

# Wildlife Hazard Assessment Final Report

## Wayne County Airport Smithville, Ohio

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*CHA Project Number: 27243*

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## 1.0 BACKGROUND

Beginning in October 2013 and extending through September 2014, a Wildlife Hazard Assessment (WHA) was conducted at the Wayne County Airport (BJJ) in Smithville, Ohio.

Title 14, Code of Federal Regulations, part 139, § 139.337(b) requires that a Wildlife Hazard Assessment be conducted when any of the following events occurs on or near the airport.

1. An aircraft experiences multiple wildlife strikes.
2. An aircraft experiences an engine ingestion of wildlife or substantial damage (defined as damage or structural failure that adversely affects the structural strength, performance, or flight characteristics of the aircraft that would normally require major repair or replacement of the affected component) from striking wildlife.
3. Wildlife of a size, or in numbers, capable of causing one of the events described above is observed to have access to any airport flight pattern or aircraft movement area.

Although BJJ is not certified under Part 139, the Federal Register Volume 78, No .18 (January 28, 2013) clarified the WHA requirements for non-certified airports. This clarification required non-certificated, Federally obligated airports that accept a new airport development grant funded under the Airport Improvement Program (AIP) must conduct a wildlife site visit or a WHA. The FAA divided these facilities into four categories based on based aircraft and total operations. The four categories were:

1. If an airports had 100 or more based turbine-powered aircraft or 75,000 or more total annual operations, the airport sponsor had to initiate a WHA within three years of receiving an AIP grant after the Federal Register notice.
2. If an airport had between 20 and 99 based turbine-powered aircraft or 30,000 to 74,999 total annual operations, a wildlife site visit must be initiated within three years of receiving a development grant after the final Federal Register notice.
3. Airports that had between 0 to 19 based turbine-powered aircraft or between 10,000 to 29,999 total annual operations, a wildlife site visit must be initiated within five years.
4. Airports with no based turbine-powered aircraft and fewer than 10,000 total annual operations had to initiate a site visit within eight years.

According to the FAA 5010 database, BJJ had over 90,000 annual operations, which categorized the airport as a Level 1 and required the County Commissioners and Airport Authority to undertake a full WHA.

Title 14 Code of Federal Regulations, Part 139 requires that WHAs be conducted over a 1-year period to capture seasonal and daily patterns of wildlife. FAA Certalert 09-10, Wildlife Hazard Assessments in Accordance with Part 139 Requirements (Appendix A) and the FAA manual entitled, "Wildlife Hazard Management at Airports," (Cleary and Dolbeer 2005) were utilized as a basis for developing the WHA.

## 2.0 LEGAL STATUS OF WILDLIFE SPECIES

Federal, state, or municipal laws protect most forms of wildlife. Before administering any control action at BJJ, whether lethal or non-lethal, the legal status of the target species should be determined. Several regulatory agencies govern the issuance of wildlife permits to trap or kill wild animals, which vary depending on the species and method of control involved. A permit is required to harass species of special concern (i.e., threatened and endangered species), but is not required to harass other migratory species threatening an airfield. BJJ is responsible for adhering to the current regulations regarding wildlife management and for obtaining the appropriate permits to take or harass specific types of wildlife.

### 2.1 Federal Regulations

The U.S. Government has passed several acts for the protection of wildlife including the Migratory Bird Treaty Act (MBTA), the Lacey Act, the Endangered Species Act, Bald and Golden Eagle Protection Act, the National Environmental Policy Act, and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). These are the basis of most wildlife regulations that have been issued in the Codes of Federal Regulations (CFR).

Several agencies are responsible for implementing these regulations, many of which affect wildlife management at airports. Federal wildlife laws are administered by the U.S. Fish and Wildlife Service (USFWS) and primarily involve migratory birds protected under the MBTA and all species protected under the Endangered Species Act (Appendices B and C). Permits from the USFWS must be updated annually unless otherwise stated on the permit.

BJJ currently does not implement a wildlife management program to manage hazardous wildlife on the air operations area (AOA), and does not currently hold depredation permits to employ lethal control measures.

### 2.2 State and Local Regulations

Ohio State law compliments the Federal regulations for migratory bird species and can further regulate actions concerning depredating mammals, game and migratory birds. The Ohio Department of Natural Resources (ODNR) Division of Wildlife is responsible for issuing state depredation permits (permits that allow birds and mammals to be taken to protect property, agriculture, and human health and safety) (Table 1). The ODNR publishes the depredation permit forms and regulations on their website (Appendix C). A copy of these regulations is available through ODNR upon request. The Ohio Department of Agriculture regulates the product labels of pesticides used to control wildlife and also regulates and issues pesticide applicator licenses to individuals applying restricted use pesticides under the authority of the Structural Pest Control Act. BJJ will need to ensure that appropriate state and federal permits (ODNR Nuisance Wildlife Animal Control Permit (NWACP), ODNR Bird Depredation Permit, USFWS Bird Depredation Permit) are obtained to manage hazardous wildlife on the airport.

**Table 1: A reference list of birds and mammals commonly found in Ohio and the permits required for depredation control.**

Category	Species	State Permit	Federal Permit
Resident game birds	Turkey, bobwhite quail, pheasants	YES	NO
Resident nongame birds <sup>1</sup>	Starlings house sparrows, pigeons	NO	NO
Migratory game birds <sup>2</sup>	Geese, ducks, snipe, woodcocks, rails, gallinules, and doves	YES	YES
Migratory nongame birds <sup>2</sup>	Raptors, gulls, jays, songbirds, swifts, swallows, shorebirds, and wading birds	YES	YES
Depredation order birds <sup>3</sup>	Crows, red-winged blackbirds, brown-headed cowbirds, and grackles	NO	NO
Mammals	Deer, red fox, gray fox, Eastern cottontail rabbits, squirrels, coyotes, bobcats, raccoons, skunks, opossums, muskrats, beaver, woodchucks	YES	NO
Threatened and Endangered Species (lethal and nonlethal control) <sup>4</sup>	See Appendix B	YES	YES
Feral domestic animals	Dogs, cats, livestock	NO	NO

- 1 Unprotected species may be taken at any time without limit.
- 2 For a complete list of migratory birds see 50 CFR § 10.13 (Appendix C)
- 3 A federal permit is not required “when concentrated in such numbers and manner as to constitute a health hazard or other nuisance,” see 50 CFR § 21.43 (Appendix C).
- 4 Federal and state permits are required to harass or take these species.

### 3.0 WILDLIFE STRIKES

Bird Strike Committee Canada (Transport Canada 1992) developed a bird strike definition that has since been revised by the FAA effective 10 February, 2004 and adopted by the International Civil Aviation Organization (ICAO), Bird Strike Committee USA, International Bird Strike Committee, and the U.S. Air Force. Under this definition, a wildlife strike is considered to have occurred if:

- A pilot reports striking one or more birds or other wildlife;
- Aircraft maintenance personnel identify aircraft damage as caused by a wildlife strike;
- Personnel on the ground report seeing an aircraft strike one or more birds or other wildlife;
- Bird or other wildlife remains, whether in whole or in part, are found within 200 feet of a runway centerline, unless another reason for the animal's death is identified; and
- An animal's presence on the airport had a significant negative affect on a flight (for example, aborted takeoff or landing, high-speed emergency stop, or an aircraft left the pavement area to avoid collision with an animal).

The number of civilian wildlife-aircraft strikes reported annually in the United States has increased from 1,804 in 1990 to 10,089 strikes reported in 2011 (FAA Wildlife Strike Database, 2012). This increase could be the result of several factors: an increase in wildlife-aircraft strike issue awareness which has led to an increase in the percentage of wildlife strikes that are reported, an increase in air traffic, or an increase in some populations of hazardous wildlife species.

From 1980 to 2007 commercial aircraft movements in the U.S. increased from about 18 million to over 28 million (Cleary et al. 2008). This rise in air traffic coincides with increasing wildlife populations. Nationally, the Canada goose population increased at a mean annual rate of 7.3% from 1966-2006; the ring-billed gull population increased at a mean annual rate of 2.2%, the red-tailed hawk population by 2.5% and the turkey vulture population by a mean annual rate of 1.6% (Sauer et al. 2007). The white-tailed deer population in the United States increased from 350,000 in 1900 to about 24 million in 1994 (Jacobson and Kroll 1994). Increasing plane movements and increasing urban wildlife populations creates risks that are greater than ever before for wildlife-aircraft strikes (Dolbeer and Eschenfelder 2002).

### 3.1 Collecting and Reporting Wildlife Strike Data

Diligent collection of bird strike data should be a priority for airport operations personnel. General aviation airports like Wayne County Airport may have severe wildlife hazard conditions due to wildlife species composition, local habitats, types of aircraft flown and pilot experience. Bird strike statistics based solely on pilot reports are unreliable and unrepresentative because most strikes go unreported. Through regular carcass searches on the runways at a major international airport, Barras and Dolbeer (2000) estimated that as few as 13% of all bird strikes were reported.

The National Wildlife Research Center (NWRC—the research division of United States Department of Agriculture, Wildlife Services) manages the FAA National Wildlife Strike Database (NWSD) with records dating from January 1990. Pilots, tower personnel, and airport staff should be encouraged to be aware of wildlife strikes and the importance of reporting them to the FAA. It is critical for the integrity of a strike record database, both locally and nationally, to receive as much information as possible. Strike reports can be submitted online. Advisory Circular 150/5200-32A explains the importance of diligently reporting strikes to the database (Appendix D).

If any of the five criteria of a wildlife strike are met, a Strike Report Form should be completed with as much information as possible and submitted to the FAA. If a carcass is found that cannot be identified, specified feathers, parts of these carcasses, or blood should be submitted to the Smithsonian Institute Feather Lab (Appendix E). If a strike is reported but no carcass recovered, any feathers or parts remaining on the plane should also be removed and submitted to the Feather Lab. Bird identification is provided at no expense to airports.

The FAA and the NWRC provide a comprehensive analysis of the national wildlife strike database each year in the annual report “Wildlife Strikes to Civil Aircraft in the United States.” This information can be found online at [wildlife.faa.gov](http://wildlife.faa.gov). Wildlife Strike Reports can be completed and submitted online at that website.



## 4.0 WILDLIFE HAZARD ASSESSMENT

The objectives of this wildlife hazard assessment (WHA) were to:

- Identify the species, numbers, locations, local movements, and daily and seasonal occurrences of wildlife observed.
- Identify and locate features on and near the airport that attract hazardous wildlife
- Describe existing wildlife hazards to airport manager and consultant
- Review any available strike records
- Provide recommendations for reducing wildlife hazards to aircraft using BJJ.

### 4.1 Site Description

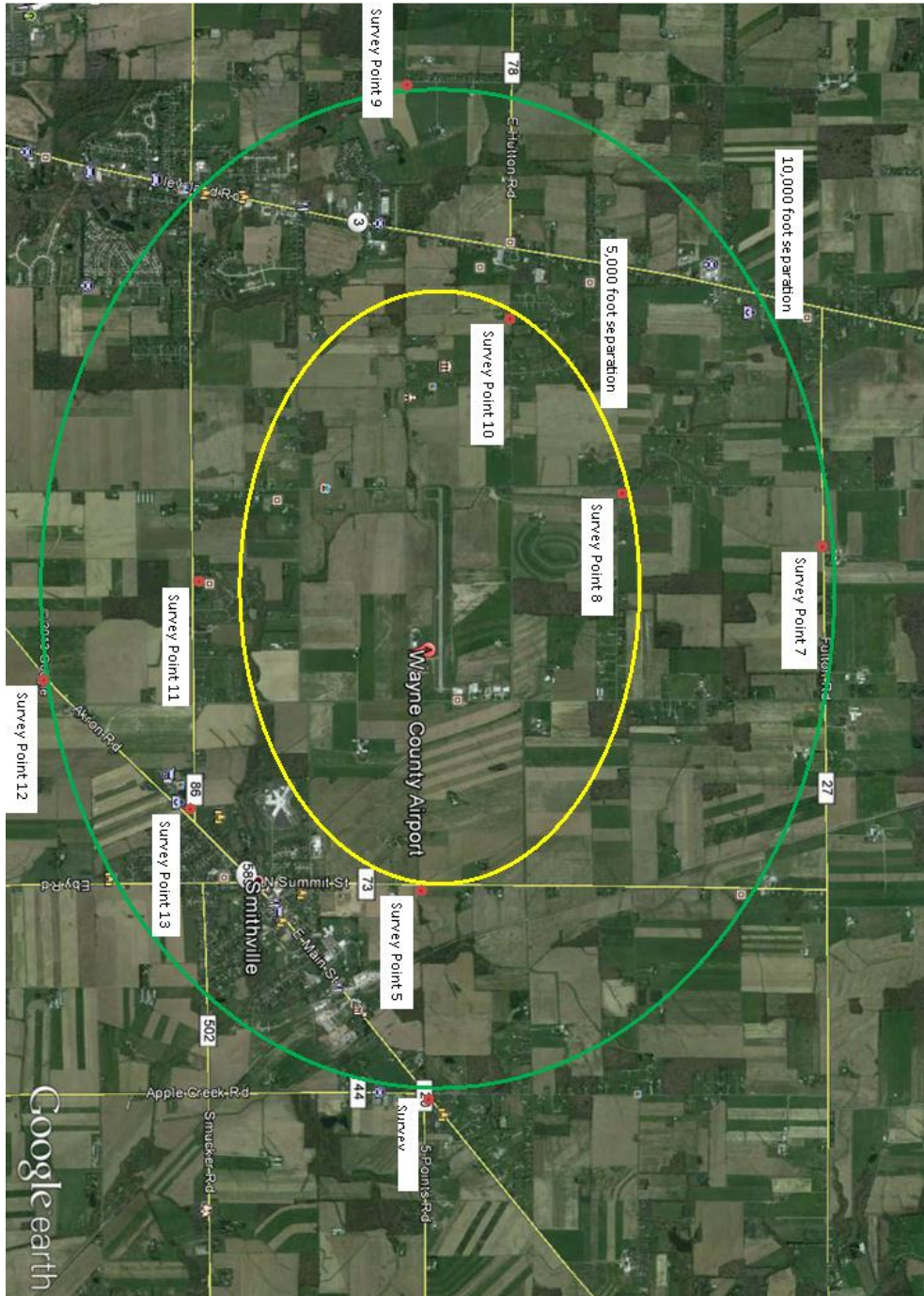
BJJ is a general aviation airport located in Wooster, Ohio with a single 5,191 foot runway (Runway 10/28) with a partial length parallel taxiway along the eastern half of the runway. Aircraft operations average 96,000 annually. There are 27 aircraft based at BJJ, including 2 multi-engine airplanes, four jet airplanes and two helicopters (including an air ambulance service). Additionally, an aircraft sales and service company is based at BJJ, increasing the number of transient based aircraft. BJJ also serves as a transient training facility for military aircraft. An aerial view of the airport can be found in Figure 1.

The airport is located at 1136 feet above sea level, and is surrounded by rural land use, including agricultural fields and wooded areas. During the WHA, wildlife activity was evaluated on BJJ property, and within a 10,000 foot radius of the airport. An aerial view of this area can be found in Figure 2.

Figure 1: Area of Operations at BJJ, including Survey Points.



Figure 2: Surrounding land use at BJJ, including Survey Points. The 10,000 ft demarcations indicate the recommended separation distances between the Air Operations Area (AOA) and a potential hazardous wildlife attractant per AC 150/5200-33B for turbine powered aircraft.





## 4.2 Habitat Description

Within the Air Operations Area (AOA), the land use is characterized by mown grass. These grass areas are currently maintained at approximately 6 to 8 inches in height, with areas directly adjacent to the pavement maintained lower for visibility of runway signage and markings. There is no perimeter fence surrounding the AOA.

Adjacent to the AOA in all directions are agricultural fields. During the 2013 growing season, the crops planted in these fields included corn, soybeans and hay. The fields located directly to the east and west of the runway, within the approach and departure paths, were planted in soybeans.

Along the northern edge of the AOA, there is a relatively steep slope separating the maintained grass areas from the adjacent agricultural fields. At the base of this slope is an overgrown drainage ditch that flows from the east to the west.

The airport terminal, apron and hangar structures are located in the southeastern portion of the AOA. There is an additional hangar and maintenance facility located at the northeastern corner of the AOA. An access road runs between the hangars and the taxiway, terminating in an overgrown gravel pad. Along this road are above ground utility lines and flowering trees.

The current lack of a perimeter fence could permit the movement of large mammals (whitetail deer and coyotes) across the AOA. However, the large forested areas that tend to provide the required shelter for these species are not located directly adjacent to the AOA and there is no evidence of a wildlife travel corridor that includes the airfield. The local topography of the airport, with relatively steep slopes to both the north and south of the AOA, appears to serve as a barrier to the easy movement of large animals. The only reports of large mammals entering the AOA have been the result of a specific activity such as hay harvesting or the use of all-terrain vehicles.

## 4.3 Adjacent land use

Agricultural land uses have the potential to attract hazardous wildlife including bird and mammal species. Specifically, crops like corn and wheat are known to attract mourning doves, waterfowl (including Canada geese) and large mammals such as white-tail deer. This is particularly true during and after crop harvest, when crop residue provides a significant food source. Wildlife usage of these areas should be monitored during harvest and appropriate measures taken to mitigate any wildlife concerns. This will be a significant portion of the WHA.

## 5.0 WILDLIFE ATTRACTANTS

Wildlife has four basic needs: food, water, cover, and loafing areas. Removing these elements on an airport is the first defense against wildlife strikes. Even when these elements of wildlife management are carefully considered, events can occur which cause the attractiveness of the airport to certain species to increase. Seldom used areas may revert to brush and tall grass, soil may settle creating collection points for water, and piled materials such as construction remnants or soil can serve as shelter for wildlife.

Land adjacent to airports may become developed, causing wildlife to seek habitats at an airport that meets their needs. For example, raised landing lights, trees, and snags (standing, dead trees) may be used as a perch by raptors to search for small mammals.

Food sources for wildlife may include overflowing dumpsters, handouts from people, vegetation, mast, seeds (including grass seeds), berries, insects, rabbits, rodents, and earthworms. Water sources can include streams, impoundments, puddles, sprinklers, dripping faucets, lakes, ponds, and rivers. Cover and nesting habitat may include hangars for doves and pigeons; brushy or grassy areas in ditches, fields, and along fences; towers and signs; urban structures; trees; or abandoned machinery and materials. Fields at airports may also provide shelter for burrowing animals.

Modifying or managing airport habitat is an effective and economical deterrent to wildlife because these methods tend to provide longer lasting results than do short term methods that remove individual animals. The goal is to render BJJ property as unattractive to hazardous wildlife species as possible. The best way to accomplish this goal is to limit food, water, and cover for wildlife by creating a monotypic (uniform) environment throughout the airport.

The following attractants were identified during the WHA at BJJ from October 2013 through September 2014. Both airports and wildlife are dynamic entities, and attractants may change over time. Therefore, this section should be viewed as a report of the current wildlife presence at BJJ during the time of the WHA and not as a permanent identification of the wildlife that could utilize BJJ. Future modifications to airport property or property surrounding the airport should take into consideration ramifications they may have on wildlife.

## 5.1 On-site Attractants

Grass: Grassy areas within the AOA at BJJ were of mixed cultivars and generally maintained at a 6-12 inch height near the terminal and runway. Offsite areas were allowed unlimited growth. These areas can be a major attractant to a host of wildlife species, and grass height can determine which species will use a given area. Grass height can also influence the ability of airport personnel to detect and react to hazardous wildlife. Grass height at BJJ should continue to be maintained between 6 – 14 inches within the AOA, which will help in limiting wildlife use. During the course of the WHA, the airport management changed the grass management protocol within the AOA to hay production. Overall grass height should be monitored to ensure that hay production does not create additional wildlife attractants.

Shrubs/Trees: Fruit bearing shrubs, Crabapple, and other trees provide food and shelter for the birds. Flowering crabapples were present on the airfield at the beginning of the WHA. However, all fruit bearing trees were removed by the airport in the spring of 2014 as part of a hangar development project.

Ditches and Wetlands: Ditches and potential wetland areas are present within the perimeter of BJJ. Along the northern edge of the AOA, there is a relatively steep slope separating the maintained grass areas from the adjacent agricultural fields. At the base of this slope is an overgrown drainage ditch that flows from the east to the west and is dominated by wetland

vegetation. While standing water was observed in the ditch, there were no areas of open water that might attract hazardous bird species such as waterfowl or wading birds. The large retention pond located to the south of the runway shows the development of some wetland vegetation, however during the course of the WHA there was no evidence of long-term standing water within the area.

Structures: There are numerous man-made structures that provide nesting and perching habitat for birds. The buildings, utility poles/lines, precision approach path indicator (PAPI) lights, obstruction lights, windsock, and runway markers are all used to varying degrees by birds. There is no continuous wildlife resistant perimeter fence surrounding BJJ.

## 5.2 Off-site Attractants

Residential Housing Communities: BJJ is located in a sparsely developed rural region. There are residential developments to the southwest and southeast of the AOA, including a nursing home and a small commercial area. These developments have several ponds, one of which is relatively large with a resident population of domestic waterfowl. The ponds provide excellent water, cover and loafing areas for all species of wildlife. The commercial area includes a restaurant that includes waterfowl feeding stations. Artificially fed or hand-fed wildlife often becomes habituated to humans, which may result in an increase in the overall wildlife population in the area. In addition, wildlife that has become accustomed to being fed can become difficult to deter from the area through the use of non-lethal control means.

Agricultural Fields: There are numerous agricultural fields surrounding BJJ on all sides. These fields, particularly during harvest, can serve as attractants for potentially hazardous wildlife.

## 5.3 Wildlife

Red-winged blackbirds, European Starlings, Columbids (Rock Doves and Mourning Doves) and Raptors (Red-tailed hawks and Turkey Vultures) were generally the most abundant hazardous wildlife observed at, near, or travelling through BJJ during the WHA. Appendix I lists all the species of wildlife observed during the WHA. This list includes many of the wildlife species common to Ohio. Mammals indigenous to this area that were not directly observed during the WHA include the opossum (*Didelphis marsupialis*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), red fox (*Vulpes fulva*), and many species of smaller rodents. Appendix F lists the Threatened and Endangered Species found in Ohio. During the course of the WHA, the Northern Harrier (a state-listed species) was observed utilizing the fields to the north and west of the airport for feeding.

Deer are the greatest single species threat to aviation in North America due to the catastrophic damage caused by species as large as deer (Dolbeer et al. 2000). While deer were observed in the vicinity of BJJ, there were no recorded observations within the AOA, either by the wildlife biologist or by the airport staff. Additionally, the winter months of the WHA were characterized by heavy snowfall. There was no evidence of wildlife movement across the AOA. The worst avian threats to aviation include large flocking birds such as gulls and waterfowl. However,

smaller birds such as starlings and blackbirds can also present significant hazards because of their propensity to form tight flocks comprised of thousands of individuals. Some solitary birds such as raptors present a concern because of their size and aerial hunting behavior.

#### **5.4 Wildlife-aircraft Strike Analysis**

BJJ has had one recorded wildlife strike entry in the National Wildlife Strike Database (NWSD) from 1990 to the present, with a strike reported in 2009 of an unknown small bird. This is likely due to underreporting by pilots, rather than an indication of the lack of wildlife strikes at the airport. Anecdotal reports of wildlife strikes were provided during the assessment to the wildlife biologist, but no date or details were included.

#### **5.5 Current Wildlife Hazard Management**

BJJ presently views wildlife hazard management as a priority but has few trained staff available to assist in managing problem wildlife at the airport. Wildlife management practices include:

1. Short-grass management adjacent to the runway.
2. Hand-launched pyrotechnics were added to the current wildlife hazard management program at the airport during the course of the WHA.
3. Wildlife strike reporting. With the initiation of the WHA at BJJ, airport staff have committed to more diligent reporting of wildlife strikes.

### **6.0 SURVEY METHODOLOGY**

The Wildlife Hazard Assessment (WHA) will be conducted in accordance with Federal Aviation Administration Advisory Circular 150/5200-33B and contain all elements outlined in Title 14 CFR 139.337.

#### **6.1 Bird Surveys**

From October 2013 through September 2014, bird surveys were conducted at BJJ monthly. The surveys used a time-area sampling design based on a modified version of the USFWS's Breeding Bird Survey. This survey is designed to capture temporal (seasonal and diurnal) and spatial use of the airport property by birds as well as behavior, abundance, and diversity of species. In addition to providing a report on the current use of the airport by birds, this assessment provides a baseline of information by which airport operations can evaluate the effectiveness of their program in the future.

An assumption of this survey method is that all birds present are seen and identified. This assumption was undoubtedly violated due to the presence of small, solitary species that occasionally went unnoticed or birds that were unidentified. However, this violation is acceptable because the intent of this survey is to capture an index of the presence and behavior of larger-bodied or flocking birds as these birds pose a greater risk to aircraft (Dolbeer et al. 2000).

Thirteen permanent observation stations (four on site and nine off-site) were selected to monitor all areas of the airfield (especially runway and approach and departure lanes) or a potential attractant (e.g., pond or wetland area). These survey points are included in Figure 1 and Figure 2. All on-site survey stations were located within the AOA. During each survey, an observer monitored these permanent observation stations on the property. Data was collected at each station for five minutes. Binoculars were used to identify species and obtain counts. Start times for the surveys were randomly selected to begin between dawn and dusk; each survey required about two and ½ hours. At each station, data recorded included each species observed, and for each species the number of individuals and the behavior (foraging or flying) was recorded.

