

**SOME SIGNIFICANT WILDLIFE STRIKES TO CIVIL AIRCRAFT
IN THE UNITED STATES, JANUARY 1990 –JANUARY 2021**

FAA Wildlife Strike Database
U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services
6100 Columbus Ave.
Sandusky, OH 44870 USA

The U.S. Department of Agriculture, through an interagency agreement with the Federal Aviation Administration, compiles a database of all reported wildlife strikes to U.S. civil aircraft and to foreign carriers experiencing strikes in the USA. We have compiled about 241,000 strike reports from over 2,000 USA airports and over 300 foreign airports for January 1990 through January 31, 2021 (about 11,600 strikes in 2020). The following examples from the database, presented in chronological order, show the serious impacts that strikes by birds or other wildlife can have on aircraft and demonstrate the widespread and diverse nature of the problem. The examples are not intended to highlight or criticize individual airports because strikes have occurred on almost every airport in the USA. Many of the strikes reported here occurred off airport property during approach or departure. For more information on wildlife strikes or to report a strike, visit www.birdstrike.org or <http://wildlife.faa.gov>. Go to https://www.faa.gov/airports/airport_safety/wildlife/media/Wildlife-Strike-Report-1990-2019.pdf to see a detailed analysis of the strike data, 1990-2019.

Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
1/11/1990	Hawker Siddeley	John Tune (TN)	Take-off Run	Not reported	Engine (aircraft damaged beyond repair)	White-tailed deer	Several deer were struck during takeoff. One was completely ingested in the left engine. The impact tore the engine loose from the aircraft. The aircraft had to be replaced at a cost of \$1.4 million.
4/7/1990	B-737-400	LaGuardia (NY)	Take-off Run	Aborted take-off	Engine	Canada goose	Ingested two Greater Canada geese. Ten blades torn or cracked. Engine core ingestion. ID by Smithsonian, Division of Birds.
6/12/1990	Fairchild Metro III	Burke Lakefront (OH)	Landing roll	None	Engine	Gull	Ingested a gull in #2 engine during landing. Engine was replaced. Time out of service was 24 hours. Cost to replace engine was \$17,000.
10/9/1990	C-550	DeKalb Peachtree (GA)	Take-off Run	Precautionary landing, engine shut down	Engine	Unknown bird	Ingested a bird in #1 engine during takeoff. Vibration increased and the engine was shut down. Fan and inlet guide vanes were destroyed. Time out of service was about 3 days. Cost of repairs estimated at \$105,000.
11/5/1990	BAe Jetstream 31	Michiana Regional (IN)	Take-off Run	Aborted takeoff, engine shut down	Engines, propellers	Dove	Doves were ingested in both engines. Engines were destroyed. Time out of service 2 ½ days. Cost of repairs estimated at \$1 million.
7/23/1991	B-757-200	O'Hare International (IL)	Climb (150 AGL)	Precautionary landing	Engine	Canada goose	Major damage to 1st stage fan blades. Unknown internal damage. Three birds ingested.

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8/28/1991	C-550	Person County (NC)	Take-off Run	Aborted takeoff	Engine	Dove	Right engine inlet was damaged by the temperature probe being tossed back and forth prior to going through the fan. All 28 fan blades were bent, torn and chipped. Stator behind fan was damaged. Time out of service was 3 days. Cost of repairs was \$160,000.
11/12/1991	DC-10	Chicago O'Hare International (IL)	Take-off Run	Precautionary landing	Engines	American crow	The #1 engine was shut down and the plane returned to land after ingesting a crow (or crows) on takeoff. Parts of the engine came out the side and damaged the #2 engine.
11/24/1991	Learjet-35	Sullivan County International (NY)	Take-off Run	Precautionary landing	Engine, wing, tail	Gull	Eight gulls were struck which damaged a wing and the #1 engine, causing an 80% thrust loss. The aircraft landed safely. Time out of service was 3 weeks. Cost of repairs was \$340,000.
12/30/1991	C-550	Angelina County (TX)	Take-off Run	Aborted takeoff	Engine	Turkey vulture	Ingested 1-2 vultures in #1 engine during takeoff. Engine had an uncontained failure, fire and vibration with 100% thrust loss. Wing and fuselage received damage from engine shrapnel. Time out of service was 2 weeks. Cost of repairs \$552,500.
2/2/1992	PA-28	Sandstone (MN)	Approach	Impacted trees and ground	Aircraft destroyed (1 injury)	White-tailed deer	Just prior to touchdown, a deer ran toward and collided with the aircraft. The pilot added power and aborted the landing. Loss of engine power was experienced during the climb and the aircraft impacted into trees then the ground ¼ mile south of airport. Pilot was seriously injured and the aircraft was destroyed. NTSB found that the deer had damaged the gascolator and fuel starvation resulted. NTSB case #CHI92LA086.
3/30/1992	B-757	Philadelphia International (PA)	Take-off Run	Precautionary landing	Engine	Canada goose	Uncontained engine failure after ingesting a goose. Loud jolt, vibration, engine stall and flame out occurred simultaneously. Emergency declared. Replaced #1 engine. Five broken fan blades. In flight engine shut down.

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6/5/1992	Starduster SA 300	Off airport at Wills Point (TX)	Low level maneuvers	Impacted ground	Aircraft destroyed (1 fatality)	Unknown bird	The pilot was viewed by several witnesses maneuvering his aerobatic airplane at a low altitude over open pasture land. It hit a large black bird. The airplane descended out of control and impacted into a field. A fire consumed the airframe. The bird's carcass was located under the cockpit of the inverted airframe. One fatality. NTSB investigated, case # FTW92LA150.
8/10/1992	C-441	Lee Gilmer Memorial (GA)	Climb	Impacted ground	Aircraft destroyed (2 injuries)	Unknown bird	Immediately after takeoff, aircraft hit birds. Right engine lost power and aircraft would not maintain altitude. Pilot was forced to land in a residential area ¼ mile from Gainesville Airport. Both pilot and passenger were seriously injured. NTSB reported that pilot shut down wrong engine and did not follow emergency checklist. Aircraft valued at between \$690,000 and \$1.7 million. NTSB case# ATL92LA156.
9/4/1992	Aero S2R	Jay Kay Ranch (TX)	Landing	Swerved to avoid	Substantial	Deer	Pilot lifted off the ground to avoid a deer crossing the runway and settled into some trees. The aircraft was rebuilt.
10/24/1992	B-747	John F. Kennedy International (NY)	Take-off Run	Precautionary landing	Engine	Herring gull	Numerous birds were struck on departure. One gull was ingested, causing engine vibration. The aircraft made a precautionary landing. Passengers were put on another aircraft and departed the next day. Four fan blades were bent. Replacement assembly and maintenance had to be flown from Tokyo for repairs. Cost reported to be \$750,000 which included hotel, lost revenue and repairs.
1/1/1993	B-737-300	LaGuardia (NY)	Take-off Run	Aborted take-off	Engine	Canada goose	A flock of geese were seen on the runway just before the birds were struck and ingested in #1 engine. A loud bang was heard and take-off was aborted at high speed. Compressor stalls. Eleven blades were damaged. Aircraft was grounded.

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3/24/1993	Bell 47	Pacific Ocean	En Route	Impacted water	Aircraft destroyed	Unknown bird	During cruise pilot heard a loud bang and felt vibration in rudder pedals then lost all yaw control. Pilot thought the tail rotor struck a large sea bird, as many were in the area. He maintained directional control and tried to lower the helicopter so that the passenger (a ship's captain) could reach small boats being lowered by his ship nearby. The passenger jumped before the pilot gave the okay and was killed. The pilot subsequently made a running landing on the water and was hoisted on board the ship.
6/10/1993	Learjet-25	Port Columbus International (OH)	Climb	Precautionary landing, engine shut down	Engine	Unknown bird	Ingested a bird in #2 engine during climb-out. Engine shut down and was completely destroyed. Time out of service was 2 days. Cost of repairs was \$254,000.
9/6/1993	Kitfox 4-1200	Mason County (WV)	Approach (6-10 feet AGL)	Landed short of runway	Aircraft destroyed	White-tailed deer	Aircraft hit a deer on short final and touched down 30 feet short of runway. The nose wheel broke off and the aircraft skidded 310 feet and was destroyed by fire. NTSB investigated, case # BF093LA160.
10/22/1993	B-757	Salt Lake City (UT)	Climb (2,500 feet AGL)	Precautionary landing	Engine	Unknown bird (suspect gull)	A bird was ingested in the #1 engine during climb-out, which caused high pressure turbine damage. The engine was replaced. Cost was \$300,000.
10/28/1993	B-757	Orlando International (FL)	Take-off Run	Aborted takeoff	Engine, tires	Cattle egret	Takeoff was aborted due to multiple bird strikes (35). Three tires on right gear were blown and aircraft was towed to the gate. Ten to twelve birds were ingested damaging fan blades and the engine cowl.
10/29/1993	BE-1900	Sioux Gateway (IA)	Climb (4,000 feet AGL)	Emergency landing	Windshield, wing (1 injury)	Duck	A duck shattered the windshield and hit the captain, who was injured from flying glass. The wing was also struck and a 1 foot square piece of aluminum was peeled off. Time out of service was 5 days.
12/3/1993	C-550	DuPage (IL)	Climb (200 feet AGL)	Diverted, emergency landing	Engine	Goose	Struck a flock of geese. A loud bang was followed by unstable flight. Lost power to #2 engine and had a substantial fuel leak. Emergency was declared and aircraft landed safely at Midway. Both engines had to be replaced. Time out of service was 3 months. Cost of repairs was \$800,000.

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3/11/1994	ATR-42	Easterwood Field (TX)	Approach (2500 feet AGL)	Precautionary landing	Multiple parts	Canada goose	Radome destroyed. Left wing shroud destroyed. Wing center spar cover damaged. Left air pack penetrated. Left of engine inboard wing leading edge penetrated. First Office pitot panel skin and stringers destroyed. Bone and blood in and outside of aircraft. Pilot reported a loud noise like an explosion on final approach. Declared an emergency and landed without incident. Inspection revealed the aircraft had struck 18-20 geese. Aircraft out of service for 168 hours.
5/16/1994	Bell 47	Tulsa, OK	En Route	Impacted ground	Aircraft destroyed (1 fatality)	Unknown bird	Witnesses heard a loud noise and saw an object separate from the second of 2 helicopters. The helicopter then impacted inverted in the backyard of a residence. The pilot of the first helicopter said he had warned the second pilot of a flock of birds and that he had to bank sharply to avoid them. NTSB reported the probable cause as loss of control due to pilot's improper use of the cyclic and collective controls when he maneuvered abruptly to avoid colliding with a flock of birds. One fatality. NTSB case# FTW94FA158.
6/18/1994	C-441	Fort Frances (Ontario)	Take-off Run	Impacted terrain/airfield	Aircraft destroyed (multiple injuries)	Ring-billed gull	During takeoff, the left engine ingested gulls and lost power. The pilot could not control the aircraft and impacted terrain. The passengers sustained minor injuries and the aircraft was destroyed. (U.S. carrier)
7/15/1994	C-172	Indian Shores, FL	En Route	Impacted water	Aircraft destroyed (1 fatality)	Pelican	Aircraft was seen flying about 200 feet above the water along the beach. The aircraft rolled inverted and hit the water. One fatality. NTSB case# MIA94FA179.
8/3/1994	B-757-200	O'Hare International (IL)	Take-off Run	Aborted take-off (?)	Engine, cowling	Canada goose	Flock of six Canada geese struck wing and engine. Incurred cowling damage and core entry. Fan blades had leading edge pieces missing. At least one bird was ingested. Costs with relocation and rerouting (\$1 million).

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1/13/1995	Lockheed L-1011	Portland International (OR)	Take-off Run	Engine shut down	Engine	Gull	Gulls was ingested in the #3 engine on takeoff. Loud booms came from the engine which was then shut down after several compressor stalls. Pilot declared an emergency and returned safely. Time lost was about 24 hours. Cost of repairs was \$300,000.
5/14/1995	BAe Jetstream 31	Capital (IL)	Climb (200 feet AGL)	Precautionary landing	Engine	Rock dove	At least 2 rock doves were ingested in the #1 engine. Engine lost 50% of thrust. Required a complete engine change. Time out of service was 15 hours. Cost was reported at \$1.5 million.
6/3/1995	Concorde	John F. Kennedy International (NY)	Landing roll	Aircraft was towed to gate	Engines	Canada goose	Aircraft ingested a Canada goose into the #3 engine, which had an uncontained failure causing parts to go into the #4 engine. Both engines were destroyed. Flames and smoke were seen coming from the engines. Aircraft was out of service for 5 days. Cost was over \$9 million. The Port Authority of NY/NJ paid \$5.3 million in compensation for losses.
9/19/1995	A-320	La Guardia (NY)	Landing	None	Engine	Canada goose	Aircraft struck several geese that were on either side of the runway centerline. Tower reported flames coming from the engine. There were no cockpit indications of fire. Two fan blades were damaged and 12 geese carcasses were removed from the runway. Time out of service was 2 days. Cost was \$2.5 million.
10/10/1995	DA-900	San Francisco International (CA)	Climb (800 feet AGL)	Engine shut down	Engine	Goose or heron	One or 2 birds struck the #3 engine. Engine was shut down due to vibration and temperature increase. Time out of service was 2 days. Cost was estimated at \$1 million.
12/10/1995	B-747	John F. Kennedy International (NY)	Approach (7,500 feet AGL)	Not reported	Engines, cowling, wing, fuselage	Snow goose	As the aircraft broke through a cloudbank, it struck a flock of snow geese, which sounded like sandbags hitting. The impact destroyed 1 engine, damaged several fan blades on another and extensively damaged the airframe. Repairs cost approximately \$6 million.
1/8/1996	B-737	Sacramento Metro (CA)	Climb (750 feet AGL)	Precautionary landing	Engine	Duck or goose	Ingested a bird in #2 engine during climb. Vibration increased and crew throttled back and returned to land. One fan blade separated and other blades were damaged by re-ingestion of broken blade fragments. Engine was replaced.

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1/9/1996	B-737	Reno/Tahoe International (NV)	Take-off Run	Precautionary landing & engine shut down	Engine	Snow goose	Ingested a large bird during rotation. The engine failed and sparks were observed. Landed runway 16L because 16R had debris. Three fan blades were fractured with associated damage throughout the engine. Engine was replaced.
3/31/1996	B-737	Kansas City International (MO)	Take-off Run	Precautionary landing	Engine	Medium to large bird	Airport operations found a piece of inlet cooling duct on runway from a B-737 that had just taken off. Aircraft returned and landed safely. Engine had several damaged guide vanes. Time out of service was about 24 hours.
6/2/1996	B-737	Chicago Midway (IL)	Climb (100 feet AGL)	Precautionary landing	Engine	Gull	Ingested a gull during climb-out. Tower observed flames from #2 engine and advised pilot who declared an emergency and returned to land without incident. Emergency equipment was on the runway. Aircraft landed using single engine landing procedures. Core and all fan blades were damaged. Engine was rebuilt.
7/8/1996	B-737	Nashville International (TN)	Take-off Run	Aborted takeoff	Engine (5 injuries)	American kestrel	Ingested a kestrel into the left engine, resulting in a compressor stall and an aborted takeoff. Aircraft overran the runway. Fire/rescue arrived, confirmed no fire and noted tires were deflating and smoking. Evacuation slides were de-armed and cabin doors opened for ventilation. Fire erupted from right brake and was extinguished by fire personnel. Flight attendants heard fireman shout fire and commanded an evacuation. One passenger was seriously injured, 4 others received minor injuries.
8/7/1996	B-737	Orlando International (FL)	Climb (20 feet AGL)	Precautionary landing	Engine	Duck	Ingested a duck during climb-out. The engine began a series of compressor stalls. Time out of service was 8 days. Cost was \$1,004,000.
10/5/1996	B-727	Washington National (DC)	Climb (2,000 feet AGL)	Precautionary landing and engine shut down	Engine	Gull	Aircraft struck a flock of gulls just after takeoff, ingesting at least 1 bird. Engine began to vibrate and was shut down. A burning smell entered the cockpit. Emergency was declared and aircraft, carrying HUD Secretary Henry Cisneros along with 52 other passengers, returned to land at Washington National. Airport Fire and Rescue was on hand. Aircraft taxied to the ramp without incident. Engine blades were damaged.

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11/1/1996	B-727	Chicago O'Hare International (IL)	Climb (25,000 feet AGL)	Precautionary landing	Window	Unknown bird	Bird broke out pane of window. Aircraft returned to ORD from 70 miles south. Dumped 6,000 pounds of fuel. Landing uneventful. (exact date unknown)
11/22/1996	MD-80	Sacramento International (CA)	Climb (75 feet AGL)	Precautionary landing & engine shut down	Engine	Gull	Several gulls were ingested just after takeoff causing the engine to lose power. Engine was shut down and an emergency was declared. The plane was forced to land much heavier than usual because of a full fuel load. There were no injuries and passengers were transferred to a replacement jet. Fan blades and engine were damaged. Runway was closed for approximately ½ hour.
12/13/1996	BE-1900	Arnold Palmer Regional (PA)	Landing roll	Skidded to stop on runway	Landing gear	White-tailed deer	Struck deer on landing causing left main gear to collapse. Propeller blades broke, underside of fuselage, wing tip and aileron flap were damaged. Aircraft was evacuated. No injuries.
1/7/1997	MD-80	Dallas-Fort Worth (TX)	Climb (50 feet AGL)	Precautionary landing	Engine, wing, radome	Blackbird	Aircraft struck over 400 birds just after takeoff. Almost every part of the plane was hit. Pilot declared an emergency and returned to land without event. Substantial damage was found on various parts of the aircraft. The #1 engine had to be replaced. Runway was closed for an hour. Personnel were sent to disperse another large flock on the airfield. Cost of repairs was estimated at \$219,000. Birds had been attracted to a un- harvested wheat field on the airport.
1/26/1997	B-737	Orlando International (FL)	Climb (900 feet AGL)	Precautionary landing	Engine	Sandhill crane	The aircraft struck a Sandhill crane after departing MCO, totally destroying the #1 engine. Pilot made a precautionary landing.
1/27/1997	DC-10	Los Angeles International (CA)	Take-off Run	Engine shut down	Engine	Gull	Crew thinks they hit a gull on takeoff. Engine had a vibration with oil quantity fluctuation. When oil quantity dropped to zero, engine was shut down ¾ of the way to Japan. Crew had planned to divert to Anchorage but decided against it due to poor weather. Feathers found in engine after landing. Cost was \$1.5 million.
2/28/1997	BE-1900	Charleston/AFB International (SC)	Approach (3,000 feet AGL)	None	Windshield (1 injury)	Egret or Heron (large white)	Windshield on the right side shattered. Co-pilot received facial abrasions and needed medical attention to remove glass fragments from his eyes.

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4/5/1997	C-90	Orlando Executive (FL)	Approach (200 feet AGL)	Nearly stalled below 150 feet	Radome, nose, propeller	Gull	Over 1,000 gulls covered the first 1,000 feet of runway. Pilot struck between 11 and 100, which caused a low altitude stall with miraculous recovery. He could not see out of the windshield. Aircraft bounced 4 times upon landing. Pilot believes there was insufficient notification and supervision of the condition on the airport. Time out of service was 10 days. Cost of repairs was \$13,000.
6/19/1997	RV 6	Bountiful Skypark (UT)	Climb (100 feet AGL)	Emergency landing	Entire aircraft (1 injury)	Homing pigeon	Bird went through the canopy, which started to break apart. The pilot was forced to land in a nearby hayfield. Most of the damage occurred during landing and tip-over. The hay was 2-3 feet tall. The pilot sustained facial lacerations and required stitches. Time out of service was about 6 months. Cost of repairs was \$30,000.
7/17/1997	Mitsubishi MU-2	Hardin County (OH)	Take-off Run	Aborted takeoff	Radome, nose, engines, propeller, landing gear, tail, wings.	Canada goose	Geese were on the ground extending across the runway and about 50 feet to each side in a line. Time out of service was about 7 weeks. Costs were over \$110,000.
7/23/1997	BE-58	Mid-America Industrial (OK)	Landing roll	Other	Radome, engines #1 and #2, propeller, landing gear	Deer	During the landing roll a small herd of deer ran across the runway, directly in front of the plane. One deer struck the nose wheel and then bounced against the nose links causing it to collapse. Both propellers struck the ground. Time out of service was 3 months. Cost of repairs was \$80,000.
8/21/1997	B-737	Portland International (OR)	Climb (1,400 feet AGL)	Precautionary landing	Radome, nose, engine	Mallard	Pilot reported striking 12-15 ducks. Aircraft returned and landed safely. Radome and all engine fan blades were replaced. Time out of service was 15 hours. Costs were over \$100,000.
9/20/1997	Bell-206	12 mi SE of Houma, LA	En Route	Lost control of aircraft	Rotor blades, tail, landing gear, lights, air frame (1 injury)	Unknown bird	Control tube was damaged, causing a hard landing (at 35 mph) which made the rotor blades flex and sever the tail boom. Airframe and skid tubes were damaged. Pilot had a disc compression injury. Time out of service was over 3 months. Cost to repair aircraft was \$168,000.

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9/26/1997	MD-80	Portland International (OR)	Approach	Other	Radome, nose	Goose	A flock of geese was struck on approach. One punctured the radome, which was replaced. Time out of service was 40 hours. Estimated cost was \$100,000.
10/8/1997	B-727	Orlando International (FL)	Climb (1,750 feet AGL)	Precautionary landing	Windshield (1 possible injury)	Unknown bird	Right cockpit window shattered. First officer had possible glass in eye.
10/13/1997	B-757	Logan International (MA)	Take-off Run	Precautionary landing	Engine, radome	Duck and great blue heron	Aircraft struck bird on takeoff. Both wings were impacted. The radome was damaged and the engine nacelle had a 2½ foot dent. Four fan blades were damaged.
10/15/1997	B-757	Los Angeles International (CA)	Take-off Run	Aborted takeoff	Engines #1 and #2	Rock dove (pigeon)	Aborted takeoff after striking and ingesting several pigeons. Aircraft returned to the gate and inspection revealed damage to both engines.
11/5/1997	B-737	McCarran International (NV)	Landing roll	None	Engine	Pigeon or gull	Bird was ingested in engine during landing while in reverse thrust. Immediate engine vibration occurred that lasted until a return to idle thrust. At least 9 fan blades had significant damage. Time out of service was 3-5 hours.
11/15/1997	A-320	John Wayne (CA)	Take-off Run	Precautionary landing	Engine	Large bird	A large bird was ingested into an engine, causing a fire. Passengers heard a loud boom, then the aircraft dropped momentarily before recovering altitude. The aircraft circled for 30 minutes before making an emergency landing. Bird hit blades on starboard fan that broke or bent all blades causing damage to cowling and to the system behind the fan. The engine was changed. Time out of service was over 30 hours. Cost of repairs \$300,000 and other cost \$800,000.
11/16/1997	BAe Jetstream 41	John F. Kennedy International (NY)	Approach	Other	Windshield, flight instruments	Gull	Hit gulls about 20 miles from airport. Both panes of the captain's windshield were shattered, and the captain's flight instruments were knocked out. First officer took over and landed successfully, no injuries. Damage estimated at \$50,000.

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11/30/1997	Canard Pusher	nearest location - Mojave Desert (CA)	En Route	Precautionary landing	Canopy, propeller (1 injury)	Unknown bird (maybe duck - web-footed)	Aircraft was leveled off at 2500 feet AGL, speed 150 mph. Pilot looked up just in time to see a bird about 50 feet above flight path and several hundred feet ahead. Within 2 seconds, bird winged over and dived down striking the canopy head on. Canopy shattered and was completely missing from pilot's head forward. Pilot's headset was knocked off and he sustained facial injury. Pilot recovered headset, declared emergency and turned back to the airport. Glasses protected him from direct wind in his face at 100 mph. Propeller had a chunk missing from each blade and 1 had a split from tip toward center about 10 long.
12/1/1997	B-737	Lehigh Valley International (PA)	Take-off Run	Diverted to PHL	Engines #1 and #2	Gull	Emergency was declared and flight was diverted to Philadelphia. Both engines and cowlings were damaged. Time out of service was 20 hours. Cost of repairs \$500,000.
12/13/1997	B-737	Wilkes-Barre/Scranton International (PA)	Landing roll	None	Engine, nose cowl	White-tailed deer	Captain radioed tower that he believed he hit something. Damage was found to the nose cowl, engine cowl and 1 fan blade. Time out of service was 2 days awaiting new parts.
12/17/1997	Bellanca Super Viking	Jefferson County (OH)	Take-off Run	Aircraft lost power	Aircraft destroyed (2 injuries)	White-tailed deer	Aircraft hit a deer on takeoff and lost power, impacted heavily wooded area. Aircraft was destroyed. Pilot was life-flighted out, passenger had minor injuries.
1/9/1998	B-727	Houston Intercontinental (TX)	Climb (6,000 feet AGL)	Precautionary landing	Engine, radome, right wing	Snow goose	Aircraft encountered a flock of birds. Three to 5 birds were ingested. The engine lost all power and was destroyed. The radome was torn from the aircraft, leading edges of both wings were damaged, and a pitot tube was torn off. Intense vibration in airframe and noise level in cockpit increased to the point that communication between crew members became difficult. An emergency was declared. The aircraft returned safely to Houston. Time out of service was 9 days. Cost was \$293,537.
1/23/1998	C-208	Salt Lake City International (UT)	Approach	Unknown	Stabilizer, elevator	Unknown bird (probably a goose)	Bird strike jammed the elevator. Pilot landed safely using power and elevator trim. Bird hit the end of the left stabilizer and peeled back some skin, which jammed the elevator in the neutral position.

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1/27/1998	C-340	Wagoner Airstrip (OK)	Landing roll	Other	Aircraft destroyed	White-tailed deer	Aircraft struck 2 deer on landing. The gear collapsed and the fuel tank was punctured, resulting in a fire which destroyed the aircraft.
1/29/1998	C-500	Horseshoe Bay Airpark (TX)	Landing roll	Unknown	Fuel tank	White-tailed deer	Aircraft struck a deer on landing. The fuel tank was punctured, spilling 200 gallons of fuel.
2/3/1998	Cessna Citation	Watsonville (CA)	Climb (rotation)	Engine shut down	Engines #1 and 2, wing, fuselage, tail	Gull	Flew through a flock of 20 gulls and ingested 1 into right engine, causing it to seize. Replaced right engine, 4 fuselage windows, left leading edge and de-ice boot, both heated leading edges, large fuselage panel and 3 other wing/fuselage panels. Time out of service was 2 months. Cost over \$470,000.
2/10/1998	Bell-206	Nearest town – Scappoose, OR	En Route	Precautionary landing	Windshield	Mallard	A news helicopter reported a bird strike 3-5 miles southeast of Scappoose, OR. A mallard came through the windshield. No injuries.
2/24/1998	B-747	Nairobi Jomo Kenyatta	Climb	Engine shut down	Engine	Lappet-faced vulture	Engine had an uncontained failure. Time out of service was about 10 days. Cost \$3.7-\$4.0 million. (U.S. carrier)
2/24/1998	B-727	Austin Bergstrom International (TX)	Climb (1,300 feet AGL)	Engines shut down, precautionary landing	Engine	Unknown bird	The #1 engine compressor stalled, then seized after ingesting large birds. The engine was replaced. Time out of service was 15 hours. Cost \$5 million.
3/4/1998	PA-23	Somerset, NJ	En Route	Lost control of airplane	Aircraft destroyed (2 fatalities)	Unknown bird	Witness saw the vertical stabilizer begin to oscillate and then separate from the plane. The plane crashed into a multiple family dwelling. NTSB investigation found an impact mark on the horizontal stabilizer which was consistent with a soft-bodied impact. Although no blood or bird remains were found, a witness reported seeing several birds flying in the area at the time of the accident. NTSB case # NYC98FA073. Two fatalities.
3/6/1998	B-727	Boise Air Terminal (ID)	Take-off Run	Engine shut down, precautionary landing	Engine	Unknown bird	A bird was ingested into 1 engine, causing an uncontained failure. The engine was shut down and the aircraft landed without incident. The runway was closed for about 1 hour, to remove fan blade parts.
3/9/1998	Merlin IV	Denver International (CO)	Approach	Unknown	Windshield (1 injury)	Unknown bird	While inbound to Denver, pilot reported a bird strike on the windshield, which shattered. Pilot reported he was okay, but had taken glass in the face.

**SOME SIGNIFICANT WILDLIFE STRIKES TO CIVIL AIRCRAFT
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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
3/13/1998	B-727	Valencia International (Venezuela)	Climb (3,600 feet AGL)	Engines shut down, precautionary landing, fuel dump	Engine	Vulture	On climb-out, pilot saw a large black bird pass over top of the cockpit. It struck the #2 engine, causing severe vibration. Crew secured the engine, dumped 12,000 pounds of fuel, declared an emergency and landed at Valencia. The engine was substantially damaged. Time out of service was 42 hours. (U.S. carrier)
4/4/1998	MD-80	La Guardia (NY)	Climb	Precautionary landing	Radome	Canada goose	Aircraft struck multiple geese at rotation. Radome had a large hole. The aircraft had an air speed problem. Flight was diverted to Newark.
4/6/1998	C-172	Mallards Landing (GA)	Take-off Run	Aborted takeoff	Aircraft destroyed (1 injury)	White-tailed deer	Deer crossed in front of aircraft during takeoff with nose gear up. Aircraft swerved to avoid a deer, ran off the runway, flipped over and was destroyed. Pilot was injured.
4/14/1998	B-727	Dane Co. Regional (WI)	Climb (1,500 feet AGL)	Precautionary landing	Engine	Unknown bird	A bird was ingested when the aircraft was 2-3 miles from the airport. An emergency landing was made without incident. Even though the C1 fan was damaged beyond limits, the engine remained operational. The engine was replaced. Time out of service was 2 days. Cost of repairs was estimated at \$15,000.
4/28/1998	Piper Cherokee	Vandenberg (FL)	Climb (550 feet AGL)	Engine shut down	Aircraft destroyed	Turkey vulture	During a training flight, the aircraft struck a bird, which damaged the fuel system. The aircraft experienced fuel starvation and subsequently impacted terrain. Cost was \$105,000.
5/3/1998	B-767	Dallas-Fort Worth (TX)	Climb (3,000 feet AGL)	Precautionary landing	Engine	Unknown bird	Major vibration after impact during climb power setting. Engine power reduced to idle. Immediate landing and shut down engine while exiting runway.
5/7/1998	B-727	Colorado Springs Muni (CO)	Climb (3,500 feet AGL)	Engine shut down, precautionary landing	Radome, wing, fuselage, engine	Canada goose	Aircraft struck several geese just north of the airport. Crew felt moderate to severe vibration due to ingestion of 1 or more birds. Aircraft lost essential electrical power, which was restored by a generator. The #3 engine had an uncontained failure. Shrapnel was ejected through the engine case, which severed electrical wires and punctured the anti-ice bleed air duct. Radome was cracked, and upper engine cowling and thrust reverser were also damaged. Time out of service was 4 days. Cost was \$1.4 million. NTSB investigated, case # FTW98IA208.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
5/11/1998	B-747	Unknown (Buenos Aires to Miami)	Unknown	None	Radome, wing, fuselage, engine	Unknown bird	Crew was unaware bird strike occurred. Damage found during maintenance post flight inspection. Damage pattern indicates bird impacted engine cone and separated into 2 parts, damaging compressor blades in 2 areas 180 degrees apart. Nose cone and 12 compressor blades were damaged. Time out of service was 14 hours. Cost was \$132,000. (U.S. carrier)
5/28/1998	B-767	John F. Kennedy International (NY)	Climb (900 feet AGL)	Precautionary landing	Engine, wing	Canada goose	One goose was ingested shortly after departure. ARFF responded. The #2 engine's 1st set of fan blades was damaged and there was a hole in the right flap. Aircraft immediately returned to JFK and landed without incident.
5/31/1998	Piper Cherokee	Sikeston Memorial Municipal (MO)	Landing roll	Lost control of aircraft	Not reported – substantial (1 injury)	White-tailed deer	Pilot tried to avoid striking a deer on landing, lost control and struck a group of trees. Aircraft had substantial damage and pilot had minor injuries. NTSB investigated, case # CHI98LA181.
6/2/1998	B-747	Not reported	Climb (11,000 feet AGL)	Precautionary landing	Engine	Unknown bird	On climb-out, suspected bird strike on engine fan cowling. The cowling broke free, damaging the wing leading edge and upper surface, pneumatic ducting, generator feeder cables and leading edge flap. Time out of service was 2 weeks.
6/4/1998	Cessna Citation	Jackson International (MS)	Climb (rotation)	Power pulled back 100%, precautionary landing	Engine	Unknown bird	Pilot declared an emergency and landed safely after ingesting a bird on takeoff. Time out of service was estimated at 1 week. Cost of repairs was \$200,000.
6/28/1998	B-737	Norfolk International (VA)	Take-off Run	Engines shut down, precautionary landing	Engine	Gull	One gull was ingested, causing the pilot to make a precautionary landing. There was smoke in the cockpit and engine vibration. Three pairs of fan blades were replaced in the engine.
7/5/1998	PA-24	Near Fort Myers, FL	En Route (1,000 feet AGL)	Other	Windshield	Double-crested cormorant	Pilot never saw bird. Cormorant penetrated the windshield. Pilot sustained facial lacerations from the windshield.

**SOME SIGNIFICANT WILDLIFE STRIKES TO CIVIL AIRCRAFT
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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
7/13/1998	B-757	Dallas-Fort Worth (TX)	Climb (600 feet AGL)	Precautionary landing	Engine	Hawk	A hawk was ingested into the left engine. Tower observed flames coming from the tailpipe. Aircraft returned and landed without incident with 54 passengers and 33,000 lbs. of fuel. Flames were extinguished quickly and the aircraft taxied to the gate without further incident. Outboard portion of at least 4 blades was damaged, 2 significantly.
7/14/1998	B-737	Nashville International (TN)	Climb (rotation)	None	Engine	Unknown bird	Ingested 1 bird at rotation. Caused odor in cabin. Engine ran normally. On arrival at Midway, mechanic found several damaged fan blades.
7/19/1998	B-737	Dallas-Fort Worth (TX)	Climb (3,500 feet AGL)	Reduced engine power, precautionary landing	Engine	Vulture	Crew saw a flock of vultures prior to impact of 1 or more birds in the vicinity of the #1 engine. Heard impact and smelled freshly baked bird throughout entire cockpit/cabin. Retarded throttle to near idle. Emergency was declared and returned to land uneventfully at DFW.
7/22/1998	BE-58	Antrim County (MI)	Landing roll	Not reported	Engines, propellers, landing gear, flaps	White-tailed deer	Two deer came onto the runway. Each propeller hit a deer cutting them in half. One was thrown into the left gear and left flap. The other deer went under the right wing striking the right flap. Time out of service was 1 month. Cost was \$33,000.
7/22/1998	MD-80	Burbank (CA)	Take-off Run	Precautionary landing	Engine	Gull	An emergency landing was made after the jetliner ingested a gull into 1 of its 2 engines at lift-off. The damaged engine was shut down. All 95 passengers were re-routed. Several flights were cancelled.
8/7/1998	DA-20 Falcon	Sioux Gateway (IA)	Climb (1,900 feet AGL)	Precautionary landing	Engine	Unknown bird	Bird hit wing, then went into the #1 engine which flamed-out and restarted. Debris from bird packed the air tubes and caused heat distress when engine relit. Time out of service was 5 days. Cost was \$59,000.
8/8/1998	B-767	Philadelphia International (PA)	Climb (300 feet AGL)	Precautionary landing	Engine	Gull	Five blades were damaged. ARFF responded. Inspection found evidence of core ingestion. Time out of service was 8 hours.
8/11/1998	B-737	Philadelphia International (PA)	Take-off Run	Not reported	Engine	Canada goose	The #1 engine was totaled. Time out of service was 36 hours.

**SOME SIGNIFICANT WILDLIFE STRIKES TO CIVIL AIRCRAFT
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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
8/15/1998	BAe Jetstream 31	Altoona-Blair County (PA)	Landing roll	Engine shut down	Engine	Mourning dove & killdeer	One or more birds were ingested bird. Twenty-two carcasses (mostly mourning doves) were removed from the runway. Engine was removed for overhaul. Outbound flight canceled, 17 passengers displaced. Time out of service was 24 hours. Cost was \$56,000.
8/25/1998	ATR-42	Reagan Washington National (DC)	Approach (150 feet AGL)	None	Fuselage	Unknown bird	Three holes found in bottom of fuselage. Landed without incident. Aircraft was ferried for repairs.
8/29/1998	B-747	Unknown	Unknown	None	Engine	Unknown bird	Fan blades were damaged. Evidence of strike found on transit check. Flight crew was unaware of the strike. Time out of service was 2 days. Cost of repair was \$75,000.
8/29/1998	BE-55	Quad City (IL)	Touch and go	Aborted takeoff	Engines, windshield, wings, landing gear, fuselage (1 injury)	Canada goose	Aircraft struck a flock of geese while practicing touch and go landings at night. Windshield broken and cut the pilot.
8/31/1998	C-550	Renton Municipal (WA)	Landing flare	None	Engines, wings, landing gear	Canada goose	Geese were sleeping on the runway. Several were struck. Wings and flaps were dented and punctured. Fan blades were damaged in #1 engine. Engine was removed and sent to the engine manufacturer for inspection.
9/1/1998	B-767	London Heathrow	Approach	Flight cancelled	Engines, radome, wings, landing gear	Canada goose	The #1 engine ingested geese. Every fan blade in the engine was replaced. Aircraft was grounded for several days. The radar inside the radome was smashed. 25-30 geese were removed from the runway. Cost of repairs was over \$1 million. (U.S. carrier)
9/6/1998	Saab-340	Gorman Pass, CA	En Route (12,000 feet MSL)	Precautionary landing	Engine, radome, windshield, nose, propeller, wing, tail, fuselage	Goose/duck	Left window was 85% covered with blood & remains. Window pressure plate was damaged and the radome was caved in. Estimated cost is \$6,500.

