short grass shall be maintained with between it and the aircraft movement areas. This open buffer will serve to deter mammal movement along its interior, thereby minimizing small mammal presence near aircraft movement areas, as well as allowing easy monitoring of the area.

Many species of birds utilize this area, though the groups of primary concern are limited to corvids and raptors. The area shall be monitored on a regular basis and proper management actions be enacted when these groups are observed. Nests should be identified during Spring months and either destroyed or made nonviable.

3.5 Structure Management

3.5.1 Overview

Structures provide cover and hunting perches for wildlife. If wildlife is considered when a building is being designed, costly control measures can be avoided. Buildings should not provide nesting, perching, or roosting sites for birds and should inhibit access by mammals, such as rodents and raccoons.

3.5.2 Airfield Structures

Airfield structures, such as runway lights, ramp/taxiway signs, ILS towers, and light poles, are used as hunting and loafing perches for birds. Structures found to routinely attract wildlife in a hazardous manner may be fitted with wire coils or porcupine wire (e.g., Nixalite).

3.5.3 Abandoned Structures

Structures not pertinent to air operations and/or no longer in use, should be removed (e.g., abandoned houses, sheds, machinery, and light poles). Such structures may harbor rodents, small birds or other wildlife that may attract hawks, owls, and other predators that become a significant aviation hazards.

3.6 Food/Prey-base Management

3.6.1 Overview

Small mammals and invertebrates, such as voles, rabbits, insects, and earthworms, are highly attractive prey species for predators and should be controlled where feasible. Handouts, trash, and scattered debris also provide food sources for wildlife. The modification and/or management of attractive habitats such as vegetation and abandoned structures will limit shelter and prey availability for potentially hazardous wildlife.

3.6.2 Rodents

Meadow voles and deer mice are the primary attractants of raptors and other predators, such as coyotes at ORD. Historically, rodent populations at ORD have been relatively high. Populations of small rodents can be managed by the use of pesticides and habitat modifications.

3.6.3 Insects and Other Invertebrates

Insects and other invertebrates (e.g., earthworms, grasshoppers, etc.) may attract many species of wildlife at ORD, particularly kestrels, crows, and gulls. Insect populations will be monitored to determine if they are present in sufficient numbers to attract wildlife. Vegetation management will keep much of this prey population in check, but airport personnel will continue to monitor these populations for problems.

3.6.4 Trash, Debris, and Handouts

Trash and debris are often responsible for attracting species, such as gulls and crows. ORD personnel will continue to conduct trash and FOD (foreign object debris/damage) collection inspections on the airfield, especially after high winds. The public or airport employees should not be allowed to feed birds or mammals around the airport. If necessary, ORD Security will be contacted to stop specific incidents of people feeding wildlife on airport property. Signs will be posted where appropriate to educate the general public.

4.0 LAWS AND REGULATIONS

FAR 139.337(e)(3) Requirements for and, where applicable, copies of local, state, and Federal wildlife control permits.

4.1 Overview

Federal, state and local governments administer laws and regulations that protect wildlife and their habitat affecting wildlife control at airports. Personnel involved with wildlife management should be educated about these regulations to ensure compliance. In general, the taking (i.e., capturing or lethal removal) of wildlife is regulated through a permit process overseen by federal and/or state agencies. Permits are necessary for a successful control program and will be obtained, as required, by the AWC and/or WB.

4.2 Illinois Wildlife Regulations

Several Illinois State agencies have regulations that affect wildlife management at airports. State wildlife laws are administered by the Illinois Department of Natural Resources (IDNR). IDNR's jurisdiction includes resident and migratory birds, mammals, reptiles, amphibians, and State threatened or endangered species. IDNR does issue permits for the taking of problematic species under their control. The Illinois Department of Agriculture regulates the product labels of pesticides used to control wildlife. The Illinois Department of Public Health regulates pesticide applicator licences for individuals permitted to apply restricted-use pesticides.

4.3 Federal Regulations

Several federal regulations, including the Migratory Bird Treaty Act, the Endangered Species Act, Eagle Protection Act, the National Environmental Policy Act, and the Federal Insecticide, Fungicide, and Rodenticide Act regulate various aspects of ORD's wildlife management activities. Additional regulations that may affect wildlife control activities at ORD are found in the Code of Federal Regulations (CFR), with several federal agencies potentially responsible for their implementation. Federal wildlife laws are typically administered by the U.S. Fish and Wildlife Service (USFWS) and involve primarily migratory birds and threatened and endangered species.

4.4 Wildlife Categories

For the purposes of this document, feral and free roaming dogs, cats and other domestic animals are considered "wildlife" because of the hazards they may pose to aircraft. They are offered no specific federal or state protection, but are generally regulated under municipal laws. General

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wildlife categories that may be found at ORD are listed in Table 2 and include, migratory and resident, game and non-game, and threatened and endangered species. Wildlife control personnel should know the category for the species that they intend to control so that they can determine the relevant laws and whether permits are necessary.

Table 2. Wildlife Categories at ORD, permits necessary for control as required by federal and state wildlife agencies, and whether permits have been obtained. Not all categories of wildlife may be present at ORD.

Category	Species	State Permit Required	State Permit Obtained	Federal Permit Required	Federal Permit Obtained
Resident Game Birds	none at ORD	Yes	No	No	N/A
Resident Nongame Birds	Pigeons, starlings, house sparrows	No	N/A	No	N/A
Migratory Game Birds	Ducks, geese, snipe, and mourning doves	Yes	Yes	Yes	Yes
Migratory Nongame Birds	All species except game birds, resident nongame birds, and domestic and exotic birds	Yes	Yes	Yes	Yes
Depredation Order Birds¹	Crows, blackbirds, and cowbirds	No	N/A	No	N/A
Game Mammals	rabbits, woodchucks,	Yes	No	No	N/A
Furbearers	fox, raccoon, opossum, coyote, striped skunk	Yes	No ²	No	N/A
Nongame Mammals	none at ORD	Yes	N/A	No	N/A
Feral Domestic Mammals	Dogs, cats, livestock	No - Call local animal control	N/A	No	N/A
Reptiles And Amphibians	none at ORD	Yes	No	No	N/A
Fully Protected Wildlife	Threatened and Endangered species listed in Table 3	Yes	No	Yes	No

¹ May be taken without permits "when concentrated in such numbers and manner as to constitute a health hazard or other nuisance" (50 CFR §21.43).

² On the rare occasion that one of the listed animals gains access to the airfield, Wildlife Services shall coordinate removal.

4.5 General Regulations for Wildlife Control

Several regulations and permits apply to wildlife management activities at airports in the City of Chicago. Many of these regulations relate to safety, methods, and special considerations or restrictions which are usually specified on the depredation permits.

4.5.1 Birds

4.5.1.1 Resident nongame birds

European starlings, pigeons, and house sparrows are non-game birds that are classified as non-migratory, or resident, and no permit is required to take them. All other non-game birds at ORD are classified as migratory.

4.5.1.2 Migratory birds

Migratory birds are regulated under federal law by USFWS. These regulations permit hazing of migratory birds when the birds are damaging property, but a permit is required to *take* birds (i.e., capture or lethal removal). Migratory bird permits are not valid for eagles or threatened and endangered species, which require separate permits for take and harassment. Although states may impose more restrictive regulations than federal law on migratory birds, Illinois typically issues permits that mirror the federal permits for non-protected migratory birds issued to the airport by USFWS.

A USFWS depredation permit (Appendix D) allows control of migratory non-game birds, provided that the species are not listed as federally or state threatened, or endangered (Table 3) and are listed on the depredation permit.

4.5.1.3 Reporting requirements of the USFWS

The USFWS requires that any action taken under the authority of their depredation permit be reported annually. The AWC or WB shall submit a report of the animals taken each calendar year to the USFWS to fulfill the requirements of this section. The report will be generated from a computerized database containing all control actions at ORD.

4.5.2 Mammals

4.5.2.1 Game mammals

Game mammals are defined primarily as those species that are hunted for sport, recreation, or meat. A Nuisance Animal Removal Permit from the IDNR is required before these animals may be controlled. ORD has a small population of rabbits, generally associated with buildings or structures, and woodlands throughout the airfield and adjacent facilities. These animals burrow under structures for shelter and may cause deterioration of the foundation of these structures. Further, they provide a prey base for predatory birds and mammals which pose a direct threat to aviation.

Woodchucks have also been found on the airfield at ORD. Burrowing activities by these animals may cause the same foundation erosion as mentioned with rabbits. Control activities will be conducted by the WB, as needed, to address any identified concerns with these animals.

4.5.2.2 Furbearers

Furbearers are offered state protection and require a Nuisance Animal Removal Permit from the IDNR before control actions can be used to take these animals. Coyotes, foxes, raccoons and opossums have been identified on the airfield at ORD. In the event that these animals do gain access to the airfield, the WB should be notified to coordinate their removal.

4.5.3 Federal and State Listed Threatened and Endangered Species

The Federal Endangered Species Act (Sec. 2 [16 U.S.C. 1531]) and Illinois Endangered Species Act both protect animal and plant species potentially threatened with extinction. These acts classify species as endangered or threatened. An *Endangered Species* is defined as "any species or subspecies which is in danger of extinction throughout all or a significant portion of its range." A *Threatened Species* is defined as "any species or subspecies which is in danger of becoming an endangered species within the foreseeable future throughout or over a significant portion of its range." Once listed, a threatened or endangered species cannot be taken or harassed without a special permit. Eagles, whether they are listed or not, are afforded additional protection under the U.S. Eagle Protection Act. Similarly, they cannot be taken or harassed without the proper permit from the USFWS.

TABLE 3. Species found in the region listed federal and/or state as threatened or endangered. Those species that have been observed at or near ORD are checked(✓).

Birds

Common Name	Scientific Name	State-Listed (Status T/E)	Federal-Listed (Status T/E)	ORD (15)
American Bittern	<i>Botaurus lentiginosus</i>	E		✓
Bachman's Sparrow	<i>Aimophila aestivalis</i>	E		
Bald Eagle	<i>Haliaeetus leucocephalus</i>	T	T	✓
Bewick's Wren	<i>Thryomanes bewickii</i>	E		
Black Rail	<i>Laterallus jamaicensis</i>	E		
Black Tern	<i>Chlidonias niger</i>	E		
Black-crowned Night-heron	<i>Nycticorax nycticorax</i>	E		✓
Brown Creeper	<i>Certhia americana</i>	T		
Common Moorhen	<i>Gallinula chloropus</i>	T		
Common Barn-owl	<i>Tyto albo</i>	E		
Common Tern	<i>Sterna hirundo</i>	E		✓
Cooper's Hawk	<i>Accipiter cooperii</i>	E		✓
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	T		✓
Forster's Tern	<i>Sterna forsteri</i>	E		
Great Egret	<i>Casmerodius albus</i>	T		✓
Greater Prairie-chicken	<i>Tympanuchus cupido</i>	E		
Henslow's Sparrow	<i>Ammodramus henslowii</i>	E		
King Rail	<i>Rallus elgens</i>	T		
Least Tern	<i>Sterna antillarum</i>	E	E	
Least Bittern	<i>Ixobrychus exilis</i>	E		

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Little Blue Heron	<i>Egretta caerulea</i>	E		
Loggerhead Shrike	<i>Lanius ludovicianus</i>	T		✓
Long-eared Owl	<i>Asio otus</i>	E		
Mississippi Kite	<i>Ictinia mississippiensis</i>	E		
Northern Harrier	<i>Circus cyaneus</i>	E		✓
Osprey	<i>Pandion haliaetus</i>	E		✓
Peregrine Falcon	<i>Falco peregrinus</i>	E		✓
Pied-billed Grebe	<i>Podilymbus podiceps</i>	T		✓
Piping Plover	<i>Charadrius melodus</i>	E	E	
Red-shouldered Hawk	<i>Buteo lineatus</i>	E		
Sandhill Crane	<i>Grus canadensis</i>	E		✓
Sharp-shinned Hawk	<i>Accipiter striatus</i>	E		
Short-eared Owl	<i>Asio flammeus</i>	E		✓
Snowy Egret	<i>Egretta thula</i>	E		
Swainson's Hawk	<i>Buteo swainsoni</i>	E		
Swainson's Warbler	<i>Limnothlypis swainsonii</i>	E		
Upland Sandpiper	<i>Bartramia longicauda</i>	E		✓
Veery	<i>Catharus fuscescens</i>	T		
Wilson's Phalarope	<i>Phalaropus tricolor</i>	E		
Yellow Rail	<i>Coturnicops noveboracensis</i>	E		
Yellow-crowned Night Heron	<i>Nyctanassa violacea</i>	T		
Yellow-headed Blackbird	<i>Xanthocephalus xanthocephalus</i>	E		

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Mammals

Common Name	Scientific Name	State-Listed (Status T/E)	Federal- Listed (Status T/E)	ORD (O)
Bobcat	<i>Lynx rufus</i>	T		
Eastern Big-eared Bat	<i>Corynorhinus rafinesquii</i>	E		
Eastern Wood Rat	<i>Neotoma floridana</i>	E		
Golden Mouse	<i>Ochrotomys nuttalli</i>	T		
Gray Bat	<i>Myotis grisescens</i>	E	E	
Indiana Bat	<i>Myotis sodalis</i>	E	E	
Marsh Rice Rat	<i>Oryzomys palustris</i>	T		
Rafinesque's Big-eared Bat	<i>Plecotus rafinesquii</i>	E		
Rice Rat	<i>Oryzomys palustris</i>	T		
River Otter	<i>Lontra canadensis</i>	T		
Southeastern Bat	<i>Myotis austroriparius</i>	E		
Southeastern Myotis	<i>Myotis austroriparius</i>	E		

4.6 Pesticide Applicator's License

Authorization to use restricted-use pesticides for the removal of hazardous wildlife or prey-base (e.g., blackbirds, starlings, rodents, rabbits, insects, earthworms, and weeds) should be limited to Certified Pesticide Applicators or persons under their direct supervision. To obtain the necessary license to apply restricted-use pesticides, a person must pass an exam administered by the Illinois Department of Public Health (see Chapter 9). All ORD personnel that use restricted-use chemicals must first obtain a pesticide applicator's license or be under the direct supervision of an applicator. Use of all pesticides should strictly adhere to the pesticide label and should follow U.S. EPA, Illinois, and Cook County guidelines.

4.7 FAA Regulations, Advisory Circulars, and Certalerts

The FAA is the federal agency responsible for developing and enforcing air transportation safety regulations. Many of these regulations are codified in the Federal Aviation Regulations (FARs).

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The FAA also publishes a series of guidelines for airport operators to follow called Advisory Circulars (ACs). ACs in the 150-series deal with airport safety issues, including wildlife hazards. In addition to FARs and ACs, the FAA periodically issues Certalerts for internal distribution and to provide recommendations on specific issues for inspectors and airport personnel. As these may be changed or updated, their current status should be verified on a regular basis. This may be accomplished by contacting the FAA directly (see Chapter 9) or by visiting their website at www.faa.gov/arp/hazard.htm or www.faa.gov/faadocs.htm for the most current revision.

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5.0 RESOURCES

FAR 139.337(e)(4) Identification of resources to be provided by the certificate holder for implementation of the plan.

5.1 Airport Supplies

Habitat management and wildlife control supplies can be purchased from several companies. An adequate supply of equipment will be kept on hand at ORD for use by trained personnel. Supplies that will normally be stocked at the airport, by the AWC, include:

- 15 mm pyrotechnic pistol launchers
- Bird bombs/bangers, screamers, and whistlers (with blanks)
- Cleaning kits for all equipment
- Field guide for local bird identification
- Mylar tape
- Snare/catch pole
- Binoculars
- Latex gloves
- Garbage bags
- Gallon-size re-sealable sandwich bags
- Freezer to preserve bird carcasses found on runways

5.2 Airport Operations Vehicles

The AO vehicles should be stocked with the supplies listed below to facilitate an immediate response to wildlife hazards. They will be responsible for responding to emergency calls from the ORD tower or AO to disperse animals from the runways. They should maintain radio communications with the tower if there is a situation within the AOA, and the patrols must operate within the air movement areas according to FAA guidelines. At a minimum, supplies to be maintained in the vehicles should include:

- 15 mm pyrotechnic pistol launchers
- An adequate supply (i.e., 1 box of 50) of 15 mm pyrotechnics (with blanks)
- Latex gloves to handle animal carcasses
- Garbage bags to transport animal carcasses found in the AOA
- Gallon-size re-sealable sandwich bags
- Gull distress audio tapes
- Plastic bucket for wildlife carcasses

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6.0 WILDLIFE CONTROL PROCEDURES

FAR 139.337(e)(5) Procedures to be followed during air carrier operations including at least ...