Nine off-site locations were selected for observation due to their proximity to the airport and potential attractiveness to hazardous wildlife. Eight of these locations were located equidistant from the airport at radii of 5,000 feet and 10,000 feet from the AOA. The ninth location was selected based upon the existing pond located at the Red Barn Restaurant (approximately 7,000 feet to the southeast of the airport). Data collection was identical to the on-site methodology.

## 6.2 Mammal Surveys

Mammal observations made during the bird survey visits were documented through the WHA. Additionally, small mammals utilizing the airfield were surveyed through the use of snap traps placed in a variety of habitats. Rodents on airports can be an attractant to hawks and predatory mammals creating a hazard for aviation (Cleary and Dolbeer 2005). Snap-trapping is an effective way to determine what small mammal species occur at an airport and their relative abundance. Many small mammals can be common within the different habitats that occur on airport property (Whitaker and Hamilton 1998).

On July 30, 2014, 150 snap traps (Victor, Inc.), baited with peanut butter and rolled oats, were placed in various areas within the AOA to survey for the presence of small mammals on site. There were nine trap-lines located in various habitats and locations within the AOA. All trap-lines had between 10 and 25 traps to adequately cover the representative habitat. The traps were placed from the afternoon of July 30, 2014 to the morning of July 31, 2013 when they were picked up; with a total of 150 trap-nights.

Trap lines 1 and 2 were located at the western end of the runway along the southern edge, between mown grass areas and taller adjacent vegetation. Trap line 3 was located along the edge of the taxiway turn around located at the western end of the runway. Trap lines 4 and 6 were located along the eastern and western end, respectively, of the drainage ditch running along the northern edge of the AOA. Trap line 5 was located around the windsock to the north of the runway. Trap-line 7 was placed along the edge of the apron located to the north of the airport terminal building. Trap line 8 was placed along the southern edge of the taxiway in front of the terminal building. Trap line 9 was located along the northern edge of the hangar buildings.



## 7.0 ANALYSIS OF SURVEY DATA

Descriptive statistics were utilized to analyze the data from the point count surveys and to represent the situation at BJJ relevant to the time the surveys were made. Because there was no hypothesis being tested, other statistical analysis was not necessary.

To analyze the bird survey data, bird species were organized by species and guilds (Appendix F). Guilds are groupings of birds based on similar behavior, especially foraging behavior, and not necessarily on species relatedness. For example, red-winged blackbirds, common grackle, brown-headed cowbirds and European starlings, are combined into the guild “blackbirds.” Tracking birds of similar behavioral characteristics is important in determining which species of birds are most likely to be involved in bird-aircraft strikes. Also, birds of similar behavior tend to respond to the same control methods such as habitat modification, hazing, or types of exclusion.

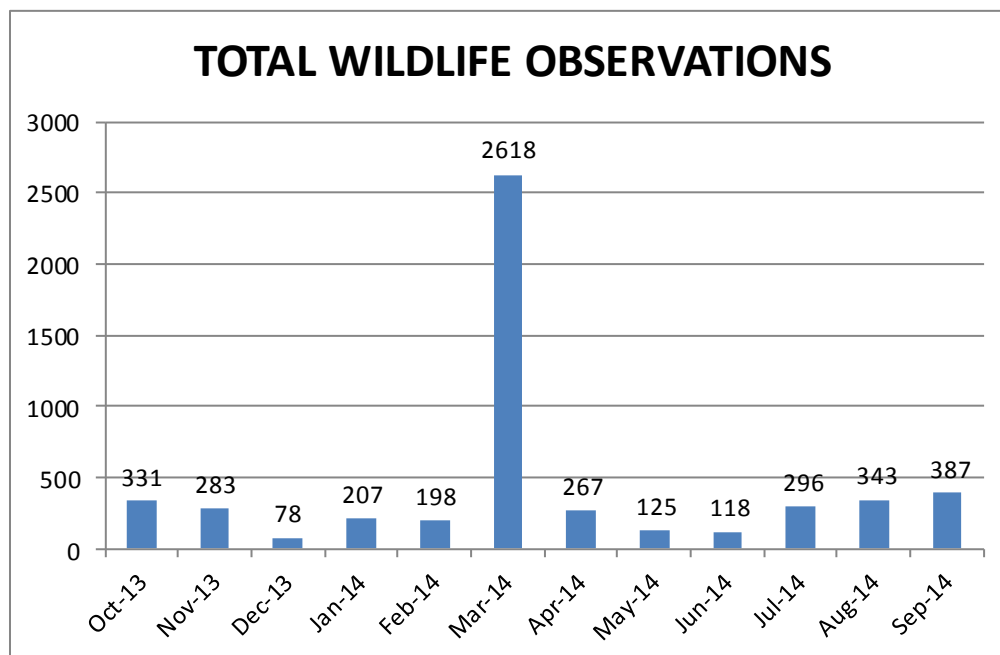
The temporal, spatial, and behavioral use of the airport by bird species/guild was analyzed. Data obtained from the WHA is presented in various tables and charts. This type of analysis allows comparison of the data between months and seasons, and shows important information about each guild represented.

### 7.1 Survey Results

BJJ and surrounding area contain a large diversity of wildlife. Only a portion of those species are primarily responsible for creating wildlife hazards at BJJ. During the WHA, a total of 52 species of birds, and 7 species of mammals were identified (Appendix F).

#### 7.1.1 Bird Surveys

**Figure 3: Total number of wildlife observed summarized by month at BJJ from October 2013 to September 2014.**



As can be seen in Figure 3, the month of March had the highest mean number of individuals observed per survey within the observation period, with birds observed in March representing 49.9% of all birds seen overall during the assessment period, followed by September at 7.4%. August and October were nearly identical, representing 6.5% and 6.3% of the overall observations.

The data shown in Figure 3 illustrates that there was wide variability in the numbers of individuals counted during each survey. During the March surveys, very large numbers of migrating blackbirds (including Red-winged blackbirds and European Starlings) were seen, representing 94.3% of all birds observed during those months.

**Figure 4: Percentage of each guild of total birds observed from October 2013 to September 2014.**

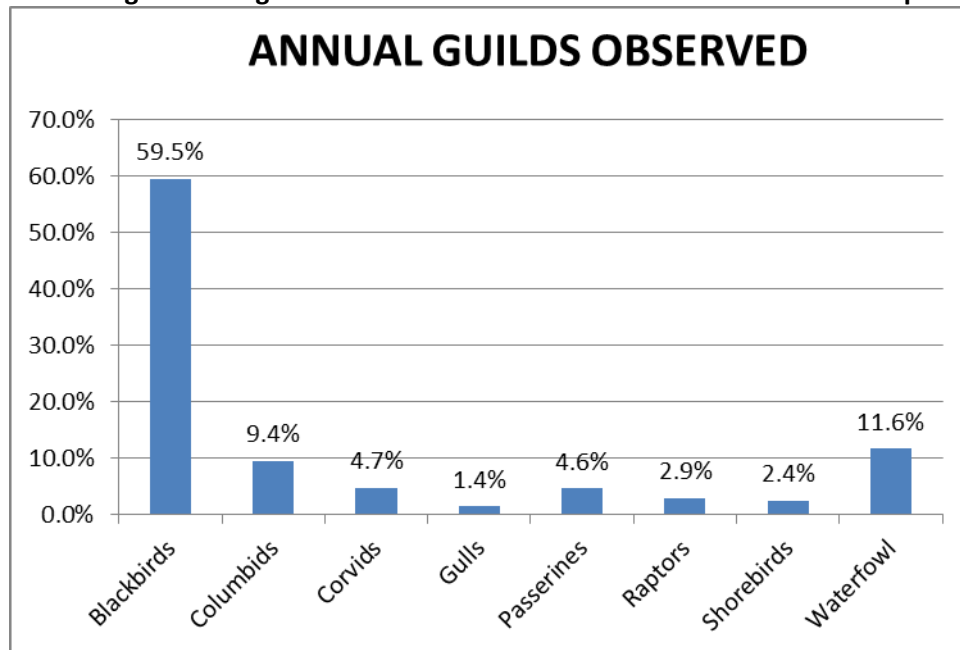


Figure 4 represent the guilds that were observed most frequently on BJJ during the study period. As can be expected, the blackbird guild represents the largest percentage of annual bird population surveyed, comprising 59.5% of the total observations. Waterfowl represented 11.6%, Columbids 9.4%, Corvids 4.7%, Passerines 4.6%, Raptors 2.9% and the remaining guilds make up the remaining 7.3%.

There were also differences in the representative guilds observed within the AOA and outside the AOA. Figures 5 and 6 summarize the observations made within and outside the AOA. Within the AOA, the most prevalent guild observed was Blackbirds, representing 74.8% of all observations. Columbids (pigeons and doves) were the second most prevalent guild, representing 8.9% of all observations. Outside of the AOA, Blackbirds were also the most prevalent guild, representing 49.4% of all observations, while Waterfowl comprised 30.0% of all observations.

Figure 5: Guilds observed within the AOA

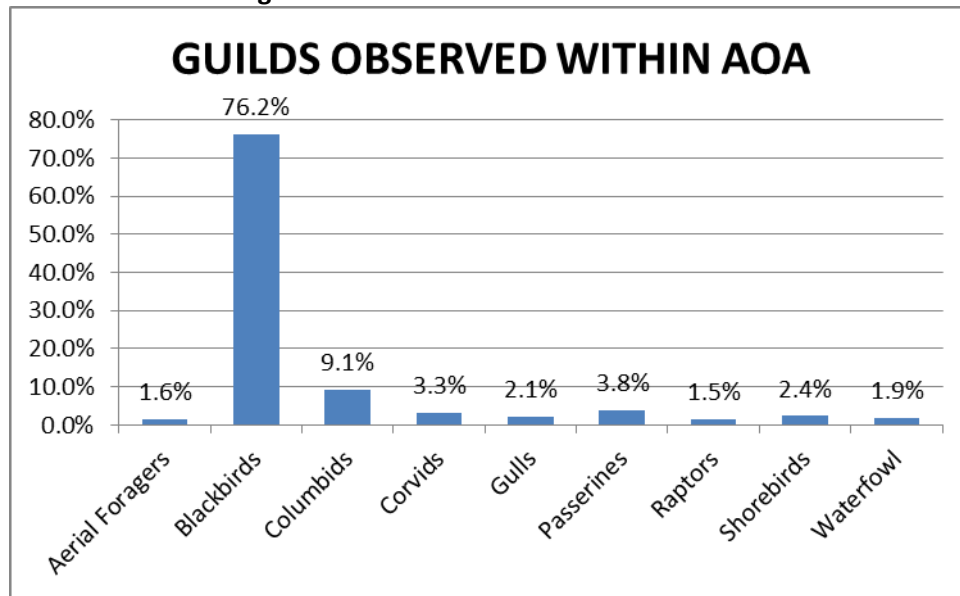
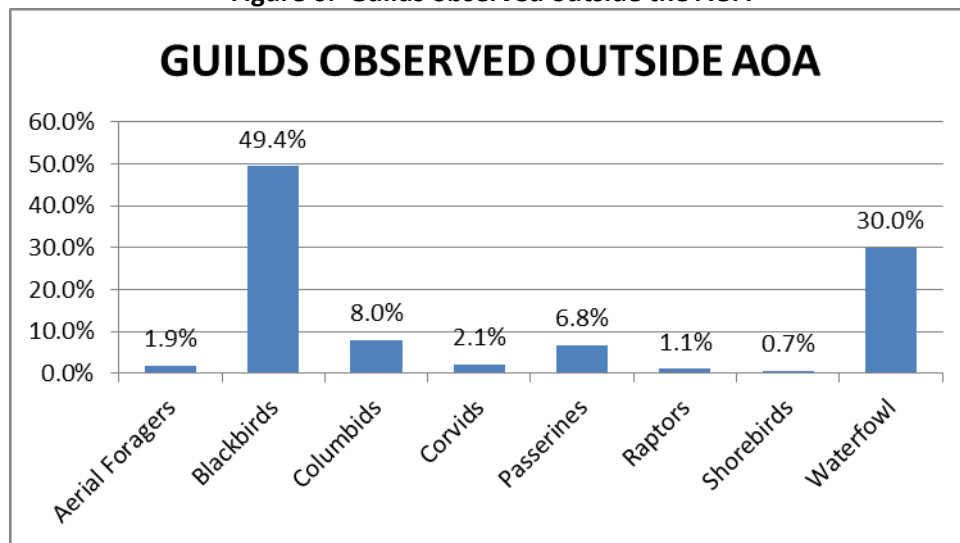


Figure 6: Guilds observed outside the AOA



**7.1.1.1 Behavior**

Behavior is an important consideration because flocking birds such as starlings, geese, Red-winged blackbirds, and swallows pose a greater threat to aircraft than solitary small birds. In addition to behavior, this observational data should also be reviewed in conjunction with a species (or guild’s) strike history to determine a species importance in terms of risk level to aircraft (Dolbeer and P. Eschenfelder 2002). Flying/feeding behavior was observed most often, accounting for 54.8% of all observed behaviors. This behavior included birds foraging adjacent to the runway and flying short distances along or across the runway and taxiway systems. To further document this, runway incursions were documented. A runway incursion was defined as a bird or group of birds flying across the runway, the approach or

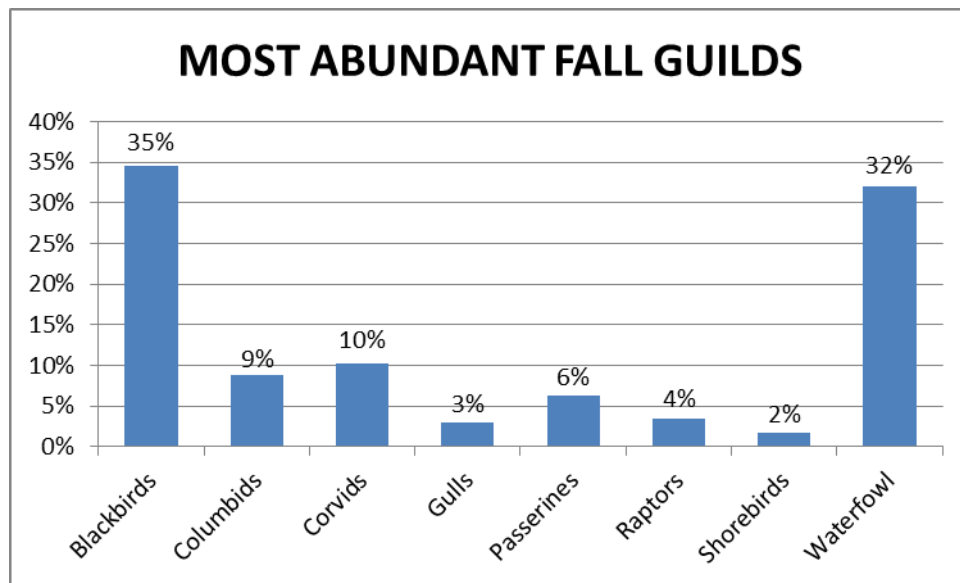
departure surfaces. 62.8% of flying observations included a runway incursion. Loafing behavior was also observed, accounting for 45.1% of all observed behaviors.

**7.1.1.2 Habitat Types**

Habitat types must be analyzed when making observations and recommendations about wildlife management on an airport. Many habitat types can be found throughout an airport, with some types attracting significantly more wildlife activity than others. Each habitat type has differing levels of attractiveness to the species found on an airport, and the intersection of habitat types provides the greatest opportunities for the largest number of species. At BJJ, survey points 1 and 4 were typified by short grass (grass that is ≤6 inches in height), with associated pavement, perching structures and included a habitat transition with adjacent agricultural areas. Observations at these two points comprised 72.3% of all bird observations on the airfield, indicating that the majority of birds utilizing the AOA at BJJ are utilizing the habitats adjacent to and around the ends of the runway.

Figures 7 through 10 indicate the seasonal distribution of guilds observed during the assessment.

**Figure 7: Most abundant fall bird guilds observed at BJJ (September, October and November)**



**Figure 8: Most abundant winter bird guilds observed at BJJ (December, January and February).**

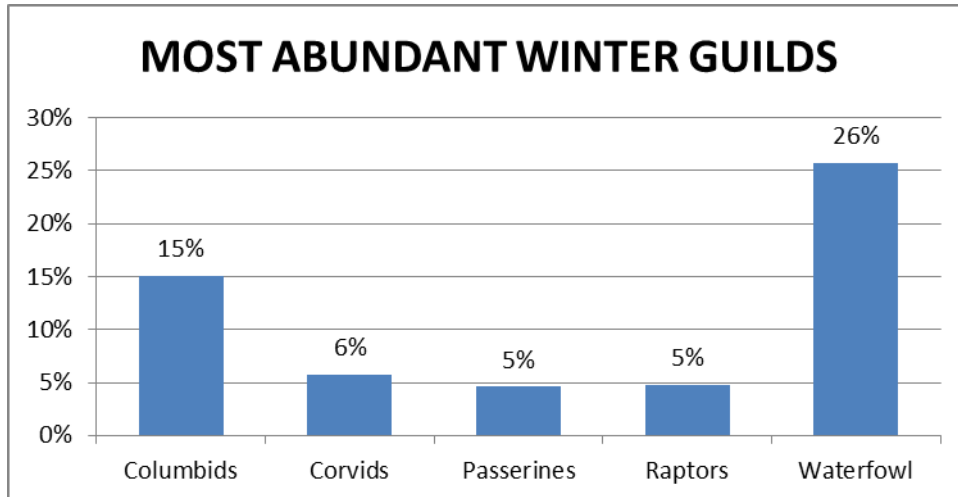


Figure 9: Most abundant spring bird guilds observed at BJJ (March, April and May).

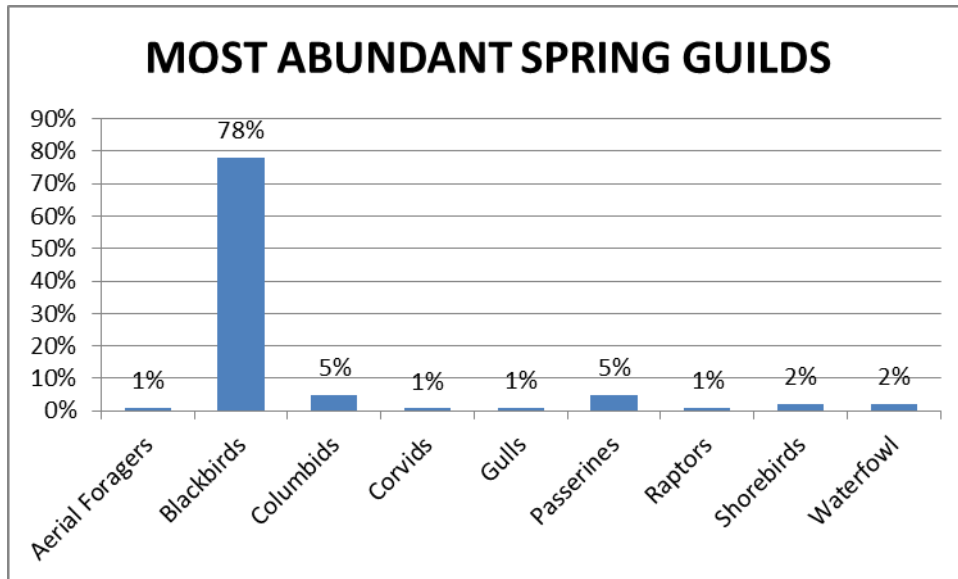
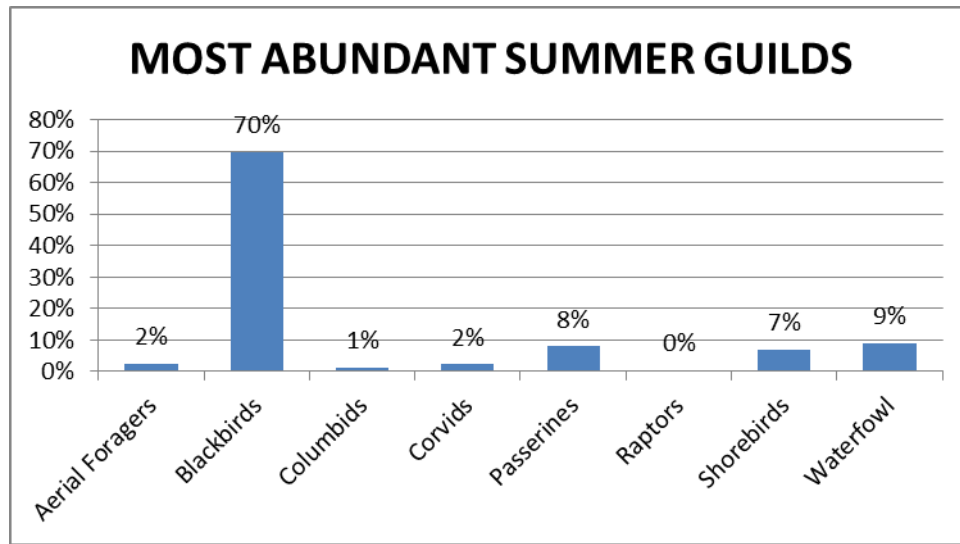


Figure 10: Most abundant summer bird guilds observed at BJJ (June, July and August).



### 7.1.2 Mammal Surveys

On July 30, 2014, 150 snap traps (Victor, Inc.), baited with peanut butter and rolled oats, were placed in various areas within the AOA to survey for the presence of small mammals on site. There were nine trap-lines located in various habitats and locations within the AOA. All trap-lines had between 10 and 25 traps to adequately cover the representative habitat. The traps were placed from the afternoon of July 30, 2014 to the morning of July 31, 2014 when they were picked up; with a total of 150 trap-nights.

Trap lines 1 and 2 were located at the western end of the runway along the southern edge, between mown grass areas and taller adjacent vegetation. Trap line 3 was located along the edge of the taxiway turn around located at the western end of the runway. Trap lines 4 and 6 were located along the eastern and western end, respectively, of the drainage ditch running along the northern edge of the AOA. Trap line 5 was located around the windsock to the north of the runway. Trap-line 7 was placed along the edge of the apron located to the north of the airport terminal building. Trap line 8 was placed along the southern edge of the taxiway in front of the terminal building. Trap line 9 was located along the northern edge of the hangar buildings.

## 8.0 DISCUSSION

### 8.1 Bird Guilds

#### 8.1.1 Waterfowl

**Description:** Due to their larger body sizes and gregarious nature, waterfowl (particularly geese) pose serious risks to aircraft. Ducks are rarely seen loafing or roosting away from water, even if it is only a puddle; however they will feed in crop fields during the winter

months. Canada geese will land on nearly any sizeable field or lawn where they can watch for predators while feeding. Geese pose a greater risk to aircraft not only because of their larger size, but also because they tend to travel in large flocks. Both like to roost on larger bodies of water to escape predation or other risks. Geese and ducks tend to leave their roosts near sunrise to locate a feeding area, and will often return to these areas to feed before sunset. They return to their roosts during or just after sunset, but will sometimes be seen foraging at night.

The USFWS defines a resident Canada goose as one that nests or resides on a year-round basis within the conterminous United States (Ankey 1996). Migratory sub-species of Canada geese migrate south during the fall and winter in the southern most parts of the United States and Mexico, and migrate north to the Northern US and Canada in the spring where they summer. Giant Canada geese are able to tolerate human and other disturbances, while proliferating in an urban/suburban environment. The giant Canada goose population in Indiana has increased significantly over the last two decades.

**Attractants:** During the day, Canada geese search for areas where they can feed and loaf. These areas include expanses of lawn where they can easily see approaching predators or an area where they can quickly escape in the event of danger (i.e. pond). The grassy areas and adjacent agriculture fields at BJJ make attractive places for geese to feed and loaf, while the nearby river and ponds provide protection.

**Risks:** Waterfowl can be particularly hazardous to aircraft because of their large size, weight, flocking behavior, and relative abundance. Nationally, waterfowl represent 8.6% of known species bird-aircraft strikes in the U.S. (Cleary et al. 2008). Canada geese and mallards rank 4th and 10th, respectively, out of the top 20 bird species reported as struck by civil aircraft in the U.S. between 1990 and 1998 (Dolbeer et al. 2000). Geese are ranked 1st among all species groups as being the most costly species for an aircraft to strike (Dolbeer et al. 2000). The potential for damage by Canada geese was tragically illustrated in September 1995 when an Air Force Airborne Warning and Control System (AWACS) plane crashed in Alaska after striking a flock of Canada geese on takeoff, killing all 24 crew members.

**Legal status:** Waterfowl are protected as migratory game birds by federal and state laws, but most may be hunted during the fall and winter. However, there are constraints that limit the feasibility of hunting as a viable control technique for resident and migratory Canada geese, such as seasonal restrictions, bag limits, and municipal ordinances. Federal and state depredation permits are required to remove waterfowl out of season or in excess of the legal bag limit during the hunting season, but not to harass these species. Federal and state permits are also required to remove waterfowl nests and eggs.

**Control measures:** The best method of control for waterfowl is the removal and exclusion of attractive wetland habitat and agricultural crops. Wire grids are effective at 1-20 foot intervals (depending on species) over ponds and other wetlands. Mylar tape stretched

between two stakes, 50-100 feet apart at 25-foot intervals may be an effective temporary harassment method for feeding areas.