**SOME SIGNIFICANT WILDLIFE STRIKES TO CIVIL AIRCRAFT
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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
9/18/1998	B-737	Houston Hobby (TX)	Approach (2,500 feet AGL)	None	Engine, fuselage	Gull	Two birds were struck. One was ingested in the #2 engine, causing vibration. Entire fan assembly was replaced. Cost was approximately \$108,500. Time out of service was 6 hours.
9/22/1998	C-500	St. Paul Downtown (MN)	Take-off Run	Aborted takeoff	Engine	American kestrel	Five blades were damaged when a kestrel was ingested. Time out of service was 2 days. Cost was \$16,000.
9/23/1998	MD-80	La Guardia (NY)	Climb (1,000 feet AGL)	Precautionary landing	Engine	Unknown bird	Hit a small flock of birds at night. One hit the clearview window. One or more were ingested in the #1 engine, breaking compressor blades and damaging the shroud.
9/25/1998	DA-20 Falcon	Birmingham International (AL)	Climb (4,000 feet AGL)	Engine shut down	Engine	Unknown bird	Hit an unknown number of birds at night. One or more were ingested in the #2 engine, causing vibration and 80% thrust loss. Aircraft returned to the airport and the engine was shut down after landing. Two blades were damaged. Time out of service was 1 week. Cost was \$131,000.
9/29/1998	B-747	John F. Kennedy International (NY)	Climb (900 feet AGL)	Precautionary landing, engine shut down, fuel dumped	Engine	Gull	Engine was shut down because of vibration. Dumped 120,000 lbs. of fuel and landed uneventfully. Uncontained engine failure. Time out of service 3 days. Cost was \$136,858.
10/15/1998	DC-10	John F. Kennedy International (NY)	Climb	Engine shut down, fuel dump, precautionary landing	Engine	Herring gull	One bird was ingested at rotation. Pilot heard a loud thud and was losing power in the #3 engine. A pilot on the ground saw the engine flame out. Engine parts and a carcass were recovered. There was substantial damage. About 26,000 pounds of fuel had to be dumped over the local community and a HAZMAT team was dispatched. Runway was closed for approximately 30 minutes.
10/19/1998	BAe Jetstream 31	Binghamton Regional (NY)	Climb (rotation)	Precautionary landing & engine shut down	Engine	Gull	Pilot reported 1 bird was ingested at rotation. There was a partial loss of power. Aircraft landed safely and the engine was shut down on the taxiway. The crew noticed smoke and flame and discharged fire extinguisher. No injuries occurred during the evacuation.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
10/19/1998	Fokker 100	Dallas-Fort Worth International (TX)	Climb (350 feet AGL)	Precautionary landing, over weight landing	Engine	Turkey vulture	Bird hit the #2 engine. Damage was noted immediately. Pilot reduced power to idle and made a precautionary landing. Landing was overweight, which required additional inspections. One engine was replaced.
10/23/1998	Cessna Citation	Houston Hobby (TX)	Climb (1,000 feet AGL)	Precautionary landing	Wing, radome, tail, fuselage, windshield	Crane	Pilot reported a flock of about 30 cranes was encountered during climb. Several birds were struck. A precautionary landing was made to inspect aircraft. Time out of service was about 1 month. Cost of repairs \$250,000.
11/4/1998	B-747	Louisville International (KY)	Climb (1,500 feet AGL)	Engine shut down, precautionary landing	Engine	Snow goose	A flock of snow geese caused engine damage soon after takeoff. Parts of the aircraft rained down on a barn at Churchill Downs, which housed several valuable racehorses. Pilot made a precautionary landing. No report was filed for this strike.
11/7/1998	Cessna Citation	Fort Smith Regional (AR)	Climb (rotation)	Engine shut down, precautionary landing	Engine, wing	Dove	A large flock of doves flew into the aircraft at rotation speed. One engine failed. An emergency landing was made. Leading edge of right wing was also damaged. Right engine fan was destroyed. Time out of service 24 hours. Cost of repair was \$170,000.
11/9/1998	B-737	Los Angeles International (CA)	Climb (rotation)	Precautionary landing	Engine	Rock dove (pigeon)	A large flock of doves flew into the aircraft at rotation. At least 12 were struck. An emergency landing was made. Several engine fan blades were damaged. Other parts were struck, but the damage was undetermined at time of the report. Cost of repair was \$63,500.
11/10/1998	Aero Commander 500	Philip Billard Municipal (KS)	Climb (3,000 feet AGL)	Precautionary landing	Engine, windshield, tail, landing gear	Goose	Four geese struck the aircraft over Lake Perry. Pilot declared an emergency and returned to land at Billard Airport. Copilot received injuries to hand and arm. Pilot temporarily lost control. There was major damage to the aircraft. Repair cost unknown at this time. Time out of service 2 months and counting, due to unavailable parts.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
11/13/1998	B-737	Albany County (NY)	Climb	Precautionary landing	Engine	Snow bunting	A flock of buntings was ingested into the #1 engine on rotation, causing a booming sound and flames streaking from the engine. The smell of smoke entered the cabin and the aircraft made an emergency landing. Ninety-one passengers were rebooked on other flights. Time out of service was 12 hours.
11/17/1998	B-737	Western Nebraska Regional (NE)	Take-off Run	Precautionary landing	Engine	Deer	Aircraft struck a buck deer on the runway and proceeded with takeoff, then returned to land. There was major damage to the engine. The flight was cancelled; passengers and crew were rerouted the next day. Total cost was \$430,000, including repairs, lost revenue, meals and hotel rooms, and other transportation for passengers.
11/24/1998	B-737	Baltimore-Washington International (MD)	Climb (3,000 feet AGL)	Engine shut down , precautionary landing	Engine	Goose	Aircraft made an emergency landing after ingesting a goose into the right engine. One passenger reported, The plane began jerking around and vibrating and everything started to smell like smoke. The pilot had to shut the engine down and land with 1 engine. Emergency vehicles were standing by and an inspection was made before the aircraft was allowed to taxi to the gate. Over 100 passengers had to be rebooked on other flights. The engine was replaced.
11/24/1998	Lancair (experimental)	Camarillo (CA)	Climb	Precautionary landing, pilots vision impaired	Windshield (1 injury)	Unknown bird	Shortly after takeoff, a bird penetrated the windshield, striking the pilot in the eye. With impaired vision, the pilot returned to land safely at airport.
12/6/1998	B-727	Southwest Florida International (FL)	Climb (rotation)	Fuel burn, precautionary landing	Engine	Mottled duck	Aircraft made an emergency landing after ingesting a bird into 1 of the 3 engines. Pilot circled for 30 minutes to burn off some of the 39,000 gallons of fuel because they were not at a safe altitude to dump the fuel. Additional fire and rescue crews were called to the scene. Engine had bent blades. All 145 passengers were placed on other flights. No report was filed on this strike. Time out of service was 24 hours. ID by the Smithsonian, Division of Birds.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
12/31/1998	MD-80	Chicago O'Hare International (IL)	Climb (2,500 feet AGL)	Precautionary landing , fuel burn	Radome, nose, landing gear door	Canada goose	Struck numerous geese shortly after takeoff. Pilot circled to burn off some fuel before landing overweight. Emergency equipment was at the runway. Replaced radome. Landing gear door bent. Two crew would not board another aircraft to continue the flight. Time out of service was 8 hours.
1/3/1999	BAe 146	Westchester County (NY)	Approach (3,000 feet AGL)	First officer took over flight	Engine cowl, radome, radar unit	Mallard	Aircraft was over the Hudson River Valley at 250 mph when it struck a flock of ducks, which completely obscured the captain's window and ½ of the first officer's window. The first officer took control of the aircraft and landed. The radome was caved in and the radar unit was damaged. A duck was ingested through the engine and a 2-foot by 4-in strip of sheet metal was ripped off the top of the engine cowl.
1/16/1999	Hawker 800	Manassas Regional (VA)	Climb (300 feet AGL)	Precautionary landing	Engine, landing gear	Unknown bird	Ingested a large bird after takeoff. The engine cowling was damaged, 12 fan blades were bent along with numerous inlet guide vanes and 2 compressor blades. The right hand stall vane was missing and 2 tires had to be replaced. Time out of service was 24 hours. Cost of repairs was \$307,000.
1/25/1999	DA-10 Falcon	Lunken (OH)	Climb (75 feet AGL)	Engine shut down	Engine	Mallard	Ingested a duck shortly after takeoff. Engine experienced an uncontained failure and was destroyed. Aircraft was towed to the ramp. Time out of service was 60 hours. Cost of repairs was \$800,000.
2/8/1999	BE-1900	General Mitchell (WI)	Approach (3,000 feet AGL)	Engine shut down	Wing	Canada goose	Twenty miles northeast of the airport, a goose passed through the leading edge, a fuel cell and a wing spar, lodging just in front of the aileron. Bird entered the fuel tank causing a leak. The aircraft landed safely with one engine out. Wing damage greatly affected the flight. Time out of service was 10 days. Repair cost was \$30,000. Other costs totaled \$75,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
2/22/1999	B-757	Cincinnati/Northern Kentucky International (KY)	Climb	Emergency landing	Engine #1 and #2, wing	European starling	At rotation a flock of starlings crossed in front of the aircraft. First officer tried to climb over them, but struck several hundred. Both engines ingested birds and were damaged. There was a massive cleanup of 400 birds. NTSB investigated, case # NYC99LA064. Cost of repairs was approximately \$500,000.
2/25/1999	Learjet-35	Kansas City Downtown (MO)	Approach (2,000 feet AGL)	Engine shut down	Engine, wing	Snow goose	On approach to Kansas City Downtown Airport, a flock of snow geese was encountered over Kansas City International Airport. One hit the copilot's side window, blocking visibility; another was ingested by an engine which shut down. At least 8 birds hit the aircraft. The wing leading edge was damaged severely on both sides. Five carcasses were found on Kansas City International Airport runway. A single engine landing was accomplished. Aircraft was out of service 3 months. Cost totaled \$501,800.
3/4/1999	DC-9	Kansas City International (MO)	Approach (800 feet AGL)	Engine shut down	Engine #1 and #2	Snow goose	Aircraft struck a flock of snow geese and ingested birds in both engines. One engine shut down and the other was severely damaged but continued working. The aircraft landed without incident. NTSB investigated, case # CHI99FA102.
3/5/1999	B-737	New Orleans International (LA)	Take-off Run	Precautionary landing	Engine	Unknown bird	Ingested 1 medium-sized bird on takeoff. Aircraft returned to the airport with 6 damaged fan blades.
3/16/1999	DC-9	Greater Pittsburgh International (PA)	Approach	Unknown	Engine	Canada goose	Two geese were struck on final approach. One engine was destroyed. Time out of service was 17 hours.
3/16/1999	SA-226	Boise Air Terminal (ID)	Climb	Precautionary landing	Nose, engine	Mallard	Strange sound heard at rotation followed by a smell in cabin. Made a precautionary landing. The SAS Vane was removed by the strike and the bird was ingested into a compressor, where it bent an impeller blade. Time out of service was 3 weeks. Engine repairs cost \$37,500 and lost revenue was \$27,000.
3/17/1999	Learjet-35	Fort Lauderdale Executive (FL)	Take-off Run	Aborted takeoff	Engine	Egret or gull	A flock of egrets or gulls was struck on takeoff. Aborted takeoff was uneventful. Four engine fan blades were bent and compressor also had bent blades. Time out of service was 3 days. Cost was \$87,500 for repairs and loss of revenue.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
4/9/1999	Learjet-25	Omaha Eppley Airfield (NE)	Take-off Run	Precautionary landing	Both engines	Gull	A flock of gulls was struck on takeoff. Both engines sustained substantial damage. Aircraft returned and landed without incident.
5/7/1999	B-737	Lincoln Municipal (NE)	Climb	Precautionary landing	Engine	Red-tailed hawk and gulls	A flock of gulls and a red-tailed hawk were struck on rotation. Aircraft returned and landed without incident. Flight was cancelled. The #1 engine had an uncontained failure and was replaced. Engine parts were found on the runway. ID of ingested bird by the Smithsonian, Division of Birds.
5/11/1999	Cessna Citation	Long Beach (CA)	Approach (2,500 feet AGL)	Engine shut down	Engine	Rock dove (pigeon)	Pilot believes a pigeon was ingested. The bird hit the temperature probe, which destroyed all 28 fan blades. Time out of service was 3 weeks. Repair cost estimated at \$150,000. Company rented an engine while repairs were being made.
5/13/1999	B-747	Narita International (Japan)	Not reported	Not reported	Engine	Unknown bird	Unknown number of birds ingested into #4 engine. All 38 blades were replaced. (U.S. carrier)
5/19/1999	B-757	Chicago O'Hare International (IL)	Climb (5,000 feet AGL)	Precautionary landing	Engine	Herring gull	An unknown number of gulls were ingested into the #1 engine 50 miles from the airport. Aircraft returned to land. Flight was cancelled. Time out of service was about 23 hours. Cost of repair estimated at \$76,000.
5/20/1999	BAe Jetstream 31	Kent County International (MI)	Approach (1,500 feet AGL)	None	Engine	Unknown bird	Aircraft ingested a medium-sized bird which required an engine change. Time out of service was 2 days. Cost of repairs was \$200,000.
5/22/1999	Saab-340	Purdue University (IN)	Landing roll	None	Engine, propeller, lights	Canada goose	Aircraft struck at least 4 geese. The propeller on each engine was damaged. Time out of service was in excess of 72 hours. Cost was \$1.2 million.
6/12/1999	BE-90	Westchester County (NY)	Take-off Run	Aborted takeoff	Landing gear, nose, engines, propellers, wings, fuselage, lights	Coyote	Aircraft struck a coyote at night. Nose gear was torn from aircraft, causing other parts of plane to be damaged. Time out of service was 5 months. Lost revenue was \$55,000 and cost of repairs was \$550,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
7/28/1999	B-767	Ben Gurion International (Israel)	Climb	Engine shut down, emergency landing	Engine, cowling, radome, landing gear	Yellow-legged gull	Aircraft ingested a flock of birds shortly after takeoff and made an emergency landing. Crew reported a fireball exiting from the exhaust and engine vibration. Engine was shut down. Engine had an uncontained failure. Large hole in engine cowl from fan blades. Overweight landing blew tires. Eight tires and brakes had to be replaced. More than 200 passengers had to be put on other flights. (U.S. carrier)
7/31/1999	B-737	Baltimore Washington International (MD)	Take-off Run	Emergency landing, engine shut down	Engine	Gull	Aircraft ingested a gull. The engine was shut down and an emergency was declared. The aircraft landed without incident and had to wait 4 days for a replacement engine.
8/5/1999	DC-10	Detroit Metropolitan (MI)	Landing roll	Engine shut down	Engine #1 and #3	Canada goose	Aircraft hit several geese upon landing. The #1 engine flamed out and was shut down immediately. Both engines were replaced. Total cost \$700,000.
9/13/1999	B-737	Chicago Midway (IL)	Take-off Run	Aborted takeoff	Engine	Red-tailed hawk	Aircraft ingested a red-tailed hawk on takeoff, destroying the engine. Time out of service was 6 days. Cost of repairs and other costs totaled \$476,250.
9/19/1999	MD-83	Wichita Mid-Continent (KS)	Climb (50 feet AGL)	Precautionary landing	Engine, landing gear, light, windshield wiper	European starling	Aircraft hit 30 starlings just after liftoff. Burning smell noted. Emergency declared and aircraft returned to land. Birds found imbedded in landing gear and windshield wipers. The engine had several nicked blades, the nose gear down-lock spring was broken, a taxi light lens was missing and one windshield wiper arm was bent.
10/15/1999	C-182	Air Haven (NY)	Landing roll	Flight delayed	Wing, landing gear, propeller, fuselage	White-tailed deer	Pilot veered to avoid deer on runway and went into an embankment. Left wing snapped in half. Propeller and left landing gear were destroyed and the fuselage was damaged. Time out of service was 3 months. Cost to repair was \$90,000.
10/15/1999	B-767	John F. Kennedy International (NY)	Landing roll	Other	Engine	Osprey	Osprey holding fish on centerline was ingested into #1 engine. Seven fan blades were damaged. The flight was delayed 1 hour. Cost of repairs was \$35,000.
10/20/1999	MD-80	Philadelphia International (PA)	Climb (200 feet AGL)	Engine shut down	Engine	Gull or goose	Burning smell in cabin after bird was ingested. Plane started to shake. Emergency landing was made. Captain reported #2 engine a complete loss.

**SOME SIGNIFICANT WILDLIFE STRIKES TO CIVIL AIRCRAFT
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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
11/7/1999	American AA-1B	Lake Viking (MO)	Approach	Left runway	Nose landing gear, wing	Deer	The aircraft struck a 12-point buck during the landing flare at night. The deer hit the front and right wing of the plane causing it to veer off the runway and stop nose down, 50 feet off the runway. The nose strut was found near the deer on the runway. Damage was substantial. NTSB investigated, case # CHI00LA024.
11/15/1999	BE-65	Alpine-Casparis Municipal (TX)	Take-off Run	Emergency landing	Wing, landing gear	White-tailed deer	The pilot attempted to rotate the aircraft in order to avoid the deer, but the landing gear hit the deer. Ground personnel could not tell if there was any damage during a flyby. The tower could not see the right main landing gear. The pilot elected to land gear up; however, the right main landing gear had not retracted. There was substantial damage to the right wing spar, landing gear and wheel assembly.
11/17/1999	Learjet-60	Truckee-Tahoe (CA)	Take-off Run	Other	Not reported	Mule deer	Aircraft struck a deer on takeoff. A fire ensued, causing substantial damage. Time out of service was 2 weeks. Cost of repairs was \$82,000. Other costs totaled \$120,000.
11/23/1999	Bell-206	4 miles NE of Addison, TX	En Route (1,200 feet AGL)	Emergency landing	Windshield	Duck	A traffic helicopter pilot saw 3-4 ducks. One hit the windshield, shattering it and leaving an 18 inch hole. Duck entered cockpit, hit pilot on left arm then hit rear seat passenger, knocking his headset off. Passenger was taken to the hospital. No serious injuries. Time out of service was 36 hours. Cost of repairs was \$1,500.
12/1/1999	B-727	Philadelphia International (PA)	Climb (5,000 feet AGL)	Engine shut down, precautionary landing	Engine, wing	Snow goose	While climbing, aircraft hit 2-10 birds. Location was 5-8 miles west of airport. The engine was shut down and the aircraft returned to land. There was a hole in the wing and the engine was destroyed. Time out of service was 3 days. Cost of repairs was \$449,000.
12/3/1999	BE-58	Festus Memorial (MO)	Climb	None	Landing gear, wing, engine, propeller	Deer	During rotation, a deer collided with the landing gear. Indicators showed no problem. Upon landing, the left main gear collapsed damaging the left wing, engine and prop.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
12/11/1999	B-747	Toledo Express (OH)	Take-off Run	Engine shut down, precautionary landing	Engine	Red-tailed hawk	A hawk hit the nose bullet, which shattered and entered the engine. Caller to sheriff reported hearing a large boom and seeing one of the engines on fire as aircraft took off. Fuel was dumped and aircraft returned to land. Pieces of fan blades put large holes in the nose cowling. The engine was shut down due to vibration. Time out of service was 3 ½ days. Cost to repair was \$1.3 million.
1/2/2000	Hawker 800	Fort Myers International (FL)	Approach (200 feet AGL)	None	Engine	Unknown, suspect gull	Engine ingested at least 1 gull. No abnormal engine indications. Maintenance found damaged stator vanes and compressor blades. Time out of service was 4 days. Cost was \$90,000.
2/7/2000	DC-10-30	Subic Bay (Philippines)	Climb (250 feet AGL)	Precautionary landing	Engine	Fruit bat	Engine ingested at least 1 bat. Vibration was felt. Five damaged fan blades had to be replaced. Time out of service was 3 days. Cost of repairs was \$61,000. Other related costs totaled \$3,008,400. (U.S. carrier)
2/19/2000	B-737	Chicago Midway (IL)	Climb (10 feet AGL)	Precautionary landing	Engine	Red-tailed hawk	Just after rotation on takeoff, a large bird was ingested and the engine vibration was high. Fan blades were damaged. The engine was operated at reduced thrust for the remainder of the flight. The landing was uneventful.
2/21/2000	A-320	San Diego International (CA)	Take-off Run	Aborted takeoff	Engine, landing light	Gull	Engine had several bent fan blades and a landing light was broken from striking a flock of gulls. Takeoff was aborted and the aircraft returned to the gate. About 30 gull carcasses were removed, closing the runway for 15 minutes and causing 7 departure delays. The airline cancelled 2 flights, inconveniencing 110 passengers. Cost for repairs and lost revenue was \$157,000.
2/22/2000	A-320	Philadelphia International (PA)	Climb (1,000 feet AGL)	Engine shut down, precautionary landing	Engine	Goose	Two geese were ingested, destroying the #1 engine. Overweight landing was made and emergency equipment was standing by. Time out of service was 2 days. Cost estimated at \$2.5 million.
2/24/2000	BAe 125-800	Floyd Jones Memorial (MO)	Landing roll	None	Engine, wing, airbrakes	Deer	Deer strike damaged the left wing flap, which, in turn, struck and damaged the engine cowling. Time out of service was 1 month. Cost to repair was \$200,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
2/25/2000	B-737	Sacramento International (CA)	Take-off Run	Precautionary landing	Engine	Unknown bird	The aircraft returned to the airport after a bird strike on takeoff. The pilots heard a loud bang and the plane suddenly yawed. The air cooler was plugged and 7 fan blades were damaged.
3/2/2000	BE-350	Ryan Field (MN)	Approach (3,000 feet AGL)	None	Horizontal stabilizer	Canada goose	Goose strike damaged the left horizontal stabilizer leading edge. Time out of service was 17 days. Costs for repairs and lost revenue were \$225,000.
3/5/2000	B-747	Forbes Field (KS)	Climb (2,500 feet AGL)	Engine shut down, precautionary landing	Engine	Unknown bird	Ingested bird caused a compressor stall and flameout at 2500 feet AGL. The flight was diverted to Minneapolis St. Paul Airport. Engine was removed and replaced, also replaced nose cowl. Cost of repairs was \$445,990.
3/29/2000	B-767	Dulles International (DC)	Take-off Run	Precautionary landing	Engine	Bonaparte's gull	Ingested a flock of gulls and returned to the airport. Fan blades were damaged. Passengers were put on later flights. Cost of repairs was \$65,000.
4/12/2000	C-500	Southeast Texas Regional (TX)	Climb	Engine shut down	Engine, landing gear	Laughing gull	The left engine ingested a flock of gulls at lift-off. The engine fan was a total loss. The right main landing gear heat shield broke. Time out of service was 3 days. Cost \$247,000.
4/19/2000	PA-28	Cedar City Regional (UT)	Climb (2,000 feet AGL)	Precautionary landing	Windshield , fuselage	Golden eagle	An eagle shattered the windshield and injured the passenger (instructor), who was taken to the hospital with serious injuries. The eagle also hit the avionics bay and the elevator control horn which pitched the aircraft into a dive. The pilot was able to regain control and landed safely at Provo Municipal. The pilot believes the eagle intentionally attacked the plane.
4/25/2000	Saab-340	Houghton Memorial (MI)	Take-off Run	Aborted takeoff	Engine, prop	White-tailed deer	Aircraft collided with 2 deer during takeoff just before V1. The left engine was substantially damaged.
4/28/2000	B-727	Kansas City International (MO)	Climb (150 feet AGL)	Precautionary landing	Engine	Canada goose	The #1 engine was destroyed when a goose was ingested. The flight returned safely. Seven flights were cancelled. Cost including repairs and lost revenue was \$250,000.
5/19/2000	Learjet-25	Allen County (OH)	Take-off Run	Engine shut down, precautionary landing	Engine	Unknown bird	The #2 engine was destroyed when a bird was ingested. Pilot declared emergency. The aircraft was diverted to another airport. Cost for repairs and lost revenue was \$113,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
5/25/2000	C-310	L M Clayton (MT)	Climb (600 feet AGL)	Lost control	Aircraft destroyed (1 injury)	Canada goose	Aircraft collided with geese shortly after departure. Windshield shattered, right wing and fuel tank ripped off on impact. The aircraft was destroyed in a post-crash fire. Pilot was hospitalized with burns and lacerations.
6/1/2000	B-747	John F. Kennedy International (NY)	Take-off Run	Engine shut down, precautionary landing	Engine, wing	Canada goose	Aircraft hit 3 geese on departure and returned to land. One goose was ingested in the #2 engine, which was shut down. Emergency team responded but aircraft taxied to the ramp without incident. Damage was estimated at \$1.5 million.
6/6/2000	Hawker Siddeley HS.125	Burke Lakefront (OH)	Take-off Run	Precautionary landing	Engine	Gull	Aircraft ingested a gull. Engine was replaced.
6/11/2000	B-737	Boston Logan (MA)	Climb (800 feet AGL)	Precautionary landing	Engine	Unknown bird	Large birds were ingested by the #1 engine, damaging several fan blades and the booster. Pilot made a precautionary landing. Engine was changed because it could not be repaired on the wing. Time out of service was 24 hours. Estimated cost was \$158,000.
6/26/2000	Saab-340	Dallas-Fort Worth (TX)	Take-off Run	Aborted takeoff	Engine #1 and #2	Unknown bird	Takeoff was aborted after birds were ingested in both engines. The runway was closed for cleaning. Aircraft returned to the gate. Inspection found damage to both propellers.
6/26/2000	DC-10	Osaka International (Japan)	Take-off Run	Aborted takeoff	Engine	Unknown bird	Takeoff was aborted after a large bird was ingested in the #3 engine. Ten fan blades were replaced. Time out of service was 36 hours. Cost of repairs was \$195,000 and lost revenue was estimated at \$3 million. (U.S. carrier)
6/27/2000	BAe Jetstream 32	W.B. Hartsfield Atlanta International (GA)	Landing roll	None	Engine	Unknown bird	Two medium-sized birds were ingested. The compressor blades were bent. Cost of repairs was \$300,000.
7/18/2000	C-650	Teterboro (NJ)	Climb (10 feet AGL)	Precautionary landing	Engine #1 and #2	European starling	Just after takeoff, the aircraft struck a flock of starlings. Both engines ingested birds and were damaged. Emergency equipment was standing by as the plane made an immediate return to the field. Over 40 carcasses were removed from the runway. Time out of service was 3 days. Costs totaled \$85,000.

**SOME SIGNIFICANT WILDLIFE STRIKES TO CIVIL AIRCRAFT
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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
8/23/2000	B-747	Philadelphia International (PA)	Take-off Run	Aborted takeoff	Engine, wing	Canada goose	The aircraft flew through a flock of about 30 geese and ingested 1 or 2 in the #1 engine. The high-speed, aborted takeoff resulted in 9 flat tires. The aircraft was towed to the ramp. Time out of service was 3 days. Engine was a total loss. Cost \$3 million.
8/27/2000	B-747	Los Angeles International (CA)	Climb (500 feet AGL)	Emergency landing	Engine	Western gull	At least 1 western gull was ingested just after takeoff. Bystanders on a beach heard a giant backfire and saw the jet spewing 8- 10-foot flames. Three pieces of the engine fell to the ground; one 5-ft piece landed on a beach where people were having a cookout. No one was injured. The pilot dumped 83 tons of fuel over the ocean for over an hour and then made an emergency landing. The flight had 449 passengers onboard who were not able to get another flight to Amsterdam until the next day. The costs reported do not include room and board. Time out of service was 3 days. Cost of repairs was \$400,000.
8/31/2000	B-737	LaGuardia (NY)	Descent (10,000 feet AGL)	Depressurized cabin	Windshield (2 injuries)	Canada goose	Middle and inner panes were shattered when a bird hit the windshield, spraying glass all over the cockpit. The captain was cut. Windshield was making a creaking sound and glass shards were still coming off so pilot slowed the aircraft and depressurized the cabin. Both pilots had ringing in their ears for several hours. Time out of service was 2 days.
9/8/2000	B-727	Piedmont Triad International (NC)	Climb (3,000 feet AGL)	Precautionary landing	Engine	Unknown bird	A medium-sized bird was ingested into the #3 engine, causing the suppression liner to pass through the engine. The aircraft returned to the airport. Time out of service was 3 days. Cost totaled \$160,000.
9/22/2000	Hawker Siddeley HS.125	Birmingham International (AL)	Climb (20 feet AGL)	None	Engine	Unknown bird	A flock of small birds was ingested on climb. The engine had to be replaced due to damaged blades. Time out of service was 5 days.
9/23/2000	BE-58	Greenville-Spartanburg International (SC)	Approach (2,500 feet AGL)	Precautionary landing	Windshield (1 injury)	Vulture	Bird was soaring above aircraft, then folded its wings and dived. It made a 1 foot sq. hole in windshield, ripping off the headset and cutting the pilot. Blood and remains splattered throughout the plane, odor was awful and wind noise was extreme. Cost was approximately \$80,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
10/24/2000	Hawker Siddeley HS.125	Detroit City (MI)	Climb (300 feet AGL)	Precautionary landing	Engine	Unknown bird	Bird went through the right engine. The compressor stalled but continued to run. Declared emergency and made single engine landing. The engine fan assembly had 18 damaged blades. Time out of service was 1 week. Cost estimated at \$84,000.
10/25/2000	DC-9-50	Detroit Metropolitan Wayne County (MI)	Take-off Run	Aborted takeoff	Brakes, tires	Unknown bird	A flock of birds was struck during takeoff, which damaged the brakes and tires. Takeoff was aborted. All 4 brakes and tires were replaced.
11/3/2000	B-737	La Guardia (NY)	Climb (400 feet AGL)	Engine shut down, precautionary landing at JFK	Engine	Herring gull	The engine must be replaced due to extensive damage after ingesting gulls. ID by the Smithsonian, Division of Birds. The engine shut down and then restarted in flight. Aircraft was diverted to JFK for emergency landing.
11/8/2000	Saab-340	Aberdeen Regional (SD)	Approach (400 feet AGL)	Aircraft was grounded	Fuselage, wiper, propeller, side window (1 injury)	Snow goose	A flock of snow geese was struck. The windshield wiper broke off and hit the prop which broke it into several pieces then threw it through the fuselage. One passenger received a leg injury from a piece of metal and was taken to the hospital. Both engines ingested birds; there were 3 holes in the fuselage, and a side window was broken.
11/9/2000	A-319	Memphis International (TN)	Climb (1,000 feet AGL)	Precautionary landing	Engine	Unknown bird	A bird was ingested into the #2 engine. The aircraft returned to the airport. The first stage fan blades were replaced along with the forward and aft spinners.
12/3/2000	RV-6 (homebuilt)	Santa Maria (CA)	Approach (2,000 feet AGL)	Aircraft was grounded	Windshield, stabilizer, wing (1 injury)	Red-tailed hawk	A hawk broke the windshield causing pieces of the windshield to dent the leading edge of the stabilizer and rudder. A passenger received cuts. Medical expenses totaled about \$1,000. Time out of service was 2 months. Cost was estimated at \$3,000 to \$5,000.
12/6/2000	EMB-120	Yeager (WV)	Landing roll	None	Propeller, fuselage (1 fatality)	White-tailed deer	Aircraft collided with 2 deer just after landing. The tip of a propeller blade (4 x 3) separated and punctured the fuselage, injuring a passenger, who later died.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
1/5/2001	B-757	Miami International (FL)	Climb (100 feet AGL)	Precautionary landing, engine shut down	Engine	Turkey vulture	The #2 engine ingested 1 or more turkey vultures just after liftoff. There were at least 20 circling vultures. The engine failed and the captain returned to land without incident. Time out of service was 1 week. Cost estimated at \$1.1 million.
1/14/2001	Learjet-60	Troy Municipal (AL)	Landing roll	Lost control, ran off runway	Aircraft destroyed (2 injuries)	White-tailed deer	The Learjet collided with 2 deer and ran off the end of the runway into a ditch because the thrust reversers would not operate. The aircraft burst into flames. Rescuers kept the fire from reaching the pilots for about 40 minutes until they could be removed. The pilot and first officer had serious injuries and were flown to a hospital. Cost to replace aircraft \$9.5 million. Other costs \$25,000. NTSB investigated, case # ATL01FA021.
1/21/2001	MD-11	Portland International (OR)	Take-off Run	Aborted takeoff, engine shut down	Engine, landing gear	Herring gull	The #3 engine ingested a herring gull. The engine stall blew off the nose cowl which was sucked back into the engine and shredded. The engine had an uncontained failure. The pilot aborted takeoff and blew 2 tires. 217 passengers were safely deplaned and rerouted to other flights. ID by the Smithsonian, Division of Birds.
2/25/2001	BE- 95	San Antonio International (TX)	Approach (150 feet AGL)	Loss of communication with tower	Windshield (2 injuries)	Black vulture	Pilot saw bird overhead. Bird tucked and dove at aircraft shattering the right windscreen. Two passengers received minor injuries. Pilot could not contact tower because the radios were inoperable due to the bird strike. The plane landed without incident. Time out of service was 5½ months. Cost for repairs and hospital totaled \$20,400.
3/4/2001	Bombardier de Havilland Dash 8	Portland International (OR)	Climb	Precautionary landing	Engine, wing, propeller, nose cone	Rock dove	During departure, a rock dove was ingested. The aircraft returned to land without incident. The engine was replaced. Aircraft was out of service for 48 hours. Estimated cost of repairs was \$752,500.
3/8/2001	Bell-206	Barnes-Jewish Hospital Helipad (MO)	Approach (500 feet AGL)	None	Windshield (1 injury)	Duck	Aircraft was transporting a heart patient to Barnes-Jewish Hospital, when a duck crashed through the windshield. Pilot was slightly injured and was partially incapacitated. The duck ended up in the patient's lap.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
3/8/2001	Aeros 350	Verrazano Bridge, Linden, NJ	En Route (1,100 feet AGL)	None	Windshield (1 injury)	Gull	A gull crashed through the right front window and exited through the right door. The passenger seated in the right front seat received minor scratches to the head. Aircraft was out of service 1 week. Cost of repairs was \$12,000.
4/2/2001	B-767-300	Charles de Gaulle (Paris, France)	Climb (14,000 feet AGL)	Precautionary landing, cockpit depressurization	Nose, radome, wing, fuselage, tail	Northern shoveler	Aircraft struck a flock of shovelers, causing dents and 11 punctures. One bird penetrated the cockpit, resulting in depressurization. The flight crew was splattered with bird debris and insulation. The windshield was covered with blood. The pilot had to use an oxygen mask. Aircraft returned safely to the airport. Cost of repairs estimated at over \$1 million. ID by the Smithsonian, Division of Birds. (U.S. carrier)
4/3/2001	Bombardier de Havilland Dash 8	Portland International (OR)	Take-off Run	Precautionary landing	Engine, propeller, wing	Rock dove	Aircraft struck 8 birds on departure and returned, landing without incident. Damage included the leading edge of a wing, prop, cone, and #1 engine. Engine was replaced. Time out of service was 48 hours. Estimated cost of repairs was \$752,500.
4/9/2001	B-737-300	Cleveland-Hopkins International (OH)	Climb	Precautionary landing	Engine, canopy	American wigeon	Aircraft made an emergency landing after ingesting a bird shortly after takeoff. Fan blades were damaged and pilot reported smoke in the cockpit and damage to the canopy. Time out of service was 8 hours. Cost of repairs \$360,000. ID by the Smithsonian, Division of Birds.
4/26/2001	B-757-200	Detroit Metropolitan (MI)	Climb (300 feet AGL)	Precautionary landing, engine shut down	Engine	Snow goose	After takeoff, flight crew saw several bird strikes to left engine. Engine made a loud rumbling noise, EGT rose above 700 degrees and smoke entered the cabin. An emergency was declared and the engine was shut down. Landed without incident.
5/3/2001	A-319	San Diego International (CA)	Climb (700 feet AGL)	Precautionary landing	Engine	Gull	Engine ran rough following bird ingestion. Pilot declared an emergency and returned to land. Eight fan blades were replaced. Cost was \$125,000 and time out of service was 16 hours.
5/16/2001	DC-10	Dayton International (OH)	Climb (50 feet AGL)	None	Engine	Gull	Compressor blades were damaged when 2-10 birds were ingested. The engine was removed and several sets of fan blades were replaced. The wing flap track canoe fairing had a large dent and a 4-inch crack. Time out of service was 4 days.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
6/8/2001	A-300	Newark International (NJ)	Approach (150 feet AGL)	None	Engine, wing	Canada goose	Geese (2-10) were ingested, damaging many fan blades. The engine was removed and several sets of fan blades were replaced. Time out of service was 4 days. Cost \$2.8 million.
6/9/2001	A-300	Dayton International (OH)	Climb (200 feet AGL)	Precautionary landing	Engine	Canada goose	Canada goose was ingested into the #2 engine shortly after liftoff. Engine had an uncontained failure; parts of the engine were found on the runway. A precautionary landing was made. Time out of service was 4 days. Cost to replace engine was \$2 million.
6/30/2001	C-152	Warrenton-Fauquier (VA)	Take-off Run	Aborted takeoff	Horizontal stabilizer, elevator	White-tailed deer	During takeoff from a touch and go landing, a deer was hit, which buckled the left horizontal stabilizer and tore off the left elevator. Student pilot made an uneventful emergency landing in a field adjacent to the airport. Aircraft was substantially damaged.
7/15/2001	BE-90	Ashe County (NC)	Take-off Run	Precautionary landing	Propeller, engine, wing, gear door	White-tailed deer	During takeoff, a deer was struck. The pilot made a precautionary landing. Damage included a bent prop blade, dented nacelle and wing, and the main gear door was partially sheared off. Time out of service was 1 month. Cost \$160,000.
7/18/2001	B-737-200	Elko Municipal (NV)	Take-off Run	Aborted takeoff	Engine	Unknown bird	During takeoff, a bird was ingested. The engine was replaced, due to damaged compressor blades. Time out of service was about 4 days. Cost of repairs \$895,000.
7/31/2001	B-737-500	Dulles International (DC)	Approach (100 feet AGL)	None	Engine	Canada goose	A Canada goose was ingested during approach. The oil cooler was plugged with bird remains. A set of fan blades and the oil cooler were replaced. Time out of service was 6 days. Cost of repairs was \$430,000. ID by the Smithsonian, Division of Birds.
8/3/2001	DC-8	Orlando International (FL)	Climb (800 feet AGL)	Diverted flight	Engine #1 and #2	Unknown bird	Plane struck multiple birds. Two of the 3 engines were damaged. The flight was diverted to land at another airport. The fuel line was broken, causing loss of fuel on an engine, and compressor blades were damaged on the other. Pilot declared a fuel emergency.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
9/3/2001	B-737	New Orleans International (LA)	Climb (14,000-20,000 feet AGL)	Precautionary landing	Radome, wing, fuselage, tail	Blue-winged teal	Plane struck multiple birds and returned to airport. Significant damage occurred to the radome, fuselage, and the leading edges of right wing and right horizontal stabilizer. ID by the Smithsonian, Division of Birds.
10/29/2001	B-737-400	Buffalo Niagara International (NY)	Approach (100 feet AGL)	Engine shut down	Engine, radome, wing	Canada goose	Aircraft hit a flock of geese and ingested some into both engines. The left engine was shut down and later replaced. The radome and wing were also damaged. Time out of service was 3 days. ID by Central Science Lab.
11/1/2001	BE-1900	Hancock County (ME)	Landing roll	None	Engine, propeller	White-tailed deer	Struck a deer just after touchdown. One of the composite propeller blades was missing and had separated from the hub. It was found 300 feet from the collision site. The firewall was cracked and 1 remaining prop blade was bent. Time out of service was 2 weeks. Cost of repairs and lost revenue \$292,000.
11/3/2001	Cessna Citation II	Lakefront (LA)	Climb (1,200 feet AGL)	Precautionary landing	Engine, wing	Duck	Aircraft flew into a flock of ducks shortly after takeoff and ingested some. The temperature probe broke off and went through the fan. Inlet fan blades broke, damaging the inlet. Right wing was dented. Time out of service was 1 month. Cost of repairs \$605,000.
11/20/2001	B-727	Memphis International (TN)	Approach (1,700 feet AGL)	None	Windshield, nose, wing	Snow goose	Approximately 25 birds were seen. One bird penetrated the cockpit, spraying the pilot with blood and remains. Two other birds penetrated the right wing near the leading edge slats. Time out of service was 1 week. Cost of repairs and lost revenue was \$700,000.
11/30/2001	A-300	Logan International (MA)	Take-off Run	Diverted to JFK	Engine	Herring gull	Aircraft ingested a herring gull on takeoff from Boston. One engine had bent fan blades. Flight was diverted to JFK due to bad weather in Boston. ID by the Smithsonian, Division of Birds.
12/6/2001	B-737	Detroit Metropolitan (MI)	Climb	Precautionary landing	Engine	Gull	Aircraft struck a flock of gulls and ingested one. The engine rolled back, and then started compressor stalls. The pilot pulled the throttle back to idle. An emergency landing was made, due to engine flame out. The engine was replaced. Cost estimated at \$2.3 million.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
1/25/2002	Learjet-60	Naples Municipal Airport (FL)	Landing roll	None	Engine	Muscovy duck	Duck was ingested into #1 engine. Bird remains were evident throughout the core and bypass sections of engine. Time out of service was 5 days. Cost of repairs was \$443,000.
1/26/2002	B-757	Denver International (CO)	Take-off Run	Precautionary landing	Engine	Great horned owl	Engine ingested a great horned owl, which caused engine vibration. Aircraft returned to land at DEN. Many fan blades were damaged. Remains were removed for ID. Maintenance thought there was fur and feathers in the engine. Time out of service was 3 days. Cost \$500,000. ID by the Smithsonian, Division of Birds.
2/21/2002	BE-1900	Phoenix Sky Harbor International (AZ)	Climb (400 feet AGL)	Precautionary landing, fuel leak	Wing, fuel tank	Northern pintail	Bird penetrated right wing, and fuel was rapidly leaking out. Emergency landing made. Passengers safely deplaned. ID by the Smithsonian, Division of Birds.
2/24/2002	Fokker F100	Dallas-Fort Worth (TX)	Climb (6,000 feet AGL)	Precautionary landing	Engine, nose, wing	Greater white-fronted goose	Aircraft struck a flock of geese and ingested one after takeoff. Engine vibration caused crew to reduce power to idle. Aircraft nose was damaged. Several blades were deformed. Engine was replaced. Cost of repairs and lost revenue totaled \$654,000. Time out of service was 8 days. ID by the Smithsonian, Division of Birds.
3/9/2002	CRJ200	Dulles International (DC)	Take-off Run	Aborted takeoff	Engine, windshield, fuselage	Wild turkey	Aircraft struck wild turkeys. One shattered the windshield, spraying the cockpit with glass fragments and remains. Another hit the fuselage and was ingested. There was a 14 inch by 4 inch section of fuselage skin damaged below the windshield seal on the flight officer's side. Time out of service was at least 2 weeks. Estimated cost of repairs was \$200,000.
3/27/2002	MD-83	Lambert-St. Louis International (MO)	Climb (2,500 feet)	Precautionary landing	Engine, windshield	Mallard	While climbing out at 2,500 feet AGL, the aircraft hit at least 2 ducks. One hit the captain's windshield covering the entire area with remains. The other hit the right wing leading edge and left a hole the size of a melon. Flight returned to St. Louis. Time out of service was 19 hours. Estimated cost of repairs was \$60,000. ID by the Smithsonian, Division of Birds. Birds were first reported as geese.