139.337(e)(5)(i) Assignment of personnel responsibilities for implementing the procedures;

Personnel responsibilities are described and delineated in Chapter 2.

139.337(e)(5)(ii) Conduct of Physical inspections of the movement areas and other areas critical to wildlife hazard management sufficiently in advance of air carrier operations to allow time for wildlife controls to be effective;

Airport Operations Supervisors (AOSs) should frequently conduct physical inspections of movement areas and other areas critical to wildlife hazard management as part of the daily protocol. The AOS should document all observed wildlife and record the data on a Weekly Wildlife Activity Report (Appendix F). In cases where no animals are seen, a record indicating that an inspection was conducted and that no animals were observed should be made. A copy of the Daily Wildlife Activity Report for each day should be submitted to the WB. The WB should also conduct physical inspections of critical areas and record wildlife activity. During periods of exceptionally heavy wildlife activity (e.g., migratory periods, outbreaks of insects etc.), the AOS should work with the WB to issue a Notice to Airmen (NOTAM).

139.337(e)(5)(iii) Wildlife control measures;

6.1 Overview

Wildlife that is identified as hazardous during and after the completion of the recommended habitat modifications should be controlled using accepted direct control techniques. Wildlife hazards at airports are extremely variable and complex. Therefore, it is essential to adopt a flexible, innovative, and adaptive approach to managing these hazards. Airport personnel should be trained to identify hazardous wildlife at ORD (see Chapter 8), and should select dispersal methods that are appropriate to the type of animal causing the hazard. Wildlife identification guides and handbooks will be available for use by wildlife control personnel at ORD.

6.2 Wildlife Patrol

ORD's wildlife patrol should consist of the WB, AOS and Motor Truck Drivers who work on the airfield. The patrol should coordinate their activities with each other to monitor and respond to wildlife hazards on the airfield. They should be trained in wildlife identification, proper control techniques, and safe operations as outlined in Chapter 8 and should always have adequate wildlife control supplies (Chapter 5). The patrol should have radio-equipped vehicles and should maintain clear communications with the tower, in accordance with FAA radio protocols. The patrol should also report all observations of wildlife activity on the Weekly Wildlife Activity Report (Appendix F). Completed forms should be forwarded to the WB for frequent review. Routine runway sweeps should be conducted at least once per shift, and the presence of any dead animals found from strikes or suspected strikes should be recorded on Form 5200-7 (Appendix E). In cases where no wildlife hazards were seen, it should be indicated that an inspection was conducted and that no hazards were observed on the Daily Wildlife Activity Report. Other wildlife-related activities (e.g., notable hazards, animals killed or dispersed, unusual wildlife behavior, etc.) should be documented on the Daily Wildlife Activity Report. All dead birds found on runways will be considered the result of a strike unless the death was obviously due to some other cause. Any bird remains that are found should be bagged, labeled (e.g., time and date found, location on runway, prevailing wind/weather conditions, person who found remains, etc.), and placed in a freezer for later inspection and identification. Wildlife strikes may be reported directly to the FAA via Internet at <http://www.faa.gov/arp/hazard.htm>, but a printout of the report must also be immediately submitted to the WB so that the situation can be assessed.

6.3 Species Management: Overview

The species of wildlife most commonly observed at ORD are outlined in this Chapter. Their impact to aviation, seasonal changes, attractants, legal status and control methods available at ORD are listed as well. Pyrotechnics are the tool most readily available to AOSs and other airfield personnel. However, all of the tools and techniques listed in this Chapter are readily available to ORD and shall be used by the WB, as needed, to alleviate specific wildlife hazards.

6.4 Species Management: Birds

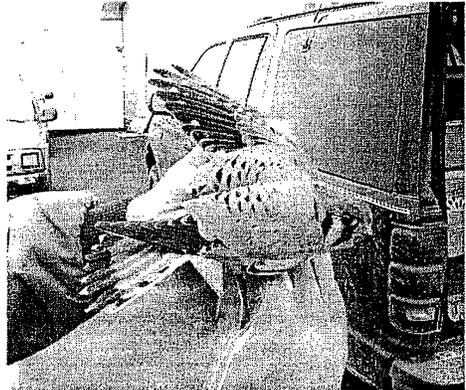
Birds represent the greatest potential for wildlife strike at ORD. This is due to their abundance near and attraction to the airport. Most of the species encountered at ORD are either large enough to individually cause damage to an aircraft or they forage in flocks, posing the threat of a multiple strike event.

6.4.1 Raptors: Hawks, Falcons and Owls

Impact at the airport: The primary species of raptors observed at ORD include the red-tailed hawk, rough-legged hawk and American kestrel, with an occasional appearance of a peregrine falcon. Raptors often perch on structures and lights around the airport to gain a vantage point to watch for prey. This habit brings them into close proximity of the landing field and aircraft. Due to the larger size of these species (except for the American kestrel) and their habit of using air currents to soar while in search of food over the grassy areas of the airport, they pose a significant threat to aircraft. The American kestrel, although smaller, also poses a hazard because of the high number of these birds that utilize the airport as a foraging area. The American kestrels hunting method is to hover over an area in search of rodents or insects. This behavior often places the birds directly in the path of aircraft movements.



Red-tailed Hawk



American kestrel

The Snowy owl and Short-eared owl are the primary species of owls found at the airport. These birds often forage near runways for small rodents, resulting in a high potential for them to be struck by aircraft.

Seasonal changes: Raptors are found at the airport year round. Observations, however, reveal two seasons of high activity occurring at ORD: winter, due to the large number of red-tailed and rough-legged hawks wintering near the airport; and summer, when most of the American kestrel young have left the nest and take flight over the airport.



Rough-legged hawk



Peregrine falcon

The Snowy owl is a migrant from the arctic circle and is present at the airport from November through April. Short-eared owls are present throughout the year, but are most common in the spring and fall. Peregrine falcons are well established in the Chicago area and are seen at ORD, on occasion, throughout the year.

Attractants on the airport to hawks, falcons and owls: The primary draw of these birds to ORD are the numerous rabbits and smaller rodents available as a food source. Although raptors may prey upon these animals and reduce their populations, benefitting airfield operations by reducing any threats these mammals may pose, the presence of raptors represents a greater threat. Lighting structures on the airfield and trees near the airport also provide excellent perching areas from which to hunt.

Legal Status: Raptors are classified as migratory nongame birds. A federal depredation permit and Illinois Nuisance Animal Removal Permit are required to take these birds or their nests/eggs.

Control methods available: Raptors are federally protected and translocation should be used to reduce hazards to aircraft whenever possible. Available control methods include:

Habitat Modification

- Habitat management
- Prey species management

Aversive Tactics

- Gas exploders
- Pyrotechnics
- Effigies/Scarecrows
- Lights

Population Management

- I. Non-lethal
 - Pole traps
 - Bal-Chatris
 - Pigeon harnesses
 - Goshawk traps
 - Bow nets
- II. Lethal
 - Shooting
 - Nest destruction



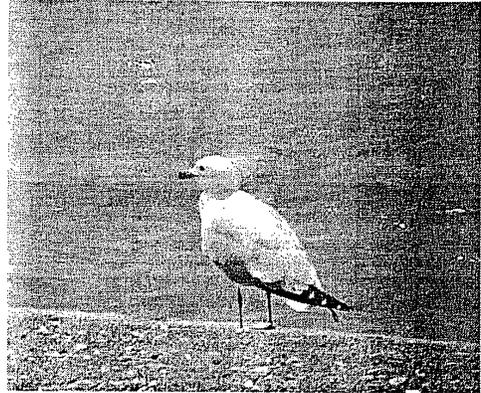
Short-eared owl



Snowy owl
02 SEPT 02
Maria Halpin
FAA Approval

6.4.2 Gulls: Ring-billed Gull, Herring Gull

Impact at the airport: Gulls have, historically, been the most numerous birds on the airport through the warm months. They present a significant threat due to their soaring habits and persistence at the airport. These birds are large enough to significantly damage a turbojet engine if ingested.



Ring-billed gull

Seasonal changes: Gulls are present most of the year, with only a few observed in the winter. Concentrations increase throughout the summer, reaching a peak in late summer/early fall when the young birds follow adults onto the airfield.

Attractants on the airport to gulls: The primary attractant on the airport to gulls is the food availability. These birds are attracted by food scraps discarded in and around the airport. They also find insects and earthworms throughout the airport, usually around the runways and taxiways in standing ephemeral water after rains. Significant increases in gull activity are often experienced during mowing operations, as these operations cause increased availability of insects and small rodents. During colder days, the birds are commonly found warming themselves on the asphalt.

Legal status: Gulls are classified as migratory nongame birds. A federal depredation permit and Illinois Nuisance Animal Removal Permit are required to take these birds or their nests/eggs.

Control methods available:

Habitat Modification

- Physical barriers
- Habitat management

Aversive Tactics

- I. Non-chemical
 - Electronic distress sounds
 - Gas exploders
 - Pyrotechnics
 - Effigies/Scarecrows

- II. Chemical
 - Methyl anthranilate

Population Management

- I. Non-chemical
 - Shooting
 - Trapping
- II. Chemical
 - Avitrol®

6.4.3 Blackbirds: European Starling, Brown-Headed Cowbird, Common Grackle, Red-Winged Blackbird

Impact at the airport: Most blackbirds are relatively small, and therefore individually represent little threat to aircraft safety. However, large numbers of these birds are typically present due to their flocking behavior and can cause significant damage to aircraft.

Seasonal changes: European starlings are present at ORD airport year round. Other species are present only in the spring, summer and fall. Being migratory in nature, these birds are concentrated most heavily in the spring and fall. Starling numbers increase in mid-summer as young birds fledge from nests. Large congregations of juvenile European starlings forage near runways and cause the greatest potential for blackbird strikes with aircraft.



European starlings

Attractants on the airport to blackbirds: There are many factors that may attract blackbirds into the area. The birds often find the three basic needs for survival at the airport. These include: (1) food, available in the form of grass/weed seeds, insects and garbage; (2) water, available throughout the airport; and (3) shelter, found in the surrounding trees and buildings, in which to hide from predators and to build nests.

Legal status: The European starling is not a protected species and may be controlled at any time with approved techniques. The remaining blackbirds are classified as migratory

nongame birds and fall under a general depredation order which allows for their control when they are present in sufficient numbers to pose a threat to human health and safety.

Control methods available:

Habitat Modification

- Physical barriers on perching/nesting structures
- Habitat management

Aversive Tactics

- Electronic distress sounds
- Gas exploders
- Pyrotechnics
- Effigies/Scarecrows
- Lights

Population Management

I. Nonchemical

- Trapping
- Shooting
- Nest destruction

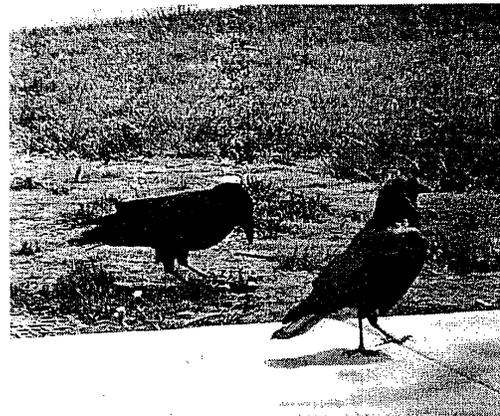
II. Chemical

- Aversive agent
- Avitrol®
- Toxicant
- DRC-1339

6.4.4 Crows

Impact at airport: Individual crows are large enough to cause significant damage to aircraft if struck. These birds forage in the grassy areas of the airfield in flocks of up to 50 birds. Crows tend to be very persistent on the airport.

Seasonal changes: Crows are present at ORD throughout the year. Concentrations tend to be heaviest from the time the first snow melts in winter until late spring.



Crows
02 SEPT 02
Maria Halpern

FAA Approval

Attractants on the airport to crows: The airport offers a wide variety of feeding opportunities to crows. Open grasslands provide weed/grass seeds, insects and small rodents. They will readily accept handouts and scraps that are discarded in accessible areas. Crows use the various structures located throughout the airport for perching to rest or to escape perceived dangers on the ground.

Legal status: Crows are considered migratory game birds and are, therefore, protected by federal law. They do, however, fall under the same general depredation order as blackbirds. This order allows for them to be controlled without a permit when they are present in sufficient numbers to pose a threat to human health and safety.

Control methods available:

Habitat Modification

- Physical barriers on perching/nesting structures
- Habitat management

Aversive Tactics

- Electronic distress sounds
- Gas exploders
- Pyrotechnics
- Effigies/Scarecrows
- Lights

Population Management

I. Nonchemical

- Trapping
- Shooting
- Nest destruction

II. Chemical

- Aversive agent
- Avitrol®
- Toxicant
- DRC-1339

6.4.5 Waterfowl: Canada goose, Mallard and other migratory waterfowl

Impact at the airport: All waterfowl are large enough to cause damage to aircraft if struck. The two primary species of concern at ORD are Canada geese and mallards, the only resident and nesting waterfowl near the airport.

Seasonal changes: Population levels of waterfowl species vary throughout the year. Major concentrations occur during the spring and fall migration because ORD is located just east of a major Canada goose flyway. Other species of waterfowl are often seen passing over the airport during migration but are generally not close enough to be affected by control techniques used on the airfield.

Attractants on the airport to waterfowl: The primary attractant to waterfowl are water resources, which include detention ponds and incidental ponds that develop after heavy rains. Waterfowl use these areas for feeding, resting and shelter from predators or as a stopover while migrating. Many of the waterfowl species will also feed or loaf upon grasses located throughout the airport.

Legal Status: All migratory waterfowl are protected by federal law as migratory game birds. Legal hunting seasons have been established in which they may be hunted for recreation. A federal depredation permit and Illinois Nuisance Animal Removal Permit are required to take these birds or their nests/eggs.

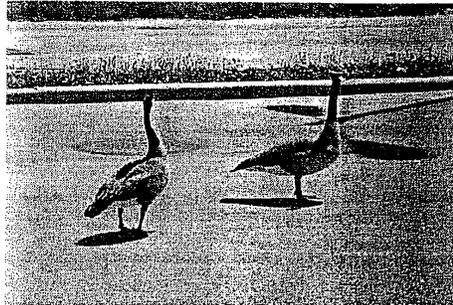
Control methods available:

Habitat Modification

- Physical barriers
- Habitat management

Aversive Tactics

- I. Non-chemical
 - Electronic distress sounds
 - Gas exploders



Canada geese



Mallards

- Pyrotechnics
- Effigies/Scarecrows

II. Chemical

- Methyl anthranilate

Population Management

- Shooting
- Egg shaking/oiling/nest destruction

6.4.6 Non-regulated birds: Pigeons and English sparrows

Impact at the airport: Pigeons may significantly impact operations at the airport. These birds are large enough to damage engines when ingested. These birds frequent structures, such as the hangers, where they are active near passing airplanes. English sparrows, due to their small size, do not individually pose a significant threat to aircraft if ingested. However, if a flock of sparrows is ingested, the engine may be damaged. Pigeons and sparrows additionally pose a nuisance at the airport in their nesting behaviors. Nesting in buildings will cause an accumulation of droppings (i.e. feces) which may pose a health threat.



Pigeons

Seasonal changes: Population densities of these birds fluctuate throughout the year, with higher concentrations in late summer and lower concentrations in the winter. Few sparrows are present in the winter.



English sparrow

Attractants on the airport to pigeons and sparrows: The airport offers good feeding and nesting habitat for these birds. The birds are attracted to grassy areas to forage for seeds and to areas where other food sources (i.e., garbage and handouts) are available. Nesting and roosting habitat is present throughout the airport. They will utilize structures (i.e., buildings, overpasses/bridges, machinery, etc.) to roost and build nests.

Legal status: These birds are not protected by federal or state laws. They may be controlled at any time with all legal and approved methods.

Control methods available:

Habitat Modification

- Physical barriers
- Habitat management

Aversive Tactics

I. Non-chemical

- Electronic distress sounds
- Gas exploders
- Pyrotechnics
- Effigies/Scarecrows

II. Chemical

- Chemical repellents
- Tactile
- Avitrol®

Population Management

Lethal

I. Non-chemical

- Trapping
- Shooting
- Nest destruction

II. Chemical

- Toxicants
- DRC-1339

6.5 Species Management: Mammals

Large mammals are far less common than birds at ORD. Their presence, however, is occasionally documented and efforts are made to remove them as a threat from the airport. Large mammals, such as white-tailed deer, coyotes, opossums, dogs and raccoons have the potential to cause significant damage to a fast moving aircraft. Smaller species, such as voles, mice and rabbits, provide a food source attractant for many of the larger species of mammals and birds.