An important aspect of managing waterfowl is to not let them feel safe. As soon as they arrive, it is imperative that they are harassed until it is certain that they have left the airport, and not merely moved to another area on the airport. Pyrotechnics work well for most waterfowl. If they habituate to hazing efforts, it may become necessary to lethally remove a few individuals to reinforce these methods. Habituation to hazing techniques is most often noticeable with resident birds, but may also occur in migrants a few weeks after the regular hunting season closes. Waterfowl can be effectively hazed using visual repellents (i.e. lasers), but they work best when used in conjunction with pyrotechnics or other audio harassment. Chemical repellants which cause a visual or digestive response can also be applied to areas waterfowl are utilizing as a feeding area. These chemicals work on the basis that the waterfowl will avoid foraging at the chemically treated areas due to the taste, or will forage and have a negative digestive response to the chemical. The chemical which causes the digestive response also reflects UV light which is highly visible to waterfowl, further discouraging them from foraging in the treated area.

In addition to implementing direct control actions, maintenance personnel responsible for reducing wildlife hazards and pilots should be made aware of potential hazards at BJJ, especially during the fall and spring migration periods when the birds are plentiful.

#### ***Risk Analysis***

***Prevalence:*** Waterfowl were the second most prevalent bird guild observed in BJJ during the study period, comprising 11.6% of total observations (Figure 3). Their flock movements continue to present a significant hazard for aviation and should be managed accordingly.

Through the entire study period, waterfowl were observed on or over ponds in the general area the majority of the time, followed by short grass and agricultural fields. Waterfowl were rarely observed within the AOA, comprising only 1.9% of total observations. By contrast, waterfowl were the most abundant species observed outside of the AOA, comprising 30.0% of total observations.

***Behavior:*** Waterfowl were most frequently observed loafing, followed by feeding and swimming, with flying representing the remaining activities. Waterfowl were utilizing properties on and adjacent to the airport, which indicates that ducks and geese could be utilizing BJJ and the immediate vicinity as a rest stop/food source and spending a considerable amount of time near the airfield.

### **8.1.2 Blackbirds**

***Description:*** The term blackbird loosely refers to about 10 different species of North American birds. The species most common to Indiana include the brown-headed cowbird, red-winged blackbird, and common grackle. Blackbirds are a varied group possessing conical, sharp-pointed bills and rather flat profiles. Some are black with iridescence, others



are highly colored. European starlings are similar in size, but appear stockier with a shorter tail and are heavily speckled in winter. Although starlings are not technically blackbirds, the two groups are often considered together due to behavioral and morphological similarities and because they are often found in mixed flocks.

All blackbirds and starlings are gregarious, especially in winter when thousands may roost together, often of mixed species, sometimes including American robins. In BJJ's geographic area, large flocks of blackbirds and starlings begin to form roosts for winter as early as August and begin disbanding in February. Starlings will remain in the area, while red-winged blackbirds, common grackles, and cowbirds migrate south for the winter. Starlings and blackbirds are active during daylight hours.

**Attractants:** Starlings and blackbirds are omnivorous, feeding on grains, weed seeds, fruits, and insects. Both starlings and blackbirds are found in urban areas, airports, grassy or weedy fields, and fallow croplands. Abandoned buildings and trees planted on or adjacent to airports serve as potential roosting sites for starlings. Starlings are cavity nesters and will nest in woodpecker holes, buildings, airport structures and even out of service airplanes. Red-winged blackbirds prefer croplands and weedy fields, and they roost and nest in marshy areas with tall vegetation such as cattails or phragmites.

**Risks:** Starlings and blackbirds are considered a serious threat to aviation because of the large flocks they form. Nationally, starlings account for 5.6% and blackbirds account for 3.8% of all bird-aircraft strikes of known species (Cleary et al. 2008). Starlings and blackbirds rank 2nd out of the 21 wildlife species most often reported struck by aircraft, but because of their small size are rated as the 19th most hazardous species (Dolbeer et al. 2000). There have been two significant incidents involving human fatalities in aviation history involving starlings and brown-headed cowbirds. The first incident was in 1960 when a Lockheed Electra turbo-prop ingested starlings into all engines during takeoff and crashed into Boston Harbor, resulting in 62 human fatalities. The second documented incident occurred in 1973 when a Lear jet struck a flock of cowbirds on departure from Peachtree Airport in Dekalb, Georgia. Engine failure resulted in a crash and eight human fatalities. Other incidents involving starlings damaging aircraft have been documented (Cleary et al. 2008).

In addition, winter roosts present a nuisance because of the noise and associated droppings that corrode and damage buildings and property. If allowed to accumulate, droppings can become a source of diseases that can infect humans and domestic animals. Also, nesting starlings can create a fire hazard in combustible structures because they continually deposit nesting materials (primarily dried grasses and twigs) in the same nesting place year after year.

**Legal status:** Starlings are an introduced species and are not protected by federal or state laws. They may be killed at any time without permit. However, the use of certain methods such as toxicants is regulated by the state of Indiana. Blackbirds are classified as migratory non-game birds, but can be killed when concentrated in a manner that constitutes a threat

to human health and safety under both federal and ODNR regulations (Appendix E). The presence of a flock of starlings or blackbirds in or adjacent to an Airport Operations Area (AOA) should be interpreted as a direct threat to human health and safety.

**Control measures:** Habitat management (i.e., grass management, roost removal, etc.) is usually the most cost effective management because it serves as a long term deterrent. However, grass management has mixed results in controlling blackbirds utilizing an airport. For example, brown-headed cow birds prefer short (<6 inch) vegetation and starlings do not differentiate between short (<6 inch) and tall (>6 inch) vegetation. Regular mowing is wise management for all accessible areas of the airport (Cleary et al. 2005). The management of roosting sites on or adjacent to an airport will also reduce starling and blackbird presence.

Habitat management alone may not be enough to discourage bird presence. When starlings and blackbirds are present, airport personnel should haze them off the field using pyrotechnics. Flocks of birds can be dispersed with pyrotechnics and visual repellants. Often birds simply move to another location on the airfield so it is important to be persistent in hazing any bird species. Lethal reinforcement (i.e. shooting) may be necessary if the birds become habituated to pyrotechnics or other non-lethal methods. Trapping or application of toxicants may be an alternative if the birds can be lured to certain areas with highly attractive baits. Proper permits and licenses must be obtained before the application of toxicants.

### **Risk Analysis**

**Prevalence:** Blackbirds were the most prevalent guild of birds, comprising 59.5% of the observations during the study period (Figure 3), including 74.8% of observations within the AOA. They were the most abundant guild during all months. Throughout the period, European starlings represented 63.5% of all birds in this guild, followed by Red-winged blackbirds at 35.1%, and mixed flocks of blackbirds including Common grackles and Brown-headed cowbirds making up the remaining 1.4%. These species were most prevalent at BJJ during the months of August through November, but were also observed from March to November.

This guild had the highest numbers of individuals observed per survey during Spring and Fall. The peak seen during this time is likely due to fall migration as well as breeding and raising young.

Throughout the year this guild was observed primarily in short grass, followed by flying to or from the airport.

**Behavior:** Birds are most dangerous to air traffic when they are flying near the AOA. Blackbirds were observed loafing on BJJ most of the time they were observed, closely followed by flying and feeding with loafing, perched and vocalizing comprising the remainder. The fact that most birds of this guild were observed loafing or flying on the airfield and in larger flocks, raises concerns that the birds are attracted to/utilizing the

airfield, and are not merely flying past the airport without interest. The longer the birds remain on or near the AOA the greater the chance that they will interfere with air traffic.

### 8.1.3 Passerines

**Description:** This guild includes a wide variety of perching birds, including insectivorous species, along with those species attracted to seeds and berries. All of the species in this group are small to medium sized birds, many of which prefer to forage in the mowed grass commonly found along the edges of taxiways and runways, making them a strike risk during certain times of the year. Of the species in this guild observed at BJJ only horned larks are classified as year round residents of Central Indiana. The remaining species migrate to the southern portion of the United States or to South America to winter, and returns to the area during the summer months.

**Attractants:** As stated earlier, most species in this group are attracted to large, open grassy areas in which they forage for insects and worms. Many species in this group (namely Eastern meadowlark) tend to prefer large expanses of grassland areas regardless of the mowing regime, while others (American robins and horned larks) tend to prefer the shortly mowed grass areas for foraging.

**Risks:** Nationally this group represents 4.3% of all known strikes that occurred between 1990 and 2006 (Cleary et al. 2008). The average body size of this group of birds does not make them extremely dangerous to air traffic singularly, but when they are grouped into flocks the risk level is raised significantly.

**Legal Status:** The bird species represented in this guild are considered migratory non-game birds. Depredation permits from the USFWS and the ODNR are needed to take these species as reinforcement to non-lethal management techniques.

**Control Measures:** These species can be effectively managed by habitat modifications, insecticides, harassment, and lethal reinforcement of harassment techniques. Many of the habitat modifications that could be implemented for managing species in this guild are contrary to FAA regulations, as well as wildlife management efforts for other species, making this type of management useful in only very specific situations. If large numbers of insects are present in areas where these species are observed, insecticides can be applied to reduce the insect population, thus decreasing the overall attractiveness of these areas.

Harassment can be an effective tool should larger flocks of some species be observed, though species in this guild are often very persistent and require extended periods of harassment. Lethal reinforcement of the harassment will increase the effectiveness of the effort. As with any harassment effort, persistence is the key to success.

### **Risk Analysis**

**Prevalence:** Passerine species represented 4.6% of the total birds seen on BJJ during the study period (Figure 3). They were observed on the airfield throughout the 12 month survey period. During the sample period, eastern meadowlark and field sparrows were the most commonly observed of all species in this guild. The other birds in this guild observed on BJJ include Northern Cardinal, yellow warbler, eastern bluebird, eastern meadowlark, downy woodpecker, red-bellied woodpecker, red-shafted flicker and various species of sparrows.

The habitat type most commonly utilized by this guild was trees, followed by weeds, shrubs, short grass and drainage areas.

**Behavior:** Passerines were observed flying, feeding, vocalizing and standing. The proportion of vocalizing observations indicates that these birds are likely residents at BJJ and have established territories on the airport. The majority of passerine observations at BJJ were of solitary or small flocks of passerines, indicating a relatively slight hazard to airport operations.

#### **8.1.4 Columbids (Pigeons and Doves)**

**Description:** Feral pigeons, also referred to as rock doves, are familiar birds that are abundant in cities and rural areas throughout Indiana. Pigeons and doves are powerful fliers with robust bodies, small heads and short beaks. Mourning doves typically fly close to the ground near cover as they travel between feeding and roosting areas, whereas feral pigeons tend to fly at higher altitudes, descending to their destinations in a rapid circling pattern with wings spread back. Although both species are primarily granivorous, they will occasionally consume protein-rich animal material, such as insect larvae. Pigeons are also opportunists, feeding upon handouts from humans.

**Attractants:** Pigeons are attracted primarily to structures where they spend their time loafing or nesting. Buildings often provide desirable nesting areas (e.g., flat surfaces and ledges, metal I-beams in hangars, etc.). They will move from these structures to feeding areas in the vicinity, potentially crossing active runways. Agricultural and short grass habitats provide feeding and loafing habitats for Columbids. Mourning doves are common near woodlands, where they nest or loaf, and agricultural or short grass areas where they feed.

**Risks:** Mourning doves, while being somewhat small in size, form loose flocks, especially in the fall and winter. This flocking behavior gives them the potential to cause a multiple strike incident. Although pigeons are not as large as many other species considered detrimental to air safety (e.g., waterfowl, gulls, raptors), they are still a concern because of their overall abundance, dense body structure and movements around the airfield. Pigeons may also damage aircraft in hangars because of accumulations of their droppings and potential to nest within the aircraft.

**Legal Status:** Feral pigeons are not protected by federal or state laws and can be taken at any time by any legal means (i.e., within label restrictions of pesticides or by the legal use of firearms). Mourning doves, however, are migratory game birds and are regulated by federal and state laws. Permits are required for lethal control actions, unless they are conducted during the annual dove hunting season, by a properly licensed hunter.

**Control Measures:** Habitat modification helps reduce the numbers of doves directly using the airfield. Weedy fields should be cut and/or replaced with grass. Wetlands should be reduced where possible to minimize watering areas. New structures that are constructed should be designed to exclude nesting by pigeons. Old buildings should be retrofitted, where feasible, with exclusionary netting or types of barriers to block access to eaves and beams. Installation of wire coils, porcupine wire, or a tactile repellent can be applied to favored roosting or loafing sites to prevent pigeons from using these areas. Exclusionary techniques are most effective when birds are initially colonizing an area.

Once reduced to a maintainable level, it is relatively easy to prevent pigeons from re-invading hangars and other structures by using air rifles and the exclusionary methods previously discussed. It is important to be diligent with control efforts because these birds will return and attract additional birds to the site.

There is a legal hunting season for mourning doves that generally runs in late summer through fall, (check with the ODNR for seasons as they are subject to change each year). While legal hunting for some species can be an effective tool for reducing bird strike hazards at airports, there are often accessibility restrictions, security concerns, harvest limits, and the hunting season limit may not coincide with the time that control is needed. Sport hunting during the regular season on properties adjacent to the airfield, however, can increase the efficacy of hazing efforts on the airfield. Pyrotechnics can be an effective deterrent for these species, particularly mourning doves.

### **Risk Analysis**

**Prevalence:** Mourning doves and pigeons were regularly seen at BJJ throughout most of the year. Columboid observations represented 4.7% of all wildlife observations at BJJ (Figure 3).

Mourning dove sightings were typically in grass areas. They were also seen on/around fences, power lines and utility structures. These are favored perching/sitting locations for mourning doves and made them easily visible during surveys. A large number of mourning doves were observed during the September surveys, utilizing degrading pavement areas and areas of recent construction activity. Likely, these areas were being used as sources of gravel utilized by this species for digestion.

**Behavior:** The Columboid behavior most commonly observed at BJJ was flying, followed by loafing. The majority of observations were of birds flying along and across the AOA. The presence of grain producing agriculture (corn or wheat) near to the AOA could raise the potential hazard from this guild, particularly during the fall months coinciding with harvest.

Care should be taken during construction activities to avoid extended exposure of bare ground and pavement should be examined for evidence of degradation.

### 8.1.5 Aerial Foragers

**Description:** This group is represented by swallows and swifts. Examples of these birds that were observed at BJJ during the WHA are barn swallows, chimney swifts, purple martins and tree swallows. They are migratory species and are not present at BJJ in the winter. Aerial foragers travel in flocks and fly erratically across an airport in search of food. This behavior makes them a commonly struck bird at certain times of the year.

**Attractants:** Aerial foragers feed upon flying insects and are often seen in flocks over fields. Because the number of insects is greater in tall grass, more swallows will be observed when the grass is allowed to grow taller than recommended on airports. Birds of this guild are routinely observed following grass cutting equipment during the summer months in search of insects that may be disturbed by the mowers. They are also commonly observed over ponds and wetland feeding on the associated insects.

**Risks:** Nationally, this guild represents 4.6% of known birds struck by aircraft between 1990 and 2006 in the U.S. (Cleary et al. 2008). Swallows are the 11th ranked species most often struck by aircraft but because of their small size, they are not in the top 20 bird species reported struck and causing damage to civil aircraft (Dolbeer et al. 2000).

**Legal status:** Aerial foragers are defined as migratory non-game birds. Depredation permits from the USFWS and ODNR are needed to take these species.

**Control measures:** Swallows and swifts may be best managed through an integrated program that includes habitat management, insect control, harassment and lethal reinforcement of harassment techniques. If insect populations spike, insecticides are a possible management option. Both a USFWS depredation permit and ODNR nuisance removal permit is required to use lethal reinforcement of harassment techniques on swallows and swifts.

#### **Risk Analysis**

**Prevalence:** Aerial foragers represented 3.6% of the total birds observed on the airfield during the survey period (Figure 3). They were observed on the airport during spring and summer (when flying insects are at peak numbers), with the highest numbers counted during August. Aerial foragers commonly increase after young of the year have fledged.

During the sample period, Barn swallows represented the majority of the species observed in this guild. Tree swallows and chimney swifts were also observed. Aerial foragers at BJJ utilized short grass areas most of the time and occasionally runways. The remaining observations were utilizing ditches, long grass, and drainage areas.

**Behavior:** The behavior most often observed was hawking (aerial foraging for insects) and flying. Since these birds typically feed on the wing it is difficult to separate flying from feeding and could be assumed that they are feeding during 99% of the observations.

### 8.1.6 Shorebirds

**Description:** The shorebirds guild is usually divided into “long-legged” and “smaller” wading birds. Long-legged shorebirds are comprised of egrets and herons while smaller shorebirds include plovers, sandpipers, killdeer, etc. Some of the birds observed in this group at BJJ include killdeer, great blue heron and solitary sandpiper.

**Attractants:** These birds are attracted to shallow water (ditches or temporary water) or shorelines (ponds) where they can hunt for small to medium-sized fish, amphibians, small marine life, and insects. Upland shorebirds such as killdeers and upland sandpipers are attracted to open grassland habitat, concrete pads, and gravel areas which are commonly found on most airports.

**Risks:** Nationally, shorebirds represent 8.5% of all known bird-aircraft strikes (Cleary et al. 2008). Herons are ranked 12th and smaller shorebirds such as killdeer and common snipes are ranked 17th out of the 21 most hazardous wildlife species to aircraft (egrets were not ranked) (Dolbeer et al. 2000). Egrets and herons pose a more serious threat to aircraft than their smaller relatives. These long-legged shorebirds are larger and can cause greater impact damage to aircraft. They are also slower and more lumbering in flight than the smaller birds. The smaller birds tend to nest close to where they feed, and they forage and travel along shorelines. The larger birds may travel farther, in comparison, between foraging areas and their roost, crossing various types of terrain including runways. The exception is killdeer which tend to loaf and feed on the edges of barren ground (i.e. taxiways/runways) and nest in bare gravel areas (unpaved roads and abandoned areas). These habits increase the risk of them coming into contact with aircraft.

**Legal status:** Shorebirds are classified as migratory non-game birds and are protected under the MBTA. They may only be taken after USFWS and ODNR depredation permits are obtained. Black-crowned night herons and upland sandpipers are listed by the ODNR as an endangered species, and special permits from the ODNR are required for harassment of these birds.

**Control measures:** The areas that attract wading birds are generally areas adjacent to airports, and are often regulated as wetlands; therefore, management for these birds can be difficult. Airport drainage ditches should be kept free of aquatic vegetation and tall grass. Standing water should be drained from ditches to reduce attractiveness to wading birds. Egrets and herons should be deterred from crossing the airport by hazing them with pyrotechnics. Hazing with pyrotechnics should also occur if these birds are observed foraging, roosting, or loafing on the airport. It may be necessary to lethally reinforce the harassment effort if individuals persist on the airfield.



### **Risk Analysis**

**Prevalence:** Shorebirds represented 2.4% of the total number of birds observed during the study period (Figure 3). Shorebirds were present on or near the airfield from Spring through Fall.

Killdeer represented the majority of all shorebirds observed during the study period, with great-blue herons being second most common. A single large flock of sandhill cranes were observed flying over the airfield during the October 2013 surveys. Killdeer were most likely to found on BJJ while great-blue herons were found only on off-site ponds.

Shorebirds at BJJ were observed utilizing the grass median/runway interface most of the time, followed by short grass areas. Killdeer are the species most often observed on paved surfaces. Great blue herons were observed most frequently utilizing pond/drainage areas.

**Behavior:** The most prevalent behavior that was exhibited by shorebirds on BJJ was loafing, feeding and vocalizing. The behaviors of running and vocalizing are most often attributed to killdeer. The relative lack of large shorebird species utilizing the AOA diminishes the overall hazard presented by this group.

#### **8.1.7 Gulls**

**Description:** Gulls are robust birds having webbed feet, long pointed wings and a stout, slightly-hooked bill. Most adult gulls are white with gray backs and black wing tips. Juvenile gulls are typically a mottled brown color with black bills. Terns are also included in this group. Terns are slender birds with long narrow wings, forked tails, and pointed bills. Terns fly with their bill pointed down as they search for fish or insects and dive on them from the air.

**Attractants:** Gulls are attracted to water or food including refuse from dumpsters and landfills, earthworms, insects, and carrion. The presence of a few gulls can act as a strong attractant to others passing. Gulls can be extremely gregarious and if they observe others feeding will flock in to get a share. They are also attracted to airports because they often provide ideal loafing sites. Agricultural tillage on the airport can be an attractant to gulls who feed on the exposed worms.

Gulls can be readily observed flocking on runways or taxiways following rainstorms to feed on earthworms. For the most part, terns eat small fish found near the water's surface, but can feed opportunistically on insects flying above crops.

**Risks:** Gulls have the distinction as the bird most commonly reported in damaging strike incidents in the nation. They are generally considered a primary hazard because of their size, abundance, wide and expanding distribution, flocking behavior, relatively slow flight characteristics, and general tendency to concentrate at airports.

**Legal status:** Gulls are classified as migratory non-game birds. Lethal control activity must be conducted under appropriate federal and state permits.



**Control measures:** Habitat modifications are among the most effective methods of gull control, such as the removal of refuse, removal of carrion (i.e., animal carcasses) from the airfield and the elimination of standing water (increased drainage). Persistent water bodies, such as drainage ditches and containment ponds, can be excluded through the use of a system of overhead wire grids with 1 to 20 foot spacing. These efforts should include an integration of other control methods. Gulls can habituate rather quickly to hazing (pyrotechnics, bioacoustics and visual scare devices), requiring the need for some individual birds to be shot as a reinforcement of non-lethal harassment techniques. Gulls should be hazed early and often in any area of the field that is safe. A zero tolerance policy prevents the birds from becoming accustomed to using the field.

#### **Risk Analysis**

**Prevalence:** Ring-billed gulls were the only species in this guild observed at BJJ during this assessment, comprising 1.4% of the observations (Figure 3). Gulls were observed only during the March surveys, indicating their presence was likely due to migratory movement.

**Behavior:** The most common behavior for gulls at an airport is flying over or loafing on airport runways/taxiways. This can present significant hazard to aircraft in both approach and departure flight modes. Gulls were only observed in the spring, during the established migratory season, resulting in this guild creating a seasonal hazard.

### **8.1.8 Raptors**

**Description:** Raptors are predatory birds and scavengers that feed upon prey animal species. Raptors include vultures, eagles, hawks (kites, harriers, accipiters, and buteos), falcons (including kestrels), ospreys, owls and vultures. They range in size from the 7-inch screech owl to the 43-inch bald eagle. Most species have characteristic hunting styles such as soaring (vultures, eagles, red-tailed hawks), flying low (harriers), dense forest ambush (accipiters), hovering (kites and kestrels), and watching from perches (buteos and owls).

**Attractants:** Raptors are attracted to habitats that have an abundant supply of prey species. For raptors such as rough legged hawks, red-tailed hawks, northern harriers, Cooper's hawks and American kestrels, prey species include rabbits, small rodents, birds, reptiles and insects, while larger owls are attracted to rabbits and rodents. In order to hunt effectively, many raptors need large trees or snags at the edge of fields in which to perch as they watch for prey. Raptors often adapt and use other perches found at airports such as glide slope and localizer antennas, wind socks, or any other structure which they can gain an elevated view of their surroundings, often putting themselves in close association with aircraft operations. The abundance of perches, short grass (< 6 inches) coupled with high small mammal numbers (voles and field mice) often make airports prime foraging areas for many species of raptor. Turkey vultures are often attracted to airports because of the strong thermals that are created as the open ground found at airports is warmed, as a result their inclination of soaring on thermals and overall size make them especially hazardous to aircraft operations.

**Risks:** Raptors represent a significant hazard to aircraft since they are typically large in size, and their hunting behavior predisposes them to collisions with aircraft. Nationally, raptors account for 13.2% of known species bird-aircraft strikes in the U.S. (Cleary et al. 2008). Hawks and owls are more commonly struck on airports while hunting, whereas vultures tend to be struck while soaring at higher altitudes. Two species in this guild have had a marked population increases in the past few decades. In Indiana, from 1966 to 2006, the red-tailed hawk and the turkey vulture populations have increased annually at a rate of 7.5 and 12.3 percent respectively (Sauer et al. 2007).

**Legal status:** All raptors are protected by the MBTA and may only be taken; trapped or relocated with a USFWS depredation permit and an ODNR permit. Bald and golden eagles are afforded additional protection under both federal and state regulations, wherein it is illegal to possess either of these birds, alive or dead, in whole or in part (including eggs and nests). In addition, the Osprey, Northern harrier, Short-eared owl, Barn owl, and Peregrine falcon are listed as endangered in the state of Indiana (Appendix D). Special permits are required to harass or relocate these birds.

**Control measures:** Raptors may be best managed through an integrated program that includes habitat management, rodent and insect control, relocation and lethal reinforcement of harassment techniques. The habitat should be managed so that the grass is a uniform composition, density and height (Cleary et al. 2005). This limits the available prey-base of rodents and insects. Any dead snags or tall trees at the edge of the AOA, which raptors are observed using, should be removed. Spike strips can be installed on structures around the airfield to prevent raptors from perching on them. If rodent and insect populations increase, rodenticides and insecticides may be applied. If specific raptors habitually frequent an area, they should be routinely dispersed with pyrotechnics. If the bird continues to remain in the area, it should be trapped and relocated or killed.

### **Risk Analysis**

**Prevalence:** Raptors were observed utilizing BJJ throughout the year. The species observed at BJJ included the Cooper's Hawk, Red-tailed hawk, Northern Harrier and Turkey vulture. The northern harrier is a State listed Endangered Species in Indiana. Nocturnal raptor species such as great-horned owl and barred owl were not observed at BJJ but are common in the area. Additionally, during the winter months of the survey period, a Snowy Owl was regularly observed utilizing the AOA and the surrounding area. This is an unusual occurrence, characterized by a regional irruption of northern species into areas beyond their typical range. The unique set of conditions that created this irruption are unlikely to reoccur in future years.