**SOME SIGNIFICANT WILDLIFE STRIKES TO CIVIL AIRCRAFT
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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
4/11/2002	C-208	Baltimore-Washington International (MD)	Approach (2,500 feet AGL)	Other	Windshield (1 injury)	Horned grebe	Bird came through the windshield, injuring the pilot. ID by the Smithsonian, Division of Birds. Time out of service was 3 days. Cost of repairs \$18,000.
4/18/2002	PA-23	Blue Grass (KY)	Approach (3,000 feet AGL)	Slowed airspeed	Fuselage	Common loon	Bird was seen just prior to impact in full dive configuration. It hit directly over pilot's head. The overhead reading light and air vent were discharged from the panel, striking a passenger. Aircraft was slowed to 100 knots. After landing, the aircraft was escorted by fire and emergency equipment. ID by the Smithsonian, Division of Birds. Time out of service was 3 months. Cost of repairs was \$6,000.
4/23/2002	PA-32	George R. Carr Memorial (LA)	Take-off Run	Aborted takeoff	Wing, fuel tank, horizontal stabilizer	White-tailed deer	During takeoff, the aircraft's left wing hit a deer that crossed in front of it. The pilot aborted takeoff and returned to the hangar. The left wing spar, left flap and horizontal stabilizer were damaged and the left fuel tank was ruptured. Time out of service was 11 weeks. Estimated cost was \$42,000. NTSB investigated, case # FTW02LA127.
5/8/2002	BE-400	Burke Lakefront (OH)	Take-off Run	Aborted takeoff	Engines	Gull (ring-billed and herring)	Pilot revved engines to move gulls from runway. The gulls lifted off, then as the aircraft took off, returned to the runway and were struck. Both engines ingested gulls and were damaged beyond repair. One had an uncontained failure. Aircraft was towed to the hanger. Airport operations recovered 14 carcasses. Estimated cost was \$1 million for repairs and \$0.5million in lost revenue. ID by the Smithsonian, Division of Birds. NTSB investigated, case # NYC02LA096.
6/1/2002	C-172	Navajo Dam Airport (NM)	Approach	Avoidance maneuver	Wings	Unknown bird	Student pilot, doing touch and go landings, executed an abrupt right turn to avoid striking a bird. A wind gust pushed the plane to the right. The aircraft touched down and then veered off the runway. The right wing hit a tree and the left wing hit the ground.

**SOME SIGNIFICANT WILDLIFE STRIKES TO CIVIL AIRCRAFT
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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
6/6/2002	C-172	Orlando-Sanford International (FL)	Approach (1,100 feet AGL)	Precautionary landing	Windshield (2 injuries)	Turkey vulture	Vulture smashed through the windshield and the right side door blew open. The instructor's headset flew out the open door. Bird ended up in baggage compartment. Student pilot was cut on face and arms, instructor cut on face and arm. Time out of service was 2 days. Cost of repairs was \$1,000.
6/8/2002	Cessna Citation	John F. Kennedy Memorial (WI)	Landing roll	Avoidance maneuver	Wing, fuselage, nose	White-tailed deer	Pilot was warned of deer on airfield. Deer was chased away but as the aircraft landed, a second deer ran onto the active runway. The pilot swerved to avoid the deer but it hit just below the pilot's window, scraped against the static ports, and hit the left wing root fairing. The aircraft was ferried to a maintenance base for repairs. Time out of service was 6 weeks. Cost was at least \$125,000.
6/15/2002	Kitfox 4-1200	Near Virginia, MN	En Route (800 feet AGL)	Emergency landing off airport	Aircraft destroyed	Unknown bird	During cruise flight at 800 feet AGL pilot smelled fuel followed by loss of engine power and smoke. The windshield began to melt. He did not see flames, but the smoke in the cabin was very thick. Aircraft touched down near a lakebed, coasted about 250 feet and the right main entered a wet area and dug in which flipped the plane on its back. Aircraft was destroyed during the post-impact fire. Pilot found the charred remains of a bird among the engine remains. He said the propeller spinner had impact damage and the fuel line was severed. NTSB investigated, case # CHI02LA165.
7/8/2002	C-560	Santa Barbara Municipal (CA)	Approach (500 feet AGL)	None	Engine	Unknown bird	Hit a medium-sized black bird on short final. Landing was uneventful. After shutdown, found excessive amount of oil draining from engine. Time out of service was 9 days.
7/8/2002	CRJ200	South Bend Michigan Regional (IN)	Landing roll	Not reported	Wing	White-tailed deer	Hit deer during landing roll. Right inboard flap and flap actuators had to be replaced. Time out of service was 2 days. Cost of parts was \$195,000.
7/10/2002	B-737	Sarasota/Bradenton International (FL)	Climb	Precautionary landing	Engine, tail, nose cowl	Unknown bird	Strike occurred at rotation. Aircraft made an overweight landing. There were golf ball-sized holes in some of blades. Four pairs of blades were replaced. The nose cowl was punctured in 2 places. Horizontal stabilizer was dented. Time out of service was over 24 hours.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
7/26/2002	B-757	San Francisco International (CA)	Climb	Engine reacted	Engine #1 and #2, radome	Unknown bird	The aircraft hit 40-50 large birds. Engines reacted but continued running with no abnormal indications. Upon landing, found both engines had fan blade and acoustic damage. Several sets of fan blades were replaced. Cost of repairs was \$300,000.
8/4/2002	A-310	Changi International (Singapore)	Take-off Run	Aborted takeoff	Engine	Unknown	Large bird was ingested during takeoff. Engine damage included fan blades, compressor blades, exit guide vanes and bases, and a dented nose inlet cowl. Aircraft was out of service 40 hours. Estimated cost of repairs was \$570,700. (U.S. carrier)
8/5/2002	B-757	Portland International (OR)	Take-off Run	Precautionary landing	Engine	Red-tailed hawk	Normal takeoff. At 300 feet, vibration and flutter started in right engine. As climb continued, vibration got worse, power was reduced on the engine and vibration stopped at idle. Declared precautionary emergency and returned to airport. Made a single engine landing without incident. Upon inspection, found blade damage due to bird ingestion. Replaced 6 pairs of fan blades. Flight was delayed 18 hours.
8/7/2002	B-757	San Francisco International (CA)	Climb (100 feet AGL)	Precautionary landing	Engine	Rock dove	Shortly after rotation, a flock of 40-45 pigeons flew into the aircraft. Multiple bird strikes. At least 2 were ingested into left engine. Engine surged and vibrated briefly. Declared emergency and returned to airport with both engines running. Taxied to gate after fire chief cleared the aircraft. Several fan blades were damaged.
8/10/2002	C-500	Griffing Sandusky (OH)	Climb	Precautionary landing	Nose gear, fuselage, forward pressure bulkhead	White-tailed deer	At rotation, a deer hit the nose gear. Pilot diverted to Toledo Express Airport. He made passes over rescue personnel, who verified the nose gear was not fully extended. Pilot burned additional fuel, shut down engines, fuel and generators, then landed and came to rest on fork of nose gear and gear doors. Substantial damage to bottom of fuselage, forward pressure bulkhead and nose gear. Cost of repairs was \$2000 and cost of rental aircraft was \$40,000. Aircraft out of service at least 3 months.

**SOME SIGNIFICANT WILDLIFE STRIKES TO CIVIL AIRCRAFT
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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
9/12/2002	Hawker Mark 20	Orlando Executive (FL)	Climb (700 feet AGL)	Precautionary landing	Windshield , canopy	Egret	Hit two egrets with bubble canopy, slightly aft of pilot's head. Canopy disintegrated, departed aircraft along with most of the frame rails and emergency escape panel. Canopy debris struck and damaged both sides of the horizontal stabilizer and damaged the vertical fin. Debris landed in a residential area. Time out of service was 8 weeks. Estimated cost of repairs was \$20,000 - \$30,000 with estimated other costs at \$80,000.
9/13/2002	BA - 41	Dayton International (OH)	Climb (50 feet AGL)	Precautionary landing	Engine, propeller	European starling	Aircraft returned after ingesting 24-30 starlings. One turbine blade bent beyond limits. The engine was replaced. Time out of service was 30 hours. Estimated cost \$172,000.
9/17/2002	DC-9-30	La Crosse Municipal (WI)	Take-off Run	Aborted takeoff	Radome, engine	Canada goose	Hit 4 geese during takeoff. Aborted takeoff at 100 knots. The radome was cracked. One bird was ingested, causing damage to the 3rd stage engine fans. The engine was removed and replaced.
9/23/2002	MD-83	San Diego International (CA)	Climb (14,000 feet AGL)	Precautionary landing	Radome, wing	Northern pintail	Hit 2-10 ducks. Plane was rerouted to Los Angeles and made a precautionary landing. Radome and bulkhead were penetrated. Remains found in landing gear compartment. Leading edge of wing was also penetrated. ID by the Smithsonian, Division of Birds.
10/6/2002	B-737	Newark International (NJ)	Approach (10 feet AGL)	None	Engine, nose	Canada goose	Hit at least 8 geese on landing flare. Two birds were found in the engine (1 in core). Nose cowl and 9 blades were damaged. Engine was removed. Cost for repairs \$1.4 million. ID by the Smithsonian, Division of Birds.
10/6/2002	CRJ200	Salt Lake City International (UT)	Approach (1,600 feet AGL)	None	Radome, wing, engine	Canada goose	Hit 5 geese on final approach. Damage included radome, left wing root and #1 engine and nacelle. Time out of service was 3 days.
10/13/2002	B-737-300	Piedmont Triad International (NC)	Approach (10 feet AGL)	None	Engine #1 and #2, wing	Canada goose	Hit flock of Canada geese on landing flare. Geese were ingested in both engines. No immediate effect. There was an odor in the cabin. Both nose cowls were replaced as well as a full set of fan blades on the left engine and 3 pairs of fan blades on the right engine. ID by the Smithsonian, Division of Birds.

**SOME SIGNIFICANT WILDLIFE STRIKES TO CIVIL AIRCRAFT
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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
10/14/2002	Bombardier de Havilland Dash 8	Albany International (NY)	Approach (3,000 feet AGL)	Disengaged auto pilot to avoid flock	Tail, wing, engine	Canada goose	Pilot saw a large flock of birds and disconnected the autopilot to try to avoid them but several hit with a big thud. Aircraft handled normally and landed without incident. At the gate, a bird was found protruding from the wing, with fuel leaking out. Another hole was found in the horizontal stabilizer. Fire and rescue were called when the engine began to smoke. ID by the Smithsonian, Division of Birds.
10/19/2002	B-767	Boston Logan (MA)	Climb (200 feet AGL)	Engine shut down, precautionary landing	Engine, landing lights	Double-crested cormorant	Encountered a flock of over 20 birds. At least 1 was ingested. There were immediate indications of the engine surging on the right side; compression stall and smoke came from engine. The engine was shutdown. Overweight landing with 1 engine was made without incident. Aircraft was towed to the gate. Nose cowl was dented and punctured. There was significant fan blade damage with abnormal engine vibration. One fan blade was found on the runway. Because pieces of the engine exited through the front it was considered a contained failure. Aircraft was towed to the ramp. Hydraulic lines were leaking and several bolts were sheared off inside the engine. Many pieces fell out when the cowling was opened. Time out of service was 3 days. Cost of repairs was \$1.7 million NTSB investigated, case # IAD03IA007.
11/12/2002	Eurocopter BK 117	Near Tequesta, FL	En Route (800 feet AGL)	Emergency landing	Unknown (1 injury)	Vulture	Emergency medical helicopter hit a flock of vultures. One medical technician was struck and received minor injuries. The helicopter was forced to make an emergency landing due to damage. This was a back-up aircraft so the county's emergency service was without any helicopters for about a day. (Strike not reported to FAA, so information is missing.)

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
12/3/2002	Learjet-36	Astoria Regional (OR)	Take-off Run	Aborted takeoff, ran off runway	Aircraft destroyed	Elk	A Learjet was destroyed after collision with multiple elk and subsequent runway overrun. Impact forces and post-crash fire destroyed the airplane. Crew believes a piece of the animal was ingested into the left engine, causing it to catch fire. No one was injured. Fire was fanned into the aircraft by fire department helicopter, which drove burning fuel into the airframe. Cost was \$5 million. NTSB investigated, case # SEA03LA010.
12/13/2002	Bombardier de Havilland Dash 8	Charlotte/Douglas International (NC)	Landing roll	Aircraft towed off runway	Landing gear	White-tailed deer	The impact with the large buck caused the nose gear to collapse. The deer was cut in two. Time out of service was 38 days. Cost was \$224,960.
1/8/2003	Bombardier de Havilland Dash 8	Rogue Valley International (OR)	Approach (1,300 feet AGL)	First officer took over controls after pilot was injured	Radome, windshield, propeller, operating systems (1 injury)	Lesser scaup	Aircraft collided with a flock of lesser scaup. The windshield was shattered, seriously injuring & incapacitating the pilot, who turned control over to the first officer for landing. Partial loss of electrical power rendered primary navigational flight & avionics displays inoperative. Numerous red fail lights and engine fire lights illuminated. Crew also found there was no elevator trim and the nose wheel steering did not work after touchdown. Birds penetrated the radome and damaged the DC power and instruments systems. An emergency was declared. The pilot was treated for cuts and glass in his eyes. Time out of service was 3 weeks. ID by the Smithsonian, Division of Birds. NTSB investigated, case # SEA03FA024.
1/31/2003	C-182	Moore Arpt (TX)	Landing roll	Sudden stop	Aircraft destroyed (1 injury)	Cattle	A/C STRUCK CALF ON APPROACH END OF RWY. SUN WAS LOW, PILOT DID NOT SEE CALF. UNDERCARRIAGE COLLAPSED WHEN IT HIT THE CALF. AIRCRAFT PROBABLY A TOTAL LOSS. MINOR INJURIES TO PILOT. NTSB investigated case number FTW03LA096.
3/9/2003	PA-34	Lakefront (LA)	Approach (800 feet AGL)	None	Windshield	Red-breasted merganser	Aircraft struck 2 mergansers over Lake Pontchartrain. One penetrated the right windshield and the other shattered the left windshield.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
3/11/2003	B-757	Newark International (NJ)	Climb (400 feet AGL)	Engine shut down, precautionary landing	Engine	Canada goose	Engine ingested a goose, causing an uncontained failure. The engine was replaced. ID by the Smithsonian, Division of Birds. Time out of service was 2 days. Cost \$740,000.
3/30/2003	BE-36	Tavernaero Park (FL)	Take-off Run	Evasive action	Aircraft destroyed (1 injury)	Dog	Pilot saw the dog during takeoff. He pulled up to avoid it and rolled left. The wing hit the ground and the aircraft impacted trees. Minor injuries were reported.
3/31/2003	EMB-135	John F. Kennedy International (NY)	Climb (400 feet AGL)	Precautionary landing	Wing	Double-crested cormorant	Bird collided with the right wing. Aircraft returned to the airport for inspection. The leading edge had a large dent.
5/10/2003	MD A-4N (former military)	Hill Air Force Base (UT)	Descent (7,800 feet AGL)	Impacted terrain	Aircraft destroyed (1 fatality)	Unknown bird	Engine ingested bird during descent. Pilot reported engine problems and tried to eject but the ejection seat malfunctioned and the pilot was fatally injured. NTSB investigated. Case #DEN03TA079.
5/24/2003	DC-10	Metropolitan Oakland International (CA)	Take-off Run	Emergency landing	Engine, landing gear	Great egret	Engine ingested a great egret, causing an emergency landing. Substantial damage to the #3 engine, resulting in NTSB and FAA investigations. Aircraft was vectored over the ocean to dump 13,000 pounds of fuel. Damage to thrust reversers, nose cowl and right main gear tire. The engine was replaced. Costs totaled \$1,840,800. ID by the Smithsonian, Division of Birds.
6/10/2003	Aerostar 601	Martin State (MD)	Climb (1,500 feet AGL)	Precautionary landing	Windshield, side window (1 injury)	Black vulture	Aircraft hit the vulture about 1 mile west of airport. Pilot saw bird just prior to strike. Bird came through the windshield on right side and slightly injured the copilot. An emergency was declared. Windshield was destroyed along with right side forward window. Time out of service was 2 weeks. Cost of repairs was \$8,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
7/8/2003	C-172	Near McKinney, TX	En Route (800 feet AGL)	Loss of control – in flight	Wings, engine, (possibly more) (2 fatalities)	Unknown bird (suspect vulture)	Pilot made Mayday call to DFW tower after hitting a bird with the left wing. He said he could not keep the aircraft straight with the power on. He thought they were going to be all right and wanted someone to pick them up after they landed in a field. The plane came to rest upright with the engine partially separated from the firewall. The left wing was separated at the wing attach points and both wings had leading edge damage. Someone on the ground saw the plane hit with left wing first and found 2 people had been killed. The fuel tanks had ruptured and were leaking but no fire was evident when the Fire Department arrived. The pilot did not say what kind of bird had been struck, but the Air Safety Inspector said it was possibly a buzzard. NTSB case # FTW03FA182
8/13/2003	A-310	Memphis International (TN)	Landing roll	None	Engine	Unknown bird	The aircraft struck a flock of small birds at touchdown. The #2 engine ingested 4-5 birds. Eight fan blades were replaced. Time out of service was 29 hours. Estimated cost of repairs was \$106,000.
8/14/2003	B-737-300	Indianapolis International (IN)	Approach (500 feet AGL)	None	Engine	Unknown bird	The aircraft ingested a large bird. The #2 engine vibration monitor increased but all other indications were normal. Eleven fan blades were replaced. Time out of service was 24 hours. Estimated cost of repairs was \$84,700.
8/16/2003	MD-80	Leon, Mexico	Climb	Engine shut down, precautionary landing	Engine	Unknown bird	The aircraft struck a flock of birds just after rotation. Passengers heard multiple banging sounds and an explosion as the plane lurched, struggling to gain altitude. Smoke came from the engine and was noticed in the cabin. One engine was shut down because of fire danger. An emergency landing was made. Time out of service was 2 days. Cost of repairs was \$243,000. (U.S. carrier).
8/19/2003	BE-1900	Muskegon County (MI)	Landing roll	Engines shut down	Engine	White-tailed deer	After touching down, the aircraft was decelerating when 2 deer crossed the runway. The smaller of the deer hit the right engine propeller. The crew shut down both engines. The right engine and mounts received substantial damage. NTSB investigated, case # CHI03LA276.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
8/31/2003	PA-28	Murfreesboro Municipal (TN)	Take-off Run	Aborted take-off	Aircraft destroyed	White-tailed deer	DEER CHARGED A/C. POWER REDUCED TO IDLE & DEER WAS STRUCK. ORIGINAL REPT STATED DAMAGED RT FRONT ENG COWLING & FIREWALL. SUBSTANTIAL DMG REPORT FILED BY PRESIDENT OF COMPANY STATED THE AIRCRAFT WAS TOTALED. DEER HIT RT FRONT OF A/C. DESTROYING FIREWALL, ENG COWLING, FRONT RT FUSELAGE, BENT RT MAIN LDG GEAR, DMG TO RT WING SKIN & RIBS, PROP BENT. STRIKE WITH FULL RPM'S RESULTED IN AN ENG REBUILD. DEER SUFFERED VERY MINIMUM WITH LOSS OF BOTH ANTLERS & AN EAR. DEER SURVIVED. NTSB investigated case number ATL03CA135
9/4/2003	Fokker F100	LaGuardia (NY)	Climb (125 feet AGL)	Engine shut down, emergency landing	Engine, nose, fuselage	Canada goose	The aircraft struck a flock of geese shortly after takeoff. Engine had an uncontained failure. Pilot was unable to shut it down with the fuel cutoff lever so the fire handle was pulled. The engine shut down, but vibration continued. The aircraft would neither climb nor accelerate. Vibration increased with speed so they kept the speed below 180 knots. The flight was diverted to JFK where an uneventful landing was made. NTSB found a 20 by 36-inch wide depression on right side of nose behind radome; maximum depth was 3-4 inches. Impact marks on right wing. A fan blade separated from the disk and several fan blades were deformed. Holes were found in the engine cowling and the fuselage was penetrated by a fan blade. Remains were recovered and identified by Wildlife Services. Both the Captain and First Officer received prestigious awards for their superior airmanship under extremely challenging circumstances. NTSB case # NYC03FA190.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
9/29/2003	A-320	Dulles International (DC)	Approach (2,500 feet AGL)	Smoke and odor in cockpit	Engine	Great blue heron	Three great blue herons appeared in front of the aircraft then we heard a thump. Pilot smelled smoke and a bad odor which spread to cabin. Engine system indicators were normal. Found remains of 1 or 2 birds in the engine. The engine was removed. One flight was cancelled. Time out of service was 3 days. Cost of repairs \$1.3 million. ID by the Smithsonian, Division of Birds.
10/22/2003	C-152	Pierson, FL	En Route (1,000 feet AGL)	Crash landing	Windshield , landing gear, nose, fuselage, tail (2 injuries)	Black vulture	The aircraft struck a black vulture while doing maneuvers during a student pilot lesson near Lake Disston. The windshield was missing and the pilot could not maintain altitude after applying full throttle and called Mayday. Aircraft hit nose first in a field and came to a stop inverted. Instructor and student received minor injuries. FAA Inspector recovered part of the windshield. Nose gear and main landing gear were broken. Vertical stabilizer and bottom of fuselage were buckled. ID by the Smithsonian, Division of Birds.
11/3/2003	Bushby Mustang II	Buckingham Field (FL)	Approach (1,000 feet AGL)	None	Windshield , nose (1 injury)	Unknown bird	Damage to forward fuselage in front of windshield and to instrument panel on right side. Passenger was hit in face and received a split lip, black eyes and 3 broken teeth. Time out of service was about 25 hours. Replacement for windshield and canopy was \$6,000. Medical and dental costs totaled \$5,900.
11/12/2003	Learjet-24	St. Louis Downtown (IL)	Climb (500 feet AGL)	Engines shut down, forced landing in a field	Aircraft destroyed (2 injuries)	Blackbird (suspected)	The pilot heard a loud thump on the right wing as he flew through a flock of small blackbirds shortly after takeoff. Both engines lost power, the plane crashed into a field and caught fire. At least 2 on board were injured. NTSB investigated. No carcasses were found on the airport runway or in adjacent fields. However, flocks containing over 800 European starlings were seen in the area 2 days later. Two people were injured. Cost was \$750,000. NTSB case # CHI04LA033.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
11/12/2003	Saab-340	Minneapolis St. Paul International (MN)	Approach (3,200 feet AGL)	None	Vertical stabilizer, wing	Canada goose	The aircraft struck a flock of geese on approach. Vertical stabilizer had 2 large holes and the left wing leading edge was dented. NTSB investigated. ID by the Smithsonian, Division of Birds. Time out of service was 22 days. Estimated costs totaled \$173,000.
11/15/2003	MD-82	Newark International (NJ)	Approach (3,000 feet AGL)	Lost control, engine shut down	Radome, bulkhead, fuselage, wing, window, nose cowl, nose gear	Snow goose (suspected)	The aircraft struck large birds followed by an explosion from the right engine. Pilot lost then regained control and landed without incident. Evidence of ingestion found in both engines. Engines were borescoped and determined to be serviceable. Significant damage to radome, nose gear and leading edge of left wing. Time out of service was 2 weeks.
12/22/2003	B-747-400	John F. Kennedy International (NY)	Take-off Run	Precautionary landing	Engine	Herring gull	Pilot hit 2 birds upon takeoff. Aircraft circled about 2 hours to burn off fuel before returning to the airport. Three fan blades were damaged. Airline had to provide overnight accommodations and meals for 308 passengers. Repair time was 11 hours with an additional 9 hours of downtime for crew rest.
12/26/2003	B-737	Lambert-St. Louis International (MO)	Climb (2,900 feet AGL)	Precautionary landing	Radome, nose, wing, tail, lights	Snow goose	The aircraft struck approximately 3 geese on climb at night and returned to land. Engine ingested at least part of a bird with no damage. Radome was dented and nose peeled up. Horizontal stabilizer was dented. Several passenger windows had feathers stuck in them. Aircraft was ferried to Texas for repair. ID by the Smithsonian, Division of Birds. Time out of service was 11 days. Costs totaled \$502,000.
1/22/2004	Augusta Westland Helicopter	Palm Beach International (FL)	Approach (500 feet AGL)	Precautionary landing	Windshield (1 injury)	Osprey	An osprey struck the windshield, forcing the pilot to land at Palm Beach International Airport. The windshield shattered and caused minor injuries to the pilot, the only person on board. Most of the windshield departed the aircraft. Interior was quite a mess. Time out of service was 3 weeks. Cost was \$16,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
1/29/2004	DA-20	Near Baltimore, MD	En Route (2,000 feet AGL)	Avoidance maneuver, Precautionary landing	Tail, horizontal stabilizer, propeller, wing	Tundra swan	Aircraft encountered approximately 10 swans. The pilot tried to avoid them but hit one. It cracked the prop, bounced off right wing and entire swan lodged in the tail. Pilot returned to Baltimore-Washington International. ID by the Smithsonian, Division of Birds. Cost was \$15,000.
2/8/2004	Eurocopter	Baton Rouge (LA)	En Route (700 feet AGL)	Precautionary landing	Windshield	American bittern	Approximately 3 miles south of Baton Rouge Metropolitan Airport, a helicopter hit an American bittern, which broke out the copilot's windshield. The body came into the cockpit on short final; before that it was wedged into the windshield. Time out of service was about 3 days. Cost of repairs was \$5,000.
2/17/2004	B-757-200	Portland International (OR)	Take-off Run	Engine shut down, precautionary landing	Engine	Mallard	The aircraft hit 5 mallards and returned with an engine out. At least 1 bird was ingested and parts of 5 birds were collected from the runway. Engine was not repairable and had to be replaced. Time out of service was 3 days. Cost was \$2.5 million.
3/19/2004	Helicopter	Near Mooreland, OK	En Route (3,000 feet AGL)	Precautionary landing	Windshield (1 injury)	Duck	Duck penetrated the windshield of a medical center helicopter. Paramedic suffered only bruises to chest and arms. A safe landing was made and the patient was taken by ambulance to a hospital along with the helicopter crew.
3/26/2004	RV-6 (homebuilt)	Adams Field (AR)	Approach (2,500 feet AGL)	Precautionary landing	Windshield (1 injury)	Lesser scaup	Duck penetrated the windshield at night, momentarily blinding pilot who was covered with duck blood. Pilot increased speed for landing due to increased drag from hole in windshield. Time out of service was about 3 weeks. Cost to repair was \$1,000.
3/30/2004	B-747	Louisville International (KY)	Climb	Precautionary landing	Engine #4 and #4	European starling	Just after takeoff, about 60-100 starlings were struck and ingested into the #3 and #4 engines. The engines lost power but were not shut down. An emergency was declared and the aircraft returned to the airport safely. Several blades were replaced.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
4/15/2004	A-319	Portland International (OR)	Climb (800 feet AGL)	Engine shut down, precautionary landing	Engine	Great blue heron	A heron was ingested, causing extensive damage to the right engine. Pilot shut the engine down as a precaution and made an emergency landing. Runway was closed 38 minutes for cleaning. Flight was cancelled. Engine and nose cowl were replaced. Time out of service was 3 days. Damage totaled \$388,000.
6/14/2004	B-737-300	Greater Pittsburgh International (PA)	Landing roll	Steering failure, aircraft departed side of runway	Landing gear	Great horned owl	The aircraft struck an owl with the front main gear severing a cable. The steering failed, the aircraft ran off the runway and became stuck in mud. Passengers were bused to the terminal. They replaced 2 nose wheels, 2 main wheels and brakes. Time out of service was 24 hours. Cost was estimated at \$20,000.
7/14/2004	B-737-500	San Francisco International (CA)	Take-off Run	Precautionary landing	Engine	Barn owl	The #1 engine ingested a barn owl on takeoff. Engine vibration went to full scale and a precautionary landing was made. Four pairs of fan blades were replaced. Time out of service was 8 hours. Repair cost was \$16,000; other costs totaled \$54,000.
8/2/2004	B-747-400	Bangkok International (Thailand)	Take-off Run	Aborted takeoff	Landing gear (4 injuries)	Spotted dove	The #2 engine ingested a dove, causing an aborted takeoff. Pilot ordered an evacuation for safety because a tire had blown and the brake caught fire. Four passengers received minor injuries. The engine was not damaged. ID by the Smithsonian, Division of Birds. Time out of service was 4 days. Repair cost was \$47,310; hotel costs estimated at \$36,100. Medical bills and meals were not included in costs (U.S. carrier).
8/18/2004	Pilatus PC-12	Show Low Regional (AZ)	Landing roll	None	Propeller, wing, fuselage fuel tank	Elk	Pilot struck an elk which stopped directly in front of the aircraft during landing roll at night The inboard portion of the left wing sustained substantial damage causing a fuel leak. The prop was also damaged. Airport Directory recommended a low pass before a night landing. Time out of service was 4 months. Costs totaled \$418,192

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
8/20/2004	BE-58	Groveton-Trinity County (TX)	Landing roll	Avoidance maneuver, exited runway	Aircraft destroyed	White-tailed deer	Not a strike, but negative affect on flight. Pilot saw 3 deer on the left side of the runway at touchdown. When the pilot tried to avoid the deer, the aircraft left the runway, hit trees in a ravine and was consumed by fire. Tall grass on both sides of the runway hid the deer. The airport was not fenced. Published airport information remarked that deer were on and in vicinity of the airport. NTSB investigated, case # FTW04CA218.
8/31/2004	B-737-800	Chicago O'Hare International (IL)	Climb (4,800 feet AGL)	Precautionary landing	Engine	Double-crested cormorant	One engine ingested a large bird about 5 miles from the airport. A precautionary landing was made due to engine vibrations. Fluid was leaking from the aircraft. Six fan blades were replaced. ID by the Smithsonian, Division of Birds. Approximate time out of service was 6 hours. Cost of repairs was estimated at \$61,000 and other costs \$7,000.
9/9/2004	PA-28	Mt Pleasant Regional (SC)	Take-off Run	Aborted take-off	Aircraft destroyed	White-tailed deer	PILOT SAW DEER AND TRIED TO SLOW DOWN. EXITED RWY. EFFORTS TO ELIMINATE DEER BY ARPT MGT IS IN PROGRESS. NTSB REPT SAYS L WNG SPAR WAS DAMAGED AND THAT THE AIRLANE WAS SUBSTANTIALLY DAMAGED. SENT LETTER ASKING FOR DETAILS 12/14/04 REPORT CAME BACK BUT NO COMMENTS WRITTEN JUST THAT A/C WAS TOTALLED. NTSB investigated case number ATL04CA184.
9/16/2004	B-747-400	Gander International (Newfoundland, Canada)	Climb	Engine shut down, precautionary landing	Engine	Ring-billed gull	Immediately after takeoff rotation, flight crew reported a loud bang followed by aircraft yaw to left. Flight engineer advised captain of engine failure. Fuel was dumped and the aircraft made a 3-engine landing at the airport. Extensive fan blade damage. ID by the Smithsonian, Division of Birds (U.S. carrier).