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02 SEPT 02
Jinca Halpin

FAA Approval

6.5.1 Canids: Coyotes, dogs and red fox

Impact at the airport: Coyotes, dogs and red fox have been involved in near misses with aircraft, threatening safety of flights. These animals are large enough to significantly damage engines if they are ingested during a strike. These predators will commonly hunt close to active runways/taxiways and have been known to chew on equipment which may cause damage and require repairs. Red fox have also been recovered on and adjacent to ORD airport.



Coyote

Seasonal changes: Little evidence has been collected to indicate significant seasonal population changes. In general, the populations would expand temporarily in the spring due to the raising of young, but decrease in the fall when the young disperse.

Attractants on the airport to canids: The airport holds a diversity of prey for predators, including rabbits, voles, and small birds. These predators, having become accustomed to the urban environment, will find the open areas preferred habitat for hunting.

Legal status: The coyote and red fox are classified as fur-bearing mammals in Illinois. A Nuisance Animals Removal Permit from the IDNR is necessary to remove these animals. WS has the needed permit and should coordinate removal of these animals. Dogs are offered no federal or state protection.

Control methods available:

Habitat Modification

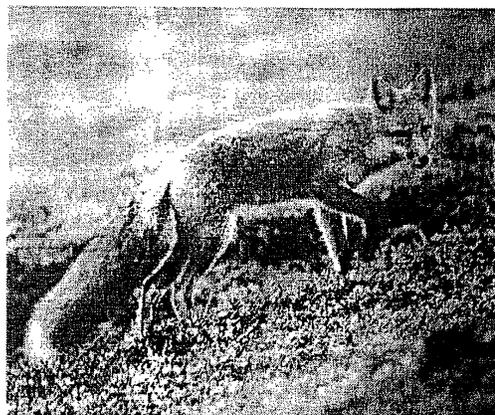
- Physical barriers
- Habitat management

Aversive Tactics

- Gas exploders
- Pyrotechnics

Population Management

- I. Non-chemical
 - Leghold traps
 - Snares



Red fox
02 SEPT 02
Jica Halpin
FAA Approval

- Shooting
- II. Chemical
 - Gas cartridge

6.5.2 Ungulates: White-tailed deer

Impact at the airport: The greatest threat of deer at ORD involves strikes and near misses with airplanes. With their large body mass they have a great impact upon planes they strike and an engine would be significantly damaged if ingested. It is also feared that with the forces involved at high speeds that such a strike could sever the engine from its mounts. The foraging behavior of deer bring them into close proximity to active runways and taxiways, which they occasionally cross.



White-tailed Deer

Seasonal changes: The deer at ORD have been monitored for several years, providing population trends. With a healthy annual recruitment through reproduction and little predation upon the population, deer numbers have been increasing. Deer harvest programs in the past have caused the only significant population reductions.

Attractants on the airport to ungulates: The airport offers a large open space of land with good foraging habitat and cover in a completely urban, or otherwise developed environment. The controlled environment of the airport also provides the deer relative protection from human interference.

Legal status: White-tailed deer are game mammals in Illinois. A deer removal permit from the IDNR is required prior to any removal of deer. The IDNR maintains an Urban Deer Project office in the Chicago area to assist with urban deer problems and issuance of deer harvest permits.

Control methods available:

Habitat Modification

- Physical barriers
- Habitat management

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Aversive Tactics

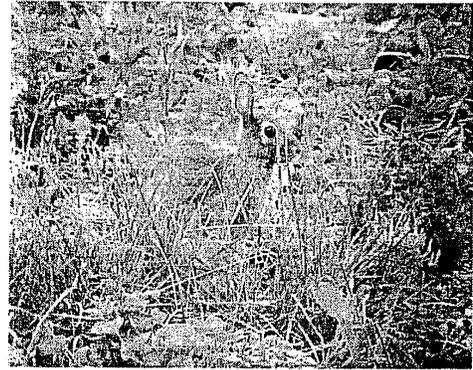
- Gas exploders
- Pyrotechnics

Population Management

- I. Non-chemical
 - Shooting

6.5.3 Rodents: Meadow voles, mice, Norway rats, rabbits and woodchucks

Impact at the airport: These rodents have little direct effect on airport operations. Their primary hazard involves attracting a host of predators, including raptors, crows and predatory mammals. Raptors have the highest rate of strikes due to their attraction to the airport to feed on Meadow voles. Rabbits and woodchucks will burrow under structures, such as blast fences and buildings, thus weakening the foundation integrity of these structures. Some rodents may gnaw on buried cables and cause power shortages to runway lights. Although this has not been documented at ORD, the potential exists.



Cottontail rabbit

Seasonal changes: Normal fluctuations of a dynamic rodent population exist at ORD (i.e., increasing populations in the spring through summer due to reproduction, decreasing populations afterwards due to mortalities caused by predations and other natural causes). Periods of activity and dormancy may be weather-related.

Attractants on the airport to rodents: Meadow voles thrive in the open grasslands found throughout the airport. These animals will feed upon grass/weed seeds and insects. Woodchucks have been found in the grassland habitats of the airport, foraging upon the grasses. Cottontail rabbits den under structures on the airfield and feed on the various weeds and grasses. Mice and Norway rats are commensal rodents, meaning that they survive off of the activities of humans. Mice may be found in and around buildings. Norway rats are most heavily concentrated around garbage disposal areas.

Legal status: The woodchuck and cottontail rabbit are classified as game animals in Illinois. A Nuisance Animal Removal Permit must be obtained from the IDNR prior to control. WS has the needed permit and will conduct control of these animals. All other rodents listed are not protected and may be controlled at any time.

Control methods available:

Habitat Modification

- Physical barriers
- Habitat management

Population Management

I. Non-lethal

- Cage traps

II. Lethal

A. Non-chemical

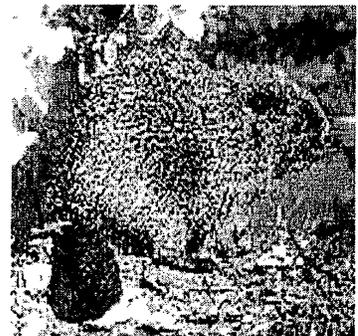
- Quick-kill traps (e.g., snap traps)
- Cage traps

B. Chemical

- Toxicants
 - Zinc phosphide
 - Gas cartridge

6.5.4 Beaver

Impact at the airport: Beaver are in the rodent family, but are discussed separately because of the difference in control methods available. Beaver may pose significant problems at ORD from their practice of damming waterways and drainages to construct ponds in which to live. Although this activity does not directly impact air carrier operations at the airport, it can impede water flow from the airfield. The creation of ponds may additionally threaten the integrity of the foundation of the runways, taxiways, and roads by restraining the drainage of moisture from the grounds. Wetlands may also be created increasing attractive sites for waterfowl.



Beaver

Seasonal changes: Populations of beaver at the airport are very low. No data has been collected that demonstrates seasonal fluctuation of populations at ORD.

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02 SEPT 02
Mica Halpin
FAA Approval

Attractants on the airport: Beaver are common throughout northern Illinois and are found in most waterways. Four main watersheds found on the airport property provide ample beaver habitat, and as surrounding populations expand, they may be forced into ORD to establish new home ranges.

Legal status: Beaver are classified as fur-bearing mammals in Illinois. A nuisance animal removal permit must be obtained from the IDNR to destroy beaver.

Control methods available:

Habitat Modification

- Physical barriers
- Habitat management

Population Management

I. Non-lethal

- Leghold traps
- Cage traps
- Snares (i.e., foot/leg or body gripping)

II. Lethal

- Leghold traps
- Cage traps
- Snares (i.e., foot/leg or body gripping)
- Quick-kill traps (i.e., Conibear-type traps)
- Shooting

6.5.5 Other mammals: Raccoon, Opossum and Striped skunk

Impact at the airport: Raccoons, opossums, and striped skunks have caused direct impacts on airport operations. They have on occasion, foraged along the edge of runways and taxiways where they pose a threat to aircraft safety. These mammals may also pose a threat to airport employee safety and cause property damage. They are potential carriers of zoonotic diseases (i.e., rabies) and, if infected, may expose humans to these diseases. They often build their dens in or near buildings, causing extensive damage.



Raccoon
02 SEPT 02
Tricia Halpin
FAA Approval

Seasonal changes: No data has been collected on population changes throughout the year of these mammals at ORD.

Attractants on the airport to raccoons, opossums, and Striped skunks: ORD offers relative protection of these mammals through limited human activity. Usable habitat for these mammals may be found throughout the property, including the underground network of pipes and basins, antenna/blast fence structures and buildings. Food, in the form of small rodents, insects, and garbage may be utilized by raccoons and opossums. Burrows may be built under structures on the airfield or in buildings.

Legal status: Raccoons, opossums and striped skunks are classified as fur-bearing mammals in Illinois. A Nuisance Animals Removal Permit from the IDNR is necessary to remove these animals. WS has the needed permit and will coordinate removal of these animals.

Control methods available:

Habitat Modification

- Physical barriers
- Habitat management

Population Management

I. Non-lethal

- Leghold traps
- Cage traps
- Snares (i.e., foot/leg or body gripping)

II. Lethal

- Leghold traps
- Quick-kill traps (i.e., Conibear-type traps)
- Cage traps
- Snares (i.e., foot/leg, neck, or body gripping)
- Shooting

6.6 Communications

139.337(e)(5)(iv) Communication between wildlife control personnel and ATCT in operations at the airport;

All wildlife control personnel should be equipped with radios and have proper training to contact the ATCT. If an immediate hazard exists that might compromise the safety of air traffic at ORD, an AOS should coordinate with the ATCT, and if necessary, detain arriving or departing air traffic until the hazard is eliminated. In extreme cases, the runway may need to be closed temporarily, at the discretion of the AOS or ATCT. In most cases, wildlife control personnel should be given priority when responding to a wildlife hazard on the AOA.

The ATCT provides an ideal vantage from which to view any wildlife movements on the airfield. Although the ATCT can not be expected to monitor all wildlife hazards on the airfield and still direct air traffic, tower personnel should notify AO immediately if pilots report hazards or any such hazards are observed from the tower.

7.0 EVALUATION

139.337(e)(6) Periodic evaluation and review of the WHMP for-

- (i) Effectiveness in dealing with the wildlife hazard; and*
- (ii) Indications that the existence of the wildlife hazard should be reevaluated.*

7.1 Overview

The WHMP will be evaluated at least annually. The Wildlife Hazard Working Group will evaluate the effectiveness of the WHMP at reducing wildlife strikes at ORD and monitor the status of hazard reduction projects, including their completion dates.

7.2 Meetings

The Wildlife Hazard Working Group will meet at least once per year, but the group may convene more regularly if situations warrant, as determined by any member of the group.

7.3 Wildlife Strike Database

The AWC will maintain a database of wildlife strikes and populations on or surrounding the airfield. Information from this database will be used to identify trends and to monitor any increases in wildlife hazards on the airfield. If unacceptable increases in wildlife populations are observed, the cause should be determined and the WHMP modified to address the problem. The records should be entered weekly into a computerized database by the AWC. WS has developed a Wildlife Hazard Management Information System (WHMIS) program specifically for tracking wildlife control activities at airports and can assist the airport in setting up this computerized record system. WS provides the WHMIS system at no charge, but the program requires Microsoft Access 97 to operate.

7.4 Airport Expansion

Airport expansion plans will be reviewed by the ORD Wildlife Hazard Working Group to ensure that new developments will not inadvertently result in increased wildlife hazards to aircraft operations. If appropriate, they will coordinate designs with the FAA.

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02 SEPT 02
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FAA Approval

7.5 FAA Involvement

FAA Regional Certification Inspectors and personnel from the Great Lakes Regional Office should be invited to make comments on the WHMP and to attend annual meetings on plan modifications.

8.0 TRAINING

139.337(e)(7) A training program to provide airport personnel with the knowledge and skills needed to carry out the WHMP required by (d) of this section.

8.1 Overview

Training is essential for those personnel involved in the WHMP. The AWC should ensure that all airport operations personnel that might be working in a wildlife deterrence capacity are trained in the proper selection and application of control methods, including species identification and reporting procedures.

8.2 Standard Training

Wildlife control personnel should receive training in mitigating wildlife hazards at airports, including an overview of the need for wildlife control, techniques used for prey-base reductions, pyrotechnic safety, and wildlife identification. Airport communication and airfield driver training should also be provided to all employees involved in wildlife control operations that may require them to operate on the AOA.

8.3 USDA-Wildlife Services Training

WS offers more specific training for personnel involved with implementation of the WHMP. The purpose of the course is to familiarize personnel involved with airport operations in basic bird and mammal identification and dispersal techniques. It includes a brief overview of the laws regulating wildlife control, both state and federal. The course also involves hands-on training using pyrotechnics, techniques used for prey-base reductions, and other deterrent equipment, with an emphasis on safety. This training should be offered to all personnel responsible for dispersing wildlife at ORD and customized to fit the needs of individual recipients or situations.

9.0 AGENCY DIRECTORY

REGULATORY AND ENFORCEMENT

Federal Aviation Administration (FAA)
Safety Certification Inspector (Tricia L. Halpin)
Great Lakes Region
2300 E. Devon Avenue
Des Plaines, IL 60018

Federal Aviation Administration (FAA)
Staff Wildlife Biologist (Ed Cleary)
FAA Airport Safety and Compliance
FAA-AA5-317
800 Independence Ave., SW
Washington, DC 20591
(202) 267-3389

Illinois Dept. of Agriculture
Agricultural Pesticide Applicator Testing
P.O. Box 19281
State Fairgrounds
Springfield, IL 62794

Illinois Dept. of Natural Resources
Nuisance Wildlife Permitting
524 S. 2nd Street
Springfield, IL 62794
Tel. (217) 782-6384

Illinois Dept. of Public Health
Structural Pesticides Applicator Testing
525 W. Jefferson Street
Springfield, IL 62761

U.S. Fish and Wildlife Service
Migratory Bird Permit Office, Region 3
Bishop Henry Whipple Federal Building
1 Federal Drive
Fort Snelling, MN 55111-4056
Tel. (612) 713-5436
Fax (612) 713-5286

U.S. Fish and Wildlife Service (Chicago Field Office)
1000 Hart Road, Ste. 180
Barrington, IL 60010
Tel. (847) 381-2253

U.S. Fish and Wildlife Service (Law Enforcement)
10600 Higgins Road, Ste. 200
Rosemont, IL 60018
Tel. (312) 353-0550

MUNICIPAL AGENCIES

Chicago Commission on Animal Care and Control
2741 S. Western Avenue
Chicago, IL
Tel. (312) 744-5000

O'Hare Airport Operations
AMC Bldg. Room 204
Chicago, IL 60666
Tel. (773) 686-2255

O'Hare Airport Security
O'Hare Command Center
10000 West O'Hare
Chicago, IL 60666
Tel. (773) 894-5000

Cook County Sheriff's Police
1401 Maybrook Drive
Maywood, IL
Tel. (708) 865-4876

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02 SEPT 02
Tricia Halpin
FAA Approval

TECHNICAL ASSISTANCE

Chicago Academy of Sciences

2001 North Clark Street
Chicago, IL 60614
Tel.(312)549-0607

Chicago Poison Control Center

1753 West Congress Parkway
Chicago, IL
Tel. (312) 942-5969

Field Museum of Natural History

Bird Division
Roosevelt Road at Lake Shore Drive
Chicago, IL 60605

Smithsonian Institution- Feather ID Lab

Dr. Carla Dove
Division of Birds
NHB E 610, MRC 116
Washington, DC 20560
Tel. (202)357-2334

Trailside Nature Center

River Forest, IL
(708) 366-6530

USDA- Wildlife Services

Chicago Midway/ Meigs Field office
1521 South Lynn White Drive
Chicago, IL 60605
Tel. (312)745-1517
Fax (312)745-1518

USDA- Wildlife Services

Illinois State Office
2869 Via Verde Drive
Springfield IL 62703-4325
Tel. (217)241-6700
Fax (217)241-6702

USDA- Wildlife Services

O'Hare International Airport
AMC Bldg., Rm. 241
Chicago, IL 60666
Tel. (773) 686-6742

INTERNET SITES OF INTEREST

Federal Aviation Administration (FAA)

<http://www.faa.gov/arp/hazard.htm>
<http://www.faa.gov/faadocs.htm>

Prevention and Control of Wildlife Damage

<http://www.ces.ncsu.edu/nreos/wild/wildlife/prevent.htm>

Transport Canada - Wildlife Control Techniques

<http://www.tc.gc.ca/aviation/aerodrme/birdstke/manual/index.htm>

U.S. Department of Agriculture-Wildlife Services

<http://www.aphis.usda.gov/ws/>

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Revision Date: July 3, 2002

02 SEPT 02
Jane Halpin

FAA Approval

APPENDIX A Code of Federal Regulations (CFR) Title 14 FAR Part 139.337

Note: Certalerts, Advisory Circulars, and regulations are frequently changed or updated, always verify that the version attached herein is the most current. Contact FAA or Wildlife Services (see directory in Chapter 9) or consult the FAA website at <http://www.faa.gov/arp/hazard.htm> for the latest version.