Raptors represented 2.9% (Figure 3) of all wildlife observed at BJJ during the study period. Their foraging habits and propensity for being struck along with the potential for damage to aircraft make them an important group for airport/wildlife managers to manage. This must be balanced with the fact that a resident experienced raptor poses less of a threat to aviation than a transient, inexperienced raptor (Anderson and Osmeck, 2005).

## 8.2 Mammals

### 8.2.1 White-tailed Deer

*White-tailed deer (Odocoileus virginianus)*

**Description:** The white-tailed deer is found throughout much of North America and is an important game animal. They are even-toed ungulates that may weigh from 50 to 400 pounds (23 to 180 kg) depending on species location. Females average 25 to 40% less weight, than males.

In Indiana, breeding occurs from October to January, with peak activity in November. Most females breed during their second fall and are in heat for 24 hours every 28 days for 2 to 3 consecutive cycles. Gestation lasts about 202 days, and the peak for fawn births occurs in May or June.

At birth, fawns are rust-colored with white spots. Their spotted coats are shed in 3 to 4 months and are replaced by a grayish-brown fall and winter coat. The summer coat of adult animals is reddish-brown. Under parts of deer are white during all seasons. Antlers grow on bucks from April to August.

**Attractants:** Deer tend to be crepuscular (active at twilight or before sunrise) or nocturnal. They mainly utilize forest edges and young forests where brush and saplings are prevalent, while dense cover provided by older forests is used for winter shelter and protection. Deer also thrive in agricultural areas interspersed with woodlots and riparian habitat. They browse on leaves, stems, and buds of woody plants, and on available forbs in the spring and summer months. Fruits and nuts are important to their diet seasonally, and agricultural crops and many landscaping plants are readily eaten when available. A small woodlot in a suburban environment can serve as daytime shelter for several deer and prefer to travel where there is cover, such as in ditches or in a line of trees or shrubs.

**Risks:** Despite their economic and aesthetic values, deer create a variety of conflicts with humans. As mentioned, they destroy agricultural crops and landscaping plants. They are also implicated in human health and safety issues including auto collisions, aircraft collisions, and Lyme Disease. The white-tailed deer population in the United States has increased from a low of about 350,000 in 1900 to about 24 million in 1994 (Jacobson and Kroll 1994).

FAA Cert Alert No. 01-01, "Deer Aircraft Hazard", was issued in February 2001 when a Learjet owned by the Dallas Cowboys struck two deer at the Troy, Alabama airport while landing and was destroyed in the resulting crash and fire. The Cert Alert reminded airport operators of the importance of controlling deer on and around airfields and to offer suggestions to resolve deer hazards to aircraft. In 2004 this Cert Alert was updated to FAA Cert Alert No. 04-16, "Deer Hazard to Aircraft and Deer Fencing" (Appendix H).

Nationally, white-tailed deer account for 44% of all mammal aircraft strikes and 2.1% of all known species strikes (Cleary et al. 2008). Deer are ranked as the most hazardous wildlife to

aircraft (Dolbeer et al. 2000) because, on the average, they do more damage when struck by a plane than any other animal. Deer are dangerous not only because of their relative size, but will dart in front of a rolling or landing aircraft leaving the pilot no time to react. It is often smaller aircraft that incur the most damage, including total destruction of the plane and possibly death of crew and passengers.

**Legal status:** Deer are a resident game animal and regulated by the state. However, they may be killed out of season under an ODNR Deer Removal Permit (DRP). This allows the permittee and any person employed by or acting under authorization of the permittee to remove deer as stipulated on the permit. This permit will define the manner of take, carcass disposal, documentation of activities, and may include special conditions pertaining to individual airports.

**Control measures:** If a population of deer utilizing the AOA is identified, the most effective long-term control measure for deer is exclusion through the installation of an appropriate fence completely enclosing the airport (Appendix H). Fences can be modified or constructed with alternate materials to comply with wetland or FAA regulations. If a deer is observed on the airfield, measures should be immediately taken to deter the animal from crossing the runway either by harassment or removal.

#### **Risk Analysis**

**Prevalence:** Deer were not observed at BJJ during the survey period. Airport staff, through regular wildlife observations, also documented the lack of this species utilizing areas within the AOA. At this time, a wildlife fence does not seem to be justified. Should the situation change, and deer incursions into the AOA become frequent, a wildlife perimeter fence should be considered.

### **8.2.2 Eastern Coyote**

Eastern Coyote (*Canis latrans*)

**Description:** The eastern coyote looks like a medium-sized dog. Its body is about 32 to 37 inches and tail 11 to 16 inches long and can weigh between 20 to 50 lbs. It can range in color from gray or reddish-gray, with rusty legs, feet, and ears and a whitish belly. Its nose is more pointed and tail is bushier than in dogs. The tail is held down between its hind legs when running. In the evenings they can be heard emitting a series of high-pitched yaps. A coyote's eye shine is a greenish gold.

Coyotes are mainly nocturnal, but may be observed any time of day. They will normally travel about 10 miles per day but may move up to 100 miles in order to find food. A coyote is a scavenger and will eat almost any animal or vegetable matter. They hunt for rodents and rabbits and will cache uneaten food.

Coyotes normally den in the ground but may use other shelters. Females will breed at one year during the mating season of January and February. Females typically have 5-10 pups that are born in April or May after a 60 to 63 day gestation period. The pup's eyes open

after 9 to 14 days. Coyotes are most active on the airport during the summer when they are seeking food or teaching the young to hunt. Coyotes are a common species that is hunted and trapped in Indiana.

**Attractants:** Coyotes are traditionally found on prairies, open woodlands, brushy or boulder-strewn areas in western U.S., but due to their extreme adaptability their range has expanded to include the midwest. Coyotes have been documented in all areas of Indiana and are frequently observed in urban and suburban areas. Coyotes are commonly found on airports foraging for rodents that thrive in open grassland habitats.

**Risks:** Nationally, coyotes account for 14.6% of known mammal strikes (Cleary et al. 2008). Coyotes are second to deer as the mammal most commonly struck by aircraft in the U. S. (Cleary et al. 2008). However, they are listed 15th as the most hazardous wild animal to aircraft based on the percentage of strikes causing damage to aircraft (Dolbeer et al. 2000).

Legal status: Coyotes are designated as furbearers in Indiana. Hunting and trapping seasons are set each year by the ODNR. Coyotes may be shot or trapped out of season with an ODNR nuisance wildlife control permit.

**Control measures:** Exclusion, habitat modification, and removal of coyotes are the most effective methods to reduce risk. Harassment methods have not been found that would reduce coyote numbers on airports over the long term. Coyotes are most successfully removed by trapping. Experienced trappers must be used because coyotes that escape from traps become trap shy and are difficult to capture again. Once coyotes are established in an area, a program to manage the population will have to be established. Like deer, coyotes can be kept from an area with a wildlife deterrent perimeter fence. The fence must be tall enough that the coyote cannot jump it and must either be buried or have gravel at the base so the coyotes cannot dig under the fence. A deer proof perimeter fence needs only minor modifications to effectively exclude coyotes as well as deer.

Many airport managers encourage the presence of coyotes with the intention of allowing a “natural control” for woodchucks and small mammals. This type of management is not appropriate on an airport since it is likely that coyotes will become difficult to control and could result in a strike with an aircraft. The effectiveness of coyotes keeping these species population under control is limited and not based on scientific data.

### **Risk Analysis**

**Prevalence:** Coyotes were not seen within the AOA during the WHA. No evidence of droppings was seen on the runways and taxiways throughout the airport and no direct observations of either adult and juvenile coyotes were made during the WHA, during both diurnal and nocturnal surveys. Trained Airport staff should continue to regularly monitor the AOA for any evidence of coyote activity.

### 8.2.3 Small Mammals

**Description:** This group represents a wide variety of species; ranging from larger species such as raccoons, opossum, and striped skunk to small rodents including fox squirrels, white-footed mice, house mice, and meadow voles. Fox squirrels, eastern cottontail rabbits, white-footed mice, house mice and meadow voles were the small mammals observed at BJJ. However, woodchucks, raccoons, opossum, striped skunks, and chipmunks, although not observed, are prominent in grassy areas in Indiana.

**Attractants:** Small rodents and rabbits utilize grasslands for feeding in addition to shrubs and ornamental plants. During the day they typically hold close to areas providing visual obstruction from predators (i.e. buildings, shrubs, and tall grasses). Raccoons, striped skunk, and opossum are omnivores and feed on plants, insects, meat and fruit. Squirrels feed on plant materials, primarily acorns and other nuts.

**Risks:** Small mammals create very little direct risk to aircraft due to small body sizes and the short stature of the animals. However, small mammals are a major prey item for raptors (13% of all strikes nationally) which can create a major indirect risk to aircraft.

**Legal Status:** Eastern Cottontail rabbits, Gray squirrels, and Fox squirrels are classified as game animals and are protected as such at all times except during legal hunting season. Exceptions may be granted to property owners, allowing them to trap or shoot squirrels outside of hunting season under the authority of a nuisance wildlife control permit. Raccoons, Striped skunk, and Opossum are fur-bearers and can be taken any time they are causing damage.

**Control Measures:** If habitat is not maintained rodent populations can grow to large densities quickly which will attract unwanted wildlife to the airport. Habitat management such as mowing grass or reducing brushy areas on airfields will reduce shelter and food for rodents. Rodenticides can be used to control rodent populations but habitat management should be tried first. For above ground treatments rodenticides in pellet and grain-bait formulations should be dispersed in vegetation or placed in known burrows or runways (Cleary and Dolbeer 2005).

#### **Risk Analysis**

**Prevalence:** On July 30, 2014, 150 snap traps (Victor, Inc.), baited with peanut butter and rolled oats, were placed in various areas within the AOA to survey for the presence of small mammals on site. There were nine trap-lines located in various habitats and locations within the AOA. All trap-lines had between 10 and 25 traps to adequately cover the representative habitat. The traps were placed from the afternoon of July 30, 2014 to the morning of July 31, 2013 when they were picked up; with a total of 150 trap-nights.

Trap lines 1 and 2 were located at the western end of the runway along the southern edge, between mown grass areas and taller adjacent vegetation. Trap line 3 was located along the edge of the taxiway turn around located at the western end of the runway. Trap lines 4 and 6 were located along the eastern and western end, respectively, of the drainage ditch

running along the northern edge of the AOA. Trap line 5 was located around the windsock to the north of the runway. Trap-line 7 was placed along the edge of the apron located to the north of the airport terminal building. Trap line 8 was placed along the southern edge of the taxiway in front of the terminal building. Trap line 9 was located along the northern edge of the hangar buildings.

Of the 150 traps, 10 were tripped by rain or wildlife and 134 were still set when the traps were checked. A total of 6 small mammals were captured. Species captured included a total of four meadow voles (*Microtus pennsylvanicus*), two eastern moles (*Scalopus aquaticus*), and one white-footed mouse (*Peromyscus leucopus*). These species do serve as a prey base for larger predators, including raptors, however the population documented does not indicate an over-abundance of small rodents and does not serve as a significant wildlife attractant.

Larger species in this group, including groundhogs, were not directly observed during the WHA. A nocturnal survey was conducted during the night of July 30, 2014. No wildlife was observed within the AOA. While this does not indicate their absence from the habitat, the likely hazard resulting from their presence is reduced.

## **9.0 WILDLIFE MANAGEMENT RECOMMENDATIONS**

Adaptive Management includes a variety of methods that may be used or recommended to reduce wildlife damage and is recommended for implementation at BJJ. These methods include altering specific airport management operations, as well as habitat and behavioral modification to discourage the presence of hazardous wildlife. However, controlling wildlife damage may require that the offending animal(s) be removed or that populations of the problem species be reduced.

The following recommendations are presented as a means to begin the process of reducing or eliminating wildlife hazards observed at BJJ during the WHA. If followed, these recommendations should result in a significant reduction of current wildlife hazards at BJJ, but they do not replace the need to continue to monitor for new hazards.

### **9.1 Wildlife Fencing**

Deer and coyotes are two of the most commonly observed large mammals in the state of Ohio. However, neither species was directly or indirectly observed utilizing the AOA at BJJ. While there is currently no fencing at the airport, based upon the lack of potential hazard posed by these species, the recommendation to install a perimeter fence is currently not justified.

Should future wildlife observations by airport staff indicate an increase in the usage of the AOA by either white-tailed deer or coyotes, the installation of a wildlife fence may be recommended. At such a time, the current FAA guidance on Wildlife Fence should be consulted prior to design and installation.



## 9.2 “Zero Tolerance Policy”

Adopt a “zero-tolerance” on the airfield toward deer, coyotes, Canada geese, raptors, large flocks of European starlings and blackbirds. If these species are observed on airport property they need to immediately be mitigated through harassment and/or lethal reinforcement. The use of lethal reinforcement requires that the airport obtain the appropriate depredation permits prior to any lethal control actions. During periods when these species are being continually observed in the area, wildlife patrols should be implemented several times a day to mitigate the threats that these species pose. Some species such as deer and coyotes may need to be lethally removed once the AOA is surrounded by a continuous perimeter fence, as these species are not easily harassed or herded from the enclosed areas. A strict approach establishes an attitude for airport personnel and helps prioritize events as they occur.

## 9.3 Training of personnel

All personnel that have duties requiring them to access the AOA should continue to be trained to recognize and respond to potential wildlife hazards in an appropriate manner. Depending on the situation, responding may entail an active hazing or shooting action, or it may simply require the employee to notify the wildlife coordinator or other responsible entity of the hazard. Every employee that might encounter wildlife hazards on the airfield should be made acutely aware that it is their responsibility to recognize and respond to the situation, and not just the role of the wildlife dispersal team. Employees should also be familiar with the damage caused by wildlife and how to respond to potentially hazardous situations. Inherent in this decision process is that employees should be trained in species identification of the most hazardous wildlife, or at least the general category/guild (e.g., gulls, waterfowl, crows, hawks, pigeons) of wildlife. A field guide is very useful for achieving this goal and should be made readily available to those who would use it. All personnel with responsibilities on the AOA should be trained in the safe handling and most effective use of hazing devices to avoid creating a more hazardous situation (e.g., chasing birds into the path of an approaching aircraft).

Proper identification of species helps airports tailor their Wildlife Hazard Management Plan to more effectively reduce wildlife hazards and to keep costs low. Knowledge of the problem species also helps researchers focus on the species of concern to develop and improve hazard management techniques.

## 9.4 Agricultural Management

The adjacent agricultural activity can serve as a significant wildlife attract, dependent upon the crop type. Agricultural production can, however, be an important part of airport operations, providing vital financial support to the airport. Wildlife activity on the agricultural areas controlled by BJJ should be monitored to determine developing risks and mitigation procedures needed to reduce the risks identified. These mitigation procedures should include, but are not be limited to the following:

1. Crop should be selected, to the greatest degree possible, to minimize attractiveness of crops to wildlife.
2. Replace grain crops with hay production within the proposed wildlife fence area.
3. Harvest crops as early as possible.



4. Immediate tillage following harvest to remove crop spillage and residue, no-till practices will not be allowed.

### 9.5 Grass Management

The management of an airport's ground cover is a crucial element in wildlife hazard management. Non-woody or herbaceous vegetation accounts for the majority of wildlife habitat at airports. If vegetation is not managed and becomes overgrown, the airport can become more attractive to hazardous wildlife (Barras et al. 2000). Currently the FAA has not specified the height that vegetation is to be maintained away from the movement area. The general recommendation has been to maintain a monoculture of tall grass (7 – 14 inches).

Vegetation management should consider the wildlife species of most concern to aviation safety. It is recommended that a mowing regime that occurs at least monthly during the growing season with a target height of 7 to 10 inches. This will create a condition of vegetation that is short enough to allow airport personnel to readily detect the presence of hazardous wildlife and employ appropriate control measures to discourage them the use of the airport. It is important to note that European starlings (blackbird guild) do not show preference for either tall or short grass (Cleary et al. 2005). Given that blackbirds as a guild make up a large component of all birds observed at BJJ, vigilance will still be required in hazing and dispersal of these species. Mowing at a height of 7-10 inches should also reduce small mammal abundance (Cleary et al. 2005).

FAA Cert Alert No. 98-05, "Grasses Attractive to Hazardous Wildlife" (Appendix I), discusses hazards associated with certain airport reseeding projects. A recent study of note found when captive Canada geese were placed on established stands of rye grass and endophyte-infected tall fescue, geese showed a strong preference for the rye grass over the fescue (Washburn, et al. 2007). Many tall fescue species naturally carry this endophyte, but planting a mixture that contains a seed variety that is highly infected with this endophyte will ensure a reduction in the attractiveness of the grassland areas on BJJ to Canada geese and potentially to whitetail deer. It is recommended that any re-seeding for future redevelopment projects be conducted with endophyte-infected fescue (at least 70% infection rate) (Washburn, et.al 2004).

### 9.6 Wildlife Monitoring

The airport staff are encouraged to maintain the current Wildlife Log, and also use this to document any control actions performed. It is recommended that this be maintained in an electronic database, giving the ability to analyze data quickly and conveniently. BJJ does not currently keep a log book of control actions. Direct strikes reported by pilots, wildlife remains on planes, and carcasses found should all be considered strikes and recorded in the database, as well as submitted to Wildlife Strike Database.

The intent of the WHA has been to document the general presence and behavior of wildlife at BJJ. It is important to recognize that the presence and behavior of wildlife on airports is very dynamic and is influenced by many variables that may change from year to year or season to season. Conclusions based on wildlife populations during this study are meant to be a guide and may or may not be consistent with subsequent years. Data from this study will provide a baseline for comparison in the following years.

The survey route on the airport, and survey method followed, required about one hour to complete. BJJ personnel should continue to perform these surveys along the same route on a regular basis, or at a minimum during the spring and fall migratory seasons. Data collected should be recorded in the database, along with any wildlife control actions so BJJ managers can use this information to continuously monitor the wildlife situation.

### **9.7 Wildlife control responsibilities**

Appoint a wildlife coordinator to respond to and monitor all wildlife-related activities. It would be the responsibility of the coordinator to see that recommendations from the WHA are implemented and the appropriate wildlife control permits and supplies are maintained. The coordinator would keep a database of wildlife strike information, and be responsible for ensuring that BJJ personnel, pilots, and ground crews are familiar with the proper procedures for collecting and reporting wildlife strike information (either on the web or using the FAA Form 5200-7). The coordinator would also oversee wildlife management activities with airport management and maintenance personnel.

The wildlife coordinator, with the assistance of a qualified wildlife hazard management biologist, would actively participate in construction and land-use projects or changes, on or off airport property that could increase wildlife hazards at BJJ. For example, new buildings can be designed in a manner that discourages use by wildlife, and mitigation projects to restore habitat potentially attractive to hazardous species can be sited as far as possible from the airfield's critical zone.

### **9.8 Permits**

BJJ should apply for and maintain Depredation/ Nuisance Wildlife Removal Permits from the ODNR and USFWS to ensure that BJJ has the ability to respond with lethal control when wildlife pose a risk to aircraft on the airfield. Permits obtained from the USFWS and ODNR to control migratory birds should include lethal take for blackbirds, killdeer and mourning doves. The take numbers requested for each of these species should be adjusted yearly according to the take, what is observed on the continued point count surveys, and should be updated to include any new species that are a threat to aviation safety. A nuisance wildlife removal permit to remove coyotes, and a Deer Damage Control Permit to remove deer should be obtained from the ODNR to remove these species should they be observed in the immediate vicinity of runways and taxiways.

Maintain a list of the name(s) of the appropriate airport personnel who will be involved in removal efforts, along with other agency personnel (if desired) as designated agents.

### **9.9 Wildlife strike reporting**

The Airport Manager or Wildlife Coordinator should ensure that the FAA Strike Report Form 5200-7 is completed for each of these types of strikes:

Direct strikes: Airport operations and maintenance personnel should work together to ensure that both parties are aware of all wildlife-aircraft strikes and that all strikes are submitted to the FAA in a timely and thorough manner. If there is a question as to whether or not a particular report has been filed, it is better to mistakenly submit a report twice rather than not at all. Reports are filtered for duplicate

submissions before they are entered into the database, and reports from different sources provide more complete data.

Wildlife remains on planes: Another source of wildlife strike data is the planes themselves. It is recommended that airport staff and pilots be asked to report remains on an aircraft to airport management. Unidentifiable bird remains (feathers, feet, wings, beaks, blood, etc.) should be collected, a strike report filed, and the remains sent to the Smithsonian Institute in Washington, D.C. for identification (Appendix E). Bird identification is provided at no expense to airports. The collection protocol detailed in Appendix E should be followed.

Carcasses found: Records from bird carcasses found during regular runway sweeps assist airport managers in developing more accurate pictures of the wildlife-aircraft strike situation at their airports. Instruct maintenance personnel to search in the grassy areas (up to 200 feet from the centerline) during runway sweeps, because many birds fall away from the runways after being struck. All birds found within 200 feet of the centerline and in the safety zones should be reported as a strike unless the cause of death is absolutely known not to be caused by an aircraft. These carcasses should be reported as wildlife strikes, also using FAA Strike Report Form (FAA 5200-7).

Positively identify carcasses using a bird field guide or by someone experienced in bird identification. If the carcass cannot be identified, store it in a freezer and contact a qualified airport wildlife biologist or send the specified parts to the Smithsonian Institute for identification (Appendix E). **Label the carcasses with name of person finding the carcass, date and time found, location found, and tentative species identification, and enter all carcasses found in a wildlife log.**

The data collected through these efforts to record wildlife strikes will be invaluable in future wildlife management efforts. Reporting wildlife strikes should become part of the safety culture at BJJ, and should apply to all users of the airport.

### **9.10 Maintain Appropriate Supplies**

It is recommended that vehicles regularly operating on the airfield (including tractors or airport maintenance equipment) be equipped with a 15 mm pyrotechnic launcher and an accompanying supply of bangers, screamers, or whistlers. In addition to hazing equipment, operations/maintenance vehicles should have carcass bags, data sheets, a bird identification book, and binoculars. This will enable all airport personnel to quickly and easily haze any birds they may encounter while conducting other collateral duties. Vehicles equipped with sirens are not as effective in dispersing wildlife as pyrotechnics, and wildlife can become quickly habituated to these sirens, paying little or no attention to them. At least one person who is regularly present on the airfield should be trained in the use of firearms to lethally reinforce harassment efforts and mitigate extreme threats to aviation safety.

### **9.11 Eliminate/Reduce Wetland and Water Sources on the Airfield**

Low areas that hold water on the airfield should be reworked so that they quickly drain and hold water for only short periods of time. Some areas of the airfield hold water during periods of rain resulting in areas of temporary standing water. These flooded areas can become attractive to hazardous wildlife. The use of pond aerators in neighboring ponds can extend the period of open water available to

hazardous species such as waterfowl during the winter. If practical, the use of these aerators should be suspended during the winter.

Any wetland or ditch management must be conducted in accordance with federal and state wetland protection regulations. If any detention basins are designed as part of future development for the airfield, a qualified airport wildlife biologist should be consulted to ensure that the proposed basin will not be unduly attractive to wildlife. It is not recommended any standing storm water retention basins be placed on airport property during future development.

At no time should compensatory stream or wetland mitigation be undertaken within the Airport Operations Area.

### **9.12 Seasonal control efforts**

During periods of bird migration, the frequency of hazing patrols should be substantially increased because non-resident birds are unaware of the off-limits nature of the airfield and will attempt to land. It may become necessary to employ shooting during these periods to enhance the duration and effectiveness of other non-lethal hazing methods.

Blackbirds were considered the greatest threat to aviation safety at BJJ during the assessment. Prior to airport operations, European starlings and other birds should be dispersed from the approaches and monitored throughout the day. Propane exploders and other static deterrents may be applied during these short-term periods of migration to discourage transient birds from landing on the airfield in the first place. Caution should be exercised in the employment of propane exploders. Though they can be very effective, most are set to report by a timer and could drive the birds toward an aircraft. Raptors are also a threat and tend to circle to hunt and to determine if a hazing threat is high enough to force them to relocate. It should be noted that static devices such as propane exploders, coyote effigies, and raptor silhouettes/kites rapidly lose their effectiveness if not frequently moved. For this reason, these deterrents are typically directed at non-resident animals just passing through the area and should only be employed for short periods.

### **9.13 Monitor Off-Site Attractants**

Off-site attractants, such as the agricultural areas and neighboring ponds have an effect on wildlife usage on BJJ. Off-site attractants should continue to be monitored and may require the airport to pursue possible wildlife mitigation measures if they pose continued threats to aircraft at BJJ. Any mitigation (grid wires, harassment, etc.) should be coordinated with a qualified airport wildlife biologist.

BJJ should work with existing businesses and landowners to manage potential wildlife hazards surrounding the airport.

Advisory Circular 1500/5200-33B (Appendix G) encourages airport operators to work with local and regional planning boards to become aware of proposed land use changes or modifications that could create hazardous wildlife attractants. The AC recommends that the airport at minimum be included on notification lists for planning and development within 5 miles of the airport.

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**10.0 SUMMARY OF RECOMMENDATIONS**

1. Build and maintain a security fence.
2. Adopt a zero-tolerance policy for hazardous wildlife.
3. Agricultural Management
4. Train personnel in wildlife identification and hazing procedures.
5. Modify grounds maintenance methods to discourage wildlife usage.
6. Develop and maintain Wildlife Control Log.
7. Designate Wildlife Coordinator.
8. Obtain any required permits.
9. Document and report ALL wildlife strikes.
10. Maintain appropriate supplies for wildlife control efforts.
11. Eliminate/reduce wetland or water sources on the airfield.
12. Increase hazing efforts during migration.
13. Monitor Off-Site attractants.