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
9/16/2004	MD-80	Chicago O'Hare International (IL)	Climb (3,000 feet AGL)	Engine shut down, precautionary landing	Engine	Double-crested cormorant	The aircraft struck a flock of cormorants. Several birds were ingested, causing an engine failure and fire. Debris fell from the engine onto a neighborhood in suburban Chicago. Aircraft made an emergency landing. ID by the Smithsonian, Division of Birds. Estimated cost of damage was \$179,000; other costs \$6,885.
9/16/2004	A-300	San Antonio International (TX)	Climb (1,200 feet AGL)	Precautionary landing	Radome, bulkhead	Unknown bird	Major damage to radome and forward pressure bulkhead. Flight cancelled. Time out of service was 17 days. Cost of repairs was \$142,000. Other costs totaled \$300,000. One flight was cancelled.
10/13/2004	RKWL 690	Winder Barrow (GA)	Climb (50 feet AGL)	Engine shut down, precautionary landing	Engine, propeller, wing, fuselage, landing gear, tail	Canada goose	The aircraft struck at least 17 geese on climb. The #1 engine failed due to ingestion. Aircraft diverted to another airport and landed safely. 14 carcasses found on departure runway. Remains of 3 other geese found on engine inlet. Time out of service was over 6 days. Cost of repairs was \$600,000 and other costs totaled \$2,000. ID by the Smithsonian, Division of Birds.
10/15/2004	BE-19	New Market (VA)	Take-off Run	Avoidance maneuver, emergency landing	Aircraft destroyed	White-tailed deer	6-8 DEER RAN OUT ON RWY. TRIED TO HOP OVER THEM. DEER HIT THE L STABILATOR. PART OF IT SEPARATED. PILOT CONTD T/O THEN CIRCLED AND MADE EMERGENCY LDG. NOSE GEAR COLLAPSED. PLANE CAME TO REST IN A GRASSY AREA BEYOND END OF RWY. A/C WAS TOTALLED. NTSB investigated case number NYC05CA007
10/19/2004	CRJ100	Bishop International (MI)	Take-off Run	Aborted takeoff	Wing, landing gear	White-tailed deer	The aircraft struck 2 deer on takeoff. The landing gear door and left inboard flap were damaged. Passengers had to be housed overnight as this was the last flight of the day. Time out of service was 2 days. Cost of repairs was estimated at \$100,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
10/24/2004	B-767	Chicago O'Hare International (IL)	Take-off Run	Engine shut down, precautionary landing	Engine	Passerine	The aircraft struck a flock of birds on takeoff. A compressor stall caused the engine to flame out. Local residents reported seeing flames coming from the plane. Approximately 11,000 gallons of fuel were dumped over Lake Michigan before returning to land. (Conflicting information about fuel dump on strike reports.) Feathers were sent to the Smithsonian, Division of Birds for identification. Could only identify species as passerines. Time out of service was about 4 days. Cost of fuel lost was \$15,000.
11/2/2004	MD-80	Chicago O'Hare International (IL)	Climb (200 feet AGL)	Precautionary landing	Engine	Ring-billed gull	The aircraft made an emergency landing after ingesting a bird in the #2 engine. Oil and fuel were leaking from the engine. Smears of remains from 2 impact areas were sent to the Smithsonian, Division of Birds for identification. Feathers could only be identified as gull. DNA sample provided a positive ID to species.
11/4/2004	C-310	Sundance Airpark (OK)	Landing roll	Propellers hit runway	Landing gear, propellers, engines, nose	White-tailed deer	The aircraft hit a deer upon landing. Deer hit left prop, then went into lower nose cone, where it took out the front landing gear causing the plane to drop onto its nose. Both propellers hit the runway. Initial estimates are \$50,000 to \$70,000. Three deer were removed from the private airport.
11/7/2004	EMB-145	Kalamazoo/Battle Creek International (MI)	Climb	Engine shut down, precautionary landing	Engine, wing	Trumpeter swan	Multiple bird strike. Pilot shut the right engine down and made an emergency landing. Leading edge of wing was dented. Engine was replaced. ID by the Smithsonian, Division of Birds. Cost of repairs was estimated at \$450,000.
11/19/2004	B-757	San Francisco International (CA)	Approach (100 feet AGL)	Engine shut down	Engine	Brown pelican	Bird flew into left engine. Numerous fan blades damaged beyond repair. Pilot shut the engine down. Landing was normal. All fan blades were replaced. ID by the Smithsonian, Division of Birds. Time out of service was 4 days. Cost of repairs was \$216,000.
12/8/2004	MD-80	Sacramento International (CA)	Climb (5,500 feet AGL)	Precautionary landing	Radome, wing	Northern pintail	Passengers reported seeing a flock of geese at time of strike. Radome was dented over 1/3 of surface and wing was punctured and dented. ID by the Smithsonian, Division of Birds. Cost of repairs estimated at \$200,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
12/13/2004	BE-90	Monroe-Walton County (GA)	Climb (3 feet AGL)	Other	Engines, propellers, wing, landing gear, nose, fuselage	White-tailed deer	Struck a deer during the landing flare. The nose gear collapsed, both prop assemblies and engine nacelles were condemned. Both engines had substantial damage. Right flap and fuselage were damaged. Time out of service was 6 months, cost was \$710,000.
1/7/2005	Hawker 1000	Bowerman (WA)	Climb	Precautionary landing	Engine #1 and #2	Dunlin	Area is a wildlife refuge with known hazards but no specific warning was issued. Pilot pulled up to avoid birds. Core ingestion in both engines. Aircraft was not flyable. Company had to rent 2 engines while the damaged ones were being torn down for inspection and repair. The landing gear was covered with small birds. Airport personnel believe the birds were dunlins.
1/12/2005	B-747	Tokyo International (Japan)	Take-off Run	Aborted takeoff	Engine, wing	Hooded crow	Flight crew saw 2 birds on centerline. They also saw a large crane-like bird pass under the nose and a crow passing off to the left. They heard a loud bang and the aircraft yawed left. Takeoff was aborted. Two fan blades broke though the cowl, others were damaged. All fan blades were replaced. A leading edge flap panel was damaged by broken fan blades. ID by the Smithsonian, Division of Birds. (U.S. carrier)
2/2/2005	PA-28	Brandywine (PA)	Climb	Precautionary landing	Propeller, wing	Canada goose	Significant damage to the wing at the point where it attaches to the fuselage. Although there was minor propeller damage, the engine had to be torn down for inspection. Time out of service was 1 month. Cost of repairs, \$15,000.
2/18/2005	MD-10	Metropolitan Oakland International (CA)	Climb (1,500 feet AGL)	Precautionary landing	Engine	Unknown bird	Bird was ingested in the #2 engine, which caused a major vibration to the tail. Emergency landing was made after dumping fuel. The inlet fan had lost 2 blades; 1 exited from the side, punching a hole in the acoustic panel. Fan blades were replaced and panel was repaired. Time out of service was 2 weeks. Cost of repairs, \$59,000 and other costs totaled \$105,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
2/20/2005	Cessna Citation Ultra	Miami International (FL)	Climb	None	Tail	Turkey vulture	Hit a turkey vulture after departure. No indications on the controls of any major damage. Reduced speed as a preventive measure. After landing, found a hole about 1 foot in diameter in the tail. The tail was replaced. ID by the Smithsonian, Division of Birds. Time out of service was 2.5 months. Cost of repairs estimated to be \$25,000.
2/27/2005	B-737-300	Orlando International (FL)	Take-off Run	None	Engine	Gull	Strike had no effect on engine operation. After landing, they found several N1 stage blades dented. Eight pairs of blades were replaced. Cost \$160,000.
3/4/2005	B-757-200	Mineta San Jose International (CA)	Climb (5 feet AGL)	Engine shut down, precautionary landing	Engine	Gull	A flock of gulls and other small birds landed on the runway as the aircraft was rotating for takeoff. The left engine ingested at least 1. The aircraft returned to the airport on the right engine while emergency vehicles stood by. The plane taxied to the gate. Several fan blades were bent. No major engine parameter variations reported. Remains were not saved for ID.
3/30/2005	SA227	Dade-Collier Training and Transportation (FL)	Landing roll	Not reported	Propeller, fuselage	White-tailed deer	During landing, while engines were in reverse, last deer in a group of 8 hit the prop, causing it to detach and puncture the fuselage. Also damaged were the nose wheel steering and right engine nacelle. Aircraft was a write-off due to cost of repairs (\$580,000) being close to the plane's value of \$650,000.
4/1/2005	B-757-200	Metropolitan Oakland International (CA)	Climb (600 feet AGL)	Precautionary landing	Engine	Common loon	Common loon was ingested into the engine core during climb-out. An emergency was declared and the aircraft diverted to SFO. Aircraft landed safely. Engine was not shut down. Vibration and burning smell reported by flight attendant. Fan blades and nose cowl were damaged. Engine was replaced. ID by the Smithsonian, Division of Birds. Costs reported at over \$1.5 million.
4/9/2005	B-737-300	Chicago O' Hare International (IL)	Climb (1,500 feet AGL)	Precautionary landing	Radome, horizontal stabilizer, engine	Unknown bird	Hit several birds. The #2 engine ingested birds into the core and had to be removed for repair. Also damaged were radome, left wing, vertical fin and pitot static probe. Aircraft was ferried out for repairs. Time out of service was 15 days. Cost of engine repairs was \$40,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
4/17/2005	Bell-407	Near Brentford, SD	En Route (1,000 feet AGL)	Emergency landing	Windshield (1 injury)	Blue-winged teal	On the way to the scene of an auto accident at night, a helicopter was hit by 3 ducks. The windshield shattered and blood from the ducks temporarily blinded the pilot. His crew helped direct him to a safe landing spot on a road. Time out of service was 8 hours. Cost of repairs was \$1,440.
4/20/2005	B-777	Unknown (DEN-SFO)	En Route	None	Engine	Unknown bird	Engine was replaced due to blade damage found in 3 stages. Time out of service was 9 days. Cost of repairs at least \$2 million.
4/24/2005	B-747	John F. Kennedy International (NY)	Climb	Engine shut down, precautionary landing	Engine	Great black-backed and herring gulls	The aircraft hit several gulls at rotation and shut down the #2 engine due to vibration. Aircraft returned to land after dumping 18,700 pounds of fuel. Several fan blades had to be replaced, others repaired. Passengers were delayed about 3 hours. Several great black-backed gulls were found on the runway. ID for Herring gull by Smithsonian, Division of Birds.
5/9/2005	RKWL 265	Brownwood Regional (TX)	Take-off Run	Aborted takeoff, overran runway	Engine	Unknown bird	A loud bang was heard followed by plane swerving left as aircraft was about to takeoff. Captain aborted takeoff due to rapidly losing directional control. Plane overran runway, hit a fence and trees, crossed a road and came to rest in a plowed field. Fuel was leaking from left wing. Evidence of bird residue was found in the left engine. No serious injuries to those on board. NTSB report was source for this strike. Expert on birds in engines suggested that it would be unusual to find remains in the hot section of an engine and not find any on the 1st stage blades. NTSB case # DFW05LA117.
5/31/2005	B-757	Lihue International (HI)	Take-off Run	Engine shut down, precautionary landing	Engine	Barn owl	Pilots saw bird go by right side of aircraft, then felt a vibration in the right engine. A precautionary landing was made at a nearby airport. Damage was found to the acoustic liner, several fan blades, LPC and HPC. Engine was removed for repairs. ID by the Smithsonian, Division of Birds. Time out of service was 4 days; cost was over \$1 million.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
6/10/2005	DC-9-30	Kansas City International (MO)	Climb (10 feet AGL)	Emergency landing	Engine	American kestrel	First officer saw small bird fly in front of the aircraft and disappear to the left. At rotation, the aircraft began to vibrate, yawed to the left and made several loud banging noises as the compressor stalled in the left engine. Pilot notified the tower and made an emergency landing that was uneventful. The engine was run at idle until after landing. Several fan blades were damaged along with the fan case. The flight was cancelled. ID by the Smithsonian, Division of Birds. Cost of repairs estimated at \$800,000.
6/24/2005	A-310	Subic Bay (Philippines)	Take-off Run	Aborted takeoff	Engine, cowling, wing	Philippine duck	Engine had multiple bird strikes on takeoff roll. A loud bang was heard, followed by vibration and pull to right. Fan blades were badly damaged. A large section of the nose cowl was torn from nacelle. Fan cowling was damaged. The #3 flap fairing was damaged by engine shrapnel. The engine and cowling were replaced. ID by the Smithsonian, Division of Birds. Time out of service was 4 days. Cost of repairs estimated at \$9,456,000 (U.S. carrier).
8/4/2005	C-421	Rooke Field (TX)	Landing roll	Separated nose gear	Nose landing gear, propellers	White-tailed deer	Aircraft hit a deer while landing, which caused the nose gear to collapse. Both propellers were damaged. Cost of repairs estimated at \$100,000.
8/17/2005	C-421	Merritt Island (FL)	Approach (2,000 feet AGL)	Emergency landing	Wing, fuel tank	Black vulture	Collision with a black vulture ripped the aircraft wing and punctured a fuel tank, causing fuel to spray out. The strike also damaged the light that confirmed the landing gear was down. Pilot was not sure if gear was down and called for an emergency landing. State Secretary of Transportation was onboard along with other dignitaries. ID by the Smithsonian, Division of Birds.
8/23/2005	MD-520	Near Phoenix, AZ	En Route (400 feet AGL)	Emergency landing	Windshield, rotor blades (1 injury)	American coot	Bird hit windscreen and shattered left side, injuring the pilot. A precautionary landing was made at the Coliseum. Rotor blades were scratched and will be replaced. Time out of service estimated at 3-4 weeks. Cost for windscreen was \$30,000. ID by the Smithsonian, Division of Birds.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
9/1/2005	DA-20 Falcon	Lorain County (OH)	Climb (15 feet AGL)	Overran runway	Aircraft damaged beyond repair (1 injury)	Mourning dove	Shortly after rotation, aircraft hit a flock of birds, causing the #1 engine to flame out. As the gear was retracted, they hit another flock, which caused the #2 engine RPM to roll-back. The pilot was not able to sustain airspeed or altitude and crash-landed, sliding through a ditch and airport perimeter fence, crossing a road and ending in a corn field. Aircraft sustained major structural damage beyond economical repairs. Both pilots were taken to hospital. Only the copilot sustained minor injuries. The NTSB investigated, case # IAD05LA129. Costs totaled \$1.4 million.
9/3/2005	B-757	Cleveland Hopkins International (OH)	Climb (100 feet AGL)	Avoidance maneuver	Engines	European starling	Pilots saw large flock of starlings just after rotation. First officer pulled up, trying to avoid major part of the flock. They heard birds hit and immediately a foul smell entered cockpit. Engine instruments remained normal and flight continued to ORD. Both engines sustained damage. Approximately 50 starlings were found on the runway 3 hours after the strike. Time out of service was approximately 2 days, and cost was estimated at \$425,000.
9/12/2005	PA-23	Anoka County (MN)	Landing roll	Not reported	Engine, prop, wing, landing gear	White-tailed deer	Deer was cut in two by propeller. Photos show significant damage to landing gear. Time out of service was 3 days, and cost totaled \$50,000.
9/13/2005	DC-10	Fort Worth Meacham International (TX)	Landing roll	Engine shut down	Engine	Rock pigeon	Ingested about 15-20 pigeons in the #3 engine on landing. Engine change required. ID by the Smithsonian, Division of Birds. Aircraft was out of service for 1 week. Cost estimated at \$1.5 -\$2 million.
9/30/2005	DC-10-10	Unknown	Unknown	None	Engine	Wood duck	During maintenance inspection, evidence of strike was found on the #1 engine. Spinner had a large dent and some fan blades were bent. Engine was borescoped. Complete set of fan blades was replaced. ID by the Smithsonian, Division of Birds. Cost of repairs was \$40,000. Aircraft was out of service for 2 days.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
10/16/2005	BE-1900	Ogdensburg International (NY)	Take-off Run	Nose gear collapsed	Aircraft destroyed	Coyote	Aircraft struck a coyote during takeoff. The nose gear collapsed, causing the plane to skid to a stop on the runway. Propeller blades went through the skin of the aircraft. Insurance declared aircraft a total loss. Cost of repairs would have been \$1.5 million.
10/17/2005	BE-400	Nut Tree (CA)	Landing roll	None	Engine, landing gear, fuselage, wing, pitot tube	Wild turkey	Aircraft struck approximately 20 wild turkeys on landing rollout. One engine had to be replaced after a bird was ingested. The other engine had evidence of a strike and was borescoped. A tire had a 1 strip of tread missing, and the right wing stall strip was dented. Pitot tube was replaced. Aircraft was out of service for 4 days and costs totaled over \$76,000.
11/1/2005	A-300	Joe Foss Field (SD)	Climb (5,100 feet AGL)	Precautionary landing	Engine	Mallard	While climbing through 6,500 feet, the #2 engine sustained a bird strike from a single large bird. Flight crew reported engine vibrations and considerable noise. They kept the engine running at idle, declared an emergency and returned to the airport, landing uneventfully. Several fan blades were damaged, along with the acoustic liner and inlet guide vanes. Flight was delayed about 3 hours. Aircraft was substituted and engine and inlet cowl were replaced. ID by the Smithsonian, Division of Birds. Cost was \$518,000.
11/6/2005	MD-80	Found at Seattle Tacoma International (WA)	Unknown	None	Engine	American robin	Pilot was unaware of strike. Flight was from LAS to SEA. Damage to the spinner was found during preflight inspection. Outbound flight was cancelled. ID by the Smithsonian, Division of Birds. Cost of repairs was \$80,000.
11/30/2005	B-747	Denver International (CO)	Approach (1,200 feet AGL)	None	Engine #1 and #2, wing	Canada goose	On approach, both engines were struck by geese. No abnormal engine parameters were noted. The #1 engine was shut down after landing. Two fan blades on the #1 engine and 9 fan blades on the #2 engine were damaged. Core ingestion in both engines. The # 3 and # 4 engines had no evidence of any strikes. The left outboard mid-flap had a 6 inch hole. The right outboard flap inboard canoe was also penetrated. A leg with webbed foot was protruding from the hole. ID by the Smithsonian, Division of Birds. Cost \$194,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
12/13/2005	EMB-145	Harrisburg International (PA)	Approach (5,000 feet AGL)	Compressor stalls	Engine	Canada goose	During approach, the crew saw a streak out the left window followed by a jolt. A smell was immediately detected. Crew turned off the LH pack and reduced power to idle to slow the plane. Engine experienced violent compressor stalls when power was increased. ID by the Smithsonian, Division of Birds.
12/28/2005	B-737-300	Chicago Midway International (IL)	Climb (300 feet AGL)	Precautionary landing, flight diverted to ORD	Engine	Snowy owl	One large bird was ingested into the #2 engine. A precautionary landing was made at Chicago O'Hare. One engine was destroyed. Passengers were put on other flights. ID by the Smithsonian, Division of Birds. Aircraft was out of service at least 24 hours.
12/28/2005	B-737-500	Sacramento International (CA)	Climb (800 feet AGL)	Precautionary landing	Engine	Unknown bird	Pilot saw a large white bird fly by, heard a loud pop, then the #1 engine began vibrating. Aircraft returned to the airport. All fan blades were replaced. Passengers were put on other flights. Cost of repairs was \$210,400.
12/30/2005	Bell-206	Near Washington, LA	En Route (500 feet AGL)	Precautionary landing, pilots vision impaired	Aircraft damaged beyond repair (1 injury)	Vulture	Pilot looked up from instruments to see a large vulture penetrating the windshield. He was temporarily blinded by blood and wind. After regaining control, the pilot tried to land in a bean field nearby, but blood was hampering his vision and the left skid hit the ground first causing the aircraft to tip on its side. Pilot was taken to the hospital and had several surgeries to repair his face, teeth and eye. Cost of aircraft repairs was \$1.5 million.
1/7/2006	B-757	Portland International (OR)	Take-off Run	Precautionary landing	Engine	Great blue heron	Bird was ingested during takeoff. Engine was shut down and a one-engine landing was made. Fan section of the engine was replaced. ID by the Smithsonian, Division of Birds. Time out of service was 15 hours. Cost was \$244,000.

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1/9/2006	C-310	Near St. Charles, MO	En Route (1,500 feet AGL)	Precautionary landing	Wing, fuel tank	Mallard	Bird hit aircraft about 10 miles west of St. Charles County Smartt Airport. The pilot said there were no problems controlling the plane after impact. A fire in the right wing tip tank was noticed by the pilot after landing. The fire department arrived about 20 minutes later but did not have foam, and the fire burned for 20 more minutes until an explosion caused the fire to go out. NTSB report found the strobe light assembly electrical short caused the fire. ID by the Smithsonian, Division of Birds. Time out of service was 6 months and cost totaled \$174,420. NTSB case # CHI06LA060.
1/12/2006	PA-28	West Branch Community (MI)	Landing roll	None	Wing	White-tailed deer	Aircraft hit a deer while landing. Substantial damage to wing. Cost of repairs was \$32,000 and time out of service was 40 days. NTSB investigated, case # CHI06CA065.
1/21/2006	C-210	Orlando Executive (FL)	Approach (2,000 feet AGL)	Precautionary landing	Windshield (1 injury)	Black vulture	Bird penetrated the windshield. The instructor was cut by Plexiglas on head and face. Aircraft landed safely. Time out of service was 24 hours. Cost was \$3,500.
2/1/2006	Bombardier de Havilland Dash 8	Boise Air Terminal (ID)	Approach (1,500 feet AGL)	None	Tail	Bald eagle	Birdstrike took out the leading edge of the tail. Aircraft was ferried out for repairs. ID by the Smithsonian, Division of Birds.
2/17/2006	B-757-200	Daniel Oduber Quiros International (Costa Rica)	Take-off Run	Precautionary landing	Engine	Crested caracara	Birdstrike took out the #1 engine. Aircraft landed without incident. ID by the Smithsonian, Division of Birds. (U.S. carrier)
2/28/2006	C-172	Near Titusville, FL	En Route (2,500 feet AGL)	Emergency landing off airport	Windshield (1 injury)	Ring-billed gull	While on traffic enforcement detail, the windshield was shattered by a gull. The pilot was forced to make an emergency landing in a cow pasture. During the landing, the aircraft clipped a fence. Pilot was taken to the hospital, treated and released. ID by the Smithsonian, Division of Birds from photograph.

**SOME SIGNIFICANT WILDLIFE STRIKES TO CIVIL AIRCRAFT
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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
3/1/2006	A-320	Washington Dulles International (DC)	Approach (100 feet AGL)	Flight cancelled	Engine	European starling	Over 270 carcasses were removed from the runway threshold. One brown-headed cowbird was in the group. Many parts of the aircraft were struck and both engines ingested birds. Damage was found in the #1 engine and it was removed The flight was cancelled. Aircraft was out of service for 24 hours. Costs totaled \$1.3 million.
3/2/2006	SA227	Salt Lake City International (UT)	Climb (600 feet AGL)	Emergency landing	Wing	Common goldeneye	Right wing of aircraft was penetrated and badly dented. Pilot declared an emergency, returned to airfield and landed without incident. Aircraft needed extensive repair. ID by the Smithsonian, Division of Birds.
3/8/2006	C-172	Near Mina, NV	En Route (2,500 feet AGL)	Emergency landing at airport	Windshield , wings, tail, fuselage (3 injuries)	Unknown bird	Birdstrike caused the windshield to implode; the doors blew open, and the plane went into a spin and a spiral. Aircraft recovered at 500ft AGL. Pilot was able to land safely at KTPH. Wings were damaged by the force of the plane in the spin. Aircraft was out of service for 7 months. Costs estimated at \$15,700 plus medical bills for cuts and hypothermia which burned the lungs, throat and eyes of one of the passengers. Injuries reported for 3 people.
3/13/2006	RV-6A (homebuilt)	Miller Airpark (NC)	Landing roll	Aircraft flipped over	Aircraft destroyed (1 injury)	Eastern cottontail rabbit	After touchdown, the nose started to drop and the plane flipped over. A dead rabbit was found prior to where the nose gear started making a trench in the grass. Blood test on the gear was positive. NTSB concluded that the rabbit caused the damage. The pilot sustained minor cut on scalp but was hospitalized for observation. Cost of the aircraft was \$78,000. NTSB case # ATL06LA052.
3/22/2006	A-319	General Mitchell International (WI)	Approach	Engine shut down	Engine	Canada goose	While on 2 mile final, 1 or 2 large birds were ingested. The engine shut down and the pilot called an emergency. Fire trucks inspected and followed aircraft to gate. Pilots did not know they had hit birds, as it was dark. There was major damage to the core and the engine was replaced. ID by the Smithsonian, Division of Birds. Cost of repair was \$2,675,600.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
4/15/2006	CRJ200	Detroit Metropolitan (MI)	Climb (500 feet AGL)	Precautionary landing	Engine	Northern pintail	Just after takeoff, aircraft had multiple bird strikes. Left engine ingested a bird causing vibration and burning smell. An emergency was declared, and the aircraft landed safely back at the airport. One duck found along runway was a scaup. Remains from engine were identified by the Smithsonian, Division of Birds. Time out of service was 43 hours, and cost of repairs was \$71,000.
4/17/2006	Learjet-60	Palm Beach International (FL)	Climb (2,000 feet AGL)	Engine shut down, precautionary landing	Engine	Black vulture	Black vulture was ingested, and the engine was shut down in flight. An uneventful landing was made on 1 engine. Engine was damaged beyond repair. ID by the Smithsonian, Division of Birds. Time out of service was 3 days, and cost of new engine was \$750,000.
4/18/2006	B-737-300	Cincinnati/Northern Kentucky International (KY)	Landing roll	None	Engine	Unknown	Medium-sized black bird was ingested during landing roll. Two fan blades damaged. Remains exited through the bypass section. Borescope inspection found distress, and the engine was removed. Cost of repairs was estimated at \$1.1 million.
4/24/2006	C-560	Little Rock Adams Field (AR)	Approach (800 feet AGL)	None	Wing	Unknown	Large area of wing leading edge dented. Removed and replaced outer section of wing leading edge. Aircraft out of service for 1 week. Cost \$19,000 for repairs.
5/6/2006	A-319	Portland International (OR)	Take-off Run	Precautionary landing	Engine	Red-tailed hawk	The #1 engine ingested a hawk during takeoff, causing vibration. An Alert 1 landing was made. Three fan blades were replaced. Flight was cancelled. Cost of repairs was \$83,200.
5/14/2006	B-747	Sydney International (Australia)	Take-off Run	Aborted takeoff	Engine, radome	White-breasted sea eagle	Bird was ingested during takeoff, causing the engine to surge. Takeoff was aborted. There was extensive fan blade damage. The first stage fan blades on the #1 engine and the radome were replaced. Flight was cancelled. (U.S. carrier)

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
5/16/2006	Bell-206	Near Sweetwater, TX	En Route (3,000 feet AGL)	Emergency landing	Windshield , rotor blade, antennas	Duck	During a patient transfer to Abilene Regional Hospital, aircraft hit a flock of what was believed to be ducks. The pilot saw 5-6 medium-sized birds just before they penetrated the windshield. The cockpit instantly became noisy, and debris was strewn about. A large piece of the windshield landed in the pilot's lap. The aircraft was vibrating and an emergency was declared. They landed at the nearest airport, 10 miles away. The patient was transferred to a land unit for care until another helicopter arrived to finish the flight. Large amounts of remains were found in the cowling, cross tubes, flight steps and bent antennas. A groove was found in the underside of the main rotor blade, which probably accounted for the vibration. This was determined to have been damaged by the windshield. Time out of service was 1 week. Cost of repairs was estimated at \$48,100.
5/18/2006	DA-10	John H Batten (WI)	Take-off Run	Aborted takeoff	Engine	Gull	Front fan on the right engine was damaged. Twelve fan blades were replaced. Aircraft was out of service for 6 days. Costs totaled \$60,000.
5/22/2006	A-320	John F. Kennedy International (NY)	Take-off Run	Aborted takeoff	Engine	Osprey	Bird was ingested into left engine. Several blades were damaged.
5/23/2006	BE-60	Camdenton Memorial (MO)	Take-off Run	Aborted takeoff, departed end of runway	Aircraft damaged beyond repair	White-tailed deer	Just prior to rotation at 110 knots, the aircraft hit a deer with the nose, then left main gear, causing it to twist. Pilot pulled the power to idle, swerved sharply and ran off the runway down an embankment. Damaged parts included nose, radome, radar, both engines and propellers, and landing gear. Cost of aircraft was \$175,000.
5/26/2006	BE-55	Near Casa Grande, AZ	En Route (2,500 feet AGL)	Emergency landing, pilots vision impaired	Windshield (1 injury)	Red-tailed hawk	Hawk penetrated the windshield and struck the pilot in the right eye, knocking his headset and glasses off. The pilot had difficulty seeing, due to swollen right eye and need for glasses in his left eye. Wind and engine noise made it almost impossible to hear the tower where he called for an emergency landing. Pilot was treated and released from the hospital.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
5/26/2006	MU-2	Houston-Hobby (TX)	Approach (100 feet AGL)	Engine shut down	Engine	Rock pigeon	Bird hit the #2 engine, propeller, wing, fuselage and tail. Cost to repair engine was \$200,000. Other costs totaled \$5,000.
6/18/2006	MD-11	Subic Bay International (Philippines)	Climb (400 feet AGL)	None	Engine	Fruit bat suspected	Maintenance found 8 damaged fan blades and fan case liner segment damage. Engine was borescoped. Aircraft was out of service for 27 hours. Cost of repairs was \$99,800. (U.S. carrier)
6/22/2006	C-172	Mount Olive Muni (NC)	Take-off Run	Aborted takeoff	Nose, propeller, landing gear, engine	White-tailed deer	Deer ran into front of plane. It was not seen until the shadows appeared in the landing lights. Aircraft was out of service for 2 weeks. Cost of repairs was \$8,000; other costs totaled \$1,000.
6/26/2006	B-757	Dallas-Fort Worth (TX)	Take-off Run	Engine shut down, precautionary landing	Engine	Rock pigeon	Initial inspection showed 9 bent compressor blades. Aircraft was taken out of service for closer inspection.
8/3/2006	C-560	Angola Tri-State (IN)	Take-off Run	Aborted takeoff, ran off end of runway	Engine, brake line	Canada goose	Left engine ingested birds, causing an uncontained engine failure. Aircraft went off the runway during the aborted takeoff. Top cowling and fan were replaced. ID by the Smithsonian, Division of Birds. Aircraft was out of service for 13 days, and costs were estimated at \$750,000.
8/13/2006	B-737-800	Salt Lake City International (UT)	Climb (1,300 feet AGL)	Precautionary landing	Nose, engine, cowling	American white pelican	Bird was hit while turning over the Great Salt Lake. Pilot saw about 8 birds flying in front of the aircraft. One hit the AOA sensor then hit the #2 engine cowling, causing a large gash. A fan blade was also damaged. ID by the Smithsonian, Division of Birds. Aircraft was out of service for 12 hours, and costs were estimated at \$100,000.
8/18/2006	CRJ200	Salt Lake City International (UT)	Climb (500 feet AGL)	Precautionary landing	Both engines	Northern pintail	Pilot saw 2 birds on takeoff climb and felt them hit the engines. Engines began to vibrate. Aircraft landed without incident and was towed to the hanger. ID by the Smithsonian, Division of Birds. Time out of service was over 24 hours and costs to repair engines totaled \$811,825.
9/6/2006	C-206	The Eastern Iowa (IA)	Climb (2,130 feet AGL)	Precautionary landing	Wing, light	Red-tailed hawk	Birdstrike pushed the leading edge of the left wing into the spar. ID by the Smithsonian, Division of Birds. Time out of service was 1 month. Costs totaled \$61,500.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
11/1/2006	B-767	San Francisco International (CA)	Climb (35 feet AGL)	Precautionary landing	Engine	White-tailed kite	Spinner cap hit. Eleven nonconsecutive fan blade tips damaged. ID by the Smithsonian, Division of Birds. Time out of service was 24 hours. Costs totaled \$500,000.
11/26/2006	B-737-500	Denver International	Take-off Run	Precautionary landing	Engine	Great horned owl	Aircraft made an emergency landing after ingesting a coyote into the #2 engine. The engine was shut down due to severe vibration. All first stage fan blades were replaced. Cost was estimated at \$35,000 to \$40,000. Aircraft was out of service for 13 hours. Remains in freezer looked more like feathers than fur, according to WS biologist. Correct ID by the Smithsonian, Division of Birds
12/8/2006	B-767	John F. Kennedy International (NY)	Climb (1,000 feet AGL)	Precautionary landing	Engine	Great blue heron	The captain saw 2 birds during takeoff and returned to JFK on Alert 3-3. One badly damaged great blue heron was recovered from the runway. The carcass appears to have gone through the #2 engine. Passengers were put on a replacement aircraft. The engine was replaced.
12/14/2006	Hughes 369	Fresno, CA	En Route (500 feet AGL)	Precautionary landing	Windshield (1 injury)	Gull	The birdstrike occurred about 6 miles away from Fresno Airport. The sheriff was in pursuit of a theft in progress when a gull penetrated the windshield on the observer's side. The observer had minor bruises and was flown to a medical center. The aircraft was put on a flatbed and taken to the Fresno Airport. The gull was either a ring-billed or California, based on photos.
12/26/2006	A-320	Long Beach (CA)	Climb	Engine shut down, precautionary landing	Engine	Unknown	Bird was ingested into the #1 engine. The pilot heard a loud noise during takeoff and shut the engine down. The flight landed about ½ hour later after burning off fuel. Emergency crews were standing by but were not needed. Bird carcasses were found on the airfield. Cost for repair was \$15,500. Time out of service was 14 hours.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
12/29/2006	RV-4 (homebuilt)	Grants Pass (OR)	Climb (1,220 feet AGL)	Impacted terrain	Prop, wing, fuselage, landing gear, tail (2 injuries)	Canada goose	A goose hit the propeller and the aircraft began to shake violently. Pilot returned to the airport and was coming in high and fast so he attempted a go-around. The engine stalled and the plane hit the ground 500 feet beyond the departure end of the runway. Both passenger and pilot received serious injuries. Cost was reported as \$30,000. NTSB investigated, case # SEA07LA039.
1/27/2007	C-172	Orlando Sanford International (FL)	Climb (1,300 feet AGL)	Forced landing off airport	Aircraft destroyed	Turkey vulture	As pilot departed the airport with a new student, a vulture hit the right wing, causing the plane to turn right, severely limiting pilot's ability to control the plane. The plane went into a spiral; the pilot made a forced landing in a field. When the nose wheel dug into the ground it separated bringing the plane to a stop. NTSB investigated, case # MIA07CA045. The aircraft was destroyed. No injuries.
1/28/2007	B-737-300	San Jose International (CA)	Climb (150 feet AGL)	Precautionary landing	Engine	Gull	Encountered a flock of gulls just prior to entering the cloud deck. Several thumps were heard, followed by a strong smell. The engine vibration level increased, and the plane returned to land. Engine parts were found on the runway along with several gulls. Fan blades were bent and cracked and the heat shielding was damaged.
3/3/2007	Hughes 369	Gustavus, AK	Hover	Abrupt landing	Tail rotor	Moose	A moose, which had been tranquilized for tagging, charged the helicopter and damaged the tail rotor, forcing it to the ground. The helicopter had to be lifted from the scene because it could not fly. The moose was euthanized due to serious injury.
3/5/2007	B-737	Portland International (OR)	Approach (300 feet AGL)	Flight cancelled	Engine cowling	Greater white- fronted goose	The aircraft was 1 mile west of PDX when 2-10 geese were struck. At least 1 was ingested. There was no internal damage to the engine, but there was major damage to the cowling. The following flight was cancelled. Cost of repairs was \$494,660 and cost due to customer impact was \$250,000. Time out of service was 24 hours.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
3/15/2007	B-767-300	Chicago O'Hare International (IL)	Climb (700 feet AGL)	Precautionary landing	Engine, pitot, cowl, nose, AOA sensor, fuselage	Canvasback duck	Just after the aircraft departed, flames were seen shooting out of the #1 engine. The aircraft returned to land overweight on 1 engine and was towed to the terminal. Remains of 9 ducks were found near the departure end of runway 9R. ID by the Smithsonian, Division of Birds. Time out of service was 12 days. Estimated cost for repairs was \$1.8 million. Cost for aircraft time out of service was \$309,000. Cost to house 165 passengers was not reported.
4/28/2007	A-300	Cleveland Hopkins International (OH)	Take-off Run	Aborted takeoff	Engine	Herring gull	A gull was ingested in the #2 engine, damaging 5 fan blades and resulting in a high-speed rejected takeoff. Aircraft was out of service for 32 hours. Cost of repairs was \$144,750. Other costs were \$19,700. ID by the Smithsonian, Division of Birds.
5/4/2007	C-180	Lopez Island (WA)	Take-off Run	Avoidance maneuver, Nosed over	Empennage	Canada goose	The pilot tried to avoid geese during taxi down the runway. He jammed on the brakes and a tailwind gust flipped the aircraft over. There was substantial damage to the empennage. NTSB investigated, case # SEA07CA121.
5/21/2007	C-525	Near Beverly, MA	En Route (3,000 feet AGL)	Emergency landing	Engine, fuselage, windshield	White-winged scoter	The aircraft hit a flock of scoters while en route to the Beverly Airport. An emergency was declared. The flight was diverted to Hanscom, and landed without incident. Both engines and the fuselage were damaged. Birds were reported as geese; correct ID by the Smithsonian, Division of Birds. Time out of service was 8 weeks. Costs for repairs were \$230,000; other costs were \$200,000.
6/3/2007	A-320	Metropolitan Oakland International (CA)	Take-off Run	Engine vibration	Engine	Rock pigeon	The aircraft hit a large flock of pigeons. There was a noticeable change in engine sound and a loud thump was heard. Because engine instruments were in the normal range, the flight continued. After landing, 3 bent fan blades were found. Time out of service was 8 hours.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
6/3/2007	Schweizer 300	Near Eden Prairie, MN	En Route (800 feet AGL)	Precautionary landing	Windshield , instrument console (1 injury)	Bald eagle	Three miles from the airport, an eagle penetrated the helicopter's windshield and struck the chest of a passenger. She lost consciousness temporarily and suffered a fractured shoulder. Pilot landed safely and passenger was taken to the hospital with several injuries. Aircraft damage estimated at \$10,000. Aircraft was out of service for 3 weeks.
6/4/2007	Learjet-36	Bismarck Municipal (ND)	Take-off Run	Aborted takeoff	Engine	Mallard	A mallard was ingested into the #2 engine. The engine was totally destroyed. Fan blades perforated the cowling. ID by the Smithsonian, Division of Birds. Cost totaled \$250,000.
6/24/2007	EMB-145	Memphis International (TN)	Climb (300 feet AGL)	Precautionary landing	Engine	Red-tailed hawk	A hawk was ingested into the #1 engine, causing erratic pressure readings and oil loss. The flight was diverted to Shreveport and later cancelled. The engine had bent compressor fan blades and broken stator vanes. ID by the Smithsonian, Division of Birds.
7/7/2007	B-767-400	Fiumicino (Rome)	Climb (20 feet AGL)	Precautionary landing, fuel dump	Both engines, landing gear	Yellow-legged gull	The engine ingested gulls during takeoff and dumped fuel before returning to land. Birds hit the cockpit window, right engine nose cowl, wing, and right main undercarriage. The main gear struts were deflated. Some of the fan blades had large chunks taken out. The left engine had many fan blades damaged midway along the blade leading edge. Both engines were replaced. ID by an ornithologist, who is a member of Bird Strike Committee Italy, and verified by the Smithsonian, Division of Birds. Time out of service was 1 week. Cost for repairs was approximately \$785,000. No cost reported for landing fees, passengers and crew hotel, and rebooking on other airlines. (U.S. carrier)
7/8/2007	C-182	Matinicus Island (ME)	Approach (50 feet AGL)	Avoidance maneuver, impacted terrain	Aircraft destroyed (2 injuries)	Bald eagle	On final approach, the pilot swerved to avoid an eagle, hit the tree tops near the runway, and crashed. The aircraft was destroyed and 2 people were injured. NTSB investigated, Case # CHI07CA220