CFR 14 - PART 139.337 (Wildlife Hazard Management).

(a) Each certificate holder (*holder of the airport operating certificate*) shall provide for the conduct of an ecological study, acceptable to the Administrator (*F.A.A.*), when any of the following events occur on or near the airport:

- (1) An air carrier aircraft experiences a multiple bird strike or engine ingestion.
- (2) An air carrier aircraft experiences a damaging collision with wildlife other than birds.
- (3) Wildlife of a size or in numbers capable of causing an event described in paragraph (a)(1) or (2) of this section is observed to have access to any airport flight pattern or movement area.

(b) The study required in paragraph (a) of this section shall contain at least the following:

- (1) Analysis of the events which prompted the study.
- (2) Identification of the species, numbers, locations, local movements, and daily and seasonal occurrences of wildlife observed.
- (3) Identification and location of features on and near the airport that attract wildlife.
- (4) Description of the wildlife hazard to air carrier operations.

(c) The study required by paragraph (a) of this section shall be submitted to the Administrator, who determines whether or not there is a need for a wildlife hazard management plan. In reaching this determination, the Administrator considers-

- (1) The ecological study;
- (2) The aeronautical activity at the airport;
- (3) The views of the certificate holder;
- (4) The views of the airport users; and
- (5) Any other factors bearing on the matter of which the Administrator is aware.

(d) When the Administrator determines that a wildlife hazard management plan is needed, the certificate holder shall formulate and implement a plan using the ecological study as a basis. The plan shall-

- (1) Be submitted to, and approved by, the Administrator prior to implementation; and
- (2) Provide measures to alleviate or eliminate wildlife hazards to air carrier operations.

(e) The plan shall include at least the following:

- (1) The persons who have the authority and responsibility for implementing the plan.
- (2) Priorities for needed habitat modification and changes in land use identified in the ecological study, with target dates for completion.
- (3) Requirements for and, where applicable, copies of local, State, and Federal wildlife control permits.
- (4) Identification of resources to be provided by the certificate holder for implementation of the plan.
- (5) Procedures to be followed during air carrier operations, including at least-
 - (i) Assignment of personnel responsibilities for implementing the procedures;
 - (ii) Conduct of physical inspections of the movement area and other areas critical to wildlife hazard management sufficiently in advance of air carrier operations to allow time for wildlife controls to be effective;
 - (iii) Wildlife control measures; and
 - (iv) Communication between the wildlife control personnel and any air traffic control tower in operation at the airport.
- (6) Periodic evaluation and review of the wildlife hazard management plan for-

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- (i) Effectiveness in dealing with the wildlife hazard; and
 - (ii) Indications that the existence of the wildlife hazard, as previously described in the ecological study, should be reevaluated.
- (7) A training program to provide airport personnel with the knowledge and skills needed to carry out the wildlife hazard management plan required by (d) of this section.
- (f) Notwithstanding the other requirements of this section, each certificate holder shall take immediate measures to alleviate wildlife hazards whenever they are detected.
- (g) FAA Advisory Circulars in the 150 series contain standards and procedures for wildlife hazard management at airports which are acceptable to the Administrator.

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APPENDIX B FAA Certalert 97-09 - Wildlife Hazard Management Plan Outline

Note: Certalerts, Advisory Circulars, and regulations are frequently changed or updated, always verify that the version attached herein is the most current. Contact FAA or Wildlife Services (see directory in Chapter 9) or consult the FAA website at <http://www.faa.gov/arp/hazard.htm> for the latest version.

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CERTALERT

ADVISORY * CAUTIONARY * NON-DIRECTIVE

FOR INFORMATION, CONTACT AIRPORT WILDLIFE SPECIALIST, AAS-317 (202) 267.3389

DATE: 17 November, 1997 **No. 97-09**
TO: AIRPORT CERTIFICATION SAFETY INSPECTORS
TOPIC: WILDLIFE HAZARD MANAGEMENT PLAN OUTLINE

An increasing number of questions are being received concerning the preparation and content of a FAA approved airport wildlife hazard management plan. Title 14 Code of Federal Regulations, part 139.337, *Wildlife Hazard Management*, prescribes the specific issues that a wildlife hazard management plan must address for FAA approval and inclusion in the ACM.

A wildlife hazard assessment, defined as an ecological study in part 139.337 (a), conducted by a wildlife damage management biologist, provides the scientific basis for the development, implementation, and refinement of a wildlife hazard management plan. Though parts of the wildlife hazard assessment may be incorporated directly in the wildlife hazard management plan, they are two separate documents. Part of the wildlife hazard management plan can be prepared by the biologist(s) who conducts the wildlife hazard assessment. However, some parts can be prepared only by the airport. For example, airport management assigns airport personnel responsibilities, commits airport funds, and purchases equipment and supplies. Airport management may request the wildlife biologist to review the finished plan.

The wildlife damage management biologist's primary responsibilities are:

- to provide information on the wildlife attractants that have been identified on or near the airport,
- to identify wildlife management techniques,
- to prioritize appropriate mitigation measures,
- to recommend necessary equipment and supplies, and
- to identify training requirements for the airport personnel who will implement the wildlife hazard management plan.

It is often helpful for the airport manager to appoint a Wildlife Hazard Management Group that has responsibility for the airport's wildlife management program. The biologist should assist the Wildlife Hazard Management Group with periodic evaluations of the plan and make recommendations for further refinements or modifications.

The following details the requirements of part 139.337 (e) and (f) and how those requirements should be addressed in a FAA approved wildlife hazard management plan.

FAR 139.337 REQUIREMENTS

**WILDLIFE HAZARD MANAGEMENT
PLAN CONTENTS**

<p>139.337(e). The (wildlife hazard management) plan shall include at least the following :</p>	<p>The wildlife hazard management plan must include, and/or identify the responsibility of, and/or actions to be taken, –</p>
<p>139.337(e)(1). The persons who have authority and responsibility for implementing the plan.</p>	<p>Specific responsibilities for various sections of the wildlife hazard management plan must be assigned or delegated to various airport departments such as:</p> <ul style="list-style-type: none"> Airport Director Operations Dept. Maintenance Dept. Security Dept. Planning Dept. Finance Dept. Wildlife Coordinator Wildlife Hazard Group <p>Local law enforcement authorities that provide wildlife law enforcement and other support also have a role to play:</p> <ul style="list-style-type: none"> State Fish and Game U. S. Fish and Wildlife Service City police County Sheriff
<p>139.337(e)(2). Priorities for needed habitat modification and changes in land use identified in the ecological study with target dates for completion.</p>	<p>Attractants (food, cover, and water) identified in wildlife hazard assessment, with priorities for mitigation and completion dates. Attractants can be grouped by areas and ownership. (A list of completed habitat modification or other projects designed to reduce the wildlife/aircraft strike potential can be included, and provides a history of work already accomplished.)</p> <ul style="list-style-type: none"> Airport property: <ul style="list-style-type: none"> Aircraft Operations Area (AOA). Within 2 miles of aircraft movement areas. Within 5 miles of aircraft movement areas. Airport structures Non-airport property <ul style="list-style-type: none"> Within 2 miles of aircraft movement areas. Within 5 miles of aircraft movement areas. Structures

FAR 139.337 REQUIREMENTS

**WILDLIFE HAZARD MANAGEMENT
PLAN CONTENTS**

<p>Habitat/population management recommendations</p>	<p>Management plans for specific areas, attractants, species, or situations, as identified in ecological study (wildlife hazard assessment). This section may include any or all of the following:</p> <ul style="list-style-type: none">Food/Prey-base Management<ul style="list-style-type: none">RodentsEarthwormsInsectsOther preyTrash and debris - handling, storage.HandoutsSpecies specific population management<ul style="list-style-type: none">i.e. deer, gulls, geese, coyotesRepellingExclusionRemovalHabitat Management<ul style="list-style-type: none">Vegetation Management<ul style="list-style-type: none">AOA vegetationDrainage ditch(s) vegetationLandscapingAgricultureWater Management<ul style="list-style-type: none">Permanent Water<ul style="list-style-type: none">WetlandsCanals/drainage ditchesDetention/retention pondsSewage (glycol) treatment pondsOther water areasEphemeral water<ul style="list-style-type: none">Runways, taxiways, & aprons.Other wet areasAirport Buildings<ul style="list-style-type: none">Airfield structuresAbandoned structuresTerminalAirport constructionResource Protection<ul style="list-style-type: none">ExclusionRepelling<ul style="list-style-type: none">ChemicalAuditoryVisual
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FAR 139.337 REQUIREMENTS

**WILDLIFE HAZARD MANAGEMENT
PLAN CONTENTS**

<p>139.337(e)(3). Requirements for and, where applicable, copies of local, state and Federal wildlife control permits.</p>	<p>Wildlife can be protected at all levels of government – city, county, state, federal, or may not be protected at all, depending on location and species. Therefore the section should address the specific species involved and their legal status.</p> <p>Wildlife management permitting requirements and procedures (spelled out) Federal - 50 CFR parts 1 to 199. State - Fish and Game Code (or equivalent) City, county - ordinances</p> <p>If pesticides are to be used, then the following are also needed. Pesticide use regulations Federal- [Federal Insecticide, Fungicide, and Rodenticide Act, as amended (FIFRA)] State (varies by state) City/county (if applicable)</p> <p>Pesticide use licensing requirements State regulations</p>
<p>139.337(e)(4). Identification of resources to be provided by the certificate holder for implementation of the plan.</p>	<p>Lists identifying what the airport will supply in terms of: Personnel Time Equipment, (i.e. radios, vehicle(s), guns, traps). Supplies (i.e. shellcrackers, mylar tape) Wildlife Patrol Personnel Vehicle(s) Equipment Supplies Pesticides Restricted/non-restricted Application equipment Sources of Supply</p>
<p>139.337(e)(5). Procedures to be followed during air carries operations, including at least...</p>	
<p>139.337(e)(5)(i). Assignment of personnel responsibilities for implementing the procedures;</p>	<p>Who, when, what circumstances Wildlife Patrol Wildlife Coordinator Operations Dept. Maintenance Dept. Security Dept. Air Traffic Control</p>
<p>139.337(e)(5)(ii). Conduct of physical inspections of the movement areas and other areas critical to wildlife hazard management sufficiently in advance of air carrier operations to allow time for wildlife controls to be effective;</p>	<p>Who, when, how, what circumstances -- Runway(s), taxiway(s), and ramp(s) sweeps, AOA monitoring Un-mitigated attractants</p>

FAR 139.337 REQUIREMENTS

**WILDLIFE HAZARD MANAGEMENT
PLAN CONTENTS**

<p>139.337(e)(5)(iii). Wildlife control measures:</p>	<p>Who, what circumstances, when, how is the Wildlife Patrol contacted.</p> <ul style="list-style-type: none"> Wildlife Patrol <ul style="list-style-type: none"> Bird Control <ul style="list-style-type: none"> repel capture kill Mammal control <ul style="list-style-type: none"> repel capture kill
<p>139.337(e)(5)(iv). Communication between wildlife control personnel and any air traffic control tower in operation at the airport.</p>	<p>Communication procedures</p> <ul style="list-style-type: none"> Training in communication procedures Equipment needed <ul style="list-style-type: none"> Radios, mobile phones, etc. Lights
<p>139.337(e)(6). Periodic evaluation and review of the wildlife hazard management plan for:</p>	<p>At a minimum the airport operator should hold annual meetings, or after an event described in 139.337(a)(1 to 3), with representatives from all airport departments involved in the airport's wildlife hazard management efforts and the wildlife damage management biologist who did the original ecological study (wildlife hazard assessment).</p>
<p>139.337(e)(6)(i). Effectiveness in dealing with the wildlife hazard:</p>	<p>Input from all airport departments, ATC, wildlife biologist, as to effectiveness of plan. Good records are a must for evaluating the effectiveness of a program. Therefore need to know what records are kept, by whom, how, where, and when.</p>
<p>139.337(e)(6)(ii). Indications that the existence of the wildlife hazard, as previously described in the ecological study, should be reevaluated.</p>	<p>Wildlife seen on AOA Request for wildlife dispersal from Tower, pilots, or others Wildlife strike database and other records. Good records are a must.</p>
<p>139.337(e)(7). A training program to provide airport personnel with the knowledge and skills needed to carry out the wildlife hazard management plan required by paragraph (d) of this section.</p>	<p>Wildlife Patrol personnel training All airport personnel - wildlife hazard awareness training Pesticide use training and certification</p>

FAR 139.337 REQUIREMENTS

**WILDLIFE HAZARD MANAGEMENT
PLAN CONTENTS**

<p>139.337(f). Notwithstanding the other requirements of this section, each certificate holder shall take immediate measures to alleviate wildlife hazards whenever they are detected.</p>	<p>Although not required as part of wildlife hazard management plan, this information should be included to fulfill part 139 requirements.</p> <p>Procedures and personnel responsibilities for notification regarding new or immediate hazards by and to:</p> <ul style="list-style-type: none"> Wildlife Patrol Operations <ul style="list-style-type: none"> NOTAM issuance/cancellation criteria and procedures Maintenance Security Air Traffic Control Others <p>Rapid response procedures for new or immediate hazards by:</p> <ul style="list-style-type: none"> Wildlife Patrol Operations Maintenance Security Air Traffic Control Others
<p>139.337(g). FAA Advisory Circulars in the 150 series contain standards and procedures for wildlife hazard management at airports which are acceptable to the Administrator.</p>	<p>AC 150/5200--33 Hazardous Wildlife Attractants on or Near Airports.</p>

OSB

Benedict D. Castellano, Manager
Airport Safety and Compliance Branch

APPENDIX C Advisory Circular No. 150/5200-33. Hazardous Wildlife Attractants on or near Airports

Note: Certalerts, Advisory Circulars, and regulations are frequently changed or updated, always verify that the version attached herein is the most current. Contact FAA or Wildlife Services (see directory in Chapter 9) or consult the FAA website at <http://www.faa.gov/arp/hazard.htm> for the latest version.

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U.S. Department
of Transportation

Federal Aviation
Administration

Advisory Circular

Subject: HAZARDOUS WILDLIFE ATTRACTANTS ON
OR NEAR AIRPORTS

Date: 5/1/97

AC No: 150/5200-33

Initiated by:

Change:

AAS-310 and APP-600

1. PURPOSE. This advisory circular (AC) provides guidance on locating certain land uses having the potential to attract hazardous wildlife to or in the vicinity of public-use airports. It also provides guidance concerning the placement of new airport development projects (including airport construction, expansion, and renovation) pertaining to aircraft movement in the vicinity of hazardous wildlife attractants. Appendix 1 provides definitions of terms used in this AC.

2. APPLICATION. The standards, practices, and suggestions contained in this AC are recommended by the Federal Aviation Administration (FAA) for use by the operators and sponsors of all public-use airports. In addition, the standards, practices, and suggestions contained in this AC are recommended by the FAA as guidance for land use planners, operators, and developers of projects, facilities, and activities on or near airports.

3. BACKGROUND. Populations of many species of wildlife have increased markedly in the

last few years. Some of these species are able to adapt to human-made environments, such as exist on and around airports. The increase in wildlife populations, the use of larger turbine engines, the increased use of twin-engine aircraft, and the increase in air-traffic, all combine to increase the risk, frequency, and potential severity of wildlife-aircraft collisions.

Most public-use airports have large tracts of open, unimproved land that are desirable for added margins of safety and noise mitigation. These areas can present potential hazards to aviation because they often attract hazardous wildlife. During the past century, wildlife-aircraft strikes have resulted in the loss of hundreds of lives world-wide, as well as billions of dollars worth of aircraft damage. Hazardous wildlife attractants near airports could jeopardize future airport expansion because of safety considerations.

DAVID L. BENNETT

Director, Office of Airport Safety and Standards

SECTION 1. HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS.

1-1. TYPES OF HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS.

Human-made or natural areas, such as poorly-drained areas, retention ponds, roosting habitats on buildings, landscaping, putrescible-waste disposal operations, wastewater treatment plants, agricultural or aquacultural activities, surface mining, or wetlands, may be used by wildlife for escape, feeding, loafing, or reproduction. Wildlife use of areas within an airport's approach or departure airspace, aircraft movement areas, loading ramps, or aircraft parking areas may cause conditions hazardous to aircraft safety.

All species of wildlife can pose a threat to aircraft safety. However, some species are more commonly involved in aircraft strikes than others. Table 1 lists the wildlife groups commonly reported as being involved in damaging strikes to U.S. aircraft from 1993 to 1995.