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## 10.0 SUMMARY OF RECOMMENDATIONS

1. Continue to observe and document the usage (or lack thereof) of the AOA by large mammals. Should the presence of large mammals be observed on a regular basis, consider the installation of a perimeter wildlife fence.
2. Adopt a zero-tolerance policy for hazardous wildlife.
3. Agricultural Management
4. Train personnel in wildlife identification and hazing procedures.
5. Modify grounds maintenance methods to discourage wildlife usage.
6. Develop and maintain Wildlife Control Log.
7. Designate Wildlife Coordinator.
8. Obtain any required permits.
9. Document and report ALL wildlife strikes.
10. Maintain appropriate supplies for wildlife control efforts.
11. Eliminate/reduce wetland or water sources on the airfield.
12. Increase hazing efforts during migration.
13. Monitor Off-Site attractants.

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## **APPENDIX A**

### **FAA Certalert 09-10, Wildlife Hazard Assessments in Accordance with Part 139 Requirements**

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# CERTALERT

## AIRPORT SAFETY AND OPERATIONS DIVISION, AAS-300

FOR INFORMATION, CONTACT John Weller, AAS-300, (202) 267-3778

DATE: June 11, 2009 No. 09-10  
TO: Airport Operators, FAA Airport Certification Safety Inspectors  
TOPIC: Wildlife Hazard Assessments in Accordance with Part 139 Requirements

**Purpose:** To remind airport operators of their obligations under Part 139 to conduct Wildlife Hazard Assessments if certain criteria are met.

**Background:** The risk of wildlife strikes to aircraft has been increasing. Many populations of wildlife species commonly involved in strikes have increased markedly in the last three decades and adapted to living in urban environments, including near airports. Thirteen of the 14 bird species in North America with mean body masses greater than 8 lbs have shown significant population increases during this time. For example, from 1980 to 2006, the resident (non-migratory) Canada goose population in the USA and Canada increased at a mean rate of 7.3 percent per year. In addition, commercial air traffic has increased from about 18 million aircraft movements in 1980 to over 28 million in 2007.

Part 139 requires certificated airports to conduct a Wildlife Hazard Assessment if they experience a triggering event.

According to section 139.337(b):

*"In a manner authorized by the Administrator, each certificate holder must ensure that a Wildlife Hazard Assessment is conducted when any of the following events occurs on or near the airport:*

- (1) An air carrier aircraft experiences multiple wildlife strikes;*
- (2) An air carrier aircraft experiences substantial damage from striking wildlife. As used in this paragraph, substantial damage means damage or structural failure incurred by an aircraft that adversely affects the structural strength, performance, or flight characteristics of the aircraft and that would normally require major repair or replacement of the affected component;*
- (3) An air carrier aircraft experiences an engine ingestion of wildlife; or*
- (4) Wildlife of a size, or in numbers, capable of causing an event described in paragraphs (b)(1), (b)(2), or (b)(3) of this section is observed to have access to any airport flight pattern or aircraft movement area."*

The Wildlife Hazard Assessment must be conducted by a qualified wildlife biologist who meets the requirements in Advisory Circular 150/5200-36, *Qualifications for Wildlife Biologists Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards at Airports*. The Wildlife Hazard Assessment must be conducted in accordance with Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports* and the Wildlife Hazard Management Manual. The Wildlife Hazard Management Manual can be viewed and downloaded free of charge from the FAA's wildlife hazard mitigation web site: <http://wildlife-mitigation.tc.FAA.gov/>. A Wildlife Hazard Assessment should include:

- (1) An analysis of the events or circumstances that prompted the assessment.
- (2) Identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences.
- (3) Identification and location of features on and near the airport that attract wildlife.
- (4) A description of wildlife hazards to air carrier operations.
- (5) Recommended actions for reducing identified wildlife hazards to air carrier

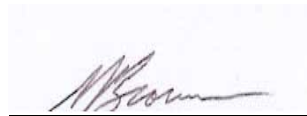
The Office of Safety and Standards (AAS) has conducted a search of the National Wildlife Strike Database. We found a number of airports (see attachment) that appear to have experienced triggering events but we have no record that they have initiated the Wildlife Hazard Assessment (WHA) required by Part 139.

**Actions:** Airports that have experienced a triggering event, but have yet to undertake a wildlife hazard assessment, should be immediately contacted by their FAA Airport Certification Safety Inspector. Airport operators should be directed to review the FAA Wildlife Strike Database at [http://wildlife\\_mitigation.tc.faa.gov/public\\_html/index.html#access](http://wildlife_mitigation.tc.faa.gov/public_html/index.html#access). No password is required. Airport operators must immediately initiate action to start a Wildlife Hazard Assessment if they confirm their airport has experienced a triggering event

Airport Improvement Funds (AIP) for FY 2009 have been identified to assist airports doing WHAs. The money is available on a first come first served basis. For more information about funding options, airport operators should contact their nearest FAA Airports District Office.

As we move to Safety Management Systems, it is incumbent upon airports to be proactive and understand the risk of wildlife strikes before they experience a triggering event. In this regard, the FAA has initiated a rulemaking project that will require certificated airports to conduct WHAs and to periodically update them. However, as the rulemaking process will take a number of years, operators of 139 airports that have not experienced a triggering event, and who have not done a WHA are encouraged to do one. The FAA also asks airports that have WHAs that are more than five years old to voluntarily update them.

Attachment:



Michael W. Brown  
Manager, Airport Safety  
And Operations Division

June 11, 2009  
DATE

DISTRIBUTION CERTALERT

## DISTRIBUTION LIST

REGION	STATE	AIRPORT NAME	ASSOCIATED CITY	AIRPORT CODE	TRIGGERING EVENT
CENTRAL	Kansas	Liberal Muni	Liberal	LBL	1
CENTRAL	Missouri	Columbia Reg	Columbia	COU	12
CENTRAL	Nebraska	Central Nebraska Reg	Grand Island	GRI	1
CENTRAL	Nebraska	McCook Muni	McCook	MCK	4
EASTERN	Maryland	Salisbury-Ocean City Wicomico Reg	Salisbury	SBY	3
EASTERN	New York	Elmira/Corning Reg	Elmira	ELM	123
EASTERN	New York	Ithaca Tompkins Reg	Ithaca	ITH	1
EASTERN	New York	Massena Int'l - Richards Fld	Massena	MSS	1
EASTERN	Pennsylvania	John Murtha Johnstown-Cambria Co	Johnstown	JST	4
EASTERN	Pennsylvania	Lancaster	Lancaster	LNS	1
EASTERN	Pennsylvania	University Park	State College	UNV	123
EASTERN	Virginia	Lynchburg Reg/ Preston Glenn Fld	Lynchburg	LYH	4
NEW ENGLAND	Maine	Bangor Int'l	Bangor	BGR	1
NEW ENGLAND	Massachusetts	Barnstable Muni	Hyannis	HYA	1
NEW ENGLAND	Massachusetts	Worcester Reg	Worcester	ORH	1
NEW ENGLAND	New Hampshire	Lebanon Muni	Lebanon	LEB	1
NEW ENGLAND	New Hampshire	Manchester	Manchester	MHT	13
NEW ENGLAND	New Hampshire	Pease Int'l Tradeport	Portsmouth	PSM	14
NORTHWEST MOUNTAIN	Colorado	Aspen-Pitkin Co Sardy	Aspen	ASE	14
NORTHWEST MOUNTAIN	Colorado	Montrose Reg	Montrose	MTJ	1
NORTHWEST MOUNTAIN	Colorado	Pueblo Muni	Pueblo	PUB	134
NORTHWEST MOUNTAIN	Colorado	Rocky Mountain Metropolitan Airport	Denver	BJC	2
NORTHWEST MOUNTAIN	Colorado	Yampa Valley	Hayden	HDN	14
NORTHWEST MOUNTAIN	Idaho	Lewiston-Nez Perce Co	Lewiston	LWS	1
NORTHWEST MOUNTAIN	Idaho	Magic Valley Reg	Twin Falls	TWF	1
NORTHWEST MOUNTAIN	Montana	Bert Mooney	Butte	BTM	4
NORTHWEST MOUNTAIN	Montana	Great Falls Int'l	Great Falls	GTF	1

NORTHWEST MOUNTAIN	Montana	Helena Reg	Helena	HLN	2
NORTHWEST MOUNTAIN	Montana	LM Clayton	Wolf Point	OLF	234
NORTHWEST MOUNTAIN	Oregon	Klamath Falls Int'l	Klamath Falls	LMT	13
NORTHWEST MOUNTAIN	Utah	Cedar City Muni	Cedar City	CDC	24
NORTHWEST MOUNTAIN	Wyoming	Natrona Co Int'l	Casper	CPR	14
SOUTHERN	Alabama	Mobile Reg	Mobile	MOB	13
SOUTHERN	Florida	Eglin Air Force Base	Valparaiso	VPS	1
SOUTHERN	Florida	Gainesville Reg	Gainesville	GNV	13
SOUTHERN	Florida	Pensacola Reg	Pensacola	PNS	123
SOUTHERN	Georgia	Middle Georgia Reg	Macon	MCN	23
SOUTHERN	Georgia	Valdosta Reg	Valdosta	VLD	1
SOUTHERN	Kentucky	Owensboro-Davies Co	Owensboro	OWB	123
SOUTHERN	Mississippi	Jackson Int'l	Jackson	JAN	13
SOUTHERN	North Carolina	Albert J Ellis	Jacksonville	OAJ	13
SOUTHERN	North Carolina	Smith Reynolds	Winston-Salem	INT	14
SOUTHERN	Puerto Rico	Luis Munoz Marin Int'l	San Juan	SJU	3
SOUTHERN	Puerto Rico	Mercedita	Ponce	PSE	1
SOUTHERN	South Carolina	Charleston International	Charleston	CHS	1
SOUTHERN	South Carolina	Columbia Metro	Columbia	CAE	134
SOUTHERN	South Carolina	Greenville-Spartanburg	Greer	GSP	1
SOUTHERN	South Carolina	Myrtle Beach Jetport	Myrtle Beach	MYR	1
SOUTHERN	Tennessee	Lovell Fld	Chattanooga	CHA	134
SOUTHERN	Tennessee	McGhee Tyson	Knoxville	TYS	13
SOUTHERN	Tennessee	Tri-City Municipal	Bristol/ Johnson/ Kingsport	TRI	14
SOUTHERN	Virgin Islands	Cyril E King	Charlotte Amalie	STT	4
SOUTHWEST	Arkansas	Adams Fld	Little Rock	LIT	13
SOUTHWEST	Arkansas	Fort Smith Reg	Fort Smith	FSM	13
SOUTHWEST	Arkansas	Memorial Fld	Hot Springs	HOT	1
SOUTHWEST	Arkansas	Northwest Arkansas	Fayetteville	XNA	1234
SOUTHWEST	Arkansas	Texarkana Reg-Webb Fld	Texarkana	TXK	4
SOUTHWEST	Louisiana	Baton Rouge Metro-Ryan	Baton Rouge	BTR	1
SOUTHWEST	Louisiana	Lafayette Reg	Lafayette	LFT	14
SOUTHWEST	Louisiana	Lake Charles Reg	Lake Charles	LCH	1
SOUTHWEST	Louisiana	New Orleans Int'l	New Orleans	MSY	1234
SOUTHWEST	New Mexico	Grant Co	Silver City	SVC	4
SOUTHWEST	Texas	Austin Bergstrom Intl	Austin	AUS	1234

SOUTHWEST	Texas	Brownsville/ South Padre Island	Brownsville	BRO	1
SOUTHWEST	Texas	Bush Intercontinental	Houston	IAH	1234
SOUTHWEST	Texas	Corpus Christi Int'l	Corpus Christi	CRP	134
SOUTHWEST	Texas	Dallas Love Fld	Dallas	DAL	1234
SOUTHWEST	Texas	Easterwood Fld	College Station	CLL	1
SOUTHWEST	Texas	El Paso Int'l	El Paso	ELP	1234
SOUTHWEST	Texas	Gregg Co	Longview	GGG	1
SOUTHWEST	Texas	Jefferson Co	Beaumont/ Port Arthur	BPT	1
SOUTHWEST	Texas	Laredo Int'l	Laredo	LRD	12
SOUTHWEST	Texas	Lubbock Int'l	Lubbock	LBB	13
SOUTHWEST	Texas	Mathis Fld	San Angelo	SJT	3
SOUTHWEST	Texas	Midland Int'l	Midland	MAF	134
SOUTHWEST	Texas	San Antonio Int'l	San Antonio	SAT	123
SOUTHWEST	Texas	Shepard AFB/Wichita Falls	Wichita Falls	SPS	1
SOUTHWEST	Texas	Tyler Pounds Fld	Tyler	TYR	1
SOUTHWEST	Texas	Valley Int'l	Harlingen	HRL	123
SOUTHWEST	Texas	Waco Reg	Waco	ACT	123
SOUTHWEST	Texas	William Hobby	Houston	HOU	1234
WESTERN PACIFIC	Arizona	Ernest Love Fld	Prescott	PRC	1
WESTERN PACIFIC	Arizona	Show Low Muni	Show Low	SOW	24
WESTERN PACIFIC	Arizona	Tucson Int'l	Tucson	TUS	134
WESTERN PACIFIC	California	Arcata	Arcata/Eureka	ACV	1
WESTERN PACIFIC	California	Chico Muni	Chico	CIC	1
WESTERN PACIFIC	California	Fresno Yosemite Int'l	Fresno	FAT	1
WESTERN PACIFIC	California	Jack McNamara Fld	Crescent City	CEC	1
WESTERN PACIFIC	California	Long Beach/ Daugherty Fld	Long Beach	LGB	1234
WESTERN PACIFIC	California	Meadows Fld	Bakersfield	BFL	1
WESTERN PACIFIC	California	Monterey Peninsula	Monterey	MRY	134
WESTERN PACIFIC	California	Ontario Int'l	Ontario	ONT	1234
WESTERN PACIFIC	California	Oxnard	Oxnard	OXR	1
WESTERN PACIFIC	California	Redding Muni	Redding	RDD	1
WESTERN PACIFIC	Nevada	Elko Muni	Elko	EKO	1
WESTERN PACIFIC	Nevada	McCarran Int'l	Las Vegas	LAS	134

Trigger Codes

1. An air carrier experiences multiple wildlife strikes.
2. An air carrier experiences substantial damage from striking wildlife.
3. An air carrier experiences an engine ingestion of wildlife.
4. Wildlife of a size, or in numbers, capable of causing an event described in 1-3 above is observed to have access to any airport flight pattern or aircraft movement area.

## **APPENDIX B**

### **Ohio Threatened and Endangered Species**





## **WILDLIFE THAT ARE CONSIDERED TO BE ENDANGERED, THREATENED, SPECIES OF CONCERN, SPECIAL INTEREST, EXTIRPATED, OR EXTINCT IN OHIO**

The Division of Wildlife's mission is to conserve and improve the fish and wildlife resources and their habitats, and promote their use and appreciation by the public so that these resources continue to enhance the quality of life for all Ohioans. The Division has legal authority over Ohio's fish and wildlife, which includes about 56 species of mammals, 200 species of breeding birds, 84 species and subspecies of amphibians and reptiles, 170 species of fish, 100 species of mollusks, and 20 species of crustaceans. In addition, there are thousands of species of insects and other invertebrates which fall under the Division's jurisdiction. Furthermore, Ohio law grants authority to the chief of the Division to adopt rules restricting the taking or possession of native wildlife threatened with statewide extirpation and to develop and periodically update a list of endangered species (Ohio Revised Code 1531.25).

The status of native wildlife species is very important to the Division. While the listing process identifies individual wildlife species needing protection, it also serves as a powerful tool in the Division's planning process. It provides direction for the allocation of personnel time and funds in Division programs and projects.

The first list of Ohio's endangered wildlife was adopted in 1974 and included 71 species. An extensive examination of the list is conducted every five years. The Division seeks input from our staff along with other noted professional and amateur wildlife experts across Ohio. In 2001, as part of our comprehensive management plan, the Division initiated a reevaluation of the endangered species list. During this process, the need for an additional state-list category was recognized and has been designated as "Special Interest." The name of the previous special interest category has been changed to "Species of Concern," but retains its original definition.

Therefore, in addition to endangered the Division uses five other categories: threatened, species of concern, special interest, extirpated, and extinct, to further define the status of selected wildlife. These categories and the species contained within them are dynamic and will be revised as our knowledge of the status of Ohio's wildlife evolves.

Definitions of these categories, a summary of the numbers of species and subspecies in each category, and the list of species and subspecies in each category follow:

**ENDANGERED** - A native species or subspecies threatened with extirpation from the state. The danger may result from one or more causes, such as habitat loss, pollution, predation, interspecific competition, or disease.

**THREATENED** - A species or subspecies whose survival in Ohio is not in immediate jeopardy, but to which a threat exists. Continued or increased stress will result in its becoming endangered.

**SPECIES OF CONCERN** - A species or subspecies which might become threatened in Ohio under continued or increased stress. Also, a species or subspecies for which there is some concern but for which information is insufficient to permit an adequate status evaluation. This category may contain species designated as a furbearer or game species but whose statewide population is dependent on the quality and/or quantity of habitat and is not adversely impacted by regulated harvest.

**SPECIAL INTEREST** - A species that occurs periodically and is capable of breeding in Ohio. It is at the edge of a larger, contiguous range with viable population(s) within the core of its range. These species have no federal endangered or threatened status, are at low breeding densities in the state, and have not been recently released to enhance Ohio's wildlife diversity. With the exception of efforts to conserve occupied areas, minimal management efforts will be directed for these species because it is unlikely to result in significant increases in their populations within the state.

**EXTIRPATED** - A species or subspecies that occurred in Ohio at the time of European settlement and that has since disappeared from the state.

**EXTINCT** - A species or subspecies that occurred in Ohio at the time of European settlement and that has since disappeared from its entire range.

## Number of Species in Major Taxa Classified as Endangered, Threatened, Species of Concern, Special Interest, Extirpated, or Extinct in Ohio

<b>Taxon</b>	<b>Endangered</b>	<b>Threatened</b>	<b>Species of Concern</b>	<b>Special Interest</b>	<b>Extirpated</b>	<b>Extinct</b>
<b>Mammals</b>	3	1	20	1	10	0
<b>Birds</b>	13	5	14	33	6	2
<b>Reptiles</b>	5	4	11	0	0	0
<b>Amphibians</b>	5	1	2	0	0	0
<b>Fishes</b>	20	13	9	0	8	2
<b>Mollusks</b>	24	4	8	0	11	6
<b>Crayfishes</b>	0	2	3	0	0	0
<b>Isopods</b>	2	1	0	0	0	0
<b>Pseudoscorpions</b>	1	0	0	0	0	0
<b>Dragonflies</b>	13	3	1	0	0	0
<b>Damselflies</b>	3	3	0	0	0	0
<b>Caddisflies</b>	3	6	3	0	0	0
<b>Mayflies</b>	2	0	1	0	0	0
<b>Midges</b>	1	3	1	0	0	0
<b>Crickets</b>	0	0	1	0	0	0
<b>Butterflies</b>	8	1	2	1	1	0
<b>Moths</b>	14	4	22	11	0	0
<b>Beetles</b>	2	2	6	0	0	1
<b>Total</b>	119	53	104	46	36	11

# OHIO'S ENDANGERED SPECIES

NOTE: \*E & \*T denote federal (U.S. Fish and Wildlife Service) listed endangered and threatened species respectively.

## MAMMALS

Indiana myotis *E	<i>Myotis sodalis</i>
Allegheny woodrat	<i>Neotoma magister</i>
Black bear	<i>Ursus americanus</i>

## BIRDS

American bittern	<i>Botaurus lentiginosus</i>
Northern harrier	<i>Circus cyaneus</i>
King rail	<i>Rallus elegans</i>
Sandhill crane	<i>Grus canadensis</i>
Piping plover *E	<i>Charadrius melodus</i>
Common tern	<i>Sterna hirundo</i>
Black tern	<i>Chlidonias niger</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Kirtland's warbler *E	<i>Dendroica kirtlandii</i>
Lark sparrow	<i>Chondestes grammacus</i>
Snowy egret	<i>Egretta thula</i>
Cattle egret	<i>Bubulcus ibis</i>
Upland sandpiper	<i>Bartramia longicauda</i>

## REPTILES

Copperbelly watersnake *T	<i>Nerodia erythrogaster neglecta</i>
Plains gartersnake	<i>Thamnophis radix</i>
Timber rattlesnake	<i>Crotalus horridus</i>
Eastern massasauga	<i>Sistrurus catenatus</i>
Smooth greensnake	<i>Opheodrys vernalis</i>

## AMPHIBIANS

Eastern hellbender	<i>Cryptobranchus alleganiensis alleganiensis</i>
Blue-spotted salamander	<i>Ambystoma laterale</i>
Green salamander	<i>Aneides aeneus</i>
Cave salamander	<i>Eurycea lucifuga</i>
Eastern spadefoot	<i>Scaphiopus holbrookii</i>

## FISHES

Ohio lamprey	<i>Ichthyomyzon bdellium</i>
Northern brook lamprey	<i>Ichthyomyzon fossor</i>
Mountain brook lamprey	<i>Ichthyomyzon greeleyi</i>
Lake sturgeon	<i>Acipenser fulvescens</i>
Shovelnose sturgeon	<i>Scaphirhynchus platyrhynchus</i>
Spotted gar	<i>Lepisosteus oculatus</i>
Shortnose gar	<i>Lepisosteus platostomus</i>
Cisco (or Lake herring)	<i>Coregonus artedi</i>
Goldeye	<i>Hiodon alosoides</i>
Shoal chub	<i>Macrhybopsis hyostoma</i>
Pugnose minnow	<i>Opsopoeodus emiliae</i>
Popeye shiner	<i>Notropis ariommus</i>
Longnose sucker	<i>Catostomus catostomus</i>
Northern madtom	<i>Noturus stigmosus</i>
Scioto madtom *E	<i>Noturus trautmani</i>
Pirate perch	<i>Aphredoderus sayanus</i>
Western banded killifish	<i>Fundulus diaphanus menona</i>
Spotted darter	<i>Etheostoma maculatum</i>
Iowa darter	<i>Etheostoma exile</i>
Gilt darter	<i>Percina evides</i>

## MOLLUSKS

Snuffbox	<i>Epioblasma triquetra</i>
Ebonysnail	<i>Fusconaia ebanas</i>
Fanshell *E	<i>Cyprogenia stegaria</i>
Butterfly	<i>Ellipsaria lineolata</i>
Elephant-ear	<i>Elliptio crassidens crassidens</i>
Purple catspaw *E	<i>Epioblasma obliquata obliquata</i>
White catspaw *E	<i>Epioblasma obliquata perobliqua</i>
Northern riffleshell *E	<i>Epioblasma torulosa rangiana</i>
Long-solid	<i>Fusconaia maculata maculata</i>
Pink mucket *E	<i>Lampsilis orbiculata</i>
Sharp-ridged pocketbook	<i>Lampsilis ovata</i>
Yellow sandshell	<i>Lampsilis teres</i>
Eastern pondmussel	<i>Ligumia nasuta</i>
Washboard	<i>Megaloniais nervosa</i>
Sheepnose	<i>Plethobasus cyphus</i>

**MOLLUSKS (CONT.)**

Clubshell *E	<i>Pleurobema clava</i>
Ohio pigtoe	<i>Pleurobema cordatum</i>
Pyramid pigtoe	<i>Pleurobema rubrum</i>
Rabbitsfoot *T	<i>Quadrula cylindrica cylindrica</i>
Monkeyface	<i>Quadrula metanevra</i>
Wartyback	<i>Quadrula nodulata</i>
Purple lilliput	<i>Toxolasma lividus</i>
Rayed bean	<i>Villosa fabalis</i>
Little spectaclecase	<i>Villosa lienosa</i>

**DRAGONFLIES**

Hine's emerald *E	<i>Somatochlora hineana</i>
Mottled darner	<i>Aeshna clepsydra</i>
Plains clubtail	<i>Gomphus externus</i>
American emerald	<i>Cordulia shurtleffi</i>
Uhler's sundragon	<i>Helocordulia uhleri</i>
Frosted whiteface	<i>Leucorrhinia frigida</i>
Elfin skimmer	<i>Nannothemis bella</i>
Canada darner	<i>Aeshna canadensis</i>
Racket-tailed emerald	<i>Dorocordulia libera</i>
Brush-tipped emerald	<i>Somatochlora walshii</i>
Blue corporal	<i>Ladona deplanata</i>
Chalk-fronted corporal	<i>Ladona julia</i>
Yellow-sided skimmer	<i>Libellula flavida</i>

**DAMSELFLIES**

Lilypad forktail	<i>Ischnura kellicotti</i>
Seepage dancer	<i>Argia bipunctulata</i>
River jewelwing	<i>Calopteryx aequabilis</i>

**CADDISFLIES**

<i>Chimarra socia</i>
<i>Oecetis eddlestoni</i>
<i>Brachycentrus numerosus</i>

**MAYFLIES**

<i>Rhithrogena pellucida</i>
<i>Litobrancha recurvata</i>

**MIDGES**

<i>Rheopelopia acra</i>
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**BUTTERFLIES**

Persius dusky wing	<i>Erynnis persius</i>
Frosted elfin	<i>Callophrys irus</i>
Karner blue *E	<i>Lycaeides melissa samuelis</i>
Purplish copper	<i>Lycaena helloides</i>
Swamp metalmark	<i>Calephelis muticum</i>
Regal fritillary	<i>Speyeria idalia</i>
Mitchell's satyr *E	<i>Neonympha mitchellii</i>
Grizzled skipper	<i>Pyrgus centaureae wyandot</i>

**MOTHS**

Unexpected cycnia	<i>Cycnia inopinatus</i>
Graceful underwing	<i>Catocala gracilis</i>
	<i>Spartiniphaga inops</i>
	<i>Hypocoena enervata</i>
	<i>Papaipema silphii</i>
	<i>Papaipema beeriana</i>
	<i>Lithophane semiusta</i>
	<i>Trichoclea artesta</i>
	<i>Tricholita notata</i>
	<i>Melanchra assimilis</i>
Pointed swallow	<i>Epiglaea apiata</i>
	<i>Ufeus plicatus</i>
	<i>Ufeus satyricus</i>
Hebard's noctuid moth	<i>Erythroecia hebardii</i>

**BEETLES**

Ohio cave beetle	<i>Pseudanophthalmus ohioensis</i>
American burying beetle *E	<i>Nicrophorus americanus</i>

**ISOPODS**

Fern cave isopod	<i>Caecidotea filicispeluncae</i>
Unnamed cave isopod	<i>Caecidotea sp. nov.</i>

**PSEUDOSCORPIONS**

Buckskin cave pseudoscorpion	<i>Apochthonius hobbsi</i>
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# OHIO'S THREATENED SPECIES

NOTE: \*E & \*T denote federal (U.S. Fish and Wildlife Service) listed endangered and threatened species respectively.