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
7/9/2007	B-737-300	Birmingham International (AL)	Take-off Run	None	Engine	Mourning dove	The engine ingested doves during takeoff with no apparent effect on the flight. Maintenance found 6 fan blades damaged. All 38 fan blades were replaced. Cost was estimated at \$900,000. ID by the Smithsonian, Division of Birds.
7/19/2007	MD-10-10	El Paso International (TX)	Take-off Run	Aborted takeoff	Engine, nose cowl	Unknown	The aircraft returned to the gate after ingesting small birds during takeoff. One engine was replaced, along with the fire bottle and nose cowl. Time out of service was 3 days. Costs totaled \$516,712.
7/20/2007	C-150	Watts-Woodland (CA)	Approach (1,000 feet AGL)	Emergency landing off airport	Aircraft destroyed (2 injuries)	Hawk	A hawk penetrated the windshield during approach. The pilot tried to land at the airport, but the aircraft was losing power, so he opted for an emergency landing in a tomato field. The plane landed and flipped upside down. Both the pilot and his passenger sustained minor injuries. The aircraft was valued at \$25,000 and other costs totaled \$10,000.
7/20/2007	Schweizer G-164B	Walker Field (IA)	Climb (50 feet AGL)	Overran runway	Aircraft destroyed (1 injury)	Unknown bird	The aircraft was substantially damaged during an emergency landing following a loss of engine power after takeoff. When the engine lost power the aircraft settled to the ground, but the pilot was not able to stop the aircraft on the remaining runway. The plane hit a fence, then a ditch and nosed over. Bird remains were found near midfield on the centerline. NTSB investigated, case # CHI07CA220. Cost to replace the aircraft was \$210,000. One minor injury.
8/1/2007	C-180	Sky Harbor (MN)	Landing roll	Aborted landing	Wing, fuselage, other unknown parts	Canada goose	The aircraft was substantially damaged when it impacted terrain during an aborted landing attempt. The pilot was lowering the tail wheel when he hit 2 geese. The plane started turning right and the pilot tried to correct using left brake and rudder and right aileron controls. He then added full power to get back in the air. The left wing hit the runway and the aircraft flipped over onto its back. NTSB investigated, case # CHI07CA253.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
8/17/2007	CRJ700	Port Columbus International (OH)	Take-off Run	Precautionary landing	Engine	European starling	A flock of over 300 starlings were struck during takeoff. The runway was closed for 40 minutes to remove 38 carcasses. Emergency landing due to lost engine thrust. Engine damage consisted of bent fan blades and several damaged compressor blades. Time out of service was 3 days. Cost was \$35,000.
8/20/2007	C-650	Benton Harbor (MI)	Take-off Run	Aborted takeoff	Radome, landing gear, fuselage, pitot tube	White-tailed deer	The pilot saw two deer and struck one deer. Damage consisted of a cracked radome, bent nose gear door and the pitot tube was pushed into the fuselage skin. Cost of repairs and lost revenue was \$97,186. Time out of service was 31 days.
8/25/2007	B-737-300	El Paso International (TX)	Climb (12,000 feet AGL)	Cabin depressurization, Precautionary landing	Nose, tail	Marbled godwit	A loud bang was heard in the cockpit during climb, followed by rushing air as the cabin began to depressurize. The cabin alt horn sounded and oxygen masks were put on as the aircraft descended to 10,000 feet. After landing at El Paso, 2 large holes were found; 1 under the captain's side by his foot and the other in the left horizontal stabilizer. The cockpit on the first officer's side was dented. Blood and feathers were found. No birds were seen in flight. Ground crew said turkey buzzards were in the area. ID by the Smithsonian, Division of Birds. Cost of repairs was \$144,000. Time out of service was 2 days.
8/28/2007	CRJ700	Louisville International (KY)	Approach (2,300 feet AGL)	Emergency landing	Nose, fuselage	Black vulture	The pilot declared an emergency after a vulture struck the front fuselage between the radome and the windshield. The strike ripped the skin, broke the avionics door, broke a stringer in half and bent 2 bulkheads. Maintenance made temporary repairs, then aircraft was ferried out for permanent repairs. ID by the Smithsonian, Division of Birds. Cost of repairs was \$200,000. Time out of service was 2 weeks.
9/6/2007	Kitfox IV	Near Cowen, WV	En Route (1,000 feet AGL)	Engine shut down, emergency landing off airport	Propeller (1 injury)	Unknown	A bird struck the wooden propeller, causing it to disintegrate. An off airport emergency landing was made, during which the aircraft hit a fence, traveled down an embankment and flipped over. There was substantial damage to the aircraft and minor injuries to the pilot. Cost was estimated at \$25,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
9/17/2007	DC-10	Found at Cherry Point MAS, NC	Unknown	None	Engine	Great blue heron	A heron was ingested. The pilot was unaware of the strike. Damage was found by maintenance during an inspection after landing. The engine was damaged beyond repair. Cost was \$1.7 million. ID by the Smithsonian, Division of Birds. Time out of service was 62 hours.
9/22/2007	MD-80	Jackson-Evers International (MS)	Landing roll	Flight cancelled	Wing, radome, landing gear	Canada goose	Seven geese were found after the strike. Parts damaged include a wing, the radome and the landing gear. ID by the Smithsonian, Division of Birds.
9/27/2007	EC130	Near Meadview, AZ	En Route (600 feet AGL)	Precautionary landing	Windshield (2 injuries)	Golden eagle	An eagle penetrated the pilot's windshield, hitting a passenger in the head. The pilot and 2 passengers were injured with cuts and scratches. Time out of service was 3 months. Cost was \$800,000. NTSB investigated, case # LAX07LA281. ID by the Smithsonian, Division of Birds.
9/29/2007	B-737-700	Philadelphia International (PA)	Climb (3,000 feet AGL)	Emergency landing	Radome, radar dish, windshield, nose (1 injury)	Canada goose	Several geese were struck. The windshield shattered, injuring the copilot. An emergency landing was made. One carcass was removed from the radome. The aircraft was taken out of service. Passengers were put on another aircraft and the flight continued about 5 hours later. Time out of service 48 hours. Cost totaled \$60,160. ID by USDA.
10/12/2007	CRJ700	Denver International (CO)	Climb (1,500 feet AGL)	Emergency landing, engine shut down	Engine, wing	Sandhill crane	Several cranes were struck shortly after takeoff. The captain said several geese came at them and they heard 3-4 thuds. The right engine immediately began to run roughly and the VIB gauge was fluctuating rapidly from one extreme to the other. Captain declared an emergency and said he didn't think he was going to make it back to DEN. The aircraft landed safely. The engine fan was damaged and there were dents along the left wing leading edge slat. ID by the Smithsonian, Division of Birds. NTSB investigated, case # DEN08LA010.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
10/23/2007	PA-44	Near Browerville, MN	En Route (3,400 feet AGL)	Impacted terrain	Aircraft destroyed (2 fatalities)	Canada goose	The aircraft disappeared during a night training flight. The instructor and student pilot did not report any difficulties or anomalies prior to the accident. Wreckage was found 36 hours later, partially submerged upside down in a bog. NTSB sent part of a wing with some remains inside to the Smithsonian. The damage that crippled the aircraft was to the left horizontal stabilator. ID by the Smithsonian, Division of Birds. NTSB investigated, Case # CHI08FA027. Two fatalities.
10/29/2007	Eurocopter BK-117	Near Hamburg, PA	En Route (1,400 feet AGL)	Emergency landing off airport	Windshield, and rear door window (1 injury)	Wood duck	Helicopter was en route to an accident scene when it hit a flock of ducks. Two penetrated the aircraft. One penetrated the front windscreen and the second through the rear door window. The impact forced both throttles into the idle position, which caused the aircraft to lose power. The pilot placed the aircraft into autorotation for an emergency landing and sent a mayday notice to the local airport. When he realized what caused the power failure he returned both throttles into the fly position and landed in a nearby parking lot, a mile from their intended pickup location. One injury. Crew was wearing helmets with visors. Time out of service was 8 days. Cost of repairs estimated at \$8,000.
10/29/2007	MD-88	Daytona Beach International (FL)	Take-off Run	Precautionary landing	Engine	American golden plover	Multiple plovers were struck on takeoff, but the pilot was unaware of the strike. A flight attendant noticed a burning odor and an airline mechanic on the flight heard a pop from the engine. The right engine fan section was ruined. ID by the Smithsonian, Division of Birds.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
11/22/2007	B-767-300	Nice Cote d'Azur (France)	Climb (250 feet AGL)	Precautionary landing	Engine, wing, tail	Yellow-legged gull	A flock of gulls was seen during takeoff. As the aircraft rotated, the flock lifted off the runway. Shortly after that the crew felt multiple strikes and vibrations and returned to land. The #2 engine had fan blade damage. One piece of a fan blade broke off and exited out the front and the core nozzle fell off. The engine was replaced. ID by the Smithsonian, Division of Birds. Time out of service was 12 days. Cost of repairs was \$8,925,000 and other cost was \$196,000. (U.S. carrier)
11/27/2007	CRJ200	Memphis International (TN)	Descent	Unknown	Engine, nose, wing, tail, fuselage	Snow goose (immature)	During descent the flight encountered a flock of birds, sustaining ingestion into both engines, a cracked nose panel, damage to the right wing root and left horizontal stabilizer, and left engine anti-ice cowling. Maintenance made temporary repairs before aircraft could be flown for more permanent repairs.
11/29/2007	B-757-200	Los Angeles International (CA)	Climb (1,000 feet AGL)	Precautionary landing	Engine	Western grebe	Grebes were ingested in the #2 engine. An emergency was declared and the aircraft returned to land. Damage was found on 13 fan blades. The flight was cancelled. ID by the Smithsonian, Division of Birds. Time out of service 1 week. Cost was over \$1 million.
12/2/2007	B-767-400	Dakar-Yoff-Léopold Sédar Senghor (Senegal)	Climb (200 feet AGL)	Precautionary landing	Engine	Unknown bird	Birds were ingested in the #1 engine just after takeoff. The pilot made a precautionary two engine landing. All fan blades were replaced. Time out of service 4 days. Cost of repairs was \$1.2 million. (U.S. carrier)
12/4/2007	B-767	John F. Kennedy International (NY)	Approach (3,000 feet AGL)	Emergency landing	Windshield, radome, radar, vertical stabilizer	Snow goose	Geese penetrated the radome, damaged the radar and then penetrated the fuselage into the aircraft. The vertical stabilizer was dented. Pilot requested emergency equipment to stand by. ID by the Smithsonian, Division of Birds.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
1/29/2008	B-747-200	Louisville International (KY)	Climb	Engine vibration	Engine	Short-eared owl	Flight crew reported minor noise and vibration shortly after lift-off, which later subsided. Damage was found to three fan blades on the #2 engine. A piece of a liberated fan blade penetrated the cowl. Six fan blade pairs, the fan case outer-front acoustic panel and inlet cowl were replaced. ID by the Smithsonian, Division of Birds.
3/4/2008	C-560	Wiley Post (OK)	Climb (3,100 feet AGL)	Crashed	Aircraft destroyed (5 fatalities)	American white pelican	Witnesses saw the aircraft fly through a flock of birds, heard the engine compressor stall and watched the plane spiral, impact terrain with post-crash fire. NTSB investigated, Case #DFW08MA076. ID by the Smithsonian, Division of Birds. Five fatalities.
3/10/2008	A-318	Denver International (CO)	Approach (500 feet AGL)	Emergency landing	Landing gear, nose cowl	Canada goose	Hit a flock of Canada geese on 1 mile final. Aircraft went around, declared an emergency due to smoke in cockpit and damage to aircraft. Loss of fluids was reported near taxiway and also brake and hydraulic problems. Aircraft had to be moved by tug to gate. Nose cowl was dented and both engines were struck. At least 1 engine ingested a bird. Time out of service was reported as a minimum of 16 hours. ID by the Smithsonian, Division of Birds.
3/12/2008	Bell-407	Miami, FL	En Route (600 feet AGL)	Emergency landing	Windshield (1 injury)	Turkey vulture	Helicopter hit bird over Biscayne Bay about 6 miles east of MIA. It landed safely at MIA. Pilot was transported to the hospital by Fire and Rescue due to cuts and lacerations to his face caused by the broken windshield. Bird remains entered the cockpit. ID by the Smithsonian, Division of Birds.
4/8/2008	Challenger 600	Colorado Springs (CO)	Climb (3,000 feet AGL)	Precautionary landing	Nose, engines 1 and 2	American white pelican	Shortly after departure, the aircraft had multiple, large bird strikes. One bird penetrated the nose area just below the windshield and continued through the forward cockpit bulkhead. Bird remains were sprayed throughout the cockpit. No injuries reported. Both engines ingested at least 1 bird. The #1 engine had fan damage: the #2 engine lost power and had a dented inlet lip. ID by the Smithsonian, Division of Birds. NTSB investigated. Cost reported to exceed \$2 million.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
4/19/2008	Piper Aerostar	Colorado Springs (CO)	Approach (2,000 feet AGL)	Emergency landing, pilots vision obscured	Windshield (1 injury)	Turkey vulture	Bird penetrated center of front windshield when aircraft was on 10-mile final leaving a 2-foot hole. Pilot was injured, his headset was knocked off. Vision was impaired by blood and the 200 mph wind coming through the broken windshield. Pilot was unable to directly communicate with the tower but transponded an emergency signal hoping the control tower would clear the airport for him. An uneventful landing was made. Pilot was treated at hospital.
5/2/2008	RV-7A (homebuilt)	Frazier Lake Airpark (CA)	Climb (50 feet AGL)	Lost control of aircraft	Destroyed	Canada goose	During departure for a touch and go landing, aircraft hit a goose with the left wing. Pilot lost control and impacted terrain 500 feet southwest of the runway and cart wheeled. The aircraft was destroyed. NTSB investigated, case # SEA08CA123.
5/25/2008	B-747-200	Brussels International (Belgium)	Take-off Run	Aborted takeoff	Aircraft destroyed	Eurasian kestrel	The aircraft overran the runway after a rejected takeoff due to a bird being ingested. The plane broke into 3 pieces. None of the 5 on board was seriously injured. ID by the Smithsonian, Division of Birds.
5/27/2008	B-737-200	Ugnu-Kuparuk (AK)	Approach (500 feet AGL)	Aborted landing, diverted to another airport	Engine	Trumpeter swan	During approach, a trumpeter swan was ingested. Pilot aborted landing at Kuparuk. Engine was shut down and secured. The flight diverted to Deadhorse without further incident. Cost of repairs was \$500,000. Time out of service was 3 days.
6/9/2008	BE-58	Hernando Village Airpark (MS)	Climb	Precautionary landing	Engine, landing gear	White-tailed deer	At rotation, aircraft hit a deer with the right engine, removing the right gear from the aircraft. Aircraft returned to land on the nose gear and left gear. Aircraft skidded off runway. Substantial damage was reported.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
6/16/2008	Alon A2	Sandpoint Arpt (ID)	Take-off Run	Lost control	Aircraft destroyed (2 injuries)	White-tailed deer	PILOT WAS DOING A TOUCH AND GO LANDINGS. FOLLOWING THE THIRD LANDING, RIGHT AT LIFTOFF (70-75 MPH) THE RT WING HIT A DEER. A/C VEERED RIGHT. PILOT LOST CONTROL AND HIT A FENCE. BOTH WINGS WERE DAMAGED, THE EMPENNAGE WAS NEARLY SEPARATED FROM THE FUSELAGE AND WAS BROKEN IN 2 PLACES. SUN HAD SET ABOUT 40 MINUTES PRIOR TO ACCIDENT. A/C WAS DESTROYED. PILOT AND PASSENGER HAD BUMPS AND BRUISES. NTSB investigated case number LAX08CA186
6/20/2008	B-747-400	Chicago O'Hare International (IL)	Take-off Run	Precautionary landing, fuel dump	Engine	Red-tailed hawk	During takeoff run, aircraft ingested a hawk. The flight continued takeoff and climbed to dump 165,000 pounds of fuel (cost \$100,000) then returned to the airport with 1 engine out. Several blades had significant damage. Both the #1 and #2 engines had vibrations but the #1 engine was not damaged. Some blades were replaced while others were blended. Thirty man-hours to repair.
7/5/2008	Mooney M20K	Livingston County Spencer J Hardy (MI)	Take-off Run	Aborted takeoff	Wing, fuselage, propeller, landing gear	White-tailed deer	Aircraft hit a deer on takeoff roll at dusk. The pilot immediately aborted the takeoff and returned to the ramp. The left wing, lower fuselage, propeller and left main landing gear were damaged. NTSB investigated, case # CHI08CA178.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
7/7/2008	B-747-400	Los Angeles International (CA)	Take-off Run	Aborted takeoff	Engine	Unknown bird (possible gull or brown pelican)	First officer and captain both saw the bird. Captain reported hearing a sound come from the #2 engine. Takeoff was aborted. Hot brakes were reported while returning to the gate. A total of 8 fan blades were damaged. No core ingestion. According to the chief engineer, the turbines had a strong odor of fish, which has a high probability of being a pelican, since they have been observed flying in the western end of the AOA and 1 was struck recently at LAX. Two other reports indicated a gull. Damages include costs related to overnight accommodations for passengers (approximately 338), repairs to turbines (engineers were flown in from New Zealand), and costs of parts and labor. Time out of service was 24 hours. Costs totaled \$806,000.
7/24/2008	Learjet-60	Morristown Muni (NJ)	Take-off Run	Aborted takeoff	Engine, wing	Canada goose	During takeoff run a flock of 2-10 geese were struck. The #2 engine ingested a Canada goose causing damage and the wing was also damaged. Takeoff was aborted. Aircraft was out of service for 8 days and cost totaled \$3 million.
8/29/2008	ERCO 415	Sebring Regional (FL)	Climb (1,300 feet AGL)	Engine shut down, emergency landing off airport	Destroyed	Unknown bird	The pilot saw wood pieces from his prop and white feathers coming into the cockpit through the open canopy. An extreme vibration ensued and he shut the engine down and made an emergency landing in a pasture. The aircraft hit a ditch which was hidden by tall grass. The nose gear collapsed, the right wing spar bent aft and the firewall buckled. The pilot was flying over a garbage dump at the time of the strike. NTSB investigated, case # NYC08CA297.
9/11/2008	MD-88	Atlanta International (GA)	Climb (5 feet AGL)	Engine shut down, precautionary landing	Engine	Rock pigeon	Multiple birds were struck. Aircraft made an emergency landing. Odor and haze in cabin. Vibration in #1 engine. The engine was totaled. ID by the Smithsonian, Division of Birds. Remains taken from nose and runway.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
9/21/2008	B-767	Orlando International (FL)	Climb (1,000 feet AGL)	Emergency landing	Engine, radome	Wood stork	Aircraft had multiple bird strikes shortly after liftoff which hit the left engine and radome. The crew declared an emergency and returned to land safely 12 minutes after departure. Passengers heard 2 loud bangs followed by vibration and noise. ID by the Smithsonian, Division of Birds.
9/26/2008	Cirrus SR-22	Fort Lauderdale Executive (FL)	Climb (2,500 feet AGL)	Emergency landing	Windshield, nose, propeller, landing gear, engine cowl (1 injury)	Anhinga	The bird entered the cockpit, striking the pilot's face. He required stitches. The deice boot on two prop blades received damage. The left engine cowl had damaged paint and fiberglass. ID by the Smithsonian, Division of Birds.
9/28/2008	PA-28	Beverly Municipal (MA)	Landing roll	None	Wing, engine, fuselage	White-tailed deer	The deer was struck at dusk. The right wing and right engine compartment were severely damaged. Aircraft was considered totaled (\$48,000). NTSB investigated, case # NYC08CA327. Aircraft was later sold and repaired.
10/25/2008	MD-90-30	Salt Lake City (UT)	Take-off Run	Aborted takeoff	Engine	Ferruginous hawk (juvenile)	Hawk was ingested at high speed during takeoff. The engine stalled, lost thrust and takeoff was aborted. Runway was closed 30 minutes for cleanup. Airline mechanics reported that the cost of 4 tires, 4 brake assemblies and 4 fan blades would be \$554,400. This cost does not include labor and down time. Flight was delayed 3 hours. Final estimate for repairs was around \$3.2 million. Airline policy required pilots be removed from service. ID by Wildlife Services biologist.
11/18/2008	Aerospatiale AS 350	Near West Point over Hudson River (NY)	En Route (2,000 feet AGL)	Precautionary landing	Canopy and nose	Canada goose	Helicopter was over the Hudson River near West Point Military Academy. Report indicates a hole in center left nose area about 21 by 14. Cost reported as over \$91,000. Time out of service was about 3 months.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
11/18/2008	MD-11	Memphis International(TN)	Climb (100 feet AGL)	Precautionary landing	Engine	Unknown bird	At approximately 100 feet AGL engine had a compressor stall and aircraft yawed left. Pilots heard a loud bang and saw the EVM Comp indicator spike. They made a precautionary landing back at Memphis. Maintenance found moderate damage to the #1 engine. Cost of repairs was \$235,000. Time out of service was 41 hours.
11/20/2008	B-757-200	Chicago O'Hare International (IL)	Climb (2,000 feet AGL)	Precautionary landing	Engine	Mallard	During climb-out, pilots felt a bump, heard a bang and smelled something burning. An emergency was declared and an uneventful landing was made. Pilots thought it might have been a birdstrike but were concerned mostly about the smell. Multiple birds were struck. Maintenance found feathers in the fan. Several fan blades were replaced. ID by the Smithsonian, Division of Birds.
12/6/2008	A-320	New Orleans International (LA)	Climb (500 feet AGL)	Engine shut down, precautionary landing	Engine	Lesser scaup	During climb-out, four birds appeared on the nose out of the dark. Birds tried to dive and were lost from view on right side followed by a loud thump and #2 engine vibrations. An emergency was declared and they returned to land. Post flight inspection found major engine damage. There were many deformed fan and exhaust blades. ID by the Smithsonian, Division of Birds.
12/6/2008	A-300	Jorge Chavez International	Take-off Run	Engine shut down	Engine	Hawk	During takeoff run, noticed debris on runway which began to move. Hawk started to lift off and was ingested into the #1 engine. Smell and engine vibration followed. Engine damage included shrapnel imbedded in the cowling. A runway FOD check was requested before landing. (U.S. carrier)
12/19/2008	MD-10-10	Memphis International (TN)	Approach (2,700 feet AGL)	None	Engine, engine cowl, thrust reverser	Gadwall	Replaced #3 engine cowl, #3 engine and #3 thrust reverser. Time out of service was 78 hours. Total cost was \$913,678. ID by the Smithsonian, Division of Birds.
12/26/2008	DC-10-30	Memphis International (TN)	Descent (9,700 feet AGL)	None	Wing	Snow goose	Repaired and replaced 2 slats. Time out of service was 8 days. Costs totaled \$220,000. ID by the Smithsonian, Division of Birds.

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1/4/2009	Sikorksy S-76C	Near Morgan City, LA	En Route (700 feet AGL)	Crashed in a marsh	Aircraft destroyed (8 fatalities) (1 injury)	Red-tailed hawk	En route to an offshore work site. Initial analysis of the flight data recorder indicated that the helicopter was cruising at 138 knots when the cockpit voice recorder indicated a loud noise followed by a substantial increase in the background noise level that was recorded on both intercoms and area microphones. About 1 second after the loud noise, the torque of both engines dropped simultaneously to near zero. DNA and feather samples were taken from the windshield and right side engine inlet filter. Additional swabs were taken from various parts of the aircraft. NTSB investigated, Case # CEN09MA117. ID by the Smithsonian, Division of Birds. Eight fatalities. One injury.
1/5/2009	B-747-400	Chicago O'Hare International (IL)	Climb (<8,000 feet AGL)	Precautionary landing, fuel dump	Engine	Red-tailed hawk	During climb, 1 or more birds were ingested in the #3 engine. Altitude of strike was not reported but the aircraft turned back at around 8,000 feet AGL and dumped 30,000 kg of fuel. ID by the Smithsonian, Division of Birds. Aircraft out of service at least 3 days.
1/15/2009	A-320	LaGuardia International (NY)	Climb (2,818 feet AGL)	Engines shut down, landed in Hudson River	Aircraft destroyed (100 injuries)	Canada goose	During initial climb, aircraft had multiple bird strikes and lost thrust in both engines. Pilot ditched in the Hudson River less than 6 minutes after takeoff. Several boats were used to rescue the 150 passengers and 5 crew members as the aircraft sank. Everyone on board survived. The NTSB report indicates that 100 people were injured, 5 had serious injuries and 95 had minor injuries. NTSB investigated. ID by the Smithsonian, Division of Birds. Geese were found to be migratory rather than resident. Cost of aircraft estimated at \$36 million.

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1/17/2009	AEROS 350	Near Forrest City, AR	En Route (1,200 feet AGL)	Emergency landing	Both windshields, chin bubble, engine nacelle and nose (1 injury)	Snow goose	Helicopter hit a flock of birds around the Forrest City area and made an emergency landing. The aircraft hit about 6 birds. Both windscreens were broken as well as the nose cone, engine nacelle and pilot's chin bubble. The pilot suffered some minor injuries and everyone was shaken up. The crew members were not wearing helmets and were fortunate the pilot's vision remained intact to land the aircraft. Aircraft was trailered for repairs. Time out of service was 3 months and costs totaled \$100,000.
2/1/2009	Schweizer G-164B	Private airstrip near Ferriday, LA	Approach (20 feet AGL)	Pilots vision impaired, Impacted runway and flipped over	Destroyed (1 injury)	Double-crested cormorant and red-winged blackbirds	While on short final, the bi-wing aircraft hit a flock of birds which penetrated the windscreen and struck the pilot in the face, temporarily blinding him. Pilot attempted a go-around but aircraft impacted the runway, nosed over and came to rest inverted. Pilot reported a cormorant penetrated the windshield. Photo showed red-winged blackbirds on field. The fuselage sustained structural damage. NTSB investigated, case # CEN09CA151. Aircraft was destroyed.
2/3/2009	B-757-200	Denver International (CO)	Climb (2,100 feet AGL)	Emergency landing	Engine	Bald eagle	Amber alert precautionary landing. Pilot reported seeing and hitting a large bird during climb through 7500 feet MSL. Bird hit right side of engine cowling making a large dent before entering the engine where it damaged all fan blades. Aircraft returned to Denver. ID by the Smithsonian, Division of Birds. Cost reported to be \$14 - \$20 million.
2/16/2009	B-757-200	Norman Y. Mineta San Jose International (CA)	Take-off Run	Aborted takeoff	Engine	California gull	Saw gulls during taxi. During takeoff run captain saw birds on runway, they began flying resulting in numerous strikes on fuselage and wings. Right engine began to vibrate significantly. Pilot aborted takeoff, exited runway and shut down the right engine. Passengers were bused to San Francisco where they were booked on other flights. ID by the Smithsonian, Division of Birds.

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2/16/2009	C-402	Fort Lauderdale International (FL)	Climb (600 feet AGL)	Precautionary landing	Windshield (1 injury)	Black vulture	Pilot had just taken off when he saw a flock of vultures ahead. One penetrated the windshield, striking the pilot in the face causing injury. Blood splattered all over the cockpit. Firefighters were on hand for the landing. Pilots in the area have reported a growing vulture problem.
3/5/2009	Agusta 109E	Shands Hospital (FL)	Approach (700 feet AGL)	Emergency landing at base	Windshield , switches, light (1 injury)	Lesser scaup	A duck penetrated the windshield and entered the cockpit. The pilot received cuts and an eye injury. A trauma patient was on board as they approached the rooftop helipad at Shands Hospital. The bird broke switches and circuit breakers on the overhead instrument panel before landing on the foot of a crewmember. The aircraft landed at the ShandsCair helipad, rather than on the hospital roof. Patient was transported by ambulance. ID by the Smithsonian, Division of Birds based on photo.
3/16/2009	B-757-200	New Orleans International (LA)	Climb	Precautionary landing	Engine	Herring gull	Pilot reported seeing up to 10 gulls on the runway during rotation. Ingestion caused vibration in the #2 engine. An emergency was declared and aircraft returned to airport, landing safely. Smoke rings were seen coming from the engine during landing. Three blades were replaced along with a leaky hydraulic actuator. Passengers were booked on other flights. ID by Smithsonian, Division of Birds. Time out of service 24 hours.
3/21/2009	B-737-800	Newark Liberty International (NJ)	Approach (1,200 feet AGL)	Engine shutdown	Engine, wing, landing gear	Canada goose	On final approach, right engine ingested a Canada goose and flamed out repeatedly. Safe landing made. Emergency vehicles were dispatched. Damage to right engine and left leading edge of wing. Nose gear had bird lodged in it. ID by the Smithsonian, Division of Birds.
3/22/2009	A-310	Gerald R Ford International (MI)	Takeoff run	Aborted takeoff	Engine	Snowy owl	Five intake fan blades, 4 fan exit vane platforms and acoustic liner sheet were damaged. ID by the Smithsonian, Division of Birds. Time out of service was 38 hours, cost reported as \$303,500.

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5/3/2009	C-414	Cavern City Air Terminal (NM)	Landing roll	Lost brakes	Engine, wing, landing gear	Mule deer	Three mule deer crossed the runway during landing. The right engine, right landing gear and right flaps were damaged. The deer got caught in the landing gear. The right brakes were lost. Time out of service was 1 month.
6/7/2009	B-747-400	Los Angeles International (CA)	Climb (150 feet AGL)	Precautionary landing, burned off fuel	Engine	Black-crowned night-heron	At about ¼ mile off runway end, a bird was ingested into the # 1 engine causing vibrations. Pilot entered holding pattern to burn off fuel then returned to land. Seven fan blades were replaced. Time out of service was 33 hours. Cost of damage and other costs totaled \$250,000. ID by Smithsonian, Division of Birds.
6/26/2009	Bell-407	Near Odessa, DE	En Route (700 feet AGL)	Emergency off airport landing	Windshield , rotor, fuselage, tail, antenna, overhead switch panel (1 injury)	Unknown (possibly vulture or eagle)	Medic observer caught a brief glimpse of a large bird just prior to impact as it approached from the left side of the aircraft in the pilot's blind spot. Impact took place simultaneously with medic's warning. Both windshields were broken. Pilot sustained a small puncture to his left hand and minor lacerations and contusions to his neck apparently from the Plexiglas windshield. Helmets were worn and visors were down. Remains were scattered throughout the cockpit. The pilot immediately landed in a field. Aircraft had to be trucked out for repairs. Time out of service was 16 days. Cost of repairs was \$25,000.
6/29/2009	DC-9-31	Gerald R. Ford International (MI)	Approach	None	Engine	Mallard	Remains found over large area covering 25 feet x 100 feet all left of runway centerline. Obvious ingestion. Largest piece less than 2.5 by 1. ATC had no reports of a birdstrike. Remains found at 1030. Operator found at 1320. Pilot unavailable. Engine had to be replaced. ID by Smithsonian, Division of Birds.
6/30/2009	B-737-800	LaGuardia International (NY)	Approach (900 feet AGL)	Aircraft was towed to gate	Landing gear	Great blue heron	Aircraft hit a bird on approach. After landing, pilot noticed the nose gear's hydraulics were not working. A large bird was found in the landing gear. Aircraft had to be towed to the gate.

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7/4/2009	Lancair LC-42	Ocean City Municipal (NJ)	Landing roll	Ran off runway	Propeller, landing gear, engine cowling and airframe	Canada goose	During landing roll, aircraft hit 2 Canada geese. The plane veered off the right side of the runway and hit a concrete runway light-mounting pad. The nose landing gear collapsed and the nose wheel assembly separated from the landing gear. The right main landing gear and its wheel assembly were damaged and the brake wheel backer plate was jammed against its wheel assembly preventing rotation. The engine was rebuilt.
7/7/2009	B-737-300	Baltimore Washington International (MD)	Climb (25 feet AGL)	Precautionary landing	Engines #1 and #2, tail	European starling	Birds were ingested in both engines. The #2 first stage fan had many bent blades and the #1 engine had 1 blade damaged. The right horizontal stabilizer was dented and the leading edge was replaced. No internal engine damage found during borescope inspection. The landing gear, wing and radome were hit numerous times but sustained no damage. Approximately 67 starlings were removed from the runway. Aircraft was out of service 4.5 hours.
7/31/2009	EMB-120	Salt Lake City International (UT)	Climb (2,600 feet AGL)	Precautionary landing	Radome	White pelican	A pelican hit the aircraft as it climbed to about 2,600 feet AGL. Aircraft returned to the airport with the bird lodged in the radome. Time out of service was 48 hours. Cost of repairs was \$150,000.
7/31/2009	BE-400	Sugar Land Regional (TX)	Take-off Run	Aborted takeoff, uncontained engine failure	Engine	Yellow-crowned night-heron	During takeoff run, approaching 95 knots the pilots saw 1 large and 2 smaller birds. The larger bird was ingested into the #2 engine which immediately rolled back. Takeoff was aborted. The engine cowling and multiple turbine blades had separated from the aircraft. It is believed that the bird hit the spinner which fell into the fan. One wing and material from inside the engine were sent to the Smithsonian. NTSB investigated, case # CEN09IA481. ID by Smithsonian, Division of Birds.
8/15/2009	MD-11	Los Angeles International (CA)	Climb (100 feet AGL)	Precautionary landing	Engine	Western gull	Pilot reported a birdstrike upon rotation. The aircraft returned with bird ingestion in the #1 engine. Emergency was declared with a heavy landing. Six turbine blades were replaced. ID by Smithsonian, Division of Birds. Cost estimated at \$135,000 and time out of service was 30 hours.