Table 1. Wildlife Groups Involved in Damaging Strikes to Civilian Aircraft, USA, 1993-1995.

Wildlife Groups	Percent involvement in reported damaging strikes
Gulls	28
Waterfowl	28
Raptors	11
Doves	6
Vultures	5
Blackbirds- Starlings	5
Corvids	3
Wading birds	3
Deer	11
Canids	1

1-2. LAND USE PRACTICES. Land use practices that attract or sustain hazardous wildlife populations on or near airports can significantly increase the potential for wildlife-aircraft collisions. FAA recommends against land use practices, within the siting criteria stated in 1-3, that attract or sustain populations of hazardous wildlife within the vicinity of airports or cause movement of hazardous wildlife onto, into, or across the approach or departure airspace, aircraft movement area, loading ramps, or aircraft parking area of airports.

Airport operators, sponsors, planners, and land use developers should consider whether proposed land uses, including new airport development projects, would increase the wildlife hazard. Caution should be exercised to ensure that land use practices on or near airports do not enhance the attractiveness of the area to hazardous wildlife.

1-3. SITING CRITERIA. FAA recommends separations when siting any of the wildlife attractants mentioned in Section 2 or when planning new airport development projects to accommodate aircraft movement. The distance between an airport's aircraft movement areas, loading ramps, or aircraft parking areas and the wildlife attractant should be as follows:

a. Airports serving piston-powered aircraft. A distance of 5,000 feet is recommended.

b. Airports serving turbine-powered aircraft. A distance of 10,000 feet is recommended.

c. Approach or Departure airspace. A distance of 5 statute miles is recommended, if the wildlife attractant may cause hazardous wildlife movement into or across the approach or departure airspace.

SECTION 2. LAND USES THAT ARE INCOMPATIBLE WITH SAFE AIRPORT OPERATIONS.

2-1. GENERAL. The wildlife species and the size of the populations attracted to the airport environment are highly variable and may depend on several factors, including land-use practices on or near the airport. It is important to identify those land use practices in the airport area that attract hazardous wildlife. This section discusses land use practices known to threaten aviation safety.

2-2. PUTRESCIBLE-WASTE DISPOSAL OPERATIONS. Putrescible-waste disposal operations are known to attract large numbers of wildlife that are hazardous to aircraft. Because of this, these operations, when located within the separations identified in the siting criteria in 1-3 are considered incompatible with safe airport operations.

FAA recommends against locating putrescible-waste disposal operations inside the separations identified in the siting criteria mentioned above. FAA also recommends against new airport development projects that would increase the number of aircraft operations or that would accommodate larger or faster aircraft, near putrescible-waste disposal operations located within the separations identified in the siting criteria in 1-3.

2-3. WASTEWATER TREATMENT FACILITIES. Wastewater treatment facilities and associated settling ponds often attract large numbers of wildlife that can pose a threat to aircraft safety when they are located on or near an airport.

a. New wastewater treatment facilities. FAA recommends against the construction of new wastewater treatment facilities or associated settling ponds within the separations identified in the siting criteria in 1-3. During the siting analysis for wastewater treatment facilities, the potential to attract hazardous wildlife should be considered if an airport is in the vicinity of a proposed site. Airport operators should voice their opposition to such sitings. In addition, they should consider the existence of wastewater treatment facilities when evaluating proposed sites for new airport development projects and avoid such sites when practicable.

b. Existing wastewater treatment facilities. FAA recommends correcting any wildlife hazards arising from existing wastewater treatment facilities located on or near airports without delay, using appropriate wildlife hazard mitigation techniques. Accordingly, measures to minimize hazardous wildlife attraction should be developed in consultation with a wildlife damage management biologist. FAA recommends that wastewater treatment facility operators incorporate appropriate wildlife hazard mitigation techniques into their operating practices. Airport operators also should encourage those operators to incorporate these mitigation techniques in their operating practices.

c. Artificial marshes. Waste-water treatment facilities may create artificial marshes and use submergent and emergent aquatic vegetation as natural filters. These artificial marshes may be used by some species of flocking birds, such as blackbirds and waterfowl, for breeding or roosting activities. FAA recommends against establishing artificial marshes within the separations identified in the siting criteria stated in 1-3.

d. Wastewater discharge and sludge disposal. FAA recommends against the discharge of wastewater or sludge on airport property. Regular spraying of wastewater or sludge disposal on unpaved areas may improve soil moisture and quality. The resultant turf growth requires more frequent mowing, which in turn may mutilate or flush insects or small animals and produce straw. The maimed or flushed organisms and the straw can attract hazardous wildlife and jeopardize aviation safety. In addition, the improved turf may attract grazing wildlife such as deer and geese.

Problems may also occur when discharges saturate unpaved airport areas. The resultant soft, muddy conditions can severely restrict or prevent emergency vehicles from reaching accident sites in a timely manner.

e. Underwater waste discharges. The underwater discharge of any food waste, e.g., fish processing offal, that could attract scavenging wildlife is not recommended within the separations identified in the siting criteria in 1-3.

2-4. WETLANDS.

a. Wetlands on or near Airports.

(1) **Existing Airports.** Normally, wetlands are attractive to many wildlife species. Airport operators with wetlands located on or nearby airport property should be alert to any wildlife use or habitat changes in these areas that could affect safe aircraft operations.

(2) **Airport Development.** When practicable, the FAA recommends siting new airports using the separations identified in the siting criteria in 1-3. Where alternative sites are not practicable or when expanding existing airports in or near wetlands, the wildlife hazards should be evaluated and minimized through a wildlife management plan prepared by a wildlife damage management biologist, in consultation with the U.S. Fish and Wildlife Service (USFWS) and the U.S. Army Corps of Engineers (COE).

NOTE: If questions exist as to whether or not an area would qualify as a wetland, contact the U.S. Army COE, the Natural Resource Conservation Service, or a wetland consultant certified to delineate wetlands.

b. **Wetland mitigation.** Mitigation may be necessary when unavoidable wetland disturbances result from new airport development projects. Wetland mitigation should be designed so it does not create a wildlife hazard.

(1) FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the separations

identified in the siting criteria in 1-3. Wetland mitigation banks meeting these siting criteria offer an ecologically sound approach to mitigation in these situations.

(2) Exceptions to locating mitigation activities outside the separations identified in the siting criteria in 1-3 may be considered if the affected wetlands provide unique ecological functions, such as critical habitat for threatened or endangered species or ground water recharge. Such mitigation must be compatible with safe airport operations. Enhancing such mitigation areas to attract hazardous wildlife should be avoided. On-site mitigation plans may be reviewed by the FAA to determine compatibility with safe airport operations.

(3) Wetland mitigation projects that are needed to protect unique wetland functions (see 2-4.b.(2)), and that must be located in the siting criteria in 1-3 should be identified and evaluated by a wildlife damage management biologist before implementing the mitigation. A wildlife damage management plan should be developed to reduce the wildlife hazards.

NOTE: AC 150/5000-3, *Address List for Regional Airports Division and Airports District/Field Offices*, provides information on the location of these offices.

2-5. DREDGE SPOIL CONTAINMENT AREAS.

FAA recommends against locating dredge spoil containment areas within the separations identified in the siting criteria in 1-3, if the spoil contains material that would attract hazardous wildlife.

SECTION 3. LAND USES THAT MAY BE COMPATIBLE WITH SAFE AIRPORT OPERATIONS.

3-1. GENERAL. Even though they may, under certain circumstances, attract hazardous wildlife, the land use practices discussed in this section have flexibility regarding their location or operation and may even be under the airport operator's or sponsor's control. In general, the FAA does not consider the activities discussed below as hazardous to aviation if there is no apparent attraction to hazardous wildlife, or wildlife hazard mitigation techniques are implemented to deal effectively with any wildlife hazard that may arise.

3-2. ENCLOSED WASTE FACILITIES. Enclosed trash transfer stations or enclosed waste handling facilities that receive garbage indoors; process it via compaction, incineration, or similar manner; and remove all residue by enclosed vehicles, generally would be compatible, from a wildlife perspective, with safe airport operations, provided they are not located on airport property or within the runway protection zone (RPZ). No putrescible-waste should be handled or stored outside at any time, for any reason, or in a partially enclosed structure accessible to hazardous wildlife.

Partially enclosed operations that accept putrescible-waste are considered to be incompatible with safe airport operations. FAA recommends these operations occur outside the separations identified in the siting criteria in 1-3.

3-3. RECYCLING CENTERS. Recycling centers that accept previously sorted, non-food items such as glass, newspaper, cardboard, or aluminum are, in most cases, not attractive to hazardous wildlife.

3-4. COMPOSTING OPERATIONS ON AIRPORTS. FAA recommends against locating composting operations on airports. However, when they are located on an airport, composting operations should not be located closer than the greater of the following distances: 1,200 feet from any aircraft movement area, loading ramp, or aircraft parking space; or the distance called for by airport design requirements. This spacing is intended to prevent material, personnel, or equipment from penetrating any Obstacle Free Area (OFA), Obstacle Free Zone (OFZ), Threshold Siting Surface (TSS), or Clearway (see AC 150/5300-13, *Airport Design*). On-airport disposal of compost by-products is not recommended for the reasons stated in 2-3.d.

a. Composition of material handled. Components of the compost should never include any municipal solid waste. Non-food waste such as leaves, lawn clippings, branches, and twigs generally are not considered a wildlife attractant. Sewage sludge, wood-chips, and similar material are not municipal solid wastes and may be used as compost bulking agents.

b. Monitoring on-airport composting operations. If composting operations are to be located on airport property, FAA recommends that the airport operator monitor composting operations to ensure that steam or thermal rise does not affect air traffic in any way. Discarded leaf disposal bags or other debris must not be allowed to blow onto any active airport area. Also, the airport operator should reserve the right to stop any operation that creates unsafe, undesirable, or incompatible conditions at the airport.

3-5. ASH DISPOSAL. Fly ash from resource recovery facilities that are fired by municipal solid waste, coal, or wood, is generally considered not to be a wildlife attractant because it contains no putrescible matter. FAA generally does not consider landfills accepting only fly ash to be wildlife attractants, if those landfills: are maintained in an orderly manner; admit no putrescible-waste of any kind; and are not co-located with other disposal operations.

Since varying degrees of waste consumption are associated with general incineration, FAA classifies the ash from general incinerators as a regular waste disposal by-product and, therefore, a hazardous wildlife attractant.

3-6. CONSTRUCTION AND DEMOLITION (C&D) DEBRIS LANDFILLS. C&D debris (Class IV) landfills have visual and operational characteristics similar to putrescible-waste disposal sites. When co-located with putrescible-waste disposal operations, the probability of hazardous wildlife attraction to C&D landfills increases because of the similarities between these disposal activities.

FAA generally does not consider C&D landfills to be hazardous wildlife attractants, if those landfills: are maintained in an orderly manner; admit no putrescible-waste of any kind; and are not co-located with other disposal operations.

3-7. WATER DETENTION OR RETENTION PONDS. The movement of storm water away from runways, taxiways, and aprons is a normal function on most airports and is necessary for safe aircraft operations. Detention ponds hold storm water for short periods, while retention ponds hold water indefinitely. Both types of ponds control runoff, protect water quality, and can attract hazardous wildlife. Retention ponds are more attractive to hazardous wildlife than detention ponds because they provide a more reliable water source.

To facilitate hazardous wildlife control, FAA recommends using steep-sided, narrow, linearly-shaped, rip-rap lined, water detention basins rather than retention basins. When possible, these ponds should be placed away from aircraft movement areas to minimize aircraft-wildlife interactions. All vegetation in or around detention or retention basins that provide food or cover for hazardous wildlife should be eliminated.

If soil conditions and other requirements allow, FAA encourages the use of underground storm water infiltration systems, such as French drains or buried rock fields, because they are less attractive to wildlife.

3-8. LANDSCAPING. Wildlife attraction to landscaping may vary by geographic location. FAA recommends that airport operators approach landscaping with caution and confine it to airport areas not associated with aircraft movements. All landscaping plans should be reviewed by a wildlife damage management biologist. Landscaped areas should be monitored on a continuing basis for the presence of hazardous wildlife. If hazardous wildlife is detected, corrective actions should be implemented immediately.

3-9. GOLF COURSES. Golf courses may be beneficial to airports because they provide open space that can be used for noise mitigation or by aircraft during an emergency. On-airport golf courses may also be a concurrent use that provides income to the airport.

Because of operational and monetary benefits, golf courses are often deemed compatible land uses on or near airports. However, waterfowl (especially Canada geese) and some species of gulls are attracted to the large, grassy areas and open water found on most golf courses. Because waterfowl and gulls occur throughout the U.S., FAA recommends that airport operators exercise caution and consult with a wildlife damage management biologist when considering proposals for golf

course construction or expansion on or near airports. Golf courses should be monitored on a continuing basis for the presence of hazardous wildlife. If hazardous wildlife is detected, corrective actions should be implemented immediately.

3-10. AGRICULTURAL CROPS. As noted above, airport operators often promote revenue-generating activities to supplement an airport's financial viability. A common concurrent use is agricultural crop production. Such use may create potential hazards to aircraft by attracting wildlife. Any proposed on-airport agricultural operations should be reviewed by a wildlife damage management biologist. FAA generally does not object to agricultural crop production on airports when: wildlife hazards are not predicted; the guidelines for the airport areas specified in 3-10.a-f. are observed; and the agricultural operation is closely monitored by the airport operator or sponsor to ensure that hazardous wildlife are not attracted.

NOTE: If wildlife becomes a problem due to on-airport agricultural operations, FAA recommends undertaking the remedial actions described in 3-10.f.

a. Agricultural activities adjacent to runways. To ensure safe, efficient aircraft operations, FAA recommends that no agricultural activities be conducted in the Runway Safety Area (RSA), OFA, and the OFZ (see AC 150/5300-13).

b. Agricultural activities in areas requiring minimum object clearances. Restricting agricultural operations to areas outside the RSA, OFA, OFZ, and Runway Visibility Zone (RVZ) (see AC 150/5300-13) will normally provide the minimum object clearances required by FAA's airport design standards. FAA recommends that farming operations not be permitted within areas critical to the proper operation of localizers, glide slope indicators, or other visual or electronic navigational aids. Determinations of minimal areas that must be kept free of farming operations should be made on a case-by-case basis. If navigational aids are present, farm leases for on-airport agricultural activities should be coordinated with FAA's Airway Facilities Division, in accordance with FAA Order 6750.16, *Siting Criteria for Instrument Landing Systems*.

NOTE: Crop restriction lines conforming to the dimensions set forth in Table 2 will normally provide the minimum object clearance required by

FAA airport design standards. The presence of navigational aids may require expansion of the restricted area.

c. Agricultural activities within an airport's approach areas. The RSA, OFA, and OFZ all extend beyond the runway shoulder and into the approach area by varying distances. The OFA normally extends the farthest and is usually the controlling surface. However, for some runways, the TSS (see AC 150/5300-13, Appendix 2) may be more controlling than the OFA. The TSS may not be penetrated by any object. The minimum distances shown in Table 2 are intended to prevent penetration of the OFA, OFZ, or TSS by crops or farm machinery.

NOTE: Threshold Siting standards should not be confused with the approach areas described in Title 14, Code of Federal Regulations, Part 77, (14 CFR 77), *Objects Affecting Navigable Airspace*.

d. Agricultural activities between intersecting runways. FAA recommends that no agricultural activities be permitted within the RVZ. If the terrain is sufficiently below the runway elevation, some types of crops and equipment may be acceptable. Specific determinations of what is permissible in this area requires topographical data. For example, if the terrain within the RVZ is level with the runway ends, farm machinery or crops may interfere with a pilot's line-of-sight in the RVZ.

e. Agricultural activities in areas adjacent to taxiways and aprons. Farming activities should not be permitted within a taxiway's OFA. The outer portions of aprons are frequently used as a taxiway and farming operations should not be permitted within the OFA. Farming operations should not be permitted between runways and parallel taxiways.

f. Remedial actions for problematic agricultural activities. If a problem with hazardous wildlife develops, FAA recommends that a professional wildlife damage management biologist be contacted and an on-site inspection be conducted. The biologist should be requested to determine the source of the hazardous wildlife attraction and suggest remedial action. Regardless of the source of the attraction, prompt remedial actions to protect aviation safety are recommended. The remedial actions may range from choosing another crop or farming technique to complete termination of the agricultural operation.

Whenever on-airport agricultural operations are stopped due to wildlife hazards or annual harvest, FAA recommends plowing under all crop residue and harrowing the surface area smooth. This will reduce or eliminate the area's attractiveness to foraging wildlife. FAA recommends that this requirement be written into all on-airport farm use contracts and clearly understood by the lessee.