## MAMMALS

Eastern harvest mouse      *Reithrodontomys humulis*

## BIRDS

Black-crowned night-heron      *Nycticorax nycticorax*

Barn owl      *Tyto alba*

Least bittern      *Ixobrychus exilis*

Peregrine falcon      *Falco peregrinus*

Trumpeter swan      *Cygnus buccinator*

## REPTILES

Kirtland's snake      *Clonophis kirtlandii*

Spotted turtle      *Clemmys guttata*

Blanding's turtle      *Emydoidea blandingii*

Lake Erie watersnake      *Nerodia sipedon insularum*

## AMPHIBIANS

Mud salamander      *Pseudotriton montanus*

## FISHES

Brook trout      *Salvelinus fontinalis*

Bigeye shiner      *Notropis boops*

Tonguetied minnow      *Exoglossum laurae*

Greater redhorse      *Moxostoma valenciennesi*

Channel darter      *Percina copelandi*

American eel      *Anguilla rostrata*

Paddlefish \*M      *Polyodon spathula*

Bigmouth shiner      *Notropis dorsalis*

Lake chubsucker      *Erimyzon sucetta*

River darter      *Percina shumardi*

Tippecanoe darter      *Etheostoma tippecanoe*

Blue sucker      *Cycleptus elongatus*

Mountain madtom      *Noturus eleutherus*

## MOLLUSKS

Black sandshell      *Ligumia recta*

Threehorn wartyback      *Obliquaria reflexa*

Fawnsfoot      *Truncilla donaciformis*

Pondhorn      *Unimerus tetralasmus*

## CRAYFISHES

Sloan's crayfish      *Orconectes sloanii*

Cavespring crayfish      *Cambarus tenebrosus*

## DRAGONFLIES

Riffle snaketail      *Ophiogomphus carolus*

Harlequin darner      *Gomphaeschna furcillata*

Green-faced clubtail      *Gomphus viridifrons*

## DAMSELFLIES

Boreal bluet      *Enallagma boreale*

Northern bluet      *Enallagma cyathigerum*

Marsh bluet      *Enallagma ebrium*

## CADDISFLIES

*Psilotreta indecisa*

*Hydroptila albicornis*

*Hydroptila artesa*

*Hydroptila koryaki*

*Hydroptila talledaga*

*Hydroptila valhalla*

## MIDGES

*Bethbilbeckia floridensis*

*Apsactrotanypus johnsoni*

*Radotanypus florens*

## BUTTERFLIES

Silver-bordered fritillary      *Boloria selene*

**MOTHS**

Wayward nymph	<i>Catocala antinympha</i>
	<i>Spartiniphaga panatela</i>
	<i>Fagitana littera</i>
The pink-streak	<i>Faronta rubripennis</i>

**BETLES**

	<i>Cicindela hirticollis</i>
Cobblestone tiger beetle	<i>Cicindela marginipennis</i>

**ISOPODS**

Frost cave isopod	<i>Caecidotea rotunda</i>
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# OHIO's SPECIES of CONCERN

NOTE: \*E & \*T denote federal (U.S. Fish and Wildlife Service) listed endangered and threatened species respectively.

## MAMMALS

Pygmy shrew	<i>Sorex hoyi</i>
Star-nosed mole	<i>Condylura cristata</i>
Eastern small-footed bat	<i>Myotis leibii</i>
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>
Little brown bat	<i>Myotis lucifugus</i>
Big brown bat	<i>Eptesicus fuscus</i>
Tri-colored bat	<i>Perimyotis subflavus</i>
Northern long-eared bat	<i>Myotis septentrionalis</i>
Woodland jumping mouse	<i>Napaeozapus insignis</i>
Badger	<i>Taxidea taxus</i>
Ermine	<i>Mustela erminea</i>
Smoky shrew	<i>Sorex fumerus</i>
Deer mouse	<i>Peromyscus maniculatus</i>
Prairie vole	<i>Microtus ochrogaster</i>
Woodland vole	<i>Microtus pinetorum</i>
Southern bog lemming	<i>Synaptomys cooperi</i>
Silver-haired bat	<i>Lasionycteris noctivagans</i>
Red bat	<i>Lasiurus borealis</i>
Hoary bat	<i>Lasiurus cinereus</i>
Snowshoe hare	<i>Lepus americanus</i>

## BIRDS

Sharp-shinned hawk	<i>Accipiter striatus</i>
Sedge wren	<i>Cistothorus platensis</i>
Marsh wren	<i>Cistothorus palustris</i>
Henslow's sparrow	<i>Ammodramus henslowii</i>
Cerulean warbler	<i>Dendroica cerulea</i>
Prothonotary warbler	<i>Protonotaria citrea</i>
Black vulture	<i>Coragyps atratus</i>
Bobolink	<i>Dolichonyx oryzivorus</i>
Northern bobwhite	<i>Colinus virginianus</i>
Common moorhen	<i>Gallinula chloropus</i>
Great egret	<i>Ardea alba</i>
Sora rail	<i>Porzana carolina</i>
Virginia rail	<i>Rallus limicola</i>
Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>

## MOLLUSKS

Purple wartyback	<i>Cyclonaias tuberculata</i>
Wavy-rayed lampmussel	<i>Lampsilis fasciola</i>
Round pig-toe	<i>Pleurobema sintoxia</i>
Salamander mussel	<i>Simpsonaias ambigua</i>
Deertoe	<i>Truncilla truncata</i>
Elktoe	<i>Alasmidonta marginata</i>
Kidneyshell	<i>Ptychobranhus fasciolaris</i>
Creek heelsplitter	<i>Lasmigona compressa</i>

## REPTILES

Eastern box turtle	<i>Terrapene carolina carolina</i>
Ouachita map turtle	<i>Graptemys ouachitensis</i>
Black kingsnake	<i>Lampropeltis getula nigra</i>
Eastern gartersnake (melanistic)	<i>Thamnophis sirtalis sirtalis</i>
Northern rough green-snake	<i>Opheodrys aestivus</i>
Eastern foxsnake	<i>Pantherophis gloydi</i>
Queensnake	<i>Regina septemvittata</i>
Little brown skink	<i>Scincella lateralis</i>
Smooth earthsnake	<i>Virginia valeriae</i>
Short-headed gartersnake	<i>Thamnophis brachystoma</i>
Eastern hognose snake	<i>Heterodon platirhinos</i>

## AMPHIBIANS

Four-toed salamander	<i>Hemidactylium scutatum</i>
Eastern cricket frog	<i>Acris crepitans crepitans</i>

## FISHES

Lake trout	<i>Salvelinus namaycush</i>
Lake whitefish	<i>Coregonus clupeaformis</i>
Burbot	<i>Lota lota</i>
Muskellunge	<i>Esox masquinongy</i>
River redhorse	<i>Moxostoma carinatum</i>
Eastern sand darter	<i>Ammocrypta pellucida</i>
Least darter	<i>Etheostoma microperca</i>
Blue catfish	<i>Ictalurus furcatus</i>
Longnose dace	<i>Rhinichthys cataractae</i>



**CRAYFISHES**

Great Lakes crayfish	<i>Orconectes propinquus</i>
Northern crayfish	<i>Orconectes virilis</i>
Allegheny crayfish	<i>Orconectes obscurus</i>

**DRAGONFLIES**

Tiger spiketail	<i>Cordulegaster erronea</i>
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**MAYFLIES**

	<i>Maccaffertium ithica</i>
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**MIDGES**

	<i>Cantopelopia gesta</i>
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**CADDISFLIES**

	<i>Hydroptila chattanooga</i>
	<i>Asynarchus montanus</i>
	<i>Nemotaulius hostilis</i>

**BUTTERFLIES**

Two-spotted skipper	<i>Euphyes bimacula</i>
Dusted skipper	<i>Atrytonopsis hianna</i>

**MOTHS**

Milnei's looper moth	<i>Euchlaena milnei</i>
Buck moth	<i>Hemileuca maia</i>
One-eyed sphinx	<i>Smerinthus cerisyi</i>
Precious underwing	<i>Catocala pretiosa</i>
	<i>Macrochilo bivittata</i>
	<i>Phalaenostola hanhami</i>
	<i>Paectes abrostolella</i>
	<i>Capis curvata</i>
	<i>Tarachidia binocula</i>
	<i>Apamea mixta</i>
	<i>Agroperina lutosa</i>
Columbine borer	<i>Papaipema leucostigma</i>
Bracken borer moth	<i>Papaipema pterisii</i>
Osmunda borer moth	<i>Papaipema speciosissima</i>
	<i>Chytonix sensilis</i>
	<i>Amolita roseola</i>
Goat sallow	<i>Homoglaea hircina</i>
	<i>Brachylomia algens</i>
Purple arches	<i>Polia purpurissata</i>
Scurfy quaker	<i>Homorthodes furfurata</i>
	<i>Trichosilia manifesta</i>
	<i>Agonopterix pteleae</i>

**BETLES**

Six-banded longhorn beetle	<i>Dryobius sexnotatus</i>
	<i>Cicindela splendida</i>
	<i>Cicindela ancocisconensis</i>
	<i>Cicindela cursitans</i>
	<i>Cicindela cuprascens</i>
	<i>Cicindela macra</i>

**CRICKETS**

Laricis tree cricket	<i>Oecanthus laricis</i>
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# OHIO'S SPECIAL INTEREST

NOTE: \*E & \*T denote federal (U.S. Fish and Wildlife Service) listed endangered and threatened species respectively.

## MAMMALS

Evening bat *Nycticeius humeralis*

## BUTTERFLIES

Olympia marble *Euchloe olympia*

## BIRDS

Canada warbler *Wilsonia canadensis*  
 Magnolia warbler *Dendroica magnolia*  
 Northern waterthrush *Seiurus noveboracensis*  
 Winter wren *Troglodytes troglodytes*  
 Black-throated blue warbler *Dendroica caerulescens*  
 Brown creeper *Certhia americana*  
 Chuck-will's-widow *Caprimulgus carolinensis*  
 Bell's vireo *Vireo bellii*  
 Long-eared owl *Asio otus*  
 Mourning warbler *Oporornis philadelphia*  
 Northern saw-whet owl *Aegolius acadicus*  
 Pine siskin *Carduelis pinus*  
 Purple finch *Carpodacus purpureus*  
 Red-breasted nuthatch *Sitta canadensis*  
 Short-eared owl *Asio flammeus*  
 Western meadowlark *Sturnella neglecta*  
 Golden-crowned kinglet *Regulus satrapa*  
 Blackburnian warbler *Dendroica fusca*  
 Wilson's snipe *Gallinago delicata*  
 Gadwall *Anas strepera*  
 Green-winged teal *Anas crecca*  
 Northern pintail *Anas acuta*  
 Northern shoveler *Anas clypeata*  
 Redhead *Aythya americana*  
 Ruddy duck *Oxyura jamaicensis*  
 American black duck *Anas rubripes*  
 Wilson's phalarope *Phalaropus tricolor*  
 Yellow-headed blackbird *Xanthocephalus xanthocephalus*  
 Common raven *Corvus corax*  
 Dark-eyed junco *Junco hyemalis*  
 Yellow-crowned night-heron *Nyctanassa violacea*  
 Hermit thrush *Catharus guttatus*  
 Least flycatcher *Empidonax minimus*

## MOTHS

Slender clearwing *Hemaris gracilis*  
*Sphinx lucitosa*  
*Tathorhynchus exsiccatus*  
*Catocala marmorata*  
*Catocala maestosa*  
 Subflava sedge borer moth *Archanara subflava*  
*Caradrina meralis*  
*Calophasia lunula*  
*Leucania insueta*  
*Protorthodes incincta*  
 Variegated orange moth *Epelis truncataria*

# OHIO'S EXTIRPATED SPECIES

NOTE: \*E & \*T denote federal (U.S. Fish and Wildlife Service) listed endangered and threatened species respectively.

## MAMMALS

Rice rat	<i>Oryzomys palustris</i>
Porcupine	<i>Erethizon dorsatum</i>
Timber wolf	<i>Canis lupus</i>
Marten	<i>Martes americanus</i>
Fisher	<i>Martes pennanti</i>
Mountain lion	<i>Puma concolor</i>
Lynx	<i>Lynx canadensis</i>
Wapiti (Elk)	<i>Cervus elaphus</i>
Bison	<i>Bison bison</i>
Southern red-backed vole	<i>Clethrionomys gapperi</i>

## BIRDS

Swallow-tailed kite	<i>Elanoides forficatus</i>
Greater prairie-chicken	<i>Tympanuchus cupido</i>
Ivory-billed woodpecker	<i>Campephilus principalis</i>
Bachman's sparrow	<i>Aimophila aestivalis</i>
Golden-winged warbler	<i>Vermivora chrysoptera</i>
Bewick's wren	<i>Thryomanes bewickii</i>

## FISHES

Alligator gar	<i>Lepisosteus spatula</i>
Pugnose shiner	<i>Notropis anogenus</i>

Longhead darter	<i>Percina macrocephala</i>
Diamond darter	<i>Crystallaria circotti</i>
Spoonhead sculpin	<i>Cottus ricei</i>
Blackchin shiner	<i>Notropis heterodon</i>
Blacknose shiner	<i>Notropis heterolepis</i>
Mississippi silvery minnow	<i>Hybognathus nuchalis</i>

## MOLLUSKS

Orange-footed pearly mussel *E	<i>Plethobasus cooperianus</i>
Rough pigtoe *E	<i>Pleurobema plenum</i>
Fat pocketbook *E	<i>Potamilus capax</i>
Winged mapleleaf *E	<i>Quadrula fragosa</i>
Mucket	<i>Actinonaias l. ligamentina</i>
Spectaclecase	<i>Cumberlandia monodonta</i>
Cracking pearly mussel *E	<i>Hemistena lata</i>
White wartyback	<i>Plethobasus cicatricosus</i>
Hickorynut	<i>Obovaria olivaria</i>
Ring pink	<i>Obovaria retusa</i>
Scale shell	<i>Leptodea leptodon</i>

## BUTTERFLIES

Mustard white	<i>Pieris napi</i>
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# OHIO'S EXTINCT SPECIES

(updated July 2014)

NOTE: \*E & \*T denote federal (U.S. Fish and Wildlife Service) listed endangered and threatened species respectively.

## BIRDS

Passenger pigeon	<i>Ectopistes migratorius</i>
Carolina parakeet	<i>Conuropsis carolinensis</i>

## FISHES

Harelip sucker	<i>Lagochila lacera</i>
Blue pike	<i>Sander vitreus glaucus</i>

## MOLLUSKS

Leafshell	<i>Epioblasma flexuosa</i>
Forkshell	<i>Epioblasma lewisi</i>
Round snuffbox	<i>Epioblasma personata</i>
Cincinnati riffleshell	<i>Epioblasma phillipsi</i>
Scioto pigtoe	<i>Pleurobema bournianum</i>
Tubercled blossom	<i>Epioblasma torulosa torulosa</i>

## BETLES

Kramer's cave beetle	<i>Pseudanophthalmus krameri</i>
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**APPENDIX C**

**50 CFR 10.13 General Provisions, List of Migratory Bird Species**



**U.S. Fish and Wildlife Serv., Interior**

**§ 10.13**

the District of Columbia, the Commonwealth of Puerto Rico, American Samoa, the Virgin Islands, and Guam.

*Whoever* means the same as person.

*Wildlife* means the same as fish or wildlife.

[38 FR 22015, Aug. 15, 1973, as amended at 42 FR 32377, June 24, 1977; 42 FR 59358, Nov. 16, 1977; 45 FR 56673, Aug. 25, 1980; 50 FR 52889, Dec. 26, 1985]

**§ 10.13 List of Migratory Birds.**

The following is a list of all species of migratory birds protected by the Migratory Bird Treaty Act (16 U.S.C. 703-711) and subject to the regulations on migratory birds contained in this subchapter B of title 50 CFR. The species listed are those protected by the Convention for the Protection of Migratory Birds, August 16, 1916, United States-Great Britain (on behalf of Canada), 39 Stat. 1702, T.S. No. 628; the Convention for the Protection of Migratory Birds and Game Mammals, February 7, 1936, United States-Mexico, 50 Stat. 1311, T.S. No. 912; the Convention for the Protection of Migratory Birds and Birds in Danger of Extinction, and Their Environment, March 4, 1972, United States-Japan, 25 U.S.T. 3329, T.I.A.S. No. 7990; and the Convention for the Conservation of Migratory Birds and Their Environment, United States-U.S.S.R., November 26, 1976, 92 Stat. 3110, T.I.A.S. 9073, 16 U.S.C. 703, 712. The species are listed two ways. In the first part of the List species are arranged alphabetically by English (common) name groups, with the scientific name following the English (common) name. All species of ducks are listed together under the heading "DUCKS". In the second part of the List, species are listed by scientific name arranged in taxonomic order. Taxonomy and nomenclature follows the American Ornithologists' Union's Check-list of North American Birds (6th Edition, 1983).

**I. ALPHABETICAL LISTING**

Accentor, Siberian, *Prunella montanella*

Albatross:

Black-footed, *Diomedea nigripes*

Laysan, *Diomedea immutabilis*

Short-tailed, *Diomedea albatrus*

Yellow-nosed, *Diomedea chlororhynchos*

Anhinga, *Anhinga anhinga*

Ani:

Groove-billed, *Crotophaga sulcirostris*

Smooth-billed, *Crotophaga ani*

Auklet:

Cassin's, *Ptychoramphus aleuticus*

Crested, *Aethia cristatella*

Least, *Aethia pusilla*

Parakeet, *Cyclorhynchus psittacula*

Rhinoceros, *Cerorhinca monocerata*

Whiskered, *Aethia pygmaea*

Avocet, American, *Recurvirostra americana*

Barn-Owl, Common, *Tyto alba*

Beardless-Tyrannulet, Northern,

*Camptostoma imberbe*

Becard, Rose-throated, *Pachyramphus aglaiae*

Bittern:

American, *Botaurus lentiginosus*

Chinese, *Ixobrychus sinensis*

Least, *Ixobrychus exilis*

Schrenk's, *Ixobrychus eurhythmus*

Black-Hawk, Common, *Buteogallus*

*anthracinus*

Blackbird:

Brewer's, *Euphagus cyanocephalus*

Red-winged, *Agelaius phoeniceus*

Rusty, *Euphagus carolinus*

Tawny-shouldered, *Agelaius humeralis*

Tricolored, *Agelaius tricolor*

Yellow-headed, *Xanthocephalus*

*xanthocephalus*

Yellow-shouldered, *Agelaius xanthomus*

Bluebird:

Eastern, *Sialia sialis*

Mountain, *Sialia currucoides*

Western, *Sialia mexicana*

Bluethroat, *Luscinia svecica*

Bobolink, *Dolichonyx oryzivorus*

Booby:

Blue-footed, *Sula nebouxii*

Brown, *Sula leucogaster*

Masked, *Sula dactylatra*

Red-footed, *Sula sula*

Brambling, *Fringilla montifringilla*

Brant, *Branta bernicla*

Bufflehead (see DUCKS)

Bullfinch:

Eurasian, *Pyrrhula pyrrhula*

Puerto Rican, *Loxigilla portoricensis*

Bunting:

Indigo, *Passerina cyanea*

Lark, *Calamospiza melanocorys*

Lazuli, *Passerina amoena*

McKay's, *Plectrophenax hyperboreus*

Painted, *Passerina ciris*

Reed (see Reed-Bunting)

Rustic, *Emberiza rustica*

Snow, *Plectrophenax nivalis*

Varied, *Passerina versicolor*

Bushtit, *Psaltriparus minimus*

Canvasback (see DUCKS)

Caracara, Crested, *Polyborus plancus*

Cardinal, Northern, *Cardinalis cardinalis*

Carib, Green-throated, *Eulampis holosericeus*

Catbird, Gray, *Dumetella carolinensis*

Chat, Yellow-breasted, *Icteria virens*

Chickadee (see Tit):

Black-capped, *Parus atricapillus*

Boreal, *Parus hudsonicus*

Carolina, *Parus carolinensis*

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Chestnut-backed, *Parus rufescens*  
 Mexican, *Parus sclateri*  
 Mountain, *Parus gambeli*  
 Chuck-will's-widow, *Caprimulgus carolinensis*  
 Condor, California, *Gymnogyps californianus*  
 Coot:  
   American, *Fulica americana*  
   Caribbean, *Fulica caribaea*  
   Eurasian, *Fulica atra*  
 Cormorant:  
   Brandt's, *Phalacrocorax penicillatus*  
   Double-crested, *Phalacrocorax auritus*  
   Great, *Phalacrocorax carbo*  
   Olivaceous, *Phalacrocorax olivaceus*  
   Pelagic, *Phalacrocorax pelagicus*  
   Red-faced, *Phalacrocorax urile*  
 Cowbird:  
   Bronzed, *Molothrus aeneus*  
   Brown-headed, *Molothrus ater*  
   Shiny, *Molothrus bonariensis*  
 Crane:  
   Corn, *Crex crex*  
   Yellow-breasted, *Porzana flaviventer*  
 Crane:  
   Common, *Grus grus*  
   Sandhill, *Grus canadensis*  
   Whooping, *Grus americana*  
 Creeper, Brown, *Certhia americana*  
 Crossbill:  
   Red, *Loxia curvirostra*  
   White-winged, *Loxia leucoptera*  
 Crow:  
   American, *Corvus brachyrhynchos*  
   Fish, *Corvus ossifragus*  
   Hawaiian, *Corvus hawaiiensis*  
   Mexican, *Corvus imparatus*  
   Northwestern, *Corvus caurinus*  
   White-necked, *Corvus leucognaphalus*  
 Cuckoo:  
   Black-billed, *Coccyzus erythrophthalmus*  
   Common, *Cuculus canorus*  
   Hawk (see Hawk-Cuckoo)  
   Lizard (see Lizard-Cuckoo)  
   Mangrove, *Coccyzus minor*  
   Oriental, *Cuculus saturatus*  
   Yellow-billed, *Coccyzus americanus*  
 Curlew (see Whimbrel):  
   Bristle-thighed, *Numenius tahitiensis*  
   Eskimo, *Numenius borealis*  
   Far Eastern, *Numenius madagascariensis*  
   Least, *Numenius minutus*  
   Long-billed, *Numenius americanus*  
 Dickcissel, *Spiza americana*  
 Dipper, American, *Cinclus mexicanus*  
 Dotterel, Eurasian, *Charadrius morinellus*  
 Dove:  
   Ground (see Ground-Dove)  
   Inca, *Columbina inca*  
   Mourning, *Zenaida macroura*  
   Quail (see Quail-Dove)  
   White-tipped, *Leptotila verreauxi*  
   White-winged, *Zenaida asiatica*  
   Zenaida, *Zenaida aurita*  
 Dovekie, *Alle alle*  
 Dowitcher:  
   Long-billed, *Limnodromus scolopaceus*  
   Short-billed, *Limnodromus griseus*