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8/17/2009	EMB-175	Charlotte/Douglas International (NC)	Take-off Run	Aborted takeoff	Engine, landing gear	Canada goose	During takeoff run, encountered a large flock of geese. One bird was ingested in the #2 engine, 1 hit the nose landing gear, and another hit the right landing gear. The pilot made a high-speed aborted takeoff, stopping safely and taxied to the apron. The flight was delayed for 2.5 hours while a replacement aircraft was brought in. ID by Smithsonian, Division of Birds.
9/29/2009	B-727-200	Memphis International (TN)	Approach (3,700 feet AGL)	None	Windshield	Great egret	The captain's front window was struck and the inner window panel shattered. Two out of 3 engines ingested birds but sustained no damage. Time out of service was 37 hours. Cost estimated at \$10,820. ID by Smithsonian, Division of Birds.
10/11/2009	MD-88	Greater Rochester International (NY)	Climb (200 feet AGL)	Engine shut down, precautionary landing	Engine	Unknown	Aircraft hit a flock of birds during climb from ROC. Left engine stalled and there was an in-flight shutdown. Unknown if pilot commanded the shutdown. Returned to land. The left engine had multiple fan blades with major damage.
10/18/2009	Piaggio P 180	Monmouth Executive (NJ)	Take-off Run	Aborted takeoff	Nose, propellers, wing, fuselage	Canada goose	Bird struck the nose cone which damaged the radar and avionics bay. Both propellers were damaged. Engine nacelles will need to be repaired. Minor damage to left wing. Time out of service was 8 days. Cost totaled \$105,000.
11/2/2009	MD-90	Phoenix Sky Harbor International (AZ)	Climb (9,300 feet AGL)	Precautionary landing	Fuselage	Western grebe	Bird hit top of aircraft and tore back 18 inches of the fuselage just above the right flight deck eyebrow window. A second strike tore a large hole just below the co-pilot's wing in front of the landing gear. These strikes activated the depressurization alarm. Aircraft returned to land. NTSB investigated, case # WPR10LA044. ID by Smithsonian, Division of Birds
11/2/2009	EC145	Near Canistota, SD	En Route (1,200 feet AGL)	Emergency landing off airport	Windshield (1 injury)	Duck	While en route to pick up a patient, the aircraft struck at least 2 ducks. One penetrated the copilot's windshield. The duck struck the medic on the shoulder and knee then continued back, striking the left side wall and splattered throughout the medical crew area. The medic suffered a small cut to the knee. Crew used night vision goggles to land in a farm field.

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11/4/2009	BE-99	Show Low Regional (AZ)	Approach (~6,800 feet AGL)	Emergency landing	Windshield (1 injury)	Western grebe	Bird shattered the windshield injuring the pilot. NTSB investigated, case # WPR10IA045. ID by Smithsonian, Division of Birds.
11/14/2009	A-319	Kansas City International (MO)	Climb (4,000 feet AGL)	Precautionary landing	Engine	Snow goose	Flight had just departed when pilot reported multiple bird strikes about 4 miles north of the airport. First report was loss of #2 engine. When the crew attempted to advance the throttle, there was a series of severe compressor stalls. Passengers described it as fireballs being ejected from the engine. The crew declared an emergency and returned to MCI. Upon landing pilot reported both engines had stalled. Damage to the #2 engine consisted of a dent in the lower lip and a hole in the underside of the cowling. The engine had internal damage. NTSB investigated, case # CEN10IA053.. ID by Smithsonian, Division of Birds.
12/6/2009	EMB-145	Philadelphia International (PA)	Approach (2,000 feet AGL)	Engine shut down	Engine	Snow goose	Pilot declared an emergency due to a birdstrike and engine shutdown while on approach. A huge bang shook the aircraft and then the engine went out. Time out of service was 48 hours and costs were \$306,000. ID by Smithsonian, Division of Birds.
12/22/2009	B-717-200	Baltimore Washington International (MD)	Climb (3,500 feet AGL)	Precautionary landing	Nose, wing, fuselage, engine cowling and engine	Snow goose	Multiple strikes with bird debris on wings and nose. The pilots reported that they hit 6 or 7 geese 4 miles west after departure. Pilots reported flight control problems, abnormal vibrations in both engines and upon landing; the #1 engine was smoking. ID by Smithsonian, Division of Birds.
12/22/2009	B-727-200	Edmonton International (Canada)	Climb (100 feet AGL)	Precautionary landing	Engine	Short-eared owl	Aircraft maintenance performed a birdstrike inspection on the #2 engine after it was removed from the aircraft for ice FOD. Evidence of strike was found. Time out of service was 41 hours. Costs totaled \$1.3 million. ID by Smithsonian, Division of Birds. (U.S. carrier)
1/3/2010	Learjet-36	Portland-Hillsboro (OR)	Climb (600 feet AGL)	Precautionary landing	Engine, wing, pitot tube	Northern pintail	Aircraft departed with a patient and medical team on board. Pilots heard a loud bang on the fuselage during gear retraction and returned to land without incident. Aircraft was taken out of service and patient and medical team were transferred to another aircraft. ID by Smithsonian, Division of Birds.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
1/22/2010	B-757-200	Washington Dulles International	Climb	Emergency landing	Engine	Red-tailed hawk	During takeoff, at rotation, struck a large bird and went into the right engine. As we started the climb, noticed a burning smell and felt engine vibration. Declared an emergency and made a normal landing. Brake and engine inspection found fan had several bent blades. Runway was closed for some time to collect bird remains. ID by Smithsonian, Division of Birds.
2/18/2010	C-208	Sacramento International (CA)	Approach (300 feet AGL)	Some control loss	Wing, lights	Tundra swan	Struck a large bird during approach. Aircraft briefly rolled to the right but landed safely. Significant damage to the leading edge of right wing. Landing light housing and skin of wing showed damage. Some control loss due to aileron control cables being pushed out of position. Aircraft was taken out of service. ID by Smithsonian, Division of Birds. Time out of service was 80 hours and cost of repairs was \$80,000.
3/7/2010	PA-34	Campbell (IL)	Approach	Avoidance maneuver, Emergency landing	Landing gear, fuselage	White-tailed deer	Just before touching down, a deer crossing the runway and darted back. The pilot tried to pull up but clipped the deer with the left landing gear. An emergency landing was made at Chicago Executive Airport with a damaged left main gear. The aircraft was substantially damaged and had to be towed.
3/11/2010	A-319	Greater Rochester International (NY)	Climb (2,000 feet AGL)	Emergency landing	Engine	Canada goose	During initial climb flock of geese was encountered. The #2 engine was damaged. An emergency landing was made and the flight was cancelled. ID by Smithsonian, Division of Birds.
4/6/2010	BE-95	32 nm NW Bismarck, ND	En Route (2,700 feet AGL)	Pilots vision impaired, Emergency landing	Windshield, nose, wing, fuselage, interior (1 injury)	Mallard	Aircraft hit 3 ducks while en route. The collision blew in both sides of the windshield, sending broken glass and debris into the cockpit. One pilot was struck in the head and his glasses were knocked off and for a time he was blinded. His cuts required stitches. The other pilot was struck in the shoulder. The headset disintegrated so the pilots could not communicate easily with wind rushing in. They activated the emergency transponder because they could not hear the control tower. Fifteen minutes later they were on the ground. Costs estimated at \$14,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
4/11/2010	PA-24	Near Middlefield, OH	En Route (1,200 feet AGL)	Emergency landing	Windshield , nose, firewall, fuselage, interior (2 injuries)	Bald eagle	Pilot and passenger received minor scratches when a bald eagle penetrated the windshield. Aircraft has substantial damage to the windshield, engine cowling, top engine mount, firewall and fuselage top and right sides resulting in the door being unable to close. Windshield frame, rear passenger seat and overhead headliner are damaged.
4/23/2010	PA-46	Oconee County Regional (SC)	Take-off Run	Nose gear collapsed	Engine, propeller, wing, landing gear, radar dome, firewall	White-tailed deer	During a takeoff at night, several deer ran across the runway. The pilot tried to pull up but deer hit the aircraft causing the nose gear to collapse. The plane came to rest at the edge of the runway. The aircraft was towed and 2 deer were removed from the runway. The aircraft received substantial damage to the engine, propeller, nose gear, engine cowling, and radome. NTSB investigated, case # WRA10LA247.. Time out of service was about 4 months and cost totaled \$256,000.
5/10/2010	Agusta 109	New Orleans International (LA)	Approach (600 feet AGL)	Precautionary landing	Windshield , tail (1 injury)	Black vulture	Birdstrike to rotor system. The windshield and skylight were broken and the windshield frame was deformed. The vertical fin was also damaged. The passenger received a cut and abrasions. ID by Smithsonian, Division of Birds. Time out of service was 5 hours and costs totaled \$105,000.
5/23/2010	A-320	Stewart International (NY)	Climb (20 feet AGL)	Precautionary landing	Engine	Canada goose	A Canada goose was ingested into 1 of the 2 engines during climb out from the airport. The aircraft immediately returned to land. Fan blades were damaged. The engine was replaced. The flight was delayed about 4 hours. ID by Smithsonian, Division of Birds. Time out of service was 22 hours.
6/7/2010	A-300	Unknown	Unknown	Engine shut down	Engine	Mallard	During post flight inspection, maintenance found bird remains in the #2 engine. Several fan blades and acoustic panels were damaged. The engine was replaced. ID by Smithsonian, Division of Birds. Time out of service was 61 hours. Costs estimated at \$5.5 million.

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7/18/2010	EMB-135	Ashville Regional (NC)	Approach (300 feet AGL)	Precautionary landing	Engines 1 and 2, landing gear and fuselage	Canada goose	During final approach at night, the aircraft flew through a flock of Canada geese. Multiple birds were struck. Both engines ingested at least 1 bird. Passengers reported seeing sparks from the right engine and one saw a goose being ingested into the left engine. They reported both engines shut down for a few seconds and when the left engine restarted it sounded like metal flying around in the engine. A burning smell was noticed. The aircraft landed safely. One engine had to be replaced. One bird was suspended from the landing gear. ID by Smithsonian, Division of Birds.
7/29/2010	MD-500	3 NM NW of Chowchilla, CA	En Route (1,000 feet AGL)	Precautionary landing	Windshield, nose, rotor blade	Swainson's hawk	A flock of buzzards was encountered and 1 was struck. It hit just above the air intake on the nose and caused both the Plexiglas panels in front of the pilots to break out completely. Remains of the bird struck one of the rotor blades causing damage. Airspeed was reduced due to windy conditions in the cockpit. A normal landing was made at a nearby airport. ID by Smithsonian, Division of Birds. Time out of service 5 days. Cost estimated at \$22,000.
8/8/2010	B-737-400	Sitka Rocky Gutierrez (AK)	Take-off Run	Engine shut down, Aborted takeoff	Engine	Bald eagle	A bald eagle was ingested into the left engine during takeoff run. The engine shut down. A passenger saw 2 bursts of flames coming from the engine. The engine was reported as being destroyed. The aircraft stopped about 3,000 feet from the end of the runway. A replacement aircraft was sent and the flight continued after a 6 hour delay. The relief aircraft also hit an eagle during take-off but continue to Seattle. ID by Department of Transportation. Cost estimated as \$2.9 million and time out of service was 3.5 days.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
8/8/2010	Robinson R22	Pettus, TX	Parked	N/A	Destroyed	Cattle	Pilot herded cattle into a cattle enclosure and landed to close gates. Engine was left running as he exited the aircraft. Several cattle were startled and 1 jumped the fence and came into contact with the main rotor, which caused the helicopter to bounce and shake violently. A number of other cattle broke free from the pen. At least one contacted the helicopter causing it to become airborne before impacting the ground in a nose-low attitude. Tail boom and main rotor mast were both partially separated from the fuselage. NTSB investigated, case # CEN10CA466.
8/10/2010	EMB-145	Salt Lake City International (UT)	Approach (6,800 feet AGL)	Landed using back up radio	Radome, windshield, nose	American white pelican	The captain lost his instruments and radio. The first officer's equipment worked and he had the only visual from his window. Aircraft is expected to be out of service for a month and cost may be over \$1 million. ID by Smithsonian, Division of Birds.
8/27/2010	C-210	17 miles from Tikchik, AK	En Route	Precautionary landing	Windshield	Loon	The pilot was on a local flight in support of a remote lodge operation. During cruise flight a loon struck and penetrated the right side of the cockpit windscreen and came to rest in the unoccupied passenger cabin. Substantial damage was reported.
9/1/2010	A-320	Sacramento International (CA)	Climb (10 feet AGL)	Precautionary landing	Engine	Great blue heron	Bird was ingested in #1 engine at rotation and aircraft returned to land. A piece of plastic from the engine was found on the runway. The runway was closed for full FOD sweep. Only small pieces of bird were found. Engine had significant damage to 2 fan blades. ID by Smithsonian, Division of Birds.
9/14/2010	Bell-407	Near Nogales, AZ	En Route	Precautionary landing	Windshield (1 injury)	Turkey vulture	The aircraft was responding to an emergency call when a bird penetrated the pilot's front windshield. The bird made contact with the instrument panel and landed on the pilot's feet. Pilot sustained cuts. ID by Smithsonian, Division of Birds.

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10/18/2010	BE-100	Palestine Municipal (TX)	Approach (4,000 feet AGL)	Precautionary landing	Wing, tail, lights	American white pelican	While descending through about 4,000 feet in IMC pilot saw a black flash and heard and felt a tremendous thud. After assessing the damage, the crew decided to return to KGKY and landed uneventfully 25 minutes later. There was substantial damage to the left wing spar and left wing leading edge. Also damage on vertical fin of the tail. ID by Smithsonian, Division of Birds. NTSB investigated, case # CEN11TA027. Cost \$197,200. 4 months out of service.
10/29/2010	Xtra-EZ	Addison (TX)	Descent	Emergency landing, pilot vision impaired	Windshield (1 injury)	Franklin's gulls	While on descent, a gull penetrated the windshield, breaking the pilot's glasses and headset. Pilot received a small laceration. He notified the ATC and declared an emergency but landed safely. Pilot was partially blinded by the strike. ID by Smithsonian, Division of Birds.
11/8/2010	Bombardier de Havilland Dash 8	Los Angeles International (CA)	Approach (6,600 feet AGL)	Emergency landing	Wing, fuel tank	Common loon	While on approach into LAX at about 18 miles north, a bird struck and damaged the leading edge of the right wing. The fuel tank was also damaged. The crew declared an emergency and landed safely. NTSB investigated, case # WPR11LA042. ID by Smithsonian, Division of Birds. Cost of repairs estimated at \$750,000.
11/11/2010	A-320	Philadelphia International (PA)	Climb (1,500 feet AGL)	Precautionary landing	Engine	Canada goose	During climb at about 3 miles from airport, the aircraft was struck by Canada geese. An emergency was declared and the flight returned to KPHL for a safe landing. Three blades had damage. Two fan acoustic panels also damaged. ID not confirmed.
11/13/2010	PA-28	Aeroflex-Andover (NJ)	Approach	Wing hit ground	Wing, landing gear, flap, aileron, fuselage, engine mount, cowl, steering control arm	White-tailed deer	During landing flare, pilot heard a bang from right side of aircraft. During landing roll, the right wing settled onto the ground and the plane came to a rest on the runway edge. The right main landing gear had separated and was found next to the deer carcass.

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11/15/2010	EMB-175	Minneapolis-St. Paul International (MN)	Climb (4,000 feet AGL)	Precautionary landing	Radome, engine, fuselage	Snow goose	During climb at about 10 miles from airport, the aircraft was struck by snow geese. One engine, the fuselage and the radome were damaged. The flight returned to KMSP for a safe landing. ID by Smithsonian, Division of Birds. NTSB investigated, case # CEN11LA072.
11/23/2010	CRJ700	Found at Ronald Reagan Washington National (DC)	Unknown	None	Vertical stabilizer, lights	Tundra swan	After landing, remains of a bird were found in the vertical stabilizer. Maintenance reported significant damage. Flight arrived from Boston. ID by Smithsonian, Division of Birds. Costs totaled \$144,153.
11/23/2010	Robinson R44	Baldwin Park, CA	En Route (900 feet AGL)	Emergency landing off airport	Canopy (1 injury)	Rock pigeon	While responding to a robbery call, a police helicopter struck a rock pigeon. The bird penetrated the Plexiglas canopy which then struck both officers. They made an emergency landing in a middle school field. One officer received minor injuries.
12/8/2010	B-737-400	Fort Lauderdale/Hollywood International (FL)	Climb (1,200 feet AGL)	Precautionary landing	Engine	Turkey vulture	During climb out crew reported a birdstrike which caused vibration to the right engine. The engine continued to operate but the generator was malfunctioning. Flight declared an emergency and returned to land. A passenger reported seeing a fireball shoot out of the engine followed by a bad smell. The engine was replaced. ID by Smithsonian, Division of Birds.
12/15/2010	B-757-200	San Francisco International (CA)	Climb (800 feet AGL)	Precautionary landing	Engine, nose cowl	Canvasback	During climb out crew reported a birdstrike over the Bay which caused vibration to the left engine. Flight returned for an overweight landing. Engine was not shut down until after landing. Found 8 fan blades damaged. Replaced fan blades and nose cowl. ID by Smithsonian, Division of Birds.
1/7/2011	MD-10-30	Sacramento International (CA)	Climb (2,000 feet AGL)	Precautionary landing	Engine, nose cowl and radome	Greater white-fronted goose	Aircraft diverted to KOAK after the strike. Pilot reported striking ducks or geese. The #3 engine was removed along with the nose cowl, both thrust reversers and the radome. ID by Smithsonian, Division of Birds. Costs estimated at \$3.2 million and time out of service was 6 days.

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1/9/2011	Bell-427	La Isabela International (Dominican Republic)	Climb (90 feet AGL)	Impacted terrain	Destroyed? (2 injuries)	Mallard and gadwall	At least 2 birds struck the tail rotor causing the aircraft to impact terrain approximately 2 miles from the airport. Both pilots were injured. The aircraft broke into 2 pieces. The cause of the accident was unknown at first. ID by Smithsonian, Division of Birds. Aircraft may or may not be repaired. Cost estimated at \$1.5 million. US registered aircraft.
2/28/2011	B-737-800	Ronald Reagan Washington National (DC)	Climb (1,200 feet AGL)	Emergency landing, engine shut down	Engine	Canada goose	Just after takeoff, pilot reported striking birds flying in V formation at approximately 1,200 feet over the Potomac River. Aircraft diverted to KIAD due to possible engine shutdown and precautionary landing. Engine was reduced to idle but not shut down. ID by Smithsonian, Division of Birds. Time out of service 110 hours. Cost reported as \$793,776.
3/15/2011	A-300	Tulsa International (OK)	Climb (25 feet AGL)	Precautionary landing	Engine #1 and #2, wing	Gadwall	Aircraft hit a flock of large birds during rotation. They returned to land. Damage included engine fan blade and outlet guide vanes in the #1 engine, #2 engine fan cowl and right wing inboard flap track fairing. ID by Smithsonian, Division of Birds. Time out of service 85 hours. Cost reported as \$5,871,028.
3/31/2011	Robinson R44	San Antonio International (TX)	Approach	Emergency landing off airport	Windshield (1 injury)	Great-tailed grackle	During approach to landing, a bird penetrated the passenger side of the windshield injuring the passenger. The pilot made an emergency landing on Highway I-37 around 9 p.m. A tow truck was called to remove the aircraft.
4/1/2011	CRJ200	Adams Field (AR)	Approach (5,000 feet AGL)	Engine shut down, emergency landing	Radome, engine #1 and #2, pylon	American white pelican	About 20 miles out, during approach, the radome, radar, electronic equipment, and both engines sustained damage when struck by a flock of white pelicans. The #1 engine was shut down and an emergency was declared. Remains were imbedded in the radome. ID by Smithsonian, Division of Birds. Aircraft was out of service for 47 days. Costs totaled \$830,000.

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4/20/2011	B-767-300	Orlando-Sanford (FL)	Climb (10 feet AGL)	Precautionary landing	Engine	Bald eagle	Bird was ingested at rotation. Aircraft leveled off at 3,000 feet. Kept engine running and returned for a safe landing about 20 minutes later. Passenger heard a big bang and smelled a burning odor. Fire crews met the aircraft. Bald eagle remains were recovered from the runway. Passengers were taken to hotels and departed the next day. ID by Smithsonian, Division of Birds. Time out of service 120 hours, Cost estimated at \$4,570,000.
5/14/2011	A-320	John F. Kennedy International (NY)	Climb (300 feet AGL)	Precautionary landing	Engine	Herring gull	Bird was ingested during climb at mid-field. An emergency was declared and the aircraft returned to make an overweight landing. Some remains were found on the runway. Passengers were put on another aircraft and departed a few hours later. Aircraft was out of service for 3 days and the engine was replaced. ID by Smithsonian, Division of Birds.
6/5/2011	PA-32	Hefner-Easley (OK)	Approach	Nose gear collapsed	Landing gear, propeller, firewall	White-tailed deer	During landing flare and touchdown, 2 deer ran onto the runway. The aircraft hit 1, separating the landing gear. The nose of the aircraft settled to the runway and the aircraft skidded 500 feet before stopping. NTSB investigated, case # CEN11CA378.
6/18/2011	B-737-400	Orlando International (FL)	Climb	Precautionary landing, engine shut down	Engine	Cattle egret	Bird was ingested into the core of the #1 engine at rotation. The engine was shut down as a precaution and they returned to land. The engine was replaced. ID by airport biologist.
6/30/2011	PA-31	Natrona County International (WY)	Approach (5 feet AGL)	Hard landing, evasive maneuver, pilot vision impaired	Aircraft destroyed	Unknown large bird	Pilot was 5-10 feet above the runway when a large bird flew past the windshield. The pilot reacted to avoid the bird and the left wing came into contact with the runway causing the aircraft to nose into the ground. The wing was severely damaged, the left landing gear collapsed and both propellers were bent. The NTSB analysis says a large bird hit and broke the front center windshield of his airplane. With the bird covering his entire windscreen the pilot reacted by quickly moving his body to the right to avoid the bird, which had penetrated the windscreen. NTSB investigated, case # WPR11CA299. Aircraft was damaged beyond repair.

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7/23/2011	MD-82	Memphis International (TN)	Climb	Precautionary landing, emergency declared	Engine	Eastern meadowlark	A bird or birds were ingested into the #1 engine at rotation. A bird smell was noted and the captain saw something pass by in front of the aircraft. Engine vibrations caused the pilot to reduce power and declare an emergency. The aircraft returned safely. There was severe damage to all fan blades. An Eastern meadowlark was found on the runway and remains scraped from the exhaust portion of the engine were also identified as an Eastern meadowlark by the Smithsonian, Division of Birds.
8/5/2011	C-340	East Hampton (NY)	Landing roll	Nose gear collapsed	Radome, nose, engine, propeller, landing gear	White-tailed deer	During landing roll, 3 deer entered the runway at a fast pace moving toward the centerline. A few seconds later 1 deer was struck and the nose gear collapsed. The aircraft exited the runway and was evacuated. The runway was closed for over 3 hours. The right leading edge and the underside of the wing were covered in blood along with the right engine spinner and right landing gear. The deer was cut in half with body parts scattered along the runway. Time out of service was 33 days. Costs totaled \$60,000.
8/12/2011	MD-83	Austin-Bergstrom International (TX)	Climb (2,500 feet AGL)	Precautionary landing	Nose cone, fuselage	Black vulture	Crew saw 4 large black birds. Strike occurred 3-5 miles south of the airport. They returned for a safe landing. The nose cone was damaged beyond repair and the pressure bulkhead was torn away from the fuselage. Passengers were rebooked on other flights. Time out of service was 24 hours. Costs totaled \$600,000.
9/19/2011	B-757-200	Salt Lake City International (UT)	Climb (1,000 feet AGL)	Precautionary landing	Engine, spinner	Northern pintail	Engine ingested a bird or birds and stalled. Passenger saw flames coming from the engine. An emergency was declared and a safe landing was made. The spinner was damaged and 4 fan blades were replaced. Cost estimated at \$50,000. ID by Smithsonian, Division of Birds.
9/25/2011	B-737-800	Metropolitan Oakland International (CA)	Climb (20 feet AGL)	Precautionary landing	Engine	Canada geese	Numerous birds were struck and ingested into the #2 engine. Engine was turned back to idle to avoid overheating. A safe emergency landing was made. Engine was changed out. ID by Smithsonian, Division of Birds.

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9/26/2011	B-757	Denver International (CO)	Landing roll	Engine shut down	Engine #1 and #2, fuselage, landing gear	Red-tailed hawk	Aircraft ingested bird in #1 engine during landing roll. Internal and external damage. Per pilot, engines were at full reverse thrust causing debris to be thrown in front of aircraft and through #2 engine. Intact red-tailed hawk remains found on the runway. ID by Smithsonian, Division of Birds. Time out of service was 21 days. Cost of repairs was \$4,533,289. Cost for time out of service was \$560,700.
10/9/2011	B-737-400	Sitka Rocky Gutierrez (AK)	Approach	Flight cancelled	Engine	Glaucous-winged gull	Aircraft ingested gull in the #1 engine during approach at runway threshold. Blades were bent and titanium heat shield stripping broke from aircraft and was found on runway. Departing flight cancelled due to damage. ID by Smithsonian, Division of Birds. Cost of repairs was estimated at \$1million.
11/10/2011	A-320	Minneapolis –St Paul International (MN)	Climb (2,500 feet AGL)	Precautionary landing, emergency declared	Radome, nose, engine	Tundra swan	Bird hit right side of nose. The forward pressure bulkhead was damaged. Aircraft returned to land after declaring an emergency. Time out of service reported as about 10 days. ID by Smithsonian, Division of Birds. NTSB case # DCA12CA043.
11/11/2011	C-550	Warroad International Memorial (MN)	Landing roll	Engine shut down	Wing root, fuel tank	White-tailed deer	Aircraft hit a deer during landing roll. Pilot did not see the deer as landing was at night. Fuel tank was punctured. Pilot taxied to ramp. EPA will have to investigate.
11/17/2011	EC135	Near Jackson, MS	En Route	Emergency landing	Windshield (1 injury)	Lesser scaup	While transporting a patient, 4 miles from KJAN, 2 birds hit the aircraft and penetrated the right windshield injuring the pilot when it hit him in the face. The pilot made a safe landing at KJAN. ID by Smithsonian, Division of Birds.
12/19/2011	B-737-700	Metropolitan Oakland International (CA)	Approach(7,500 feet AGL)	None	Wing	Greater white-fronted goose	Substantial damage to k-flaps, wing root, wing and body fairing and underlying structure. Aircraft was taken to KSEA for repairs. Time out of service was 8 days. Cost reported as between \$150,000 and \$200,000. ID by Smithsonian, Division of Birds.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
12/31/2011	B-737	Portland International (OR)	Climb	Emergency landing	Engine	Glaucous-winged gull	During initial climb out, the aircraft hit several gulls. One went through the engine. An emergency was declared and the aircraft returned to the airport safely. Twenty-four blades and the oil cooler were replaced. The flight was delayed 5.5 hours. Aircraft was out of service at least 24 hours. Remains were found on the runway. Cost estimated as \$252,000.
1/2/2012	BE-58	Lambert-St Louis International (MO)	Approach (3,900 feet AGL)	Degraded performance	Windshield , fuselage, tail	Mallard or black duck	Two almost basketball size holes in front windscreen. Damage to rear left horizontal stabilizer and metal on top of fuselage. ID by Smithsonian as either mallard or black duck. Time out of service 5 days. Cost was \$40,300.
1/21/2012	B-737-800	Sacramento International (CA)	Climb (1,200 feet AGL)	Precautionary landing, emergency declared	Engine #1 and #2	Greater white-fronted goose	Two engines were damaged when geese were struck during climb out. The aircraft returned to land after declaring an emergency. Fan blades were damaged in both engines Passengers were rebooked on other flights. ID by Smithsonian.
2/17/2012	EC130	Near Paris, TN	En Route (1,600 feet AGL)	Emergency landing off airport	Windshield	Mallard	While en route to pick up a patient for transport, a duck penetrated the right windscreen. The pilot maintained control and landed in a field. There were no injuries. The aircraft had to be towed out for repairs. Time out of service was 3 days and costs estimated at \$100,000.
3/1/2012	MD-11	Memphis International (TN)	Climb (8,500 feet AGL)	Precautionary landing, emergency declared	Radome, nose, engine, wing, fuselage	Snow goose	Preliminary information shows that 75% of the compressor blades were damaged, the engine cowling, radome were both heavily damaged. There is a hole in the leading edge of the left wing and side of fuselage forward of the right wing. The lower E & E compartment access door is damaged. There are numerous dents on the forward fuselage. At least 12 impact points were noted. ID by WS biologist. Costs totaled \$2,739,462. Time out of service was 22 days.