Table 2. Minimum Distances Between Certain Airport Features And Any On-Airport Agriculture Crops.

Aircraft Approach Category And Design Group ¹	Distance In Feet From Runway Centerline To Crop		Distance In Feet From Runway End To Crop		Distance In Feet From Centerline Of Taxiway To Crop	Distance In Feet From Edge Of Apron To Crop
	Visual & $\geq \frac{3}{4}$ mile	< $\frac{3}{4}$ mile	Visual & $\geq \frac{3}{4}$ mile	< $\frac{3}{4}$ mile		
Category A & B Aircraft						
Group I	200 ²	400	300 ³	600	45	40
Group II	250	400	400 ³	600	66	58
Group III	400	400	600	800	93	81
Group IV	400	400	1,000	1,000	130	113
Category C, D & E Aircraft						
Group I	530 ³	575 ³	1,000	1,000	45	40
Group II	530 ³	575 ³	1,000	1,000	66	58
Group III	530 ³	575 ³	1,000	1,000	93	81
Group IV	530 ³	575 ³	1,000	1,000	130	113
Group V	530 ³	575 ³	1,000	1,000	160	138
Group VI	530 ³	575 ³	1,000	1,000	193	167

1. Design Groups are based on wing span, and Category depends on approach speed of the aircraft.

Group I: Wing span up to 49 ft.

Group II: Wing span 49 ft. up to 78 ft.

Group III: Wing span 79 ft. up to 117 ft.

Group IV: Wing span 118 ft. up to 170 ft.

Group V: Wing span 171 ft. up to 213 ft.

Group VI: Wing span 214 ft. up to 261 ft.

Category A:

Category B:

Category C:

Category D:

Category E:

Speed less than 91 knots

Speed 91 knots up to 120 knots

Speed 121 knots up to 140 knots

Speed 141 knots up to 165 knots

Speed 166 knots or more

2. If the runway will only serve small airplanes (12,500 lb. and under) in Design Group I, this dimension may be reduced to 125 feet; however, this dimension should be increased where necessary to accommodate visual navigational aids that may be installed. For example farming operations should not be allowed within 25 feet of a Precision Approach Path Indicator (PAPI) light box.

3. These dimensions reflect the TSS as defined in AC 150/5300-13, Appendix 2. The TSS cannot be penetrated by any object. Under these conditions, the TSS is more restrictive than the OFA, and the dimensions shown here are to prevent penetration of the TSS by crops and farm machinery.

SECTION 4. NOTIFICATION OF FAA ABOUT HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AN AIRPORT.

4-1. GENERAL. Airport operators, land developers, and owners should notify the FAA in writing of known or reasonably foreseeable land use practices on or near airports that either attract or may attract hazardous wildlife. This section discusses those notification procedures.

4-2. NOTIFICATION REQUIREMENTS FOR WASTE DISPOSAL SITE OPERATIONS.

The Environmental Protection Agency (EPA) requires any operator proposing a new or expanded waste disposal operation within 5 statute miles of a runway end to notify the appropriate FAA Regional Airports Division Office and the airport operator of the proposal (40 CFR 258, *Criteria for Municipal Solid Waste Landfills*, section 258.10, *Airport Safety*). The EPA also requires owners or operators of new municipal solid waste landfill (MSWLF) units, or lateral expansions of existing MSWLF units that are located within 10,000 feet of any airport runway end used by turbojet aircraft or within 5,000 feet of any airport runway end used only by piston-type aircraft, to demonstrate successfully that such units are not hazards to aircraft.

a. Timing of Notification. When new or expanded MSWLFs are being proposed near airports, MSWLF operators should notify the airport operator and the FAA of this as early as possible pursuant to 40 CFR Part 258. Airport operators should encourage the MSWLF operators to provide notification as early as possible.

NOTE: AC 150/5000-3 provides information on these FAA offices.

b. Putrescible-Waste Facilities. In their effort to satisfy the EPA requirement, some putrescible-waste facility proponents may offer to undertake experimental measures to demonstrate that their proposed facility will not be a hazard to aircraft. To date, the ability to sustain a reduction in the numbers of hazardous wildlife to levels that existed before a putrescible-waste landfill began operating has not been successfully demonstrated. For this reason, demonstrations of experimental wildlife control measures should not be conducted in active aircraft operations areas.

c. Other Waste Facilities. To claim successfully that a waste handling facility sited within the separations identified in the siting criteria in 1-3

does not attract hazardous wildlife and does not threaten aviation, the developer must establish convincingly that the facility will not handle putrescible material other than that as outlined in 3-2. FAA requests that waste site developers provide a copy of an official permit request verifying that the facility will not handle putrescible material other than that as outlined in 3-2. FAA will use this information to determine if the facility will be a hazard to aviation.

4-3. NOTIFYING FAA ABOUT OTHER WILDLIFE ATTRACTANTS.

While U. S. EPA regulations require landfill owners to provide notification, no similar regulations require notifying FAA about changes in other land use practices that can create hazardous wildlife attractants. Although it is not required by regulation, FAA requests those proposing land use changes such as those discussed in 2-3, 2-4, and 2-5 to provide similar notice to the FAA as early in the development process as possible. Airport operators that become aware of such proposed development in the vicinity of their airports should also notify the FAA. The notification process gives the FAA an opportunity to evaluate the effect of a particular land use change on aviation safety.

The land use operator or project proponent may use FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, or other suitable documents to notify the appropriate FAA Regional Airports Division Office.

It is helpful if the notification includes a 15-minute quadrangle map of the area identifying the location of the proposed activity. The land use operator or project proponent should also forward specific details of the proposed land use change or operational change or expansion. In the case of solid waste landfills, the information should include the type of waste to be handled, how the waste will be processed, and final disposal methods.

4-5. FAA REVIEW OF PROPOSED LAND USE CHANGES.

a. The FAA discourages the development of facilities discussed in section 2 that will be located within the 5,000/10,000-foot criteria in 1-3.

b. For projects which are located outside the 5,000/10,000-foot criteria, but within 5 statute miles of the airport's aircraft movement areas, loading ramps, or aircraft parking areas, FAA may review development plans, proposed land use changes, operational changes, or wetland mitigation plans to determine if such changes present potential wildlife hazards to aircraft operations. Sensitive airport areas will be identified as those that lie under or next to approach or departure airspace. This brief examination should be sufficient to determine if further investigation is warranted.

c. Where further study has been conducted by a wildlife damage management biologist to evaluate a site's compatibility with airport operations, the FAA will use the study results to make its determination.

d. FAA will discourage the development of any excepted sites (see Section 3) within the criteria specified in 1-3 if a study shows that the area supports hazardous wildlife species.

4-6. AIRPORT OPERATORS. Airport operators should be aware of proposed land use changes, or modification of existing land uses, that could create hazardous wildlife attractants within the separations identified in the siting criteria in 1-3. Particular attention should be given to proposed land uses involving creation or expansion of waste water treatment facilities, development of wetland mitigation sites, or development or expansion of dredge spoil containment areas.

a. **AIP-funded airports.** FAA recommends that operators of AIP-funded airports, to the extent practicable, oppose off-airport land use changes or practices (within the separations identified in the siting criteria in 1-3) that may attract hazardous wildlife. Failure to do so could place the airport operator or sponsor in noncompliance with applicable grant assurances.

FAA recommends against the placement of airport development projects pertaining to aircraft movement in the vicinity of hazardous wildlife attractants. Airport operators, sponsors, and planners should identify wildlife attractants and any associated wildlife hazards during any planning process for new airport development projects.

b. **Additional coordination.** If, after the initial review by FAA, questions remain about the existence of a wildlife hazard near an airport, the airport operator or sponsor should consult a wildlife damage management biologist. Such questions may be triggered by a history of wildlife strikes at the airport or the proximity of the airport to a wildlife refuge, body of water, or similar feature known to attract wildlife.

c. **Specialized assistance.** If the services of a wildlife damage management biologist are required, FAA recommends that land use developers or the airport operator contact the appropriate state director of the United States Department of Agriculture/Animal Damage Control (USDA/ADC), or a consultant specializing in wildlife damage management. Telephone numbers for the respective USDA/ADC state offices may be obtained by contacting USDA/ADC's Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD, 20737-1234, Telephone (301) 734-7921, Fax (301) 734-5157. The ADC biologist or consultant should be requested to identify and quantify wildlife common to the area and evaluate the potential wildlife hazards.

d. **Notifying airmen.** If an existing land use practice creates a wildlife hazard, and the land use practice or wildlife hazard cannot be immediately eliminated, the airport operator should issue a Notice to Airmen (NOTAM) and encourage the land owner or manager to take steps to control the wildlife hazard and minimize further attraction.

APPENDIX 1. DEFINITIONS OF TERMS USED IN THIS ADVISORY CIRCULAR.

1. GENERAL. This appendix provides definitions of terms used throughout this AC.

a. Aircraft movement area. The runways, taxiways, and other areas of an airport which are used for taxiing or hover taxiing, air taxiing, takeoff, and landing of aircraft exclusive of loading ramps and aircraft parking areas.

b. Airport operator. The operator (private or public) or sponsor of a public use airport.

c. Approach or departure airspace. The airspace, within 5 statute miles of an airport, through which aircraft move during landing or takeoff.

d. Concurrent use. Aeronautical property used for compatible non-aviation purposes while at the same time serving the primary purpose for which it was acquired; and the use is clearly beneficial to the airport. The concurrent use should generate revenue to be used for airport purposes (see Order 5190.6A, *Airport Compliance Requirements*, sect. 5h).

e. Fly ash. The fine, sand-like residue resulting from the complete incineration of an organic fuel source. Fly ash typically results from the combustion of coal or waste used to operate a power generating plant.

f. Hazardous wildlife. Wildlife species that are commonly associated with wildlife-aircraft strike problems, are capable of causing structural damage to airport facilities, or act as attractants to other wildlife that pose a wildlife-aircraft strike hazard.

g. Piston-use airport. Any airport that would primarily serve FIXED-WING, piston-powered aircraft. Incidental use of the airport by turbine-powered, FIXED-WING aircraft would not affect this designation. However, such aircraft should not be based at the airport.

h. Public-use airport. Any publicly owned airport or a privately-owned airport used or intended to be used for public purposes.

i. Putrescible material. Rotting organic material.

j. Putrescible-waste disposal operation. Landfills, garbage dumps, underwater waste discharges, or similar facilities where activities include processing, burying, storing, or otherwise disposing of putrescible material, trash, and refuse.

k. Runway protection zone (RPZ). An area off the runway end to enhance the protection of people and property on the ground (see AC 150/5300-13). The dimensions of this zone vary with the design aircraft, type of operation, and visibility minimum.

l. Sewage sludge. The de-watered effluent resulting from secondary or tertiary treatment of municipal sewage and/or industrial wastes, including sewage sludge as referenced in U.S. EPA's *Effluent Guidelines and Standards*, 40 C.F.R. Part 401.

m. Shoulder. An area adjacent to the edge of paved runways, taxiways, or aprons providing a transition between the pavement and the adjacent surface, support for aircraft running off the pavement, enhanced drainage, and blast protection (see AC 150/5300-13).

n. Turbine-powered aircraft. Aircraft powered by turbine engines including turbojets and turboprops but excluding turbo-shaft rotary-wing aircraft.

o. Turbine-use airport. Any airport that ROUTINELY serves FIXED-WING turbine-powered aircraft.

p. Wastewater treatment facility. Any devices and/or systems used to store, treat, recycle, or reclaim municipal sewage or liquid industrial wastes, including Publicly Owned Treatment Works (POTW), as defined by Section 212 of the Federal Water Pollution Control Act (P.L. 92-500) as amended by the Clean Water Act of 1977 (P.L. 95-576) and the Water Quality Act of 1987 (P.L. 100-4). This definition includes any pretreatment involving the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a POTW. (See 40 C.F. R. Section 403.3 (o), (p), & (q)).

q. Wildlife. Any wild animal, including without limitation any wild mammal, bird, reptile, fish, amphibian, mollusk, crustacean, arthropod, coelenterate, or other invertebrate, including any part, product, egg, or offspring thereof (50 CFR 10.12, *Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants*). As used in this AC, WILDLIFE includes feral animals and domestic animals while out of the control of their owners (14 CFR 139.3, *Certification and Operations: Land Airports Serving CAB-Certificated Scheduled Air Carriers Operating Large Aircraft (Other Than Helicopters)*).

r. Wildlife attractants. Any human-made structure, land use practice, or human-made or natural geographic feature, that can attract or sustain hazardous wildlife within the landing or departure airspace, aircraft movement area, loading ramps, or aircraft parking areas of an airport. These attractants can include but are not limited to architectural features, landscaping, waste disposal sites, wastewater treatment facilities, agricultural or aquacultural activities, surface mining, or wetlands.

s. Wildlife hazard. A potential for a damaging aircraft collision with wildlife on or near an airport (14 CFR 139.3).

2. RESERVED.

APPENDIX D Federal and State Depredation Permits

Original Date: October 1993
Revision Date: July 3, 2002

02 SEPT 02
Incia Holm
FAA Approval



FEDERAL FISH AND WILDLIFE PERMIT

2. AUTHORITY-STATUTES
16 USC 703-712

1. PERMITTEE

O'HARE INTERNATIONAL AIRPORT
P.O. BOX 66142
CHICAGO, IL 60666

REGULATIONS (Attached)
50 CFR Part 13
50 CFR 21.41

3. NUMBER
MB811454-1 AMENDMENT

4. RENEWABLE	5. MAY COPY
<input type="checkbox"/> YES	<input type="checkbox"/> YES
<input type="checkbox"/> NO	<input type="checkbox"/> NO

6. EFFECTIVE	7. EXPIRES
04/26/2002	08/31/2002

8. NAME AND TITLE OF PRINCIPAL OFFICER (If #1 is a business)
WILLIAM LONERGAN
AIRPORT MANAGER

9. TYPE OF PERMIT
DEPREDDATION

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED
O'HARE INTERNATIONAL AIRPORT
COOK COUNTY
CHICAGO IL 60666

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

D. AUTHORIZED TO TAKE UP TO 200 CANADA GEESE , 300 MALLARDS, 100 MOURNING DOVES, 50 COOTS TO PROMOTE PUBLIC SAFETY AND/OR TO REDUCE HAZARDS TO AIRCRAFT. METHOD OF TAKING IS LIMITED TO THE USE OF A SHOTGUN, NO LARGER THAN 10 GAUGE, FIRED FROM THE SHOULDER ON OR OVER THE THREATENED AREAS ONLY. NON-TOXIC SHOT MUST BE USED. BIRDS MAY BE KILLED ONLY IN CONJUNCTION WITH AN ON-GOING NON-LETHAL CONTROL PROGRAM. AUTHORIZED TO DESTROY 50 CANADA GOOSE AND 50 MALLARD NESTS AND ALL OF THE EGGS IN THOSE NESTS THAT ARE FOUND ON AIRPORT PROPERTY.

E. AUTHORIZED TO TAKE UP TO 800 RING-BILLED GULLS AND 25 HERRING GULLS WITH A SHOTGUN NO LARGER THAN 10 GAUGE, USING NON-TOXIC SHOT, FIRED FROM THE SHOULDER ON OR OVER THREATENED AREAS ONLY OR PNEUMATIC PELLET GUN IN AREAS WHERE THE USE OF SHOTGUN IS INCOMPATIBLE WITH NEARBY PUBLIC ACTIVITIES.

F. PERMITTEE MUST COMPLY WITH THE ATTACHED STANDARD CONDITIONS.

G. THE FOLLOWING ARE AUTHORIZED TO CONDUCT THE DEPREDDATION CONTROL ACTIVITY: GLEN DUNN, TODD GRIMM, LAURENCE SCHAFER , BRADLY ROBBINS, JACK SENGL, DOUG ARRENDTS, AARON SPENCER & WILDLIFE SERVICES STATE DIRECTOR KIRK GUSTAD.

H. AUTHORIZED TO DONATE CANADA GEESE AND MALLARD CARCASSES THAT ARE TAKEN TO FEDERALLY LICENSED REHABILITATION FACILITIES.

I. AUTHORIZED TO DESTROY UP TO 10 RED-TAILED HAWK NESTS AND ALL OF THE EGGS IN THOSE NESTS AND UP TO 10 AMERICAN KESTREL NESTS AND ALL OF THE EGGS IN THOSE NESTS FOUND ON AIRPORT PROPERTY.