DUCKS

American Black Duck, *Anas rubripes*  
 Bufflehead, *Bucephala albeola*  
 Canvasback, *Aythya valisineria*  
 Eider:  
   Common, *Somateria mollissima*  
   King, *Somateria spectabilis*  
   Spectacled, *Somateria fischeri*  
   Steller's, *Polysticta stelleri*  
 Gadwall, *Anas strepera*  
 Garganey, *Anas querquedula*  
 Goldeneye:  
   Barrow's, *Bucephala islandica*  
   Common, *Bucephala clangula*  
 Harlequin Duck, *Histrionicus histrionicus*  
 Hawaiian Duck, *Anas wyvilliana*  
 Laysan Duck, *Anas laysanensis*  
 Mallard, *Anas platyrhynchos*  
 Masked Duck, *Oxyura dominica*  
 Merganser  
   Common, *Mergus merganser*  
   Hooded, *Lophodytes cucullatus*  
   Red-breasted, *Mergus serrator*  
 Mottled Duck, *Anas fulvigula*  
 Oldsquaw, *Clangula hyemalis*  
 Pintail:  
   Northern, *Anas acuta*  
   White-cheeked, *Anas bahamensis*  
 Pochard:  
   Baer's, *Aythya baeri*  
   Common, *Aythya ferina*  
 Redhead, *Aythya americana*  
 Ring-necked Duck, *Aythya collaris*  
 Ruddy Duck, *Oxyura jamaicensis*  
 Scaup:  
   Greater, *Aythya marila*  
   Lesser, *Aythya affinis*  
 Scoter:  
   Black, *Melanitta nigra*  
   Surf, *Melanitta perspicillata*  
   White-winged, *Melanitta fusca*  
 Shoveler, Northern, *Anas clypeata*  
 Smew, *Mergellus albellus*  
 Teal:  
   Baikal, *Anas formosa*  
   Blue-winged, *Anas discors*  
   Cinnamon, *Anas cyanoptera*  
   Falcated, *Anas falcata*  
   Green-winged, *Anas crecca*  
 Tufted Duck, *Aythya fuligula*  
 Whistling-Duck:  
   Black-bellied, *Dendrocygna autumnalis*  
   Fulvous, *Dendrocygna bicolor*  
   West Indian, *Dendrocygna arborea*  
 Wigeon:  
   American, *Anas americana*  
   Eurasian, *Anas penelope*  
 Wood Duck, *Aix sponsa*

END OF DUCKS

Dunlin, *Calidris alpina*  
 Eagle:  
   Bald, *Haliaeetus leucocephalus*  
   Golden, *Aquila chrysaetos*  
   Sea (see Sea-Eagle)  
   White-tailed, *Haliaeetus albicilla*

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- Egret:  
 Cattle, *Bubulcus ibis*  
 Chinese, *Egretta eulophotes*  
 Great, *Casmerodius albus*  
 Plumed, *Egretta intermedia*  
 Reddish, *Egretta rufescens*  
 Snowy, *Egretta thula*
- Eider (see DUCKS)
- Elaenia, Caribbean, *Elaenia martinica*
- Emerald, Puerto Rican, *Chlorostilbon maugaeus*
- Euphonia, Antillean, *Euphonia musica*
- Falcon:  
 Aplomado, *Falco femoralis*  
 Peregrine, *Falco peregrinus*  
 Prairie, *Falco mexicanus*
- Fieldfare, *Turdus pilaris*
- Finch:  
 Cassin's, *Carpodacus cassinii*  
 House, *Carpodacus mexicanus*  
 Purple, *Carpodacus purpureus*  
 Rosy, *Leucosticte arctoa*
- Flamingo, Greater, *Phoenicopterus ruber*
- Flicker, Northern, *Colaptes auratus*
- Flycatcher:  
 Acadian, *Empidonax virescens*  
 Alder, *Empidonax alnorum*  
 Ash-throated, *Myiarchus cinerascens*  
 Brown-crested, *Myiarchus tyrannulus*  
 Buff-breasted, *Empidonax fulvifrons*  
 Dusky, *Empidonax oberholseri*  
 Dusky-capped, *Myiarchus tuberculifer*  
 Fork-tailed, *Tyrannus savana*  
 Gray, *Empidonax wrightii*  
 Gray-spotted, *Muscicapa griseisticta*  
 Great Crested, *Myiarchus crinitus*  
 Hammond's, *Empidonax hammondi*  
 Least, *Empidonax minimus*  
 Narcissus, *Muscicapa narcissina*  
 Nutting's, *Myiarchus nuttingi*  
 Olive-sided, *Contopus borealis*  
 Puerto Rican, *Myiarchus antillarum*  
 Scissor-tailed, *Tyrannus forficatus*  
 Sulphur-bellied, *Myiodynastes luteiventris*  
 Vermilion, *Pyrocephalus rubinus*  
 Western, *Empidonax difficilis*  
 Willow, *Empidonax traillii*  
 Yellow-bellied, *Empidonax flaviventris*
- Frigatebird:  
 Great, *Fregata minor*  
 Magnificent, *Fregata magnificens*  
 Lesser, *Fregata ariel*
- Fulmar, Northern, *Fulmarus glacialis*
- Gadwall (see DUCKS)
- Gallinule, Purple, *Porphyryla martinica*
- Gannet, Northern, *Sula bassanus*
- Garganey (see DUCKS)
- Gnatcatcher:  
 Black-capped, *Poliophtila nigriceps*  
 Black-tailed, *Poliophtila melanura*  
 Blue-gray, *Poliophtila caerulea*
- Godwit:  
 Bar-tailed, *Limosa lapponica*  
 Black-tailed, *Limosa limosa*  
 Hudsonian, *Limosa haemastica*  
 Marbled, *Limosa fedoa*
- Golden-Plover, Lesser, *Pluvialis dominica*
- Goldeneye (see DUCKS)
- Goldfinch:  
 American, *Carduelis tristis*  
 Lawrence's, *Carduelis lawrencei*  
 Lesser, *Carduelis psaltria*
- Goose:  
 Barnacle, *Branta leucopsis*  
 Bean, *Anser fabalis*  
 Canada, *Branta canadensis*  
 Emperor, *Chen canagica*  
 Greater White-fronted, *Anser albifrons*  
 Hawaiian, *Nesochen sandvicensis*  
 Ross', *Chen rossii*  
 Snow, *Chen caerulescens*
- Goshawk, Northern, *Accipiter gentilis*
- Goshawk:  
 Boat-tailed, *Quiscalus major*  
 Common, *Quiscalus quiscula*  
 Great-tailed, *Quiscalus mexicanus*  
 Greater Antillean, *Quiscalus niger*
- Grasshopper-Warbler, Middendorff's, *Locustella ochotensis*
- Grassquit:  
 Black-faced, *Tiaris bicolor*  
 Yellow-faced, *Tiaris olivacea*
- Grebe:  
 Eared, *Podiceps nigricollis*  
 Horned, *Podiceps auritus*  
 Least, *Tachybaptus dominicus*  
 Pied-billed, *Podilymbus podiceps*  
 Red-necked, *Podiceps griseigena*  
 Western, *Aechmophorus occidentalis*
- Greenfinch, Oriental, *Carduelis sinica*
- Greenshank, Common, *Tringa nebularia*
- Grosbeak:  
 Black-headed, *Pheucticus melanocephalus*  
 Blue, *Guiraca caerulea*  
 Crimson-collared, *Rhodothraupis celaeno*  
 Evening, *Coccothraustes vespertinus*  
 Pine, *Pinicola enucleator*  
 Rose-breasted, *Pheucticus ludovicianus*  
 Yellow, *Pheucticus chrysopleps*
- Ground-Dove:  
 Common, *Columbina passerina*  
 Ruddy, *Columbina talpacoti*
- Guillemot:  
 Black, *Cepphus grylle*  
 Pigeon, *Cepphus columba*
- Gull:  
 Bonaparte's, *Larus philadelphia*  
 California, *Larus californicus*  
 Common Black-headed, *Larus ridibundus*  
 Franklin's, *Larus pipixcan*  
 Glaucous, *Larus hyperboreus*  
 Glaucous-winged, *Larus glaucescens*  
 Great Black-backed, *Larus marinus*  
 Heermann's, *Larus heermanni*  
 Herring, *Larus argentatus*  
 Iceland, *Larus glaucoides*  
 Ivory, *Pagophila eburnea*  
 Laughing, *Larus atricilla*  
 Lesser Black-backed, *Larus fuscus*  
 Little, *Larus minutus*  
 Mew, *Larus canus*  
 Ring-billed, *Larus delawarensis*  
 Ross', *Rhodostethia rosea*  
 Sabine's, *Xema sabini*

- Slaty-backed, *Larus schistisagus*  
 Thayer's, *Larus thayeri*  
 Western, *Larus occidentalis*  
 Yellow-footed, *Larus livens*  
 Gyrfalcon, *Falco rusticolus*  
 Harrier, Northern, *Circus cyaneus*  
 Hawkfinch, *Coccothraustes coccothraustes*  
 Hawk:  
 Asiatic Sparrow, *Accipiter gularis*  
 Black (see Black-Hawk)  
 Broad-winged, *Buteo platypterus*  
 Cooper's, *Accipiter cooperii*  
 Ferruginous, *Buteo regalis*  
 Gray, *Buteo nitidus*  
 Harris', *Parabuteo unicinctus*  
 Hawaiian, *Buteo solitarius*  
 Red-shouldered, *Buteo lineatus*  
 Red-tailed, *Buteo jamaicensis*  
 Rough-legged, *Buteo lagopus*  
 Sharp-shinned, *Accipiter striatus*  
 Short-tailed, *Buteo brachyurus*  
 Swainson's, *Buteo swainsoni*  
 White-tailed, *Buteo albicaudatus*  
 Zone-tailed, *Buteo albonotatus*  
 Hawk-Cuckoo, Hodgson's, *Cuculus fugax*  
 Hawk-Owl, Northern, *Surnia ulula*  
 Heron:  
 Great Blue, *Ardea herodias*  
 Green-backed, *Butorides striatus*  
 Little Blue, *Egretta caerulea*  
 Night (see Night-Heron)  
 Pacific Reef, *Egretta sacra*  
 Tricolored, *Egretta tricolor*  
 Hoopoe:  
*Upupa epops*  
 House-Martin, Common, *Delichon urbica*  
 Hummingbird (see Carib, Emerald, Mango,  
 Starthroat, Woodstar, Violet-ear):  
 Allen's, *Selasphorus sasin*  
 Anna's, *Calypte anna*  
 Antillean Crested, *Orthorhynchus cristatus*  
 Berylline, *Amazilia beryllina*  
 Black-chinned, *Archilochus alexandri*  
 Blue-throated, *Lampornis clemenciae*  
 Broad-billed, *Cyananthus latirostris*  
 Broad-tailed, *Selasphorus platycercus*  
 Buff-bellied, *Amazilia yucatanensis*  
 Calliope, *Stellula calliope*  
 Costa's, *Calypte costae*  
 Lucifer, *Calothorax lucifer*  
 Magnificent, *Eugenes fulgens*  
 Ruby-throated, *Archilochus colubris*  
 Rufous, *Selasphorus rufus*  
 Violet-crowned, *Amazilia violiceps*  
 White-eared, *Hylocharis leucotis*  
 Ibis:  
 Glossy, *Plegadis falcinellus*  
 Scarlet, *Eudocimus ruber*  
 White, *Eudocimus albus*  
 White-faced, *Plegadis chihi*  
 Jabiru, *Jabiru mycteria*  
 Jacana, Northern, *Jacana spinosa*  
 Jaeger:  
 Long-tailed, *Stercorarius longicaudus*  
 Parasitic, *Stercorarius parasiticus*  
 Pomarine, *Stercorarius pomarinus*  
 Jay:  
 Blue, *Cyanocitta cristata*  
 Brown, *Cyanocorax morio*  
 Gray, *Perisoreus canadensis*  
 Gray-breasted, *Aphelocoma ultramarina*  
 Green, *Cyanocorax yncas*  
 Pinyon, *Gymnorhinus cyanocephalus*  
 Scrub, *Aphelocoma coerulescens*  
 Steller's, *Cyanocitta stelleri*  
 Junco:  
 Dark-eyed, *Junco hyemalis*  
 Yellow-eyed, *Junco phaeonotus*  
 Kestrel:  
 American, *Falco sparverius*  
 Eurasian, *Falco tinnunculus*  
 Killdeer, *Charadrius vociferus*  
 Kingbird:  
 Cassin's, *Tyrannus vociferans*  
 Couch's, *Tyrannus couchii*  
 Eastern, *Tyrannus tyrannus*  
 Gray, *Tyrannus dominicensis*  
 Loggerhead, *Tyrannus caudifasciatus*  
 Thick-billed, *Tyrannus crassirostris*  
 Tropical, *Tyrannus melancholicus*  
 Western, *Tyrannus verticalis*  
 Kingfisher:  
 Belted, *Ceryle alcyon*  
 Green, *Chloroceryle americana*  
 Ringed, *Ceryle torquata*  
 Kinglet:  
 Golden-crowned, *Regulus satrapa*  
 Ruby-crowned, *Regulus calendula*  
 Kiskadee, Great, *Pitangus sulphuratus*  
 Kite:  
 American Swallow-tailed, *Elanoides  
 forficatus*  
 Black, *Milvus migrans*  
 Black-shouldered, *Elanus caeruleus*  
 Hook-billed, *Chondrohierax uncinatus*  
 Mississippi, *Ictinia mississippiensis*  
 Snail, *Rostrhamus sociabilis*  
 Kittiwake:  
 Black-legged, *Larus tridactyla*  
 Red-legged, *Larus brevis*  
 Knot:  
 Great, *Calidris tenuirostris*  
 Red, *Calidris canutus*  
 Lapwing, Northern, *Vanellus vanellus*  
 Lark, Horned, *Eremophila alpestris*  
 Limpkin, *Aramus guarauna*  
 Lizard-Cuckoo, Puerto Rican, *Saurothera  
 vieilloti*  
 Longspur:  
 Chestnut-collared, *Calcarius ornatus*  
 Lapland, *Calcarius lapponicus*  
 McCown's, *Calcarius mccownii*  
 Smith's, *Calcarius pictus*  
 Loon:  
 Arctic, *Gavia arctica*  
 Common, *Gavia immer*  
 Red-throated, *Gavia stellata*  
 Yellow-billed, *Gavia adamsii*  
 Magpie:  
 Black-billed, *Pica pica*  
 Yellow-billed, *Pica nuttalli*  
 Mallard (see DUCKS)  
 Mango:  
 Antillean, *Anthracothorax dominicus*



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- Green, *Anthracothonax viridis*  
 Martin:  
   Caribbean, *Progne dominicensis*  
   Cuban, *Progne cryptoleuca*  
   Gray-breasted, *Progne chalybea*  
   House (see House-Martin)  
   Purple, *Progne subis*  
 Meadowlark:  
   Eastern, *Sturnella magna*  
   Western, *Sturnella neglecta*  
 Merganser (see DUCKS)  
 Merlin, *Falco columbarius*  
 Mockingbird, Northern, *Mimus polyglottos*  
 Moorhen, Common, *Gallinula chloropus*  
 Murre:  
   Common, *Uria aalge*  
   Thick-billed, *Uria lomvia*  
 Murrelet:  
   Ancient, *Synthliboramphus antiquus*  
   Craveri's, *Synthliboramphus craveri*  
   Kittlitz's, *Brachyramphus brevirostris*  
   Marbled, *Brachyramphus marmoratus*  
   Xantus', *Synthliboramphus hypoleucus*  
 Needletail, White-throated, *Hirundapus caudacutus*  
 Night-Heron:  
   Black-crowned, *Nycticorax nycticorax*  
   Japanese, *Nycticorax goisagi*  
   Malay, *Nycticorax melanolophus*  
   Yellow-crowned, *Nycticorax violaceus*  
 Nighthawk:  
   Antillean, *Chordeiles gundlachii*  
   Common, *Chordeiles minor*  
   Lesser, *Chordeiles acutipennis*  
 Nightjar:  
   Buff-collared, *Caprimulgus ridgwayi*  
   Jungle, *Caprimulgus indicus*  
   Puerto Rican, *Caprimulgus noctitherus*  
 Noddy:  
   Black, *Anous minutus*  
   Blue-gray, *Procelsterna cerulea*  
   Brown, *Anous stolidus*  
   Lesser, *Anous tenuirostris*  
 Nutcracker, Clark's, *Nucifraga columbiana*  
 Nuthatch:  
   Brown-headed, *Sitta pusilla*  
   Pygmy, *Sitta pygmaea*  
   Red-breasted, *Sitta canadensis*  
   White-breasted, *Sitta carolinensis*  
 Oldsquaw (see DUCKS)  
 Oriole:  
   Altamira, *Icterus gularis*  
   Audubon's, *Icterus graduacauda*  
   Black-cowled, *Icterus dominicensis*  
   Black-vented, *Icterus wagleri*  
   Hooded, *Icterus cucullatus*  
   Northern, *Icterus galbula*  
   Orchard, *Icterus spurius*  
   Scott's, *Icterus parisorum*  
   Streak-backed, *Icterus pustulatus*  
 Osprey, *Pandion haliaetus*  
 Ovenbird, *Seiurus aurocapillus*  
 Owl:  
   Barn (see Barn-Owl)  
   Barred, *Strix varia*  
   Boreal, *Aegolius funereus*  
   Burrowing, *Athene cucularia*  
   Elf, *Micrathene whitneyi*  
   Flammulated, *Otus flammeolus*  
   Great Gray, *Strix nebulosa*  
   Great Horned, *Bubo virginianus*  
   Hawk (see Hawk-Owl)  
   Long-eared, *Asio otus*  
   Pygmy (see Pygmy-Owl)  
   Saw-whet (see Saw-Whet Owl)  
   Screech (see Screech-Owl)  
   Short-eared, *Asio flammeus*  
   Snowy, *Nyctea scandiaca*  
   Spotted, *Strix occidentalis*  
 Oystercatcher:  
   American, *Haematopus palliatus*  
   Black, *Haematopus bachmani*  
 Parula:  
   Northern, *Parula americana*  
   Tropical, *Parula pitiayumi*  
 Pauraque, Common, *Nyctidromus albicollis*  
 Pelican:  
   American White, *Pelecanus erythrorhynchos*  
   Brown, *Pelecanus occidentalis*  
 Petrel:  
   Black-capped, *Pterodroma hasitata*  
   Bonin, *Pterodroma hypoleuca*  
   Bulwer's, *Bulweria bulwerii*  
   Cook's, *Pterodroma cookii*  
   Dark-rumped, *Pterodroma phaeopygia*  
   Herald, *Pterodroma arminjoniana*  
   Kermadec, *Pterodroma neglecta*  
   Mottled, *Pterodroma inexpectata*  
   Murphy's, *Pterodroma ultima*  
   Storm (see Storm-Petrel)  
   White-necked, *Pterodroma externa*  
 Pewee:  
   Greater, *Contopus pertinax*  
   Lesser Antillean, *Contopus latirostris*  
   Wood (see Wood-Pewee)  
 Phainopepla, *Phainopepla nitens*  
 Phalarope:  
   Red, *Phalaropus fulicaria*  
   Red-necked, *Phalaropus lobatus*  
   Wilson's, *Phalaropus tricolor*  
 Phoebe:  
   Black, *Sayornis nigricans*  
   Eastern, *Sayornis phoebe*  
   Say's, *Sayornis saya*  
 Pigeon:  
   Band-tailed, *Columba fasciata*  
   Plain, *Columba inornata*  
   Red-billed, *Columba flavirostris*  
   Scaly-naped, *Columba squamosa*  
   White-crowned, *Columba leucocephala*  
 Pintail (see DUCKS)  
 Pipit:  
   Pechora, *Anthus gustavi*  
   Red-throated, *Anthus cervinus*  
   Sprague's, *Anthus spragueii*  
   Tree (see Tree-Pipit)  
   Water, *Anthus spinoletta*  
 Plover:  
   Black-bellied, *Pluvialis squatarola*  
   Common Ringed, *Charadrius hiaticula*  
   Golden (see Golden-Plover)  
   Great Sand, *Charadrius leschenaultii*  
   Little Ringed, *Charadrius dubius*  
   Mongolian, *Charadrius mongolus*

- Mountain, *Charadrius montanus*  
Piping, *Charadrius melodus*  
Semipalmated, *Charadrius semipalmatus*  
Snowy, *Charadrius alexandrinus*  
Wilson's, *Charadrius wilsonia*  
Pochard (see DUCKS)  
Poorwill, Common, *Phalaenoptilus nuttallii*  
Puffin:  
Atlantic, *Fratercula arctica*  
Horned, *Fratercula corniculata*  
Tufted, *Fratercula cirrhata*  
Pygmy-Owl:  
Ferruginous, *Glaucidium brasilianum*  
Northern, *Glaucidium gnoma*  
Pyrrhuloxia, *Cardinalis sinuatus*  
Quail-Dove:  
Bridled, *Geotrygon mystacea*  
Key West, *Geotrygon chrysia*  
Ruddy, *Geotrygon montana*  
Rail:  
Black, *Laterallus jamaicensis*  
Clapper, *Rallus longirostris*  
King, *Rallus elegans*  
Sora (see Sora)  
Virginia, *Rallus limicola*  
Yellow, *Coturnicops noveboracensis*  
Raven:  
Chihuahuan, *Corvus cryptoleucus*  
Common, *Corvus corax*  
Razorbill, *Alca torda*  
Redhead (see DUCKS)  
Redpoll:  
Common, *Carduelis flammea*  
Hoary, *Carduelis hornemanni*  
Redshank, Spotted, *Tringa erythropus*  
Redstart:  
American, *Setophaga ruticilla*  
Painted, *Myioborus pictus*  
Slaty-throated, *Myioborus miniatus*  
Reed-Bunting:  
Common, *Emberiza schoeniculus*  
Pallas', *Emberiza pallasii*  
Roadrunner, Greater, *Geococcyx californianus*  
Robin:  
American, *Turdus migratorius*  
Clay-colored, *Turdus grayi*  
Rufous-backed, *Turdus rufopallatus*  
Rosefinch, Common, *Carpodacus erythrinus*  
Rough-winged Swallow, Northern,  
*Stelgidopteryx serripennis*  
Rubythroat, Siberian, *Luscinia calliope*  
Ruff, *Philomachus pugnax*  
Sanderling, *Calidris alba*  
Sandpiper:  
Baird's, *Calidris bairdii*  
Broad-billed, *Limicola falcinellus*  
Buff-breasted, *Tryngites subruficollis*  
Common, *Actitis hypoleucos*  
Curlew, *Calidris ferruginea*  
Least, *Calidris minutilla*  
Marsh, *Tringa stagnatilis*  
Pectoral, *Calidris melanotos*  
Purple, *Calidris maritima*  
Rock, *Calidris ptilocnemis*  
Semipalmated, *Calidris pusilla*  
Sharp-tailed, *Calidris acuminata*  
Solitary, *Tringa solitaria*  
Spoonbill, *Eurynorhynchus pygmeus*  
Spotted, *Actitis macularia*  
Stilt, *Calidris himantopus*  
Terek, *Xenus cinereus*  
Upland, *Bartramia longicauda*  
Western, *Calidris mauri*  
White-rumped, *Calidris fuscicollis*  
Wood, *Tringa glareola*  
Sapsucker:  
Red-breasted, *Sphyrapicus ruber*  
Williamson's, *Sphyrapicus thyroideus*  
Yellow-bellied, *Sphyrapicus varius*  
Saw-whet Owl, Northern, *Aegolius acadicus*  
Scaup (see DUCKS)  
Scoter (see DUCKS)  
Screech-Owl:  
Eastern, *Otus asio*  
Puerto Rican, *Otus nudipes*  
Western, *Otus kennicottii*  
Whiskered, *Otus trichopsis*  
Sea-Eagle, Steller's, *Haliaeetus pelagicus*  
Seedeater, White-collared, *Sporophila torqueola*  
Shearwater:  
Audubon's, *Puffinus lherminieri*  
Black-vented, *Puffinus opisthomelas*  
Buller's, *Puffinus bulleri*  
Christmas, *Puffinus nativitatus*  
Cory's, *Calonectris diomedea*  
Flesh-footed, *Puffinus carneipes*  
Greater, *Puffinus gravis*  
Little, *Puffinus assimilis*  
Manx, *Puffinus puffinus*  
Pink-footed, *Puffinus creatopus*  
Short-tailed, *Puffinus tenuirostris*  
Sooty, *Puffinus griseus*  
Townsend's, *Puffinus auricularis*  
Wedge-tailed, *Puffinus pacificus*  
Shoveler (see DUCKS)  
Shrike:  
Loggerhead, *Lanius ludovicianus*  
Northern, *Lanius excubitor*  
Siskin, Pine, *Carduelis pinus*  
Skimmer, Black, *Rhynchops niger*  
Skua:  
Great, *Catharacta skua*  
South Polar, *Catharacta maccormicki*  
Skylark, Eurasian, *Alauda arvensis*  
Smew (see DUCKS)  
Snipe:  
Common, *Gallinago gallinago*  
Jack, *Lymnocyptes minimus*  
Pin-tailed, *Gallinago stenura*  
Swinhoe's, *Gallinago megala*  
Solitaire, Townsend's, *Myadestes townsendi*  
Sora, *Porzana carolina*  
Sparrow:  
American Tree, *Spizella arborea*  
Bachman's, *Aimophila aestivalis*  
Baird's, *Ammodramus bairdii*  
Black-chinned, *Spizella atrogularis*  
Black-throated, *Amphispiza bilineata*  
Botteri's, *Aimophila botterii*  
Brewer's, *Spizella breweri*  
Cassin's, *Aimophila cassinii*  
Chipping, *Spizella passerina*  
Clay-colored, *Spizella pallida*