**SOME SIGNIFICANT WILDLIFE STRIKES TO CIVIL AIRCRAFT
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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
3/6/2012	B-767-300	Portland International (OR)	Landing roll	None	Engine	Canada goose	Upon landing, while engines were in thrust reverse mode, a bird was ingested causing extensive damage to fan blades, acoustic shield & inlet. Engine was removed for repair. Pilot reported excess vibration and a strange noise. Runway was closed for 1.5 hours for cleanup. Next flight was delayed 14 hours. Meal and transport vouchers were issued to passengers. ID by Smithsonian, Division of Birds. Costs estimated to be \$378,000 and time out of service was 48 hours.
4/19/2012	B-757-200	John F. Kennedy International (NY)	Climb (800 feet AGL)	Engine shut down, emergency landing	Engine	Double-crested cormorant	Captain saw a flock of birds (15-20) during climb out. Birds were ingested into the #2 engine causing the captain to shut the engine down and return to land about 10 minutes later. The engine suffered extensive internal damage. Runway sweep found no remains, but a sample was taken from the engine for submission. ID by Smithsonian, Division of Birds. A passenger near the engine took a video of the birds.
5/1/2012	C-172	Three Rivers Municipal (MI)	Climb (1 foot AGL)	Emergency landing	Propeller, nose, fuselage, wing strut, landing gear	White-tailed deer	Pilot was performing touch and go maneuvers when the aircraft struck a deer. Although the aircraft sustained substantial damage, the pilot was able to make a safe landing in Kalamazoo. The aircraft was sold for salvage.
6/4/2012	Bell-427	Near Indiantown, FL	En Route (800 feet AGL)	Avoidance maneuver, Emergency landing off airport, hard landing	Rotor head, pitch change rods (5 injuries)	Black vulture	Pilot tried to avoid the birds but felt something impact the upper right side near the main rotor mast area. Pilot elected to land in an open field The aircraft went into a spin and hit the ground hard then rolled over on its side. Everyone on board was able to exit on their own. Five people received minor injuries. NTSB investigated ERA12LA379. ID by Smithsonian, Division of Birds.
6/14/2012	EMB-175	Minneapolis-St Paul International (MN)	Climb (250 feet AGL)	Engine shut down, precautionary landing	Engine	American coot	During climb-out the engine ingested a bird or birds. Aircraft returned to land. The engine was totaled. Estimated cost was reported as \$5 million for a new engine. ID by Smithsonian, Division of Birds.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
6/14/2012	C-560	Lee C Fine Memorial (MO)	Landing roll	Part not reported	Landing gear	White-tailed deer	Aircraft struck a deer on landing. Bent nose wheel actuator. Ferried for repairs. Substantial damage. Time out of service was 75 days. Cost of repairs totaled \$190,000.
7/6/2012	Grumman AA-5A	Ray Community (MI)	Approach (3 feet AGL)	Avoidance maneuver	Destroyed	White-tailed deer	Pilot saw 2 deer near the runway. One ran across the runway and the pilot tried to avoid it. The deer struck the left wing and the plane went into a field. The nose gear was sheared off and the engine cowling was crushed. The underside of the fuselage and right horizontal stabilizer were substantially damaged. The aircraft was destroyed. NTSB investigated CEN12CA419.
7/9/2012	A-320	Southwest Florida International (FL)	Climb (2,000 feet AGL)	Engine shut down, precautionary landing	Engine	Black vulture	Engine ingestion caused compressor failure. Aircraft landed safely back at airport. Flight was cancelled. ID by Smithsonian, Division of Birds. Cost reported as \$2 million. Aircraft was out of service 2 days.
7/31/2012	B-737-900	Denver International (CO)	Approach (5,500 feet AGL)	Emergency landing	Radome, nose cone, tail, pitot tube	White-faced ibis	Aircraft struck birds 25 miles east of airport. Flight was re-routed to the nearest runway due to loss of airspeed sensor and limited visibility. Captain's pitot was damaged. Nose cone had a large dent and nose had a 10 x 14 hole. Vertical stabilizer had a small dent. Feather remains found in engine but no engine damage. NTSB investigated, case # CEN12IA502. ID by Smithsonian, Division of Birds.
8/14/2012	EMB-170	Charleston AFB International (SC)	Climb (3,000 feet AGL)	Precautionary landing	Engine	Anhinga	Aircraft struck several birds about 2 miles east of the airport. The right hand engine ingested a number of birds causing fan blade and acoustic panel damage. The aircraft returned for a safe landing. Passengers were rebooked on other flights. Aircraft was out of service 42 hours. ID by Smithsonian, Division of Birds.
9/20/2012	Learjet-36	Tweed-New Haven (CT)	Take-off Run	Aborted take-off	Wing, landing gear	White-tailed deer	Aircraft struck a deer on take-off roll at 100 knots. The pilot aborted take-off. Damage was found to the right wing near the fuselage and the right main landing gear. A patient was on board the air ambulance and was taken back to the hospital while the plane was being assessed. There were no injuries. Cost estimated to be in the millions.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
10/2/2012	C-550	Great Falls International (MT)	Climb (100 feet AGL)	Precautionary landing	Engine #1	Merlin	The #1 engine fan section was damaged and the engine was replaced. ID by Smithsonian, Division of Birds. Cost was \$500,000
10/3/2012	B-737-300	Bradley International (CT)	Descent (15,000 feet AGL)	Emergency landing	Radome, fuselage	Northern shoveler	During descent over Long Island Sound at about 15,000 feet AGL a loud bang was heard followed by loud air noise. The aircraft was in heavy cloud cover and visibility was poor. No birds were seen. Pilot declared an emergency. Aircraft landed safely. The fuselage and radome had significant damage. Skin was torn back from structural areas. ID by Smithsonian, Division of Birds. Aircraft was out of service for almost 3 days.
10/25/2012	B-757-200	Boise Air Terminal/Gowen Field (ID)	Climb (12,000 feet AGL)	Precautionary landing	Radome, nose, engine	Snow goose	Two to ten snow geese were struck at 15,000 feet MSL during climb from KBOI. A precautionary landing was made at KBOI. There was extensive damage to the radome and the #2 engine. Aircraft was out of service for 12 days. ID by Smithsonian, Division of Birds.
11/17/2012	C-550	Greenwood County (SC)	Landing roll	Other	Aircraft destroyed	White-tailed deer	Aircraft struck a deer just after touchdown. The deer struck the left leading edge of the left wing above the left main landing gear and ruptured an adjacent fuel cell. The pilot maintained directional control and stopped on the runway spilling fuel and on fire. The plane ignited a brush fire. The aircraft was destroyed in the blaze. Pilot and passenger got out safely. There were no injuries.
11/21/2012	C-402	Over Atlantic Ocean near Barnstable, MA	En Route (2,000 feet AGL)	Precautionary landing	Windshield (1 injury)	Red-throated loon	While en route from Barnstable to Nantucket over the ocean, a loon shattered the co-pilot's windshield. The aircraft, pilots and passengers were sprayed with blood. The co-pilot was cut and later treated in the ER. The aircraft returned to Barnstable Municipal Airport for a safe landing. Time out of service was 170 hours and cost for repairs reported as \$15,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
12/5/2012	CRJ200	La Guardia (NY)	Approach (7,000 feet AGL)	Other	Radome, wing, fuselage	Snow goose	While on approach encountered multiple bird strikes. Right wing leading edge, fuselage and radome were struck and damaged. Emergency equipment escorted aircraft to the gate. ID by Smithsonian, Division of Birds. NTSB investigated, case # DCA13CA066. Time out of service was 38 days. Cost of repairs totaled \$250,000. Other costs reported as \$114,000 noted as hangar storage during repairs.
12/18/2012	AEROS 350	Over the Florida Turnpike (FL)	En Route (500 feet AGL)	Precautionary landing off airport	Windshield (1 injury)	Turkey vulture	Miami-Dade Police Department helicopter made a precautionary landing at a Florida Turnpike Service Plaza following a birdstrike that penetrated the windshield and injured the pilot. Helicopter will be taken out on a flatbed truck.
1/24/2013	B-737-700	Sacramento International (CA)	Climb (1,500 feet AGL)	Precautionary landing	Engine	Snow goose	The aircraft had multiple strikes on climb-out, declared an emergency due to vibration in the #2 engine. They returned to land safely. The #2 engine had significant fan blade damage and the #1 engine had bird remains. ID by Smithsonian, Division of Birds. Time out of service was 24 hours. Cost of repairs reported as \$20,000 and other costs \$25,000.
2/8/2013	EC135	Near Viera, FL	En Route (1,000 feet AGL)	Precautionary landing	Windshield , rotor blades, fuselage (2 injuries)	Ducks	There was a large explosion and a bird struck the pilot in the face during a night flight. His goggles were knocked off and he was bleeding. The front canopy had blown out. The aircraft was slowed and they made a precautionary landing without incident. A second bird penetrated the left side co/pilot's window and that duck hit the nurse in the back seat injuring his arm. A couple of birds went through the rotor system damaging the blades and took a chunk out of the main rotor hub hat. The pilot was taken to the hospital. Time out of service was 2 weeks. Cost of repairs totaled \$70,000 and other costs totaled \$35,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
2/13/2013	Avions Fairey Topsy Nipper	Near Winters, CA	En Route	Impacted ground	Aircraft destroyed (1 fatality)	Turkey vulture	The experimental aircraft was destroyed when it impacted terrain after being struck by a turkey vulture. The pilot was fatally injured. Witnesses saw the aircraft wing separate from the aircraft after hearing a loud crack. ID by Smithsonian, Division of Birds. NTSB investigated, Case # WPR13FA123.
3/7/2013	A-320	Charlotte/Douglas International (NC)	Take-off Run	Aborted take-off	Engine, landing gear	Red-tailed hawk	Take-off was aborted when a red-tailed hawk was ingested into the #2 engine. The aircraft had to be towed back to the gate due to a flat tire caused by hot brakes from the high-speed aborted take-off. Fire Department trucks were called to the scene. Several fan blades were bent. Replaced fan set and repaired acoustical liner. ID by Smithsonian, Division of Birds. Time out of service 4 days.
3/24/2013	CRJ700	Calgary International (Canada)	Climb (500 feet AGL)	Engine shut down, precautionary landing	Engine	Canada goose	During initial climb a Canada goose was ingested into the #2 engine. The crew shut the engine down and returned to Calgary for a safe landing. Post flight inspection showed fan blade damage with a number of blade tips missing. Damage on the engine cowl suggests the blade tips exited through the top cowl. ID by Smithsonian, Division of Birds. Time out of service 17 days. Cost estimated to be \$1 million.
4/19/2013	PA-42	Edwin A Link Field (NY)	Take-off Run	Aborted take-off	Propeller	Wild turkey	Significant damage to the right propeller. Engine and rest of airframe while splattered with remains, were not damaged. Time out of service was 10 days. Costs of repairs totaled \$90,000.
5/25/2013	AEROS 350	near Nevada, MO	En route (1,200 feet AGL)	Precautionary landing	Nose	American coot	Bird was struck at night causing a large hole in the nose on the left side. ID by Smithsonian, Division of Birds. Time out of service was 12 days. Cost estimated to be \$55,000.
6/8/2013	Vans RV7	Vinton Veterans Memorial Airpark (IA)	Landing roll	None	Wing, fuel tank, fuselage	White-tailed deer	Just after touchdown, pilot saw three deer and struck one. Pilot was able to maintain directional control.
8/17/2013	C-172	Greater Kankakee (IL)	Climb (10 feet AGL)	Precautionary landing	Nose, propeller, fuselage, landing gear	White-tailed deer	Aircraft was out of service at least a month. Costs estimated at \$15,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
8/22/2013	MD-82	Dallas/Fort Worth International (TX)	Climb (500 feet AGL)	Precautionary landing	Engine	Swainson's hawk	Struck a bird on departure, declared an emergency and returned for an uneventful, overweight landing. Taxied to gate under own power. Fan blades were heavily damaged. It appeared more than one bird might have been ingested. ID by Smithsonian, Division of Birds. Aircraft out of service 35.5 hours.
8/24/2013	MD-11	Newark Liberty International (NJ)	Approach (400 feet AGL)	Radar impaired	Radome	Herring gull	Bird was struck on short final. Pilots saw bird strike radome then radar cut out. Radome was destroyed. ID by Smithsonian, Division of Birds. Aircraft was out of service for 3 days. Costs totaled \$17,240
8/29/2013	C-750	Napa County (CA)	Landing roll	None	Wing	Mule deer	Aircraft struck a deer upon landing and exited the runway without assistance. There was substantial damage to the right wing. Pilot did not see the deer, only felt a slight bump. Co-pilot saw the deer approaching from the right but did not have time to warn the pilot. Time out of service was 1 month. Cost estimated to be between \$230,000 and \$250,000.
9/1/2013	BE-36	Ashland Regional (KY)	Landing roll	None	Nose, propeller, spinner, alternator, wings, fuselage, landing gear, tail	Canada goose	Airport removed 16 birds from the runway. Aircraft was not airworthy after the strike. Time out of service and costs not reported.
9/2/2013	B-737-700	Raleigh-Durham International (NC)	Take-off Run	Engine shut down, precautionary landing	Engine	Canada goose	During take-off run, at least one large bird was ingested in the #1 engine. Tower advised that there was smoke and flame. There were erratic engine indications. The engine was shut down and the aircraft made an emergency landing safely. One fan blade was replaced. Cost of repairs was \$12,500. Cost of re-routing passengers not reported.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
9/2/2013	B-737-700	Bishop (MI)	Climb	Precautionary landing	Angle of attack vane, wing, engine	Herring gull	During rotation at take-off, several birds were struck. The aircraft made a safe landing. Aircraft had lost some systems and needed to make easy turns to come back. The Captains' AOA vane was sheared off. Bird remains were found in the left wing, #1 engine inboard cell. Another aircraft was used to continue the flight. Time out of service was 24 hours. Cost totaled \$37,688.
9/7/2013	Bell-206	Near Amistad, NM	En route (300 feet AGL)	Avoidance maneuver	Destroyed (2 injuries)	Unknown large birds	Not a strike but effected flight. Pilot tried to avoid multiple large black birds in the flight path. The abrupt maneuver resulted in an impact with terrain. Both the pilot and a crew member received minor injuries. The aircraft was destroyed. It was valued at over \$800,000. NTSB investigated, case # CEN13TA535.
9/12/2013	C-525	Porter County Municipal (IN)	Take-off Run	Aborted take-off	Engine	Red-tailed hawk	Bird was ingested during take-off. Extensive internal damage to the engine. Time out of service was 19 days. Cost totaled \$330,000.
9/13/2013	PA-28	Near Princeton, MN	En Route	Precautionary landing	Destroyed	Bald eagle	During flight instruction, a bald eagle struck the right horizontal stabilizer. The instructor took the controls and declared an emergency. He proceeded to land at the nearest airport. The rudder controls were impaired. A large dent was found on the right horizontal stabilizer with feathers embedded in it. The tail cone had been pushed upward and was in contact with the rudder, impeding its movement. The insurance company determined the aircraft as a total loss based on cost of repairs. Repairs cost would have exceeded \$45,000.
9/22/2013	C-172	College Park (MD)	Approach (800 feet AGL)	Aircraft controls effected	Windshield (2 injuries)	Unknown medium bird	Bird struck propeller and penetrated the windshield when aircraft was approximately 7 miles from the airport. Pilot and front seat passenger sustained minor cuts. The strike required emergency approach as the aerodynamics were significantly affected. Navigation and communication were almost impossible with the wind in the cockpit. Costs totaled \$9,400.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
10/8/2013	B-767-300	John F. Kennedy International (NY)	Approach (100 feet AGL)	Schedule interruption	Engine, wing fuel dump nozzle	Canada goose	Pilot saw and struck 20-30 birds on approach. Engine ingested numerous birds causing compressor damage. The engine was replaced. Left wing fuel dump nozzle was also damaged. Passengers were housed in a hotel and flight departed the next day.
10/9/2013	C-310	Leo Goetz County (MI)	Approach (5 feet AGL)	Landing gear collapsed	Destroyed	White-tailed deer	Pilot was in the landing flare just prior to touchdown when he saw 3 deer run onto the runway. One was struck by the left main landing gear. The collision folded the gear aft and the left wing contacted the runway as the plane touched down. The aircraft slid down the runway and veered off the left side before coming to rest. Substantial damage to the left wing and aileron. Aircraft was salvaged. Repairs costs reported to be approximately \$180,000.
10/12/2013	C-525	Lincoln (NE)	Climb (1,200 feet AGL)	Precautionary landing	Wing	American white pelican	During climb, the flight crew noted a flock of birds 7-8 miles northeast of the airport. They struck one with the right outboard wing. After noting substantial wing damage, they returned to the airport and landed without incident. Costs totaled \$258,083. NTSB investigated, case # CEN14LA063. ID by Smithsonian, Division of Birds.
10/18/2013	B-747-400	Dallas/Fort Worth International (TX)	Take-off Run or climb	Engine shut down, fuel dump	Engine, flight diverted	American coot	On departure struck birds in the #1 engine. Engine shut down, flight was diverted to KLAX and the flight to KBNE was cancelled. Engine vibration. Fuel was dumped. Two fan blades were replaced, later entire engine was changed out. Passengers were put up in hotels overnight. Aircraft was out of service for two days. Cost for engine repairs was \$40,000. ID by Smithsonian, Division of Birds.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
10/20/2013	AEROS 350	Near Madison, MS	En Route	Pilot's vision impaired. Emergency landing off airport	Windshield, dash, doors (3 injuries)	Black vulture	Pilot was climbing through 1,300 feet when he felt an explosion in his face that knocked his visor up affecting his visibility and crew communications. He landed safely in a field. Both windshields were blown out, the cabin shell was damaged. Both cabin doors were blown open and came off the top sliding track. Onboard medical equipment was missing. All 3 crew members received minor injuries after being struck by pieces of the windscreen or dash. There was no patient onboard. ID by Smithsonian, Division of Birds. Cost estimated to be \$175,000. Aircraft still out of service as of March 11, 2014.
11/15/2013	MD-83	Mineta San Jose International (CA)	Climb (900 feet AGL)	Engine shut down, precautionary landing	Engine	White-headed gull	Multiple birds were struck during climb. At least one bird was ingested. The engine was shut down as a precaution. The crew declared an emergency and returned to land safely. ID by Smithsonian, Division of Birds as white-headed gull (<i>Larus sp.</i>). Insufficient diagnostic material for more specific ID.
12/1/2013	BE-35	Placerville (CA)	Landing roll	Ran off runway	Destroyed	Mule deer	Aircraft struck a deer with the right wing during landing roll and veered off the runway down an embankment. The aircraft was destroyed.
12/5/2013	CRJ200	LaGuardia (NY)	Approach (7,000 feet AGL)	None	Radome	White-headed gull	Multiple birds were struck during climb. At least one bird was ingested. The engine was shut down as a precaution. The crew declared an emergency and returned to land safely. ID by Smithsonian, Division of Birds as white-headed gull (<i>Larus sp.</i>). Insufficient diagnostic material for more specific ID.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
12/20/2013	Challenger 300	Naples Municipal (FL)	Climb (1,800 feet AGL)	Precautionary landing	Engine, tail	Turkey vulture	About 2 minutes after take-off at 1,800 feet AGL, a large (50+) kettle of turkey vultures was encountered. Bottom edge of the kettle was impacted. Estimate 4-5 birds struck. Upon impact to left engine and vertical stabilizer, a very significant increase in noise and vibration was noted. Engine parameters were fairly normal with the exception of Eicas message for vibration. An emergency was declared and a normal landing was made at KRSW. At least one bird was ingested. The engine was shut down by the pilot upon exiting the runway. ID by Smithsonian, Division of Birds. Damage costs reported as \$800,000 and other costs reported as \$90,000.
12/23/2013	B-737-300	Lambert-St. Louis International (MO)	Climb (1,500 feet AGL)	Engine shut down, precautionary landing	Engine, wing	Mallard	Multiple birds were struck during climb. At least one bird was ingested. The engine was shut down as a precaution. The flight returned to land safely. There was a 12 to 14 inch hole in the leading edge of the right wing. Fan blades are missing or bent. A full set of fan blades was replaced. ID by Smithsonian, Division of Birds. Time out of service was 3 days. Costs totaled \$493,584.
1/19/2014	C-195B	Winchester Regional (VA)	Landing roll	Evasive maneuver	Wing, landing gear	White-tailed deer	While practicing touch and go landings, the aircraft veered off the runway and into a rut. Damage to left wing and the left landing gear was torn off. Pilot stated he tried to avoid three deer. Airport closed for four hours and at least two flights diverted.
1/19/2014	EMB-135	Lafayette Regional (LA)	Approach (2,000 feet AGL)	Engine shut down	Nose, engine	Snow goose	Multiple birds were struck on approach resulting in the failure of the #1 engine and skin damage to the nose. An emergency was declared. One hit the windshield but did not cause any damage. Passengers were deplaned normally. The engine was replaced. ID by Smithsonian, Division of Birds.
2/9/2014	B-737-300	Cleveland Hopkins International (OH)	Take-off Run	Aborted take-off	Engine	Snowy owl	Bird was struck during take-off run. Pilot aborted take-off. A complete fan blade change was made. Borescope and high energy stop inspections were done. Costs estimated as \$22,895 for repair, parts, inspection and labor. ID by Smithsonian, Division of Birds.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
2/22/2014	PA-32	Page Field (FL)	Approach (1,000 feet AGL)	Emergency landing	Windshield	Red-shouldered hawk	About 10 miles out from Page Field, a hawk shattered the windshield cutting the pilot on his forehead. A mayday call was made and the aircraft landed safely. The incident was videotaped. Remains were collected. ID by Smithsonian, Division of Birds. Time out of service was about 1 week and costs for repair totaled approximately \$2400.
3/13/2014	BE-400	Greater Rochester International (NY)	Climb (400 feet AGL)	Engine shut down, precautionary landing	Aircraft destroyed	Herring gull	After liftoff, the crew caught a glimpse of what appeared to be a large bird go past them and immediately afterwards, they felt a high vibration and the loss of the right engine power. They declared an emergency and went back to the departure airport for a safe landing. Estimated cost of aircraft was \$1.5 million. ID by Smithsonian, Division of Birds.
4/25/2014	Hawker 800	Philadelphia International (PA)	Climb (700 feet AGL)	Engine shut down, precautionary landing	Nose, engine #1, fuselage	Double-crested cormorant	Airport Ops responded to Alert 1 and accompanied aircraft back to hangar. Costs reported as \$800,000. Aircraft out of service approximately one week. ID by Smithsonian, Division of Birds.
5/13/2014	BE-400	Sugar Land Regional (TX)	Take-off Run	Aborted take-off	Engine #1, wing, fuselage	Yellow-crowned night-heron	Pilots were about to call out V-Speed V1 when Captain saw the bird which looked like it hit the side of the nose below his side window. It flew back and through the engine. Pilots aborted takeoff successfully. They received warning of a fire in the engine compartment, deployed fire extinguisher bottles and put the fire out. Sugar Land FD responded. Fuel was leaking from wing and engine nacelle. Absorbent material was laid down to prevent further contamination of pavement. Metal debris was retrieved from runway. Damage to engine was severe. A hole on top and two holes on side of engine cowling looked burnt. Fuselage damage from metal debris from the engine looks like scratches. Aircraft was repositioning to another airport and was empty. NTSB investigated case # ENG14IA013.

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5/27/2014	A-320	Logan International (MA)	Climb (88 feet AGL)	Precautionary landing	Engine #2	Mallard	Pilot reported striking birds just after rotation and returned to land. Aircraft taken out of service for inspection. Maintenance reported 14 damaged fan blades and damage to fan case liners resulting in an engine swap. Borescope found core compressor damage. Engine was sent to factory in Germany for a complete overhaul. Estimated cost of repair reported as \$3,000,000. Aircraft out of service 36 hours. ID by Smithsonian, Division of Birds.
5/28/2014	EMB-135	Cherry Capital (MI)	Approach (3,500 feet AGL)	Schedule interruption	Radome, nose, instrument panel	Common loon	During approach at about 10 miles out, a bird penetrated the forward pressure bulkhead and went into the back of the instrument panel. Pilots were struck with bird remains. A safe landing was made. Partial instrument panel loss. The aircraft was patched and ferried to complete the final repairs. Aircraft out of service 3.9 months. NTSB investigated case # CEN14LA262. ID by Smithsonian, Division of Birds.
6/10/2014	B-767-300	Denver International (CO)	Climb (400 feet AGL)	Engine shutdown, precautionary landing	Engine #1, wing	Canada goose	Pilot reported seeing 5 geese on climb out from runway 8. One bird ingested with engine vibration reported. Engine was shut down and aircraft returned to airport. Damage to leading edge of right wing and damage to 25-30 fan blades within #1 engine. Remains of two birds, ingested bird and whole bird, collected from runway safety area along with pieces of fan blades. Costs reported as \$3.9 million. ID by Smithsonian, Division of Birds.
7/7/2014	B-737-800	Pohnpei International (Micronesia)	Landing roll	Schedule interruption	Engine #2	Ruddy turnstone	Engine #2 struck by birds and as a result eight engine blades were dented. Cancelled the future departure clearance they had received due to the reported engine damage. Based on the feather collected assumed to be ruddy turnstone.
8/9/2014	A-321	Luis Munoz Marin International (PR)	Take-off Run	Aborted take-off, engine failure	Engine #1	Red-tailed hawk	Ingestion resulted in engine failure, rejected take-off and evacuation on adjacent taxiway. Multiple minor injuries sustained during evacuation. Engine replacement required. Costs reported as \$6.5 million. Aircraft out of service 5 days. ID by Smithsonian, Division of Birds.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
8/10/2014	Bombardier de Havilland Dash 8	Harrisburg International (PA)	Take-off Run	Aborted take-off	Engine #2 and propeller, passenger window	Canada goose	At the start of take-off, aircraft struck several Canada geese. One struck and broke a passenger window after hitting the right engine propeller and damaging it. ID by Smithsonian, Division of Birds.
9/25/2014	C-208B	Kenai Municipal (AK)	Climb (1,100 feet AGL)	Precautionary landing, declared emergency	Landing gear	Bald eagle	Declared an emergency for priority landing and emergency services. Nose gear spring bar was disconnected making steering difficult. Cost of repairs \$2,315. Aircraft out of service for 18 hours.
9/26/2014	C-172S	15 miles west of Rochester (NY)	En Route	Precautionary landing	Windshield	Double-crested cormorant	Bird penetrated the windshield and was inside the aircraft after landing. Half of windshield was blown out. ID by Smithsonian, Division of Birds.
10/2/2014	AEROS 350	11NM SE Levelland, TX	En Route (1,500 feet AGL)	Precautionary landing	Nose	Mallard	Hole in nose of aircraft and cabin floor.
10/2/2014	Challenger 604	Portland International (OR)	Approach (1,000 feet AGL)	None	Wing	Osprey	Struck bird on 2 mile final. Damage to leading edge of left wing. Costs of repairs (\$71,000) to replace a wing fairing and a wing rib. Crew lodging (\$6,050), lost revenue (\$61,000), temporary repair at airport (\$17,000), cost to ferry aircraft to St Louis for repairs (\$20,000). Aircraft was out of service for 14 days. ID by Smithsonian, Division of Birds.
11/20/2014	A-320	San Francisco International (CA)	Take-off Run	Aborted take-off	Engine #1, engine #2	Dunlin	Both engines ingested birds and have bent fan blades.
11/22/2014	B-737-700	Sacramento International (CA)	Approach (1,800 feet AGL)	None	Radome, nose	Snow goose	Pilot saw a flock of large birds on seven mile final. Strike occurred on right side of the radome just below the First Officer causing a 2- foot dent. Engine ingestion. Aircraft was out of service for one day. ID by Smithsonian, Division of Birds.
11/22/2014	A-320	Sacramento International (CA)	Approach (1,100 feet AGL)	Engine shutdown	Engine #1, left wing, fuselage	Snow goose	Numerous bird strikes on approach at approximately 1,100 feet AGL. At 600 feet engine #1 began overheating due to ingestion and the pilot shut it down. Damage to compressor was beyond limits and necessitated engine removal for repair. ID by Smithsonian, Division of Birds.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
11/27/2014	A-330	Miami International (FL)	Climb (300 feet AGL)	Engine shutdown, precautionary landing	Engine #2	Turkey vulture	One bird suddenly appeared after liftoff. Aircraft returned single engine to land back at MIA as Alert II. Six fan blades damaged. Damage to rear acoustic panels. Aircraft was out of service for 12 days. ID by Smithsonian, Division of Birds.
11/28/2014	A-330	Charlotte/Douglas International (NC)	Climb (1,500 feet AGL)	Precautionary landing, fuel burn	Engine #1	Diving duck	Engine ingestion 2nm from airport. Ingestion caused the engine to stall. Flight crew decided to return to KCLT but had to burn off fuel for approximately two hours to reach landing weight. Aircraft landed without incident. Multiple fan blades damaged. Fan rotor replacement and balance and thrust reverser change. Aircraft was out of service for 2 days. ID by Smithsonian. Division of Birds.
12/3/2014	CRJ200	Sacramento International (CA)	Approach (1,500 feet AGL)	None	Radome, left wing flaps, fuselage	Snow goose	Major bird strike while on approach. Blood smears, feathers and bird remains were visible on the nose, windshield, leading edge of both wings, flaps and in both engines. Remains were embedded in the nose. Time out of service was 8 days. Total costs were \$213,598. ID by Smithsonian, Division of Birds.
12/12/2014	B-737-700	Baltimore/Washington International (MD)	Approach (3,000 feet AGL)	Precautionary landing	Radome, nose, engine #1, engine #2, wing, fuselage, tail	Canada goose	Hit a flock of birds with several impacts. Ingested into both engines. Engine #2 fire that went out. Landed immediately.
12/12/2014	B-737-700	Sacramento International (CA)	Approach (2,000 feet AGL)	Emergency landing	Engine #2, engine cowling	Greater white-fronted goose	Hit a flock of birds on approach. Ingested at least one bird into the #2 engine. Emergency declared due to compressor stalls, asymmetrical thrust and flames coming from back of engine. ID by Smithsonian, Division of Birds.
1/3/2015	B-737-300	Denver International (CO)	Approach (150 feet AGL)	Engine shutdown	Engine #1	Canada goose	Shut down engine on taxi as precaution. Number 1 engine struck and damaged with some fan blade damage. ID by Smithsonian, Division of Birds.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
1/7/2015	B-757-200	Portland International (OR)	Climb (972 feet AGL)	Precautionary landing	Engine #1	Northern pintail	Emergency landing. Pilot reported a bad vibration immediately after takeoff. Runway inspection revealed five Northern pintail carcasses. At least one ingested into engine #1 damaging fan blades and cowling. Estimated cost of repairs (\$5 million), other costs (\$452,320). Aircraft was out of service for 11 days.
3/23/2015	B-737-800	Dallas/Fort Worth International (TX)	Climb (1,800 feet AGL)	Precautionary landing	Engine #1, wing, landing gear door	Ring-necked duck	Returned on Alert II conditions. ID by Smithsonian, Division of Birds. Time out of service was 4 days.
3/31/2015	CRJ200	Minneapolis-St Paul International (MN)	Climb (5,000 feet AGL)	Precautionary landing	Wing	Bald eagle	Right wing leading edge dent 20-24 inches long, located mid-section of right wing. Returned for inspection. Repair costs (\$50,000). ID by Smithsonian, Division of Birds.
4/9/2015	B-737-800	Dallas/Fort Worth International (TX)	Climb (50 feet AGL)	Emergency landing	Engine #2	Swainson's hawk	During climb, reported severe vibration in engine #2. Emergency declared and returned to airport. Damage found to several of the impeller blades of the engine. ID by Smithsonian. Division of Birds.
4/25/2015	A-319	Jacksonville International (FL)	Climb (350 feet AGL)	Precautionary landing, emergency	Engine #2, landing gear	Canada goose	Two Canada geese struck aircraft on the right side. One in the #2 engine and the other on right landing gear. Tower reported flames out of the #2 engine. Pilot declared an emergency for landing gear issue. Runway 8 closed for debris. Aircraft made an uneventful landing on runway 14. Aircraft time out of service reported as 20 days. Estimated costs of repairs (\$1.5 million) and other costs (\$30,000).
4/30/2015	CRJ700	LaGuardia (NY)	Climb (200 feet AGL)	Precautionary landing, flight cancelled	Wing	White-headed gull	First officer advised they received a slat fault indication and declared an emergency landing. Damage caused to the inboard slats on the leading edge and aircraft will be out of service for repairs. Flight was cancelled and passengers were rebooked on another flight. ID by Smithsonian, Division of Birds.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
4/30/2015	C-172R	Rusk County (TX)	Take-off Run	Aborted take-off	Horizontal stabilizer	White-tailed deer	Incident occurred during rotation during a touch and go procedure. Small button buck was struck by the horizontal stabilizer when the nose wheel was off the ground and the main gear was just leaving the ground. At approximately 40 AGL the pilot determined that there was adequate runway to safely land. Pilot reduced power and made a normal controlled landing. Extensive skin damage to the left half of the horizontal stabilizer including dents, ripples in skin, cracked and chipped paint.
5/18/2015	B-757-200	Honolulu International (HI)	Climb (7000 feet AGL)	Precautionary landing, engine vibration	Engine #1	White Tern	A small part of the engine was damaged and broken off. Aircraft time out of service reported as 1 day. ID by Smithsonian, Division of Birds.
5/26/2015	B-737-800	Simón Bolívar International (Venezuela)	Approach (300 feet AGL)	Engine shutdown	Engine #2	New world vulture	Damage required engine change. Aircraft time out of service reported as 6.5 days. Repair costs (\$1 million) and other costs (\$500,000). U.S. Carrier.
6/3/2015	A-320	LaGuardia (NY)	Approach (300 feet AGL)	Go-around	Landing gear	Herring gull	Bird struck left main gear shearing the landing gear sensor. Aircraft to remain overnight and ferry out to conduct gear swing testing. Aircraft time out of service was 5 hours. Repair costs (\$825). ID by Smithsonian, Division of Birds.
6/4/2015	Grumman AA5	Springhill (LA)	Landing roll	Aircraft controls effected	Aircraft destroyed	White-tailed deer	On final approach pilot unable to see the runway clearly due to setting sun. Left wing struck a deer during the landing roll causing the aircraft to veer left off runway, collapsing gear. Damage to both wings, upper and lower cowling, spinner, all gear and wheel fairings, aft fuselage, flight controls, engine mount and oil cooler. Aircraft transferred to salvage.
6/5/2015	A-319	Austin Straubel International (WI)	Take-off Run	Emergency	Engine #2	Gulls	Significant damage to the #2 engine to include damaged first stage fan blades and damage to the interior of the cowl. Engine vibration. Removed and replaced the engine.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
6/22/2015	Learjet-35	Grosse Ile Municipal (MI)	Take-off Run	Precautionary landing, Aircraft controls effected	Wing	White-tailed deer	On takeoff roll while accelerating through 130 knots a faint bump was felt. Flight crew continued the take off and experienced difficulty controlling the aircraft but were able to stabilize the aircraft in flight. Flight crew reported no annunciations or warnings on the flight deck. They were able to identify the damage to the leading edge of the right wing. Flt crew diverted to an alternate airport and landed without incident. Substantial damage to the right wing. Following the accident, the deer was found on the runway at the departure airport.
6/23/2015	A-320	Orlando International (FL)	Climb (3000 feet AGL)	Precautionary landing, emergency	Windshield	Unknown large bird	Both pilot and co-pilot saw a very large bird about 1 second before it impacted the First Officer's forward windshield near upper frame. Upper part of window showed considerable cracking and some fine particles came into the cockpit. Decided to stay low and return because of pressurization and structural uncertainty. Two display units failed on impact. Declared an emergency and made an overweight landing uneventfully. Time out of service 26 hours. Costs reported as \$6700.
7/14/2015	B-747-400	Ted Stevens Anchorage International (AK)	Climb (50 feet AGL)	Engine shutdown, fuel jettison	Engine #4	Bald eagle	Two eagles observed together at 50 feet AGL at end of runway catching thermals. Last 200 feet of runway, 1 bird was ingested into #4 Engine. Fuel was dumped to the south. Time out of service 60 hours. Repair costs (\$1 million). Assume 31,000 gallons dumped as B-747-400 has fuel capacity of 48,445 gallons. Polar air could not confirm as records had been discarded.
7/25/2015	PA-24-250	Philip (SD)	Approach (2 feet AGL)	Crash landing	Windshield , wing, fuselage, tail, lights	Deer	Repair costs (\$40,000).

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
7/31/2015	Challenger 300	Columbus (GA)	Take-off Run	Precautionary landing	Engine #2	Mourning dove	Slight airframe/engine vibration and noise during climb. Elected to return for a precautionary landing. Replaced 4 fan blades, fan inlet housing, frangible sleeve, #1 bearing, #1 carbon seal, spinner cover ring and 7 stator grommets. Time out of service 216 hours. Repair costs reported as \$196,000 and other costs reported as \$65,388. ID by Smithsonian, Division of Birds.
8/10/2015	C-152	Ohio State University (OH)	Take-off Run	Aborted take-off	Windshield	Red-tailed hawk	Bird circled in front of aircraft on take-off. Struck and shattered windscreen resulting in aborted take-off.
8/20/2015	CRJ200	Port Columbus Airport (OH)	Take-off Run	Precautionary landing, emergency	Engine #2	Red-tailed hawk	Aircraft conducted an Alert 1 return to airport after ingesting a bird resulting in engine vibration. Runway inspection revealed a large debris field of remains consistent with ingestion. Aircraft has at least three damaged fan blades. Runway closed for approximately 25 minutes for cleanup. Time out of service approximately 24 hours. ID by Smithsonian, Division of Birds. Photos.
9/8/2015	B-747-400	Amsterdam Schiphol (Amsterdam)	Take-off Run	Vibration, Precautionary landing, fuel jettison	Engine #2	Gull	Engine #2 ingested a Gull and damaged 5 fan blades. Engine vibration. Jettisoned 130,000 pounds of fuel. Aircraft time out of service approximately 20 hours. Repair costs (\$30,000), other costs (\$35,000).
9/23/2015	EC135	(CA)	En Route	Emergency landing	Windshield (1 injury)	Unknown	Reported a birdstrike with injury that requested emergency landing and ambulance. Passenger in rear of aircraft sustained a cut in the neck from flying glass from the broken windshield.
10/8/2015	A-330	Seattle-Tacoma International (WA)	Climb	Precautionary landing, engine flame out	Engine #2	Red-tailed hawk	Bird struck at V1 with nose wheel off the ground. Engine #2 flamed out and made a loud bang. Remains from the engine and the runway analyzed separately by the Smithsonian. ID by Smithsonian, Division of birds. Aircraft time out of service approximately 24 hours. Repair costs (\$2 million), other costs (\$200,000).

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
10/26/2015	EC130	(KY)	En Route	Avoidance maneuver, Precautionary landing off airport	Fuselage, greenhouse window (1 injury)	Black vulture	Bird flew into path of aircraft, pilot started to turn left to deviate from the flight path of the bird. Once contact seemed imminent pilot banked the aircraft to the left in an effort to miss the bird. Bird contacted aircraft in the right greenhouse window and entered the aircraft. The window along with the upper plastic lining of the ceiling of the aircraft broke free and continued rearward along with the bird striking the paramedic in the face. Medic was wearing his issued helmet and had his tinted visor down at the time of the impact. Conducted precautionary landing and landed safely in an open field. Once safely on the ground the pilot and nurse evaluated medic for minor injuries. Local police, fire and EMS notified. Medic transported by ambulance to the ER. Reported as Black vulture.
10/26/2015	Czech Sport, Piper Sport	Collin County Regional Airport at McKinney (TX)	Climb (400 feet AGL)	Precautionary landing	Windshield	Turkey vulture	Bird struck right side of canopy and shattered the glass over the airport threshold. Sole occupant was not injured.
11/10/2015	Bell-427	(FL)	En route	Engine shutdown	Windshield (1 injury)	Turkey vulture	Entire bird penetrated the windshield into the cockpit where it settled against the pilot's leg. Minor scratch to pilot. Flight aborted immediately and landed asap. Repair costs (\$20,000).
12/22/2015	CRJ200	Charlotte-Douglas International (NC)	Landing roll	None	Landing gear	Coyote	Crew reported seeing one coyote on runway and possibly striking the specimen during landing roll. Taxied to gate without incident. Carcass of one coyote found near the taxiway intersection. The runway was closed for less than one hour for cleanup of remains due to the strike. The hydraulic line was found damaged on the landing gear. Aircraft taken out of service and the next flight was delayed for an unknown amount of time due to inspections and damage.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
12/26/2015	B-737-300	Sacramento International (CA)	Climb	Precautionary landing	Tail	Canada goose	Reported as two ducks with primary impact points having been found. One struck the lower right hand side of the nose with no damage. The other bird impacted the left horizontal stabilizer approximately one foot from the outer end with extensive damage to the leading edge and caved in a section approximately eight to ten inches. Bird remains penetrated the tail and remained throughout the flight. ID by Smithsonian, Division of Birds.
1/8/2016	A-320	Sacramento International (CA)	Approach	None	Engine #2 cowling, Wing, Pitot tube	Greater white-fronted goose	Multiple bird strikes on downwind approach. Aircraft taken out of service for repairs. ID by Smithsonian, Division of Birds.
2/18/2016	C-172	Dexter Municipal Airport (MO)	Climb	None	Wing	Goose	Four miles south east of KDXE. Large dent and tear in the skin of the right wing leading edge. Damage was found post flight. Aircraft time out of service estimated at 3900 hours.
3/6/2016	Bell-407	(FL)	En Route	Precautionary landing	Windshield	Herring gull	Bird penetrated windshield and entered cockpit. Struck the pilot who was wearing a helmet with the sun visor down. Aircraft time out of service approximately 1025 hours.
3/28/2016	Gulfstream 150	Wilmington International Airport (NC)	Climb	None	Wing	Herring gull	Damage to right wing leading edge. Total aircraft time out of service approximately 240 hours. Estimated cost of repairs \$110,000. ID by Smithsonian, Division of Birds.
4/4/2016	C-525	Smith Reynolds Airport (NC)	Landing roll	Avoidance maneuver	Nose cone, avionics	White-tailed deer	Pilot advised he applied the brakes when he saw four deer crossing the runway. At the point of impact with one deer, the aircraft was traveling at approximately 40 knots. The deer hit the nose cone and the aircraft suffered damage to the avionics behind the nose cone. No other areas of the aircraft appeared to be damaged. Estimated costs of repair \$100,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
4/10/2016	EMB-170	Key West International Airport (FL)	Climb	Engine shutdown, emergency landing	Engine #1	Turkey vulture	During takeoff roll after V1 was called by non-flying pilot, a large black/dark bird was noticed by the flying pilot sitting on the runway centerline approximately 100 feet in front of the aircraft. The nose was raised for standard takeoff profile and the bird started to leave the center line of the runway to the aircraft left. Loud nose heard and the engine failed. Aircraft control was maintained and the takeoff was continued. An emergency was declared, emergency landing conducted with no injuries reported. Total aircraft time out of service approximately 100 hours. Estimated costs of repairs \$1 million. Estimated other costs \$500,000. ID by Smithsonian, Division of Birds.
4/20/2016	C-172	2 miles SW Birchwood Arpt (AK)	En Route (900 feet AGL Est.)	Impacted terrain	Aircraft destroyed (4 fatalities)	Bald eagle	Possible bird snarge recovered from tail structure following the accident. The included feather was located in a small sampling near the initial impact point through the trees and first pieces of debris.ID by Smithsonian, Division of Birds. NTSB ID: ANC16FA019. Height reported as 800-1000 AGL, took average of 900. Speed reported as 100kts est. Species ID by Smithsonian from feather barbules removed from tail section and a whole feather on the ground. Immature Bald Eagle. Four fatalities.
4/26/2016	A-319	Dallas Love Field Airport (TX)	Climb	Precautionary landing	Engine #2	Rock pigeon	Pilot stated he saw 3-4 birds flying left to right on take-off roll. After rotation heard a continuous loud noise from engine #2 and decided to make a precautionary landing. All engine instruments indicated normal operation. Less than 2 miles from the airport. Distortion to three fan blades. Total aircraft time out of service 24 hours. Estimated costs of repairs \$430,000 and \$10,000 other costs.
5/6/2016	EMB-145	(MD-DC)	En Route	None	Windshield	Unknown large bird	Pilots heard loud noise and noticed outer layer of co-pilots windshield was shattered. Entire window shattered into hundreds of pieces. IMC conditions. Location reported as 30 miles NE KBWI at approximately 11,000 feet MSL.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
5/11/2016	RV-8 (homebuilt)	Dillant-Hopkins Arprt (NH)	Landing roll	Loss of directional control	Wings, tail, fuselage (1 injury)	White-tailed deer	Per flight instructor, during landing roll, two deer ran into the runway. He reported that the aircraft struck one of the deer and exiting the right side of the runway and nosed over inverted. The aircraft sustained substantial damage to the vertical stabilizer and rudder. There is damage to the left and right wing tips and about four inches surrounding the leading edge of both wings near the wing tip, the belly of the fuselage, underneath the engine compartment and directly behind the prop sustained damage as well. The landing gear is intact. Minor injury.
5/24/2016	EMB-170	Ronald Reagan Washington Intl Airport (DC)	Climb	Engine shutdown, precautionary landing	Engine #1	Unknown medium bird	Lost Engine #1 and declared an emergency. Severe damage to engine. Crew ran the emergency checklists, left engine at idle and returned to KDCA for an uneventful landing. Engine fan blade damage requiring engine replacement. Total aircraft time out of service 48 hours. Estimated costs of repairs \$1 million. Other costs \$100,000.
6/7/2016	B-737-700	Boise Air Terminal/Gowen Field (ID)	Take-off Run	Aborted take- off	Engine #2	Mallard	Flight crew heard a loud bang and aborted the take-off. On post flight inspection, Captain noticed bent fan blades on Engine #2. Maintenance removed and replaced engine #2 fan blade set. ID by Smithsonian, Division of Birds.
6/9/2016	PA-32-300	Lincoln Park Airport (NJ)	Landing roll	Aircraft controls effected	Landing gear	White-tailed deer	Struck a deer after landing runway 1. Right landing gear was torn off the aircraft.
6/29/2016	C-172	(TX)	En Route	Emergency landing	Windshield (2 injuries)	Unknown bird	Training flight approximately 13 miles from KDWH. On their way back to KDWH both pilots noticed a flock of birds in the distance to the right and below the aircraft. One bird penetrated the windshield with debris on both pilots. The bird struck the pilot, exited through the right window and then struck the wing. Minor injury to both pilots.
7/3/2016	Learjet-45	Mason County Airport (MI)	Climb	Diverted to KMKG	Engine #1	American crow	Damage to 15 fan blades. Engine ran fine. Did not know the extent of the damage until post flight at alternate airport. Total aircraft time out of service 720 hours. Estimated costs of repairs \$200,000. Other costs \$10,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
7/10/2016	C-310	Graham Municipal Airport (TX)	Take-off Run	Aborted take-off	Windshield	Red-tailed hawk	Broken windshield. Plane will be out of service approximately 504 hours. May also need paint work. Estimated costs of repairs \$7,000. Other costs \$750.
8/7/2016	BE-90	(CO)	Climb	Engine shut down	Engine	Unknown bird(s)	Pilot reported flying into a flock of birds. Lost function from one of the engines due to engine ingestion while ascending during sky diving operation. All thirteen sky divers exited several thousand feet short of the normal jump altitude. All divers landed and were recovered safely despite being scattered in the surrounding area. Pilot returned to airport and landed without incident. NTSB investigation pending.
8/22/2016	Bell-407	(TX)	En Route	Precautionary landing	Windshield (1 injury)	Red-tailed hawk	Pilots windscreen penetrated with facial injury to the pilot. Estimated aircraft time out of service 12 hours. Estimated costs of repairs \$2,000.
9/19/2016	B-737-800	Portland Intl Airport (OR)	Approach	Smoke in cabin, pilot called an alert	Engine #2, leading edge right wing, right horizontal stabilizer, fuselage	Greater white-fronted goose	Struck multiple geese at 5000 AGL. Pilot called an alert, smoke in the cabin and damage to #2 engine. Flight landed safely. At least nine impact points found on aircraft. Two dents on the leading edge of the right wing, three impacts on the outside of #2 engine. Multiple geese believed to have gone into the #2 engine but exact number not known. Damage impact to the right horizontal stabilizer, snarge and bent metal on the bottom of the fuselage between the engines. At least one goose ingested in the #1 engine. ID by Smithsonian, Division of Birds.
10/18/2016	B-737-300	Found on preflight at Indianapolis Intl Airport (IN)	Unknown	None	Wing	American Coot	Large hole in right wing next to engine. Pilot was unaware of the birdstrike. The damage was found during a preflight inspection. The following flight was cancelled. Clean up crews figured he was 4-6 miles out for the flap to be in that position when the strike occurred. ID by Smithsonian, Division of Birds.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
11/18/2016	BE-36	Southwest Florida Intl Airport (FL)	Approach (1000 feet AGL)	Utilized nearest runway	Windshield	Turkey vulture	The aircraft was crossing the KRSW Class C airspace when they struck a large bird approximately 3 miles west of KRSW. The windshield was completely damaged and the pilot decided to land the aircraft on runway 6 as it was the nearest runway. Airport Ops inspected the runway with negative results. Snarge was collected. ID by Smithsonian, Division of Birds.
12/5/2016	EMB-170	Newark Liberty Intl Airport (NJ)	Approach (7000 feet AGL)	Precautionary landing, unreliable airspeed and altitude	Nose	Tundra swan	Pilot reported seeing a flock of 8-10 large white birds before striking one bird resulting in damage to the nose of the aircraft beneath the first officer's window. Airline maintenance advised the strike was to the RVSM area including the angle of attack sensor and pitot tube. The flight crew reported no depressurization, however received unreliable airspeed and altitude on the first officers side (250 knots indicated to landing, resulting in high speed warnings.) Ferry flight from KSTL with no passengers onboard. ID by Smithsonian, Division of Birds.
12/5/2016	MD-88	Memphis Intl Airport (TN)	Climb (900 feet AGL)	Emergency landing	Engine #1	Common loon	Bird ingested into Engine #1, all fan blades damaged with one fan blade broken off. Contained engine failure. Returned to KMEM as an emergency. ID by Smithsonian, Division of Birds.
1/13/2017	EC-145	(TX)	En Route	None	Windshield	Turkey vulture	Four foot by five foot hole in the left windshield. After controllability and injuries check, continued to receiving hospital and landed without incident. The left seat was unoccupied at the time of the incident and there were no injuries. The bird penetrated the windscreen, hit and was almost wrapped in the NVG curtain and ended up between the left rear seat and the door. Bird was deceased on impact.