J. AMENDED 4-26-2002 ONLY ON AN EMERGENCY BASIS ON AIRPORT PROPERTY: AUTHORIZED TO KILL, CAPTURE, TRAP AND/OR RELOCATE UP TO TEN (10) OTHER MIGRATORY BIRDS, DESTROY MIGRATORY BIRD NESTS AND EGGS THAT ARE NOT CURRENTLY

ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS
ANNUAL REPORT DUE: 1/10

ISSUED BY

TITLE
CHIEF - PERMIT SECTION

DATE
04/26/2002



Illinois Department of Natural Resources

<http://dnr.state.il.us>

524 South Second Street, Springfield, Illinois 62707-1787

George H. Ryan, Governor • Brent Manning, Director

2001-02 Nuisance Wildlife Control Permit

Type: Class C (Governmental)

Expires January 31, 2002

Permittee:

USDA/APHIS/Animal Services
2869 Via Verde Drive
Springfield, IL 62703
217/241-6700

Conditions:

- 1) Permittee may take, possess and transport species protected by the Wildlife Code in accordance with provisions set forth in 17 Ill. Adm. Code, Ch. I, Part 525.
- 2) Permittee may not take, possess or transport white-tailed deer, migratory birds or endangered and threatened species without authorization from the Department and accompanying state/federal permits if required.
- 3) Permittee must check all traps at least once each calendar day. Permittees who rent, lend or otherwise transfer traps to clients under authority of this permit are responsible for client's compliance with trap check laws.
- 4) All species which are defined as game or fur-bearing mammals and are not endangered or threatened may be euthanized in accordance with 17 Ill. Ad. Code, Ch. I, Part 525, and disposed of in accordance with the Dead Animal Disposal Act. All striped skunks must be euthanized. Raccoons must be euthanized, released within 100 yards of the capture site or surrendered to a licensed veterinarian who is also a licensed wildlife rehabilitator.
- 5) Only devices and methods allowed by 17 Ill Adm. Code, Ch. I, Part 525 may be used under authority of this permit.

APPENDIX E FAA Bird Strike Incident Report - Form 5200-7

Note: Bird strike forms can be obtained or filed electronically over the internet by visiting the FAA's website at <http://www.faa.gov/arp/hazard.htm>

Original Date: October 1993
Revision Date: July 3, 2002

02 SEPT 02
Mick Halpin
FAA Approval

APPENDIX F Weekly Wildlife Activity Report form

Original Date: October 1993
Revision Date: July 3, 2002

02 SEPT 02
Juan Holguin
FAA Approval

**APPENDIX G Memorandum of Understanding (MOU) and Certalert 97-02 -Relationship
Between FAA and WS**

Note: USDA-Wildlife Services recently changed their name from Animal Damage Control (ADC) to Wildlife Services (WS) in the Summer of 1997. The MOU and Certalert 97-02 are currently being updated to reflect the name change.

Original Date: October 1993
Revision Date: July 3, 2002

82 SEPT 02
Nick Halpin
FAA Approval

No. 12-34-71-0003-MOU

MEMORANDUM OF UNDERSTANDING
BETWEEN
UNITED STATES DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION (FAA)
and
UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
ANIMAL DAMAGE CONTROL (ADC)

ARTICLE 1

This Memorandum of Understanding (MOU) establishes a cooperative relationship between FAA and ADC for resolving animal hazards to aviation that benefits public safety.

ARTICLE 2

This MOU is reached pursuant to the Animal Damage Control Act of March 2, 1931, (7USC 426-426b), and The Rural Development, Agriculture, and Related Agencies Appropriations Act, 1988 (P.L. 100-202), which established the authority of the Secretary of Agriculture to cooperate with States, individuals, public and private agencies, organizations, and institutions in the control of nuisance mammals and birds deemed injurious to the public.

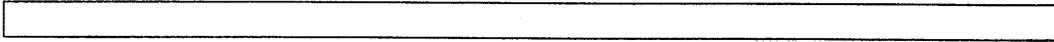
The Administrator of the FAA is empowered to issue airport operating certificates for airports serving air carrier aircraft and certifies that such airports are properly and adequately equipped, and able to conduct safe operations, pursuant to the Federal Aviation Act of 1958, (49USC 1432), as amended. Federal Aviation Regulation (14 CFR Part 139) requires certificated airports having a wildlife hazard problem to develop and implement a wildlife hazard management plan to manage and control wildlife which present a risk to public safety caused by aircraft collisions with wildlife. "Wildlife hazard" has been defined as a potential for a damaging aircraft collision with wildlife, on or near an airport.

ARTICLE 3

FAA and ADC agrees:

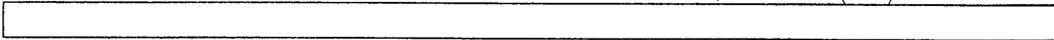
- a. That ADC has the expertise to provide technical and operational assistance needed to reduce wildlife hazards to aviation on and near airports.
- b. That most airports lack the technical expertise to identify underlying causes of wildlife hazard problems, but do have the capability to control their own wildlife, following proper instruction in control techniques.
- c. That situations arise where nuisance wildlife control is necessary off airport property (roost relocations, reductions in nesting populations, etc.) requiring specialized technical assistance of ADC personnel.
- d. That FAA or the certificated airport may request technical and operational assistance from ADC to reduce wildlife hazards. This assistance includes, but is not limited to, site visits to identify wildlife and their movement patterns and habitats which increase the risk of animal and aviation conflicts. ADC personnel may also provide, (1) recommendations on control and habitat management to minimize the hazards, (2) training in the use of control devices, and (3) recommendations on the scope of further studies necessary to identify and minimize wildlife hazards.

CERTALERT



ADVISORY * CAUTIONARY * NON-DIRECTIVE

FOR INFORMATION, CONTACT CERTIFICATION BRANCH, AAS-317 (202) 267.3389



DATE: APRIL 25, 1997

NO. 97-02

TO: AIRPORT CERTIFICATION PROGRAM INSPECTORS.

TOPIC: RELATIONSHIP BETWEEN FAA AND ADC.

The attached Certalert clarifies the roles of, and relationship between the Federal Aviation Administration (FAA) and the United States Department of Agriculture/ Animal and Plant Health Inspection Service/Animal Damage Control (ADC) with regards to wildlife hazards on or near airports.

Robert E. David

Manager, Airport Safety and Compliance

Date: April 25, 1997

CERTALERT DISTRIBUTION LIST

RELATIONSHIP BETWEEN FAA AND ADC.

PURPOSE

This Certalert clarifies the roles of, and relationship between the Federal Aviation Administration (FAA) and the United States Department of Agriculture/ Animal and Plant Health Inspection Service/Animal Damage Control (ADC) with regards to wildlife hazards on or near airports.

Federal Aviation Administration

The FAA issues airport operating certificates for airports serving certain air carrier aircraft under Title 14, Code of Federal Regulations, part 139. Section 139.337 requires certificated airports having a wildlife hazard problem to develop and implement a wildlife hazard management plan to manage and control wildlife which present a risk to public safety caused by aircraft collisions with wildlife. The FAA relies heavily on the assistance of ADC to review and contribute to such plans.

Animal Damage Control

The Animal Damage Control Act of March 2, 1931, (7USC 426-426c, as amended), charges the Secretary of Agriculture with management of wildlife injurious to agricultural interests, other wildlife, or human health and safety. Further, the Secretary is authorized to cooperate with States, individuals, public and private agencies, organizations, and institutions in the control of nuisance mammals and birds, including wildlife hazards to aviation. Because of the experience, training, and background of its personnel, ADC is recognized throughout the world as an expert in dealing with wildlife damage management issues. ADC has an active presence in all U. S. states and territories.

MEMORANDUM OF UNDERSTANDING

A Memorandum of Understanding (MOU) between the FAA and ADC (No. 12-4-71-0003-MOU) establishes a cooperative relationship between these agencies for resolving wildlife hazards to aviation.

AGENCY FUNDING

Both agencies are funded by congressional appropriations. The majority of funding for the FAA comes from the Aviation Trust Fund with the remainder coming from the general funds of the U. S. Treasury. Any revenues generated by the FAA are returned to the U. S. Treasury. ADC receives a limited amount of funds from the general fund of the U.S. Treasury that allows it to perform some services for the public good. However, ADC's funding is also based upon its ability to enter into contracts to provide services and receive reimbursement for the cost of the services. Legislation allows ADC to collect this money and return it to the program rather than the general funds of the U. S. Treasury. Consequently, ADC may enter into a cooperative service agreement with an airport operator for reimbursement of services to perform an ecological study¹ on an airport.

¹ ADC uses the term "wildlife hazard assessment" rather than "ecological study" as is used in 14 CFR part 139.337. The two terms should be considered synonymous.

WILDLIFE HAZARD MANAGEMENT

14 CFR part 139.337 requires the certificate holder conduct an ecological study, acceptable to the FAA Administrator, when any of the following events occur on or near the airport:

1. An air carrier aircraft experiences a multiple bird strike or engine ingestion, or
2. An air carrier aircraft experiences a damaging collision with wildlife other than birds, or
3. Wildlife of a size or in numbers capable of causing an event described in paragraph (1) or (2) is observed to have access to any airport flight pattern or movement area.

The ecological study shall contain at least the following:

1. Analysis of the event which prompted the study.
2. Identification of the species, numbers, locations, local movements, and daily and seasonal occurrences of wildlife observed.
3. Identification and location of features on and near the airport that attract wildlife.
4. Description of the wildlife hazard to air carrier operations.

The certificate holder may look to ADC or to private consultants to conduct the required ecological study. However, because the ecological study is used by the FAA to determine if a wildlife hazard management plan is needed for the airport, it should be conducted by persons having the education, training, and experience necessary to adequately assess any wildlife hazards.

ADC may conduct preliminary wildlife hazard assessments at no charge to the certificate holder, as ADC's funding and personnel limitations permit. More detailed assessments may require the certificate holder to enter into a cooperative service agreement with ADC.

APPENDIX H METHODS OF CONTROL

Description of Methods

A variety of nonlethal and lethal methods are used to accomplish the objectives of reducing wildlife interactions at Chicago's Midway Airport. Control strategies are based on applied Integrated Wildlife Damage Management principles, with nonlethal methods receiving first consideration. When nonlethal techniques are impractical or incapable of producing the desired damage abatement, lethal control may be applied. Lethal control includes both mechanical and chemical methods. All chemicals are used in compliance with federal and state pesticide regulations. No pesticide is used or recommended if it is likely to have significant adverse effects on non-target wildlife, the food chain, or other components of the natural environment.

Various federal, state and local statutes and regulations govern the management of certain wildlife species and the use of control tools and substances. Compliance with all such regulations and statutes is required, prior to implementation of any control project.

Methods

Habitat Modification

- Physical barriers
- Habitat management

Aversive Tactics

- I. Non-chemical
 - Electronic distress sounds
 - Gas exploders
 - Pyrotechnics
 - Effigies/Scarecrows
 - Lights
- II. Chemical
 - Chemical repellents
 - Methyl anthranilate
 - Polybutenes
 - Avitrol®

Population Management

- I. Non-lethal
 - Leghold traps
 - Cage/Suitcase traps

Original Date: October 1993
Revision Date: July 3, 2002

OZSEPT02
Michelle Halpin
FAA Approval

- Snares (i.e., foot/leg or body gripping)
- Pole traps
- Bal-chatri traps
- Bow nets
- Swedish Goshawk traps
- Net traps

II. Lethal

A. Non-chemical

- Leghold traps
- Quick-kill traps (e.g., snap, gopher, and Conibear-type traps)
- Cage traps
- Snares (i.e., foot/leg, neck, or body gripping)
- Shooting
- Egg shaking/Addling/Nest destruction

B. Chemical

- DRC-1339
- Gas cartridge
- Zinc phosphide

The following descriptions provide a brief explanation of the control methods recommended:

Habitat Modification

Habitat modifications can restrict the access of wildlife or render the habitat less hospitable to wildlife. Habitat modifications recommendations are described below.

Physical Barriers: Several mechanical methods, such as fences, netting, metal flashing, and spiked metal strips, are advocated for suppression of damage to aircraft, property and facilities by birds and mammals. Fences are widely used to prevent access to the airport by coyotes, fox, rabbits, etc. Wire and plastic netting are also used to exclude a variety of birds and mammals from sensitive areas and buildings requiring exclusion of animals.

Two forms of physical barriers are available which may exclude animals from undesirable areas. These include: (1) complete enclosure with screens, fences and/or netting; and (2) partial enclosure using overhead wires, lines, nets, and/or screens. Complete enclosure may be expensive compared to other control methods, but is very effective in excluding problem animals. Hence, the cost of enclosure may be justified over time by reduced damage and a

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lessened need for active control measures. In addition, the increased availability of relatively inexpensive, lightweight plastic netting may reduce costs considerably. Partial enclosure (e.g., overhead lines) is less expensive but does not exclude all bird species. For example, wires or lines over detention ponds can effectively deter gulls, ducks and geese but not smaller birds such as blackbirds.

The selection of a barrier system depends on the particular problem species, the expected duration of resource loss, size of the affected facility, compatibility of the barrier with other operations or uses of the area, possible damage from severe weather, FAA regulations impacting their use, and the barrier's effect on site aesthetics. Complete enclosure of basins to exclude all birds requires at a minimum 2-inch mesh netting secured to frames or supported by overhead wires.

Ponds and basins can sometimes be protected with overhead wires or monofilament lines suspended horizontally in a parallel or diagonal pattern. Spacing between the wires or lines is based on the habits and size of the birds causing the damage. For example: 4-foot spacing has been effective in deterring gulls; 2-foot spacing is necessary to exclude ducks; and a minimum of 1-foot spacing is required to exclude the smaller birds. As birds will attempt to enter the system by way of the sides or ends, these areas must also be protected.

Habitat Management: Just as habitat management is an integral part of other wildlife management programs, it plays an important role in wildlife damage control. The type, quality, and quantity of habitat will determine which wildlife species inhabit the area. Habitat can therefore be managed not to support or attract certain wildlife species.

The combination of birds and low-flying aircraft represent a concern to human safety. In airport environs, low altitude aircraft are common and the presence of birds, especially in high numbers, represents a safety hazard. Generally, bird problems on airport grounds can be reduced by the modification of vegetation and the elimination of standing water from runway areas. Runway infield areas at ORD should be mowed frequently, maintaining grass at a height of less than 6", to discourage use by birds feeding on seeds. As standing water is especially attractive to many species of birds, runway areas should be modified to prevent water accumulation. The overall objective of bird habitat management around airports is the elimination of avian nesting, roosting, loafing, and feeding sites to reduce the attractiveness of the area to birds.

Dense rodent populations are an attractant to raptors and predatory mammals. Maintaining short grass heights allows predatory birds and animals feed easily on these rodents which in turn has the potential to attract and hold numerous raptors. In this case, the rodent population will need to be controlled by methods listed in the Population Management section of this appendix.

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Aversive Tactics

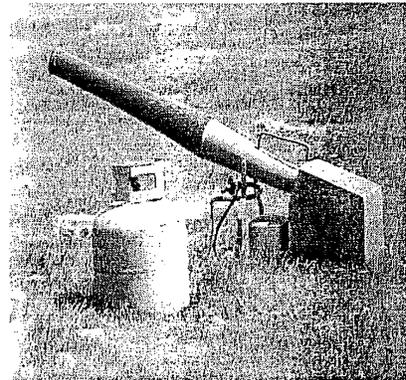
Behavioral modifications which control damage caused by wildlife may be achieved through a variety of aversive tactics. The objective in using aversive tactics is to alter the behavior of the target animal so the potential for damage is reduced or eliminated. Scaring and harassment are some of the oldest methods of combating animal damage, and they continue to be effective in controlling many kinds of damage.

A number of techniques have been developed to frighten or harass wildlife from an area. The use of noise-making devices and visual stimuli are perhaps the most commonly used method of frightening wildlife. An important advantage of these techniques is the potential for only a short-term, localized impact on the environment. As with other damage control efforts, these techniques tend to be more effective when used in conjunction with an integrated wildlife control program, rather than individually. The continued success of noise making and visual stimuli frequently requires reinforcement by limited lethal action such as shooting (See Shooting).

I. Non-chemical

Electronic Distress Sounds. Distress and alarm calls of various animals have been used independently and in conjunction with other scare devices to successfully scare or harass animals. Many of these vocalizations are available on records and tapes. Calls are broadcast from either fixed or mobile equipment in the immediate or surrounding area of the problem. The reactions to distress calls vary considerably with how they are used, when they are used, what species is targeted, and the problem. Distress calls varies from short periodic bursts to longer periods in conjunction with other scare techniques (i.e., pyrotechnics), depending on the severity of damage and relative effectiveness of the calls. Some artificially created sounds also repel birds in the same manner as recorded "natural" distress and alarm calls.