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- Field, *Spizella pusilla*  
 Five-striped, *Amphispiza quinquestriata*  
 Fox, *Passerella iliaca*  
 Golden-crowned, *Zonotrichia atricapilla*  
 Grasshopper, *Ammodramus savannarum*  
 Harris', *Zonotrichia querula*  
 Henslow's, *Ammodramus henslowii*  
 Lark, *Chondestes grammacus*  
 Le Conte's, *Ammodramus leconteii*  
 Lincoln's, *Melospiza lincolni*  
 Olive, *Arremonops rufivirgatus*  
 Rufous-crowned, *Aimophila ruificeps*  
 Rufous-winged, *Aimophila carpalis*  
 Sage, *Amphispiza belli*  
 Savannah, *Passerculus sandwichensis*  
 Seaside, *Ammodramus maritimus*  
 Sharp-tailed, *Ammodramus caudacutus*  
 Song, *Melospiza melodia*  
 Swamp, *Melospiza georgiana*  
 Vesper, *Pooecetes gramineus*  
 White-crowned, *Zonotrichia leucophrys*  
 White-throated, *Zonotrichia albicollis*  
 Worthen's, *Spizella wortheni*  
 Spoonbill, Roseate, *Ajaia ajaja*  
 Starling:  
     Ashy, *Sturnus cineraceus*  
     Violet-backed, *Sturnus philippensis*  
 Starthroat, Plain-capped *Helimaster constantii*,  
 Stilt, Black-necked, *Himantopus mexicanus*  
 Stint:  
     Little, *Calidris minuta*  
     Long-toed, *Calidris subminuta*  
     Rufous-necked, *Calidris ruficollis*  
     Temminck's, *Calidris temminckii*  
 Stork, Wood, *Mycteria americana*  
 Storm-Petrel:  
     Ashy, *Oceanodroma homochroa*  
     Band-rumped, *Oceanodroma castra*  
     Black, *Oceanodroma melania*  
     Fork-tailed, *Oceanodroma furcata*  
     Leach's, *Oceanodroma leucorhoa*  
     Least, *Oceanodroma microsoma*  
     Sooty, *Oceanodroma tristrami*  
     Wedge-rumped, *Oceanodroma tethys*  
     White-faced, *Pelagadroma marina*  
     Wilson's, *Oceanites oceanicus*  
 Surfbird, *Aphriza virgata*  
 Swallow:  
     Bahama, *Tachycineta cyaneoviridis*  
     Bank, *Riparia riparia*  
     Barn, *Hirundo rustica*  
     Cave, *Hirundo fulva*  
     Cliff, *Hirundo pyrrhonota*  
     Rough-winged (see Rough-winged Swallow)  
     Tree, *Tachycineta bicolor*  
     Violet-green, *Tachycineta thalassina*  
 Swan:  
     Trumpeter, *Cygnus buccinator*  
     Tundra, *Cygnus columbianus*  
     Whooper, *Cygnus cygnus*  
 Swift:  
     Antillean Palm, *Tachornis pheonicobia*  
     Black, *Cypseloides niger*  
     Chimney, *Chaetura pelagica*  
     Common, *Apus apus*  
     Fork-tailed, *Apus pacificus*  
     Needle-tailed (see Needletail)  
     Vaux's, *Chaetura vauxi*  
     White-collared, *Streptoprocne zonaris*  
     White-throated, *Aeronautes saxatalis*  
 Tanager:  
     Hepatic, *Piranga flava*  
     Puerto Rican, *Neospingus speculiferus*  
     Scarlet, *Piranga olivacea*  
     Stripe-headed, *Spindalis zena*  
     Summer, *Piranga rubra*  
     Western, *Piranga ludoviciana*  
 Tattler:  
     Gray-tailed, *Heteroscelus brevipes*  
     Wandering, *Heteroscelus incanus*  
 Teal (see DUCKS)  
 Tern:  
     Aleutian, *Sterna aleutica*  
     Arctic, *Sterna paradisaea*  
     Black, *Chlidonias niger*  
     Black-naped, *Sterna sumatrana*  
     Bridled, *Sterna anaethetus*  
     Caspian, *Sterna caspia*  
     Common, *Sterna hirundo*  
     Elegant, *Sterna elegans*  
     Forster's, *Sterna forsteri*  
     Gray-backed, *Sterna lunata*  
     Gull-billed, *Sterna nilotica*  
     Least, *Sterna antillarum*  
     Little, *Sterna albifrons*  
     Roseate, *Sterna dougallii*  
     Royal, *Sterna maxima*  
     Sandwich, *Sterna sandvicensis*  
     Sooty, *Sterna fuscata*  
     White, *Gygis alba*  
     White-winged, *Chlidonias leucopterus*  
 Thrasher:  
     Bendire's, *Toxostoma bendirei*  
     Brown, *Toxostoma rufum*  
     California, *Toxostoma redivivum*  
     Crissal, *Toxostoma crissale*  
     Curve-billed, *Toxostoma curvirostre*  
     Le Conte's, *Toxostoma lecontei*  
     Long-billed, *Toxostoma longirostre*  
     Pearly-eyed, *Margarops fuscatus*  
     Sage, *Oreoscoptes montanus*  
 Thrush:  
     Aztec, *Ridgwayia pinicola*  
     Blue Rock, *Monticola solitarius*  
     Dusky, *Turdus naumanni*  
     Eye-browed, *Turdus obscurus*  
     Gray-cheeked, *Catharus minimus*  
     Hawaiian, *Phaeornis obscurus*  
     Hermit, *Catharus guttatus*  
     Red-legged, *Turdus plumbeus*  
     Small Kauai, *Phaeornis palmeri*  
     Swainson's, *Catharus ustulatus*  
     Varied, *Ixoreus naevius*  
     Wood, *Hylocichla minima*  
 Tit, Siberian, *Parus cinctus*  
 Titmouse:  
     Bridled, *Parus wollweberi*  
     Plain, *Parus inornatus*  
     Tufted, *Parus bicolor*  
 Towhee:  
     Abert's, *Pipilo aberti*  
     Brown, *Pipilo fuscus*  
     Green-tailed, *Pipilo chlorurus*

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Rufous-sided, *Pipilo erythrophthalmus*  
 Tree-Pipit, Olive, *Anthus hodgsoni*  
 Trogon:  
   Eared, *Euptilotus neoxenus*  
   Elegant, *Trogon elegans*  
 Tropicbird:  
   Red-billed, *Phaethon aethereus*  
   Red-tailed, *Phaethon rubricauda*  
   White-tailed, *Phaethon lepturus*  
 Turnstone:  
   Black, *Arenaria melanocephala*  
   Ruddy, *Arenaria interpres*  
 Veery, *Catharus fuscescens*  
 Verdin, *Auriparus flaviceps*  
 Violet-Ear, Green, *Colibri thalassinus*  
 Vireo:  
   Bell's *Vireo bellii*  
   Black-capped, *Vireo atricapillus*  
   Black-whiskered, *Vireo altiloquus*  
   Gray, *Vireo vicinior*  
   Hutton's, *Vireo huttoni*  
   Philadelphia, *Vireo philadelphicus*  
   Puerto Rican, *Vireo latimeri*  
   Red-eyed, *Vireo olivaceus*  
   Solitary, *Vireo solitarius*  
   Warbling, *Vireo gilvus*  
   White-eyed, *Vireo griseus*  
   Yellow-throated, *Vireo flavifrons*  
 Vulture:  
   Black, *Coragyps atratus*  
   Turkey, *Cathartes aura*  
 Wagtail:  
   Black-backed, *Motacilla lugens*  
   Gray, *Motacilla cinerea*  
   White, *Motacilla alba*  
   Yellow, *Motacilla flava*  
 Warbler:  
   Adelaide's, *Dendroica adelaidae*  
   Arctic, *Phylloscopus borealis*  
   Bachman's, *Vermivora bachmanii*  
   Bay-breasted, *Dendroica castanea*  
   Black-and-white, *Mniotilta varia*  
   Black-throated Blue, *Dendroica caerulescens*  
   Black-throated Gray, *Dendroica nigrescens*  
   Black-throated Green, *Dendroica virens*  
   Blackburnian, *Dendroica fusca*  
   Blackpoll, *Dendroica striata*  
   Blue-winged, *Vermivora pinus*  
   Canada, *Wilsonia canadensis*  
   Cape May, *Dendroica tigrina*  
   Cerulean, *Dendroica cerulea*  
   Chestnut-sided, *Dendroica pensylvanica*  
   Colima, *Vermivora crissalis*  
   Connecticut, *Oporornis agilis*  
   Elfin Woods, *Dendroica angelae*  
   Golden-cheeked, *Dendroica chrysoparia*  
   Golden-crowned, *Basileuterus culicivorus*  
   Golden-winged, *Vermivora chrysoptera*  
   Grace's, *Dendroica graciae*  
   Grasshopper (see Grasshopper-Warbler)  
   Hermit, *Dendroica occidentalis*  
   Hooded, *Wilsonia citrina*  
   Kentucky, *Oporornis formosus*  
   Kirtland's, *Dendroica kirtlandii*  
   Lucy's, *Vermivora luciae*  
   MacGillivray's, *Oporornis tolmiei*  
   Magnolia, *Dendroica magnolia*

Mourning, *Oporornis philadelphia*  
 Nashville, *Vermivora ruficapilla*  
 Olive, *Peucedramus taeniatus*  
 Orange-crowned, *Vermivora celata*  
 Palm, *Dendroica palmarum*  
 Parula (see Parula)  
 Pine, *Dendroica pinus*  
 Prairie, *Dendroica discolor*  
 Prothonotary, *Protonotaria citrea*  
 Red-faced, *Cardellina rubrifrons*  
 Rufous-capped, *Basileuterus rufifrons*  
 Swainson's, *Limnothlypis swainsonii*  
 Tennessee, *Vermivora peregrina*  
 Townsend's, *Dendroica townsendi*  
 Virginia's, *Vermivora virginiae*  
 Willow, *Phylloscopus trochilus*  
 Wilson's, *Wilsonia pusilla*  
 Worm-eating, *Helminthos vermivorus*  
 Yellow, *Dendroica petechia*  
 Yellow-rumped, *Dendroica coronata*  
 Yellow-throated, *Dendroica dominica*  
 Waterthrush:  
   Louisiana, *Seiurus motacilla*  
   Northern, *Seiurus noveboracensis*  
 Waxwing:  
   Bohemian, *Bombycilla garrulus*  
   Cedar, *Bombycilla cedrorum*  
 Wheatear, Northern, *Oenanthe oenanthe*  
 Whimbrel, *Numenius phaeopus*  
 Whip-poor-will, *Caprimulgus vociferus*  
 Whistling-Duck (see DUCKS)  
 Wigeon (see DUCKS)  
 Willet, *Catoptrophorus semipalmatus*  
 Wood-Pewee:  
   Eastern, *Contopus virens*  
   Western, *Contopus sordidulus*  
 Woodcock:  
   American, *Scolopax minor*  
   Eurasian, *Scolopax rusticola*  
 Woodpecker:  
   Acorn, *Melanerpes formicivorus*  
   Black-backed, *Picoides arcticus*  
   Downy, *Picoides pubescens*  
   Gila, *Melanerpes uropygialis*  
   Golden-fronted, *Melanerpes aurifrons*  
   Hairy, *Picoides villosus*  
   Ivory-billed, *Campephilus principalis*  
   Ladder-backed, *Picoides scalaris*  
   Lewis', *Melanerpes lewis*  
   Nuttall's, *Picoides nuttallii*  
   Pileated, *Dryocopus pileatus*  
   Puerto Rican, *Melanerpes portoricensis*  
   Red-bellied, *Melanerpes carolinus*  
   Red-cockaded, *Picoides borealis*  
   Red-headed, *Melanerpes erythrocephalus*  
   Strickland's, *Picoides stricklandi*  
   Three-toed, *Picoides tridactylus*  
   White-headed, *Picoides albolarvatus*  
 Woodstar, Bahama, *Calliphlox evelynae*  
 Wren:  
   Bewick's *Thryomanes bewickii*  
   Cactus, *Campylorhynchus brunneicapillus*  
   Canyon, *Catherpes mexicanus*  
   Carolina, *Thryothorus ludovicianus*  
   House, *Troglodytes aedon*  
   Marsh, *Cistothorus palustris*  
   Rock, *Salpinctes obsoletus*

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Sedge, *Cistothorus platensis*  
 Winter, *Troglodytes troglodytes*  
 Wryneck, Eurasian, *Jynx torquilla*  
 Yellowlegs:  
 Greater, *Tringa melanoleuca*  
 Lesser, *Tringa flavipes*  
 Yellowthroat:  
 Common, *Geothlypis trichas*  
 Gray-crowned, *Geothlypis poliocephala*

II. TAXONOMIC LISTING

ORDER GAVIIFORMES

FAMILY GAVIIDAE

*Gavia stellata*, Red-throated Loon  
*Gavia arctica*, Arctic Loon  
*Gavia immer*, Common Loon  
*Gavia adamsii*, Yellow-billed Loon

ORDER PODICIPEDIFORMES

FAMILY PODICIPEDIDAE

*Tachybaptus dominicus*, Least Grebe  
*Podilymbus podiceps*, Pied-billed Grebe  
*Podiceps auritus*, Horned Grebe  
*Podiceps grisegena*, Red-necked Grebe  
*Podiceps nigricollis*, Eared Grebe  
*Aechmophorus occidentalis*, Western Grebe

ORDER PROCELLARIIFORMES

FAMILY DIOMEDEIDAE

*Diomedea albatrus*, Short-tailed Albatross  
*Diomedea nigripes*, Black-footed Albatross  
*Diomedea immutabilis*, Laysan Albatross  
*Diomedea chlororhynchos*, Yellow-nosed Albatross

FAMILY PROCELLARIIDAE

*Fulmarus glacialis*, Northern Fulmar  
*Pterodroma hasitata*, Black-capped Petrel  
*Pterodroma phaeopygia*, Dark-rumped Petrel  
*Pterodroma externa*, White-necked Petrel  
*Pterodroma inexpectata*, Mottled Petrel  
*Pterodroma ultima*, Murphy's Petrel  
*Pterodroma neglecta*, Kermadec Petrel  
*Pterodroma arminjoniana*, Herald Petrel  
*Pterodroma cookii*, Cook's Petrel  
*Pterodroma hypoleuca*, Bonin Petrel  
*Bulweria bulwerii*, Bulwer's Petrel  
*Calonectris diomedea*, Cory's Shearwater  
*Puffinus creatopus*, Pink-footed Shearwater  
*Puffinus carneipes*, Flesh-footed Shearwater  
*Puffinus gravis*, Greater Shearwater  
*Puffinus pacificus*, Wedge-tailed Shearwater  
*Puffinus bulleri*, Buller's Shearwater  
*Puffinus griseus*, Sooty Shearwater  
*Puffinus tenuirostris*, Short-tailed Shearwater  
*Puffinus nativitatis*, Christmas Shearwater  
*Puffinus puffinus*, Manx Shearwater  
*Puffinus opisthomelas*, Black-vented Shearwater  
*Puffinus auricularis*, Townsend's Shearwater  
*Puffinus assimilis*, Little Shearwater  
*Puffinus lherminieri*, Audubon's Shearwater

FAMILY HYDROBATIDAE

*Oceanites oceanicus*, Wilson's Storm-Petrel

*Pelagodroma marina*, White-faced Storm-Petrel  
*Oceanodroma furcata*, Fork-tailed Storm-Petrel  
*Oceanodroma leucorhoa*, Leach's Storm-Petrel  
*Oceanodroma homochroa*, Ashy Storm-Petrel  
*Oceanodroma castro*, Band-rumped Storm-Petrel  
*Oceanodroma tethys*, Wedge-rumped Storm-Petrel  
*Oceanodroma melania*, Black Storm-Petrel  
*Oceanodroma tristrami*, Sooty Storm-Petrel  
*Oceanodroma microsoma*, Least Storm-Petrel

ORDER PELECANIFORMES

FAMILY PHAETHONTIDAE

*Phaethon lepturus*, White-tailed Tropicbird  
*Phaethon aethereus*, Red-billed Tropicbird  
*Phaethon rubricauda*, Red-tailed Tropicbird

FAMILY SULIDAE

*Sula dactylatra*, Masked Booby  
*Sula nebouxii*, Blue-footed Booby  
*Sula leucogaster*, Brown Booby  
*Sula sula*, Red-footed Booby  
*Sula bassanus*, Northern Gannet

FAMILY PELECANIDAE

*Pelecanus erythrorhynchos*, American White Pelican  
*Pelecanus occidentalis*, Brown Pelican

FAMILY PHALACROCORACIDAE

*Phalacrocorax carbo*, Great Cormorant  
*Phalacrocorax auritus*, Double-crested Cormorant  
*Phalacrocorax olivaceus*, Olivaceous Cormorant  
*Phalacrocorax penicillatus*, Brandt's Cormorant  
*Phalacrocorax pelagicus*, Pelagic Cormorant  
*Phalacrocorax urile*, Red-faced Cormorant

FAMILY ANHINGIDAE

*Anhinga anhinga*, Anhinga

FAMILY FREGATIDAE

*Fregata magnificens*, Magnificent Frigatebird  
*Fregata minor*, Great Frigatebird  
*Fregata ariel*, Lesser Frigatebird

ORDER CICONIIFORMES

FAMILY ARDEIDAE

*Botaurus lentiginosus*, American Bittern  
*Ixobrychus exilis*, Least Bittern  
*Ixobrychus sinensis*, Chinese Bittern  
*Ixobrychus eurhythmus*, Schrenk's Bittern  
*Ardea herodias*, Great Blue Heron  
*Casmerodius albus*, Great Egret  
*Egretta eulophotes*, Chinese Egret  
*Egretta sacra*, Pacific Reef Heron  
*Egretta intermedia*, Plumed Egret  
*Egretta thula*, Snowy Egret  
*Egretta caerulea*, Little Blue Heron  
*Egretta tricolor*, Tricolored Heron  
*Egretta rufescens*, Reddish Egret

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*Bubulcus ibis*, Cattle Egret  
*Butorides striatus*, Green-backed Heron  
*Nycticorax nycticorax*, Black-crowned Night-Heron  
*Nycticorax melanolophus*, Malay Night-Heron  
*Nycticorax goisagi*, Japanese Night-Heron  
*Nycticorax violaceus*, Yellow-crowned Night-Heron

FAMILY THRESKIORNITHIDAE

*Eudocimus albus*, White Ibis  
*Eudocimus ruber*, Scarlet Ibis  
*Plegadis falcinellus*, Glossy Ibis  
*Plegadis chihi*, White-faced Ibis  
*Ajaia ajaja*, Roseate Spoonbill

FAMILY CICONIIDAE

*Jabiru mycteria*, Jabiru  
*Mycteria americana*, Wood Stork

ORDER PHOENICOPTERIFORMES

FAMILY PHOENICOPTERIDAE

*Phoenicopterus ruber*, Greater Flamingo

ORDER ANSERIFORMES

FAMILY ANATIDAE

*Dendrocygna bicolor*, Fulvous Whistling-Duck  
*Dendrocygna autumnalis*, Black-bellied Whistling-Duck  
*Dendrocygna arborea*, West Indian Whistling-Duck  
*Cygnus columbianus*, Tundra Swan  
*Cygnus cygnus*, Whooper Swan  
*Cygnus buccinator*, Trumpeter Swan  
*Anser fabalis*, Bean Goose  
*Anser albifrons*, Greater White-fronted Goose  
*Chen caerulescens*, Snow Goose  
*Chen rossii*, Ross' Goose  
*Chen canagica*, Emperor Goose  
*Branta bernicla*, Brant  
*Branta leucopsis*, Barnacle Goose  
*Branta canadensis*, Canada Goose  
*Nesochen sandvicensis*, Hawaiian Goose  
*Aix sponsa*, Wood Duck  
*Anas crecca*, Green-winged Teal  
*Anas formosa*, Baikal Teal  
*Anas falcata*, Falcated Teal  
*Anas rubripes*, American Black Duck  
*Anas fulvigula*, Mottled Duck  
*Anas platyrhynchos*, Mallard  
*Anas wyvilliana*, Hawaiian Duck  
*Anas laysanensis*, Laysan Duck  
*Anas bahamensis*, White-cheeked Pintail  
*Anas acuta*, Northern Pintail  
*Anas querquedula*, Garganey  
*Anas discors*, Blue-winged Teal  
*Anas cyanoptera*, Cinnamon Teal  
*Anas clypeata*, Northern Shoveler  
*Anas strepera*, Gadwall  
*Anas penelope*, Eurasian Wigeon  
*Anas americana*, American Wigeon  
*Aythya ferina*, Common Pochard  
*Aythya valisineria*, Canvasback  
*Aythya americana*, Redhead  
*Aythya baeri*, Baer's Pochard

*Aythya collaris*, Ring-necked Duck  
*Aythya fuligula*, Tufted Duck  
*Aythya marila*, Greater Scaup  
*Aythya affinis*, Lesser Scaup  
*Somateria mollissima*, Common Eider  
*Somateria spectabilis*, King Eider  
*Somateria fischeri*, Spectacled Eider  
*Polysticta stelleri*, Steller's Eider  
*Histrionicus histrionicus*, Harlequin Duck  
*Clangula hyemalis*, Oldsquaw  
*Melanitta nigra*, Black Scoter  
*Melanitta perspicillata*, Surf Scoter  
*Melanitta fusca*, White-winged Scoter  
*Bucephala clangula*, Common Goldeneye  
*Bucephala islandica*, Barrow's Goldeneye  
*Bucephala albeola*, Bufflehead  
*Mergellus albellus*, Smew  
*Lophodytes cucullatus*, Hooded Merganser  
*Mergus merganser*, Common Merganser  
*Mergus serrator*, Red-breasted Merganser  
*Oxyura jamaicensis*, Ruddy Duck  
*Oxyura dominica*, Masked Duck

ORDER FALCONIFORMES

FAMILY CATHARTIDAE

*Coragyps atratus*, Black Vulture  
*Cathartes aura*, Turkey Vulture  
*Gymnogyps californianus*, California Condor

FAMILY ACCIPITRIDAE

*Pandion haliaetus*, Osprey  
*Chondrohierax uncinatus*, Hook-billed Kite  
*Elanoides forficatus*, American Swallow-tailed Kite  
*Elanus caeruleus*, Black-shouldered Kite  
*Rostrhamus sociabilis*, Snail Kite  
*Ictinia mississippiensis*, Mississippi Kite  
*Milvus migrans*, Black Kite  
*Haliaeetus leucocephalus*, Bald Eagle  
*Haliaeetus albicilla*, White-tailed Eagle  
*Haliaeetus pelagicus*, Steller's Sea-Eagle  
*Circus cyaneus*, Northern Harrier  
*Accipiter gularis*, Asiatic Sparrow Hawk  
*Accipiter striatus*, Sharp-shinned Hawk  
*Accipiter cooperii*, Cooper's Hawk  
*Accipiter gentilis*, Northern Goshawk  
*Buteogallus anthracinus*, Common Black-Hawk  
*Parabuteo unicinctus*, Harris' Hawk  
*Buteo nitidus*, Gray Hawk  
*Buteo lineatus*, Red-shouldered Hawk  
*Buteo platypterus*, Broad-winged Hawk  
*Buteo brachyurus*, Short-tailed Hawk  
*Buteo swainsoni*, Swainson's Hawk  
*Buteo albicaudatus*, White-tailed Hawk  
*Buteo albonotatus*, Zone-tailed Hawk  
*Buteo solitarius*, Hawaiian Hawk  
*Buteo jamaicensis*, Red-tailed Hawk  
*Buteo regalis*, Ferruginous Hawk  
*Buteo lagopus*, Rough-legged Hawk  
*Aquila chrysaetos*, Golden Eagle

FAMILY FALCONIDAE

*Polyborus plancus*, Crested Caracara  
*Falco tinnunculus*, Eurasian Kestrel  
*Falco sparverius*, American Kestrel  
*Falco columbarius*, Merlin  
*Falco femoralis*, Aplomado Falcon

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*Falco peregrinus*, Peregrine Falcon  
*Falco rusticolus*, Gyrfalcon  
*Falco mexicanus*, Prairie Falcon

ORDER GRUIFORMES

FAMILY RALLIDAE

*Coturnicops noveboracensis*, Yellow Rail  
*Laterallus jamaicensis*, Black Rail  
*Crex crex*, Corn Crake  
*Rallus longirostris*, Clapper Rail  
*Rallus elegans*, King Rail  
*Rallus limicola*, Virginia Rail  
*Porzana carolina*, Sora  
*Porzana flaviventer*, Yellow-breasted Crake  
*Porphyryla martinica*, Purple Gallinule  
*Gallinula chloropus*, Common Moorhen  
*Fulica atra*, Eurasian Coot  
*Fulica americana*, American Coot  
*Fulica caribaea*, Caribbean Coot

FAMILY ARAMIDAE

*Aramus guarauna*, Limpkin

FAMILY GRUIDAE

*Grus canadensis*, Sandhill Crane  
*Grus grus*, Common Crane  
*Grus americana*, Whooping Crane

ORDER CHARADRIIFORMES

FAMILY CHARADRIIDAE

*Vanellus vanellus*, Northern Lapwing  
*Pluvialis squatarola*, Black-bellied Plover  
*Pluvialis dominica*, Lesser Golden-Plover  
*Charadrius mongolus*, Mongolian Plover  
*Charadrius leschenaultii*, Great Sand Plover  
*Charadrius alexandrinus*, Snowy Plover  
*Charadrius wilsonia*, Wilson's Plover  
*Charadrius hiaticula*, Common Ringed Plover  
*Charadrius semipalmatus*, Semipalmated Plover  
*Charadrius melodus*, Piping Plover  
*Charadrius dubius*, Little Ringed Plover  
*Charadrius vociferus*, Killdeer  
*Charadrius montanus*, Mountain Plover  
*Charadrius morinellus*, Eurasian Dotterel

FAMILY HAEMATOPODIDAE

*Haematopus palliatus*, American Oystercatcher  
*Haematopus bachmani*, Black Oystercatcher

FAMILY RECURVIROSTRIDAE

*Himantopus mexicanus*, Black-necked Stilt  
*Recurvirostra americana*, American Avocet

FAMILY JACANIDAE

*Jacana spinosa*, Northern Jacana

FAMILY SCOLOPACIDAE

*Tringa nebularia*, Common