**SOME SIGNIFICANT WILDLIFE STRIKES TO CIVIL AIRCRAFT
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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
2/15/2017	CRJ700	Charlotte/Douglas Intl Airport (NC)	Take-off Run	Fuel leak, emergency landing	Wing	White-tailed deer	Deer struck right wing of aircraft, damaging leading edge slat and leading edge. Flight crew reported to ATC hearing a loud bang during take-off run and declared that the aircraft would return to the airport for a precautionary landing. ATC was informed by another flight crew on taxi that they witnessed a deer strike. Operations personnel retrieved the remains of 1 deer from the runway. The aircraft returned to KCLT and completed a low pass over runway 36R for inspection for damage and was observed to be leaking fuel from the right wing. The aircraft made an emergency landing, exiting the runway onto taxiway while continuing to leak fuel. ARFF responded and sprayed the area with foam while the aircraft was evacuated. Passengers were returned to the airport terminal via bus. All fuel was drained from the aircraft before it was towed to maintenance for inspection and repair. Substantial damage was found on the right wing of the aircraft with initial estimated time out of service of 14 days and cost of repair of \$500,000. Flight Crew reported that they did not see deer during take-off run but did feel an impact.
3/19/2017	EMB-175	Philadelphia Intl Airport (PA)	Approach	None	Engine #2	Ring-billed gull	Replaced 8 fan blades and other small parts in the engine. At 50 feet AGL above runway 9R, 3 white birds, gull sized flew across runway north to south. The aircraft struck no less than one of the birds with engine #2 cowl and the bird was ingested between 30-50 feet AGL. Thump heard when the bird was struck. Once clear of the runway, ATC notified that we struck a bird over the runway threshold and there might be FOD on the runway. Aircraft time out of service was 27 hours. Repairs reported as \$50,000. ID by Smithsonian, Division of Birds.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
3/30/2017	PA-28	Tampa Executive Airport (FL)	Take-off Run	Aborted take-off	Wing , landing gear	Turkey vulture	Dual instruction flight. Birds were noticed in a resting position late in the take-off run. Two birds were struck after trying to fly away. The take-off was aborted and the aircraft returned to the maintenance department of the school for inspection. Time out of service reported as 10 hours.
4/13/2017	EC-135	(IA)	En Route (1,500 feet AGL)	Precautionary landing	Windshield (1 injury)	American Coot	Bird struck and penetrated the upper left side of the right windshield (Pilot's side). Struck pilot in left shoulder and continued through aircraft. Struck the rear facing seat in the cabin coming to rest near the right cabin door. Pilot sustained minor bruising of the left shoulder and minor cut from the windshield.
5/17/2017	EMB-190	Washington Dulles Intl Airport (DC)	Take-off Run	Declared Alert; returned to departure airport; fuel leak	Engine #2	Great horned owl	Damaged engine #2, fan and stator blades, and engine outer casing perforated. Aircraft leaked approximately 200 gallons of fuel from damaged engine before flow was mitigated. Airport Ops recovered remains from the departure runway at 5,100 feet remaining. ID by Smithsonian, Division of Birds.
6/1/2017	B-737-900	Chicago O'Hare Intl Airport (IL)	Climb (400 feet AGL)	Engine shutdown, Precautionary landing	Engine #2	Canada goose	Pilot reported striking birds shortly after take-off and had to shut down the #2 engine. A stand-by alert called but aircraft landed without incident. Feather and snarge samples taken from 4 locations of the aircraft. All 4 locations were identified as Canada goose. Pilot reported seeing a flock of geese before the strike occurred. Time out of service reported as 40 hours. Reported repairs \$1.5 million. ID by Smithsonian, Division of Birds.
6/9/2017	AT-502	(UT)	En Route	Precautionary landing	Front window	Unknown bird	called Ogden Tower at 1415 UTC 5 miles south of Ogden Airport inbound for landing and advised he had a bird strike 20 minutes earlier while crop dusting approximately 10 miles west of KSLC. The bird strike took out the right front window and caused his door to pop open. No injuries or further assistance required. Aircraft landed without incident.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
6/27/2017	Jordan John RV7	Arlington, AZ	En route (5,600 feet AGL)	Aircraft destroyed (2 fatalities)	Windshield , Tail	Rock pigeon	One of five bags submitted for identification contained feathers from Rock Pigeon. Assume parts struck were windshield and tail because feathers found in cockpit and remains embedded on dent in right horizontal stabilizer. NTSB case#WPR17FA134.
7/19/2017	Weatherly 620A	Pemberton Airport (NJ)	Climb (10 feet AGL)	Forced landing	Propeller	Canada goose	One of the three propeller blades took impact of the birdstrike. Propeller blade pitch control arm and pin were separated and blade rotated 180 degrees causing severe loss of propeller thrust and lift. Forced landing resulted in substantial aircraft damage. No injuries or other property damage. Reported repairs and other costs \$75,000. NTSB case # ERA17CA251.
7/28/2017	B-737	Deadhorse Airport (AK)	Approach	Go-around	None	Caribou	The pilot saw the caribou just prior to touch down and initiated a go-around. The caribou was struck by the landing gear and perished. There were 100 passengers and 5 crew onboard with no injuries.
8/5/2017	Stoddard-Hamilton Glasair II	(CA)	En Route	Declared emergency; precautionary landing; fuel leak	Fuel tank	Unknown bird	Diverted and declared an emergency due to reported birdstrike. Minor damage.
8/30/2017	PA-31-350	Rota Intl Airport (U.S. Commonwealth of N. Mariana Islands)	Climb (150 feet AGL)	Partial gear up landing	Landing gear, wing	Unknown medium-sized bird	Shortly after takeoff and while the landing gear was being retracted the pilot reported hearing unusual sounds similar to impact and observed a flock of 10-20 medium sized birds. The aircraft sustained a dent in the left wing inboard the leading edge and a gear malfunction that prevented the gear from fully retracting. The aircraft landed with the right main gear extended but unlocked, left main gear and nose gear retracted, both main gear inboard doors were extended. Time out of service reported as 4000 hours. Reported repairs \$80,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
9/7/2017	C-510	Danbury Municipal Airport (CT)	Approach (120 feet AGL)	Engine shutdown	Engine #2	Canada goose	Short final approximately 0.5 miles to runway 26 threshold. Struck several geese ingesting at least one into the right engine. Pilot reported right engine immediately shut down. Landed without further incident and taxied to ramp. Upon inspection, right engine appears to be severely damaged with remains of goose still lodged in the engine. The right gear door and right fuselage near engine show signs of blood but no visible damage. Time out of service reported as 14 hours. Reported repairs and other costs \$750,000.
9/12/2017	OH-58C	(FL)	En Route (450 feet AGL)	Precautionary landing	Windshield	Gull	Number two in flight of two aircraft; VFR flight plan assigned by ATC to at/or below 500 feet in communication with Eglin AFB approach. Flight was east bound over water following coast line in Eglin/Valparaiso terminal area (east-west corridor). Pilot windscreen (right side) struck by gull, windscreen shattered, bird entered cockpit striking right door emergency jettison handle, ejecting door into Gulf waters. Bird continued rearward striking pilot on top of helmet and then falling to floor at pilot's feet, dead. No injury to pilot. Helmet sent to vendor for inspection, no visible signs of damage to helmet. Lead aircraft made call that number two aircraft sustained a bird strike and needed to make immediate landing, Eglin approach advised Destin (KDTS) was 1.5 miles to left and flight proceeded to airport and made safe landing. Visual inspection of aircraft revealed only right windscreen shattered, no other damage noted at that time. Reported repairs and other costs \$12,000.
9/16/2017	Vans RV8	Nehalem Bay State Airport (OR)	Approach	Ground loop	Landing gear, wing	Elk (Wapiti)	Aircraft had just touched down when an Elk ran in front of the plane. Pilot tried to speed up and relaunch in an attempt to fly over the Elk. Landing gear and propeller struck the Elk. An instant later, a second Elk ran in front of the aircraft and struck the left wing. Aircraft ground looped twice. Substantial damage per NTSB final report case # GAA17CA541.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
10/25/2017	C-17A	Kelly Field Airport (TX)	Climb (800 feet AGL)	Engine shutdown	Engine #4	Turkey vulture	Shortly after takeoff, in a turn to heading 210 as assigned by ATC, a large turkey vulture impacted the #4 engine. All 3 crewmembers in cockpit made visual contact with the bird but too late for evasive maneuver. Aircraft was just northwest of Wilford Hall Medical Center on Lackland AFB. The crew could feel, hear and smell the bird's impact. Immediately the engine began to vibrate and the throttle was retarded to idle. Subsequently, the crew ran the Engine Shutdown InFlight Checklist, Landing With One or More Engines Inop Checklist, 3 Engine Go-Around Checklist and all normal checklists. Visual confirmation of no fire, leaks and outside damage was confirmed by the loadmaster. Aircrew declared an emergency and requested vectors to a visual approach to runway 34. Landing at KSKF was uneventful. Reported repairs \$15 million.
11/5/2017	Bell-407	Gulf of Mexico (20 miles E of KGAO)	En Route (750 feet AGL)	Precautionary landing on oil rig	Windshield	Brown pelican	Rotorcraft en route to oil rig. Bird shattered the windshield. Landed without incident on oil rig MP281, off the coast of Galliano, LA. Note: Pilot reported that bird was believed to be a pelican; flight behavior of bird flock as described by pilot resembled that of brown pelicans. Assume brown pelican based on pilot report and location. No remains were collected.
11/18/2017	C-172M	(CA)	En Route (3,300 feet AGL)	Declared emergency landing	Windshield (2 injuries)	Greater white-fronted goose	Occurred at night. Windshield destroyed. Cockpit exposed to flight environment. Minor injuries to 2 of the occupants. Time out of service reported as 5 hours. Reported repairs and other costs total \$7,100.
11/19/2017	Bell-407	Near Stuttgart (AR)	En route (1,040 feet AGL, 116 knots)	Impacted terrain	Aircraft destroyed (3 fatalities)	Snow goose	Comments: Medical transport helicopter struck several snow geese while en route at night to pick up patient. Burned wreckage was found several hours later next to reservoir containing large numbers of waterfowl. Bird remains were found in helicopter at wreckage site. ID by Smithsonian, Division of Birds. NTSB Case # CEN18FA033. Three fatalities.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
12/4/2017	A-320	Sacramento Intl Airport (CA)	Climb (1,000 feet AGL)	Declared emergency landing	Nose, engine #1, engine #2, wing	Snow goose, Ross's goose	Comments: Pilots stated they had just reached 1,000 feet AGL when they encountered a flock of birds and had multiple bird strikes. Upon inspection, there was evidence of ingestion and damage to both engines as well as damage to the left wing slats and nose of the aircraft. Airport biologist found 12 carcasses (11 snow geese and 1 Ross's goose).
12/4/2017	C-402	Barnstable Municipal Airport (MA)	Climb (800 feet AGL)	Declared emergency landing, obscured vision	Radome, windshield, nose, wing	Canada goose	Comments: The aircraft windshield was damaged. Dent on right side of nosecone/radome. Minor damage to the right wing. Time out of service reported as 504 hours. Reported repair and other costs total \$25,000. ID by Smithsonian, Division of Birds.
2/2/2018	Gulfstream G550	Cairo Intl Airport (Egypt)	Climb (14,000 AGL)	Diverted to Luton	Engine #1 , Engine #2, Radome	Northern shoveler	Comments: Saw a large flock of birds which immediately impacted numerous areas of the aircraft. Aircraft filled with a strong burning scent indicating ingestion in at least one engine. Disconnected auto pilot and auto throttles to ensure normal flying capability and that all aerodynamic surfaces were functioning properly. Since all indications were normal, decided best course of action was to proceed away from Africa and proceed to Europe to further evaluate the situation. After speaking to Gulfstream tech ops decided the safest and best course of action would be to divert to Luton so Gulfstream could inspect the aircraft. Uneventful landing. Visual inspection revealed additional large dent in both engine cowl rings (not visible from inside the aircraft), a severely damaged radome, and indications of multiple strikes on other surfaces of the aircraft. Time out of service reported as 240 hours. Reported repair and other costs total \$662,000. ID by Smithsonian, Division of Birds.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
3/24/2018	C-172	Montgomery County Airpark (MD)	Landing roll	Precautionary engine shut down, towed to gate	Fuselage	White-tailed deer	Comments: Touched down approx. 1,200 feet into approach end runway 14. After touchdown with nose gear, noticed a deer entering runway from the left. Applied max braking. Deer made contact with propeller and appeared to pass under the right side of the aircraft. Completed full stop of aircraft on the runway. As a precaution, shut down the engine. Inspected damage to nose and underside engine cover. Towed plane to parking.
3/24/2018	Bell-407	Winchester, VA	En Route (2,300 feet AGL)	Precautionary landing	Windshield (1 injury)	Horned grebe	Comments: Life Flight departed and encountered a birdstrike. Bird went through the windshield and struck the pilot with minor injury to head. Time out of service reported as 72 hours. Reported repair and other costs total \$2,500. ID by Smithsonian, Division of Birds by photo.
4/28/2018	Bell-407	AZ	En route (1,330 feet AGL)	Precautionary landing	Chin bubble	Unknown medium bird	Using NVG's aircraft struck multiple birds. Both crew members described a large bang and a rush of air into the cockpit area. Aircraft made an uneventful precautionary landing to an off airport site. Damage was found to the left front chin bubble (broken) and a bird lodged in the lower area of the front left seat foot rest. Additional strikes were located on lower portions of the aircraft, all of which had no associated damage. A subsequent inspection also revealed additional minor damage to an AC condenser and fresh air vent (cracks) which were associated with the chin bubble strike. Aircraft time out of service reported as 336 hours. Repair costs reported as \$22,000.
5/16/2018	B-757-200	Minneapolis St Paul Intl (MN)	Climb	None	Engine #2	Red-tailed hawk	Seven bent blades, aircraft out of service at KSEA. Time out of service estimated at 24 hours.
6/6/2018	A-319	Austin-Bergstrom Intl (TX)	Climb	Engine shutdown, precautionary landing	Engine #2	Crested Caracara	Pilot indicated the aircraft rotated and then he saw the bird and felt a bump. Aircraft returned to airfield and landed safely. ID by Smithsonian, Division of Birds.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
7/11/2018	B-737-300	Found at Honolulu Intl (HI)	Found post flight	None	Engine #2	Common Myna	Bird ingested into the right side engine of the aircraft. Pilot unaware of ingestion, remains found post flight/aircraft maintenance. Three blades were damaged and the engine must be removed and replaced. ID by Smithsonian, Division of Birds.
7/13/2018	C-550	Myrtle Beach Intl (SC)	Climb (50 feet AGL)	Precautionary landing	Wing	Mourning dove and Microbat	Significant damage to left wing as well as other strikes to the nose/windshield. Fourteen mourning doves and one microbat were recovered.
8/2/2018	B-757-224	Orlando International (FL)	Climb (1,300 feet AGL)	None	Wing	Black vulture	Port Authority personnel recovered snarge on the leading edge of the right wing of the aircraft. UAL captain advised the bird strike occurred on the climb from Orlando Florida. ID by Smithsonian, Division of Birds. Repair costs \$350,000.
8/23/2018	EC-145	Between KEMV and VG45	En route (1,100 feet AGL)	None	Tail	Red-tailed hawk	Left side Vertical fin on horizontal damaged by bird strike. Bird was embedded in leading edge, leaving a 3 inch hole. 24 hours out of service and repair costs of \$80,000. ID by Smithsonian, Division of Birds.
9/4/2018	DA-2000	Dallas Love Field (TX)	Climb (200 feet AGL)	None	Wing	Raptor	Repair costs reported as \$200,000.
9/27/2018	Learjet-45	Salt Lake City Intl (UT)	Climb (300 feet AGL)	Precautionary landing	Engine #2	Swainson's hawk	Aircraft was in its climb just after the takeoff roll out about 300 feet AGL when they saw a bird and then immediately heard the right engine make a noise. Pilots noticed a decrease in power on the right side. They decided to circle the airport and come back to land. During the runway inspection multiple pieces of fan blades and inside engine pieces were found along with a large amount of bird remains. Samples were collected from the right side fuselage, leading edge of the right wing, the top rear portion of the #2 engine, the rear section of the right elevator/flap and the vertical stabilizer. ID by Smithsonian Division of Birds. Wildlife ID and number struck Smithsonian gender-typed the results and found that at least one male and one female bird were struck; meaning at least 2 birds were struck.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
10/8/2018	PA 28-235	South Valley Regional (UT)	Approach (1,500 feet AGL)	Precautionary landing	Fuselage, Tail, Windshield	Ruddy duck	The windscreen, right wing, rear left window and the vertical stabilizer were damaged. No injuries. Lots of remains inside of the cabin. 120 hours out of service and \$20,000 in repair costs were reported. ID by Smithsonian, Division of Birds. All five samples of remains sent to Smithsonian for ID were Ruddy duck.
11/3/2018	PA 28-180	Comanche County-City Airport (TX)	Take-off Run	Emergency landing	Nose, engine #1, fuselage, lights	White-tailed deer	Emergency landing. Propeller strike, nose cowling and nose gear wheel pant struck and cracked. Right side of fuselage struck and damaged. Strobe light under fuselage broken off. Repair costs reported as \$50,000. Note: Reported as Deer; assume white-tail based on location.
11/7/2018	CRJ200	Salt Lake City Intl Airport (UT)	Approach (Altitude unknown)	None	Nose, engine #1, engine #2, wing, fuselage	Snow/Ross's goose complex	Multiple strikes and double ingestion on final approach approximately 1 mile from the airport. Multiple samples collected and sent for identification. ID by Smithsonian, Division of Birds: Samples from pitot tube & engine 1 both = Snow/Ross's Goose complex. Samples from right inboard flap & outboard flap = undetermined goose. Sample from left wing = no viable DNA or feather found. Time out of service reported as 336 hours. Repair costs reported as \$100,000.
11/25/2018	B-777-300	San Francisco Intl Airport (CA)	Take-off Run	Fuel dump, precautionary landing	Engine #1	Great blue heron	Engine failure upon takeoff run at KSFO Airport. Airfield operations heard a loud boom and inspected runway 28l with negative results. Aircraft declared an emergency (Alert 2) and upon arriving at G99 advised they suspect engine #1 damage was due to hitting a large bird. The #1 engine acoustic panel was damaged due to the strike. ID by Smithsonian, Division of Birds. Fuel dump of approximately 36,698 gallons of fuel.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
11/26/2018	A-320	Portland Intl Airport (OR)	Climb	Fuel burn, precautionary landing	Engine #2, wing	Canada goose	Crew felt and heard impact on rotation but initially thought it was a blown tire. The A/C had ingested a large bird that went through fan section of #2 engine creating considerable bird debris on runway. A/C flew to area NW of airport and burned fuel for 1 hour. When flaps deployed for landing, crew felt vibration indicating damage to flaps. Upon landing the flight crew examined the damage--a 6-8 inch hole in the leading edge of the right flap and a 12 inch dent in cowling of engine #2. Bird ingested in the fan area with no obvious signs of core entry-core will be scoped to confirm. Passengers provided hotel accommodations and rescheduled for next day departure. ID by Smithsonian, Division of Birds.
12/22/2018	EMB-170	George Bush Intercontinental Arpt (TX)	Take-off Run	Precautionary landing	Engine #2	Unknown	Five engine blades were damaged as well as a stator. Time out of service reported as 96 hours. Repair costs reported as \$45,000.
12/26/2018	C-402	Provincetown Municipal Arpt (MA)	Landing roll	Engine shutdown	Nose gear, nose gear door	White-tailed deer	Damage to nose gear and nose gear door. Aircraft disabled on runway and airport was closed. Passengers were deplaned on the runway and bused to the terminal. Aircraft was towed from the runway and airport was reopened.
1/26/2019	PA-34-200	Delaware Airpark (DE)	Landing roll	None	Engine #2, propeller	White-tailed deer	The deer ran onto the runway from left to right about mid-field and was struck by a propeller on the right engine. There was no visible damage to the airframe. Blood and fur was on the right main gear. The strike will require a tear down of the right engine. Aircraft time out of service reported as 1,500 hours. Repairs reported as \$20,000.
2/7/2019	G-V	Teterboro Arpt (NJ)	Approach (100 feet AGL)	None	Nose, fuselage	Canada geese	Short final struck approximately 10-15 birds. Aircraft landed runway 6 safely and taxied to ramp without incident. ID by Smithsonian Division of Birds.
2/26/2019	B-737-800	Will Rogers World Arpt (OK)	Approach (3,000 feet AGL)	None	Wing	Unknown large bird	The leading edge device metal was dented (approximately 8 inches horizontal dent). Time out of service reported as 24 hours. Repair costs reported as \$25,000. Other costs reported as \$210,000.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
3/12/2019	EC-135	Near Monroe, LA	En route (1,500 feet AGL)	Precautionary landing	Windshield	Northern shoveler	Two ducks struck the windshield with one penetrating the front windscreen. Time out of service reported as 72 hours. Repair costs reported as \$30,000. Other costs reported as \$90,000.
3/24/2019	B-767-300	Salt Lake City Intl Arpt (UT)	Approach (200 feet AGL)	None	Engine #2 cowling	Western/Clark's Grebe species complex	Mechanics confirmed that the bird was ingested into the #2 engine. Borescope completed with no internal damage. Engine cowl was replaced. Time out of service reported as 36 hours. Repair costs reported as \$959,000. ID by Smithsonian Division of Birds.
3/29/2019	B-737-700	Houston-Hobby (TX)	Descent (12,000 feet AGL)	None	Radome, fuselage	Wilson's Snipe	Dented radome with remains across the Captains side of the windscreen. Time out of service reported as 4 days. Repair costs reported as \$20,000. ID by Smithsonian Division of Birds.
3/31/2019	P-180 Avanti II	(CA)	En Route (5,000 feet AGL)	None	Wing	Unknown (Suspect Eagle or Osprey)	En Route at 5000' approximately 30 miles North/West of KVRB. Leading edge dented about the size of a quarter behind stall strips and top side of wing outside of Rt. Engine Nacelle was scratched. Underneath wing looked like blood stained slight scratching and hit the propeller. Estimated costs or repairs reported as \$100,000. Other costs reported as \$60,000.
4/12/2019	B-737-700	Sacramento Intl Airport (CA)	Climb (10 feet AGL)	Precautionary landing	Landing gear	Mallard	Damaged nose gear hydraulic system, as nose gear would not retract. Hydraulic leak noted after returning to gate after landing. Mallard carcass recovered on Runway 34R. ID by Smithsonian Division of Birds.
4/22/2019	Emb Phenom 300	Naples Municipal Airport (FL)	Climb (1,600 feet AGL)	Precautionary landing	Wing	Black Vulture	The pilots observed the bird prior to the strike. They looked out the window and confirmed the strike by the visual damage seen to the right wing leading edge. Time out of service reported as 7 days. Repairs or replacement reported as \$180,000. Other costs reported as \$275,000. ID by Smithsonian Division of Birds.
5/22/2019	MD-83	Brownsville/South Padre Island Intl Arpt (TX)	Take-off Run	Precautionary landing, loss of power to engine	Engine #2	Gull	Loss of power to right engine. Captain saw the birds before takeoff. Stated that he ran up the engines to try to scare the birds. The birds flew away then returned while he was taking off on runway 13.

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Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
5/27/2019	C-208 (Amphibious)	Francis S Gabreski Arpt (NY)	Approach (600 feet AGL)	None	Wing	Gull	Time out of service reported as 42 days. Repairs or replacement reported as \$200,000.
6/2/2019	B-737-200	Addison Arpt (TX)	Take-off Run	Aborted takeoff	Engine #1	Unknown medium bird	Seventeen fan disk blades were damaged in the #1 engine. Time out of service reported as 3 days. Repairs or replacement reported as \$75,000 and estimated other costs reported as \$156,000.
7/2/2019	C-680	Charlotte/Douglas Intl Airport (NC)	Approach (4,000 AGL)	None	Wing	Black vulture	Leading edge damage to right wing. Dent the size of a football. ID by Smithsonian Division of Birds.
8/1/2019	Learjet-40	Found KADS (TX)	Unknown	None	Engine #1 stator vane	Unknown medium bird	Upon arrival in Addison we discovered blood evidence of a bird strike on the #1 engine inlet. We did not notice any damage, and reported to maintenance for inspection. Maintenance did a borescope inspection the following day and discovered a stator vane that was damaged beyond limits. They replaced the part, and returned it to service on 8/3/19. Time out of service reported as 40 hours. Repair costs reported as \$14,350.
9/4/2019	Hawker 900	Sheboygan County Memorial Airport (WI)	Take-off Run	None	Radome, Nose	Sandhill crane	Aircraft struck multiple Sandhill Cranes on takeoff from Sheboygan County Airport in Wisconsin. Aircraft went to Cessna Citation at KMKE for repairs. ID by wildlife biologist.
9/18/2019	HC-130	Richmond International Airport (VA)	Take-off Run	None	Engine #2	American kestrel	Bird struck nose of aircraft and was then ingested into the #2 engine. Borescope inspection revealed engine damage requiring engine replacement. Time out of service reported as 288 hours. Repair costs reported as \$1.2 million. ID by Smithsonian Division of Birds.
10/12/2019	Robinson R44	(UT)	En Route (300 feet AGL)	None	Windshield , nose, Forward vent, cockpit	Ducks	Bird came through the windshield just above the landing light on the pilot's side leaving blood and organs along the pilot's legs and all throughout the cockpit.
11/3/2019	Mooney M20	Johnson County Airport (NC)	Climb (900 feet AGL)	Precautionary landing	Wing	Ruddy duck	Leading edge of left wing causing a 12x10 hole. Repair costs reported as \$15,000. ID by Smithsonian Division of Birds.

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IN THE UNITED STATES, JANUARY 1990 –JANUARY 2021**

Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
11/12/2019	RV-7 (homebuilt)	Memorial Field (AR)	Landing roll	Fuel spill	Wing, fuselage, propeller, main fuel tank	White-tailed deer	Deer was crossing aircraft path left to right and struck the propeller and impacted primarily the left wing leading edge. For the RV7 this is where the left main fuel tank is located and resulted in a fuel spill from the damaged tank. Damage was substantial and fatal to the deer. Deer (~7 point buck). Occurred after touchdown. Directional control was maintained and aircraft was stopped on runway. Repair costs reported as \$100,000.
12/30/2019	RV-10 (homebuilt)	The Landings Airport (TX)	Approach (600 feet AGL)	Change in aerodynamics	Wing	Turkey vulture	90% left aileron to maintain level flight after the strike. Repair costs reported as \$10,000.
2/23/2020	A-321	General Edward Lawrence Logan International (MA)	Take-off Run	Precautionary landing	Engine #1	Red-tailed hawk	Pilot reported strike to ATC upon take-off and reported returning to KBOS. Alert 2 issued and AC landed without incident. Aircraft taxied to gate and was inspected. Damage found in #1 engine to approximately 7 fan blades and snarge in engine core. Snarge collected from engine. Time out of service reported as 51 hours. Repair costs reported as \$7.6 million. ID by Smithsonian Division of Birds.
3/12/2020	BE-36	Orlando Sanford International (FL)	Approach (1,600 feet AGL)	Precautionary landing. Pilot had difficulty communicating and a light gun was used to clear the aircraft to land	Windshield, wing and tail	Anhinga	Reported a bird strike to the center of the passenger side of the windshield 7 miles W KSFB. The bird penetrated the windshield striking the interior dashboard and the pilot's right shoulder/arm. Pilot had difficulty communicating and a light gun was used to clear the aircraft to land without incident. Broken windshield, instrument panel, hole in tail, and dent in wing surface. Repair costs reported as \$40,000.
4/30/2020	C-172	Mineral Wells Airport (TX)	Approach (700 feet AGL)	None	Windshield, antenna	Red-tailed hawk	12 inch x 3-4 inch hole plus cracks, left upper antenna damaged.
5/24/2020	EC-135	Allentown Queen City Municipal (PA)	Approach (500 feet AGL)	None	Windshield	Red-tailed hawk	The aircraft sustained a broken windscreen and was able to maintain control during landing. Time out of service reported as 72 hours. Repair costs reported as \$7,500. ID by Smithsonian Division of Birds.

**SOME SIGNIFICANT WILDLIFE STRIKES TO CIVIL AIRCRAFT
IN THE UNITED STATES, JANUARY 1990 –JANUARY 2021**

Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
6/16/2020	B-737-700	John Glenn Columbus International (OH)	Take-off Run	None	Engine #1, engine #2	European starling	Aircraft arrived to KMCO and was taken out of service upon arrival due to damage to engine #1 and engine #2 after evidence of bird ingestion. 52 struck European starlings found after report of strike with engine ingestion; no effect on flight; starlings removed and disposed.
7/18/2020	Lockheed C-130H	(FL)	En Route (1,500 feet AGL)	Precautionary landing	Wing	Unknown medium bird	Bird impacted the right wing leading edge which resulted in an 8 inch diameter hole. Time out of service reported as 168 hours. Repair costs reported as \$35,000.
8/8/2020	EC-135	(AR)	En Route (1,900 feet AGL)	Precautionary landing	Chin bubble	Turkey vulture	Chin bubble Plexiglas was broken. Time out of service reported as 24 hours.
9/2/2020	B-737-700	Lambert- St Louis International (MO)	Climb (100 feet AGL)	Precautionary landing	Engine #1, engine #2	European starling	Birds ingested in both engines causing two bent fan blades on engine #2 and one bent fan blade on engine #1. The aircraft struck birds with both wings, both engines and main landing gear. Aircraft returned to STL. More than 100 birds were reported as seen and 11-100 struck. Time out of service reported as 17.5 hours. Repair costs reported as \$10,000.
9/27/2020	EMB-170	Manhattan Regional (KS)	Climb (40 feet AGL)	Engine vibration/ Precautionary landing	Engine #1, Engine #2, Wing and Landing gear	Franklin's gull	Numerous strikes to both engines, wing leading edges, flaps, and landing gear. Both engines ingested birds but kept running with noticeable vibration. They were taking off on runway 3. In the area between Taxiway D and Runway 13/31 a large flock of birds was seen on the runway that took flight as the plane approached. Pilots estimated they were about 40 feet off the ground with an airspeed about 125 when they flew through the flock of birds. The pilots knew there were multiple impacts with birds and the left engine "thumped" due to ingesting a bird. The plane was able to continue flight and landed safely back at Manhattan Regional Airport. At this time, it is unknown the extent of the damage or the amount of time the plane will be out of service. Note: 11-100 birds seen, and 11-100 birds struck. ID by Smithsonian Division of Birds.

**SOME SIGNIFICANT WILDLIFE STRIKES TO CIVIL AIRCRAFT
IN THE UNITED STATES, JANUARY 1990 –JANUARY 2021**

Date	Aircraft	Airport/Location	Phase of Flight	Effect on Flight	Damage	Wildlife Species	Comments from Report
10/8/2020	Robinson R44	Westchester County Airport (NY)	Approach (1,000 feet AGL)	None	Windshield	Northern flicker	The pilot was able to maintain positive control and continue his 1.5-mile final approach to Taxiway C/K. Two passengers were shuttled to the lobby of Ross West. The right-front windshield had a large hole and glass shards were lying on the floor. The bird was found on the floor beneath the backseat of the helicopter. Time out of service reported as 168 hours. Repair costs reported as \$2,500. ID by Smithsonian Division of Birds.
11/14/2020	B-737-700	Yakutat Airport (AK)	Landing roll	None	Engine #1 fan cowl, side cowl, landing gear	Brown bear	Two bears (sow and cub) were spotted by the pilots. Struck sow in the left engine at the end of the landing rollout. Time out of service reported as 120 hours. Repair costs reported as \$142,000. Other costs reported as \$454,000.
12/3/2020	BE-35	Grand Strand Airport (SC)	Approach (1,100 feet AGL)	None	Wing	Black vulture	On the pilot's base turn to land on RWY 23, he struck a black vulture with his pilot's side wing. The aircraft landed without incident. ID by Smithsonian Division of Birds.
1/24/2021	A-319	Tampa International (FL)	Take-off Run	Precautionary landing	Engine #1	Cattle egret	One bird believed to be ingested into #1 engine, another bird struck leading edge of left Wing. Returned to TPA. Multiple bird strikes along leading edge of wing and number 1 engine. Multiple number 1 engine fan blades damaged.

END