Gas Exploders. Gas exploders operate on acetylene or propane gas and are designed to produce loud explosions at controllable intervals. The exploders are placed around the problem site. As the sound is more effective if not hampered, the exploder is best if elevated above the vegetation or other obstacles. Exploders must be moved frequently and used in conjunction with other scare devices to avoid animals habituating to the sound. It is



Gas exploder

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recommends that exploders be left active for a period of time in the problem site after dispersal is complete to discourage animals from returning.

Pyrotechnics. Double shotgun shells, known as shellcrackers or scare cartridges, are 12-gauge shotgun shells containing a firecracker. When fired, the firecracker is projected up to 100 yards before exploding. Shellcrackers are used to frighten wildlife to move them from sensitive areas or to discourage birds from undesirable roost locations. For best results, the shells are fired so they explode in front of or underneath the animals. The intent is to produce an explosion between the animal and their objective.



Pyro launcher with banger and screamer

Noise bombs (bird bangers) and whistle bombs (screamers) are fired from hand-held launch guns. Bird bangers are firecrackers that travel about 75 feet before exploding. These are used similarly to shellcrackers, but travel a shorter distance. Screamers are similar to noise bombs, but produce a whistling noise in flight rather than exploding. The screamer produces a trail of smoke and fire, as well as the whistling sound.

A variety of other pyrotechnic devices, including firecrackers, rockets, and Roman candles are used for dispersing animals. Birds can often be frightened from the airfield but may soon return if pyrotechnics are not reinforced with other control methods.

Effigies, Scarecrows, and Other Scaring Techniques. Owl decoys, reflective flash tape, and helium-filled balloons are used as scaring devices. These devices are sometimes effective for dissuading birds from sensitive areas inside buildings. Their effectiveness is enhanced when used in conjunction with auditory scare devices. Other devices such as scarecrows, ribbons, flagging, suspended pie pans, etc., are similarly used to control wildlife damage.

Lights. The proper use of a variety of lighting devices provides effective control in some circumstances. A variety of lights, including strobe, barricade, and revolving units have been used to frighten birds with varied results. Strobe lights, similar to those used on aircraft, are most effective in frightening night-feeding birds. These extremely bright flashing lights have a blinding effect, causing confusion. Some birds avoid the bright glare by landing with their backs to the lights. This avoidance may be minimized by increasing the number of lights or dispersing the lights to cover the unprotected areas or by adding reflective tape.

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Flashing amber barricade lights, revolving or moving lights may frighten birds. However, most birds rapidly become accustomed to such lights and long-term effectiveness is questionable. In general, the type of light, the number of units, and their location are determined by the size of the area to be protected and by the power source available.

A portable strobe light, in combination with a siren, has been developed by the USDA National Wildlife Research Center. This unit, called the Electronic Guard, can be easily transported from one location to another. The device activates automatically at nightfall and is programmed to discharge periodically throughout the night.

The emergency lights on the Airport Operations Vehicles may be used to harass wildlife from the AOA. Rotating, strobe, and spot lights are most effective in low ambient light conditions, but may be moderately effective at any time.

II. Chemical

Chemical Repellents. Repellents are compounds which prevent the use of an area or consumption of a food item. Repellents operate by producing an undesirable taste, odor, feel, or behavior pattern. Effective and practical repellents generally meet the following requirements:

- they are non-toxic to wildlife, plants, seeds, and man;
- they are resistant to weathering;
- they are easily applied; and
- they are reasonably priced.

A disadvantage of many repellents is the high cost of application, and the frequency of reapplication, which often makes their use uneconomical. The reaction of different animals to a single chemical formulation varies, and for any species there may be variations in repellency.

Polybutenes. Several polybutene repellents are used to repel birds from around structures. These are glue-like materials which are either sprayed or applied with a caulking gun to window sills, ledges, or similar perches to discourage use by birds. They are most frequently used to control pigeon and starling problems.

Avitrol®. The avian frightening agent Avitrol® (4-Aminopyridine) is limited for use in specific areas and for the protection around structures. Avitrol® is a toxic chemical but is used as an area repellent by limiting the treated bait particles through dilution. Use sites are monitored to assure bait is consumed by only targeted species.

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Avitrol® is used mostly to control flocking blackbirds and starlings but may also be used to control gulls, pigeons, sparrows, and crows. Avitrol® is applied to grain baits as a mixture of treated and untreated grain according to label restrictions. After prebaiting with untreated grain to establish a satisfactory feeding pattern, the treated mixture is placed for the target flock of birds to consume. A few of the birds will eat treated grain, emit distress calls, and exhibit erratic behavior. A large number of untreated birds in the flock will respond to the distress calls of the few affected individuals. Proper bait placement can reduce the hazard to nontarget species. If properly used, Avitrol® does not present a significant secondary poisoning hazard to either birds or mammals.

Extreme caution must be exercised when Avitrol® is used at airports as affected birds will often fly erratically. When used on gulls, unaffected birds tend to tower or spiral over the baited site when reacting birds exhibit distress symptoms. These reactions can temporarily increase the threat of bird strikes.

Methyl Anthranilate. Methyl anthranilate (MA) is currently being used on some airports to reduce gull and waterfowl activity. MA is commonly found in beverages used for human consumption in the form of grape flavoring. It is a taste repellent to birds and, therefore, is used in areas where they are feeding. MA can be sprayed on the turf areas or as an airborne mist from a fogging device.

Population Management

Many capture methods are available that can be used as nonlethal or lethal methods depending on the management objective. When the objective is to relocate the animal or if the animal captured is a nontarget, it may be released. If the captured animal is a target species and the object is population reduction in the local area, the animal may be euthanized. Because of this flexibility, the objective of the user determines whether some of these methods are nonlethal or lethal. The following section describes the local population management methods.

I. Nonlethal

Leghold Traps. Leghold traps are frequently used to capture animals such as coyote, fox, raccoon, and opossum. These traps are very versatile and widely used for capturing many species. They are effectively used in both terrestrial and shallow aquatic environments.

Leghold traps placed in travel lanes of the targeted animal, using location rather than attractants, are known as "blind sets." More frequently, traps are placed as "baited" or "scented" sets. These trap sets use an attractant consisting of the animal's preferred food or some other lure such as fetid meat, urine, or musk to attract the animal into the trap.

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Two primary advantages of the leghold trap are that it can be set under a wide variety of conditions, and that underpan tension devices can be used to prevent animals of smaller size than the target animal from springing the trap, thus allowing a degree of selectivity not available with many other methods. Effective trap placement greatly contributes to trap selectivity. Another advantage of the leghold trap is that it is a "livetrap", which generally permits the release of nontarget animals or translocation, when appropriate.

Disadvantages of using leghold traps include the difficulty of keeping them in operation during rain, snow, or freezing weather. In addition, they lack selectivity where nontarget species of similar size and nature to target species are abundant. The selectivity of leghold traps is an important issue and has been shown to be a function of how they are used. The type of set and attractant used significantly influences both capture efficiency and the risk of catching nontarget animals.

The use of leghold traps is costly due to the amount of manpower and time involved. The leghold trap, however, is indispensable in resolving many animal damage situations.

Cage Traps. A variety of cage traps are used in animal damage control efforts. The most commonly used cage trap is of the box trap variety. Cage traps are usually rectangular in shape and made from heavy gauge mesh wire. Cage traps are often covered with burlap or a similar material to increase trapping efficiency. Covering the trap also results in considerably less stress to the caged animal.

Cage traps are often used where lethal or more controversial tools would be inappropriate due to a potential hazard to other wildlife or humans. Cage traps are well suited for use at Midway airport. These traps may be used to capture animals of all sizes, but are generally ineffective for capturing coyotes.

Large decoy traps, modified after the Australian crow trap, may be used to capture starlings, blackbirds, crows, and pigeons. Generally, these traps are large screen enclosures with the access modified to accommodate the target species. They are provided with sufficient bait to both attract birds and sustain live "decoy birds" maintained in the trap.

The main advantage to the use of cage traps is that captured animals are not harmed by the trap. It is therefore less controversial in areas where people may witness the wildlife control activities.

Snares. Snares, made of wire or cable, are among the oldest existing control tools. They can be used effectively to catch most species but are most frequently used to capture

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coyotes, fox, and raccoon. They offer the advantage of being much lighter than most other traps and are not as affected by inclement weather.

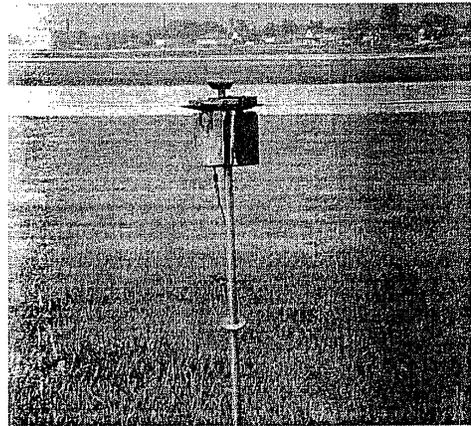
Snares can be effectively used wherever a target animal moves through a restricted lane of travel (i.e., "crawls" under fences, trails through grass/weeds, den entrances, etc.). When an animal moves forward into the snare loop, the noose tightens and the animal is held.

Snares can be employed as either lethal or live-capture devices depending on how and where they are set. Snares set to capture an animal by the neck can be a lethal use of the device, whereas snares positioned to capture the animal around the body or leg can be a live-capture method. Careful attention to details in placement of snares and the use of slide stops can also allow for the live-capture of neck-snared animals.

The foot or leg snare is a nonlethal device activated when an animal places its foot on the trigger. When triggered, the spring-operated snare tightens around the leg and holds the animal.

The catch pole snare is used to capture or handle problem animals. Catch poles are primarily used to remove live animals from traps without injury to the animal or danger to the employee.

Pole Traps. Pole traps can be effectively used to capture raptors (i.e., hawks and owls) because of their behavioral tendency to perch prior to making a kill. One to several conduit poles, 5 to 10 feet high, are erected near the area where depredations are occurring. A padded-jaw, leghold trap (usually size 1-1/2) is set on the top of each pole. The trap is attached to the pole with a large washer which will allow the bird to slide smoothly down the pole and come to rest on the ground after being captured. The use of pole trapping as a damage control technique is dependent on the nature of the problem, target species and time of year. Pole trapping requires a permit from the USFWS.



Pole Trap

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II. Lethal

A. Non-chemical

Leghold Traps. (See the section on leghold traps in the nonlethal section.) When the target animal is captured, the animal is generally euthanized. The method of euthanasia varies, but the quickest, most painless method should be utilized.

Quick-kill Traps. A number of "quick-kill" traps are used in animal damage control work. They include the Conibear-type, snap, gopher, and mole traps.

The Conibear-type trap consists of a pair of rectangular wire rod frames attached on both sides, that close in a scissor-like fashion when triggered, killing the captured animal with a quick body blow. The primary advantage to using the Conibear-type trap is that it quickly kills the trapped animal, minimizing the stress an animal might experience while in the trap. The principal disadvantage of a Conibear-type trap is that non-target animals caught in the trap are also killed, eliminating any opportunity of release.

The Conibear trap can be used in aquatic situations or used in dry land sets for trapping raccoons, foxes, groundhogs and rats. Safety must be considered when using Conibear-type traps as they can be hazardous to individuals not properly warned of their placement.

Snap traps (i.e., rat and mouse traps) are used to collect and identify rodent species that are causing damage, so that species-specific control tools can be applied. In minor infestations these traps may be used as the primary means of control. Frequently, these traps are used within buildings, but seldom recommended for use outside of such structures. An alternative to snap traps is the glue board (i.e., a shallow flat container of an extremely sticky substance).

Mole traps are used to control surface-tunneling moles (i.e., Nash mole trap and harpoon trap). Soil is pressed down in the active tunnel and the trap is placed with the trigger against the compressed area. When the mole re-opens the tunnel, the trap is triggered.

Cage Traps. (See the section on cage traps in the nonlethal section.) Cage traps may be set with the intention of providing lethal controls. When the target animal is captured, it should be quickly and humanely dispatched. The advantage of this form of trap use allows for the release of nontarget animals.

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Snares. (See the section on snares in the nonlethal section.) Snares set with the intention of lethal control generally result in quick death of the captured animal. Animals not killed at capture by the snare are euthanized.

Shooting. Shooting is selective for the target species but is relatively expensive due to the staff hours required. Shooting is, nevertheless, a valuable control method. Quick removal of problem mammals may be accomplished through shooting or calling and shooting in some instances.

Lethal reinforcement is often necessary to assure the continued success in bird scaring and harassment efforts (see the discussion on shooting under Aversive Tactics). This is especially important where birds are drawn to locations where food is readily available. In situations where the feeding instinct is strong, birds quickly habituate to scaring and harassment efforts unless the harassment is periodically supplemented by lethal reinforcement (i.e., shooting).

Egg Shaking/Oiling/Nest Destruction. These control techniques involve the destruction of bird eggs in the nest or the complete removal of nests. A destruction permit is required from the USFWS before this control method may be implemented on migratory birds. Egg shaking, or addling, may be useful in reducing populations of waterfowl at the airport. Eggs are located shortly after being laid and shaken to render them infertile and replaced in the nest. If the eggs are not replaced, the birds will often produce another clutch. The birds will remain territorial, chasing off other birds. The eggs are removed two weeks later, simulating predation. The adult birds normally will not produce another clutch of eggs.

Egg oiling uses the same principles. Eggs are removed from the nest, coated with vegetable oil and returned to the nest. This oiling prohibits the exchange of gases (oxygen) through the pores of the eggshell, thus rendering the egg non-viable.

These techniques reduce the success of nests to produce hatchlings. If allowed to hatch, the young birds would imprint on the area and return during subsequent nesting seasons to nest themselves. Egg destruction will therefore reduce the numbers of birds returning to the airport in successive years.

Nest destruction would be helpful in eliminating nests of birds from sensitive areas and within structures. This would be more applicable for small birds which have nested in buildings or runway signs and fixtures.

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B. Chemicals

Toxicants. Several toxic chemicals have been developed for use in the control of wildlife damage. Because of their efficiency, such toxicants have been widely employed when other methods have proven unsuccessful or costly. Since toxicants are generally not species specific, special attention to proper placement and use is necessary to prevent non-target takes. The hazards of non-target takes are minimized when the toxicants are used with care by trained and certified personnel. The proper placement, size, type of bait, and time of year are keys to selective and successful control.

The following section describes available chemicals to control targeted animals.

DRC-1339. DRC-1339 is a chemical used to control pigeons around structures. This chemical is highly toxic to starlings, generally less toxic to other birds, and relatively nontoxic to most mammals. There is minimal danger to raptors or to mammalian carnivores that might eat DRC-1339 poisoned starlings since hawks and mammals are resistant to DRC-1339. Additionally, most or all of the DRC-1339 ingested is metabolized within the bird before it dies. DRC-1339 causes most birds to die at the roosting site.

Poultry pellets or other feeds are treated with this avicide and broadcast at the baiting site. Death results normally within 24 hours after ingesting treated pellets, with most birds dying at their roosting site. Death results from kidney failure, thus the chemical is generally metabolized prior to the birds showing signs of illness, which could cause them to be more susceptible to predation. Acceptability of the material is best in areas where snow covers other food sources.

DRC-1339 concentrate is only available for use only by WS personnel.

Gas Cartridge. WS manufactures and uses gas cartridges specifically formulated for rodent and predator control. These cartridges are hand placed in the active burrow or den of the target animal, and the entrance is tightly sealed with soil. The burning cartridge causes death from a combination of oxygen depletion and carbon monoxide poisoning. The taking of nontarget animals is avoided by confirming active burrows or dens of target animals prior to treatment. Fresh sign (e.g., tracks, scat, etc.) of animals around the den entrance will confirm if target or nontarget species are not present in the den. Treatment will or will not follow accordingly.

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Zinc Phosphide. Zinc phosphide is a metallic toxicant used as a rodenticide. It has no secondary hazard problems and poses little environmental hazard. Zinc phosphide is effective and may be used in rat and vole control programs. Zinc phosphide baits are prepared using pet food, apples, cracked corn, or oats. The odor of zinc phosphide is not offensive to rodents but is repulsive to most other animals. Zinc phosphide can be coated on dry baits using vegetable oil or dusted onto moist baits, tumbling them to assure an even distribution. Tarter emetic is sometimes added to baits used to control rats as a safety precaution. The emetic causes most animal species to regurgitate any consumed zinc phosphide baits. Its effectiveness for rat control is not compromised because rats are unable to regurgitate.

Application of zinc phosphide baits for vole control varies according to the situation and species involved. Baits are either broadcast on the surface or placed in underground runways. Trail building devices may be used to place bait in artificial runways. The trail builder is a mechanical device which, when pulled behind a tractor, will place measured doses of treated grains in a trail which it builds near the surface of the ground. Trail builders may be effectively used on airports in areas where electrical lines will not be jeopardized by its use.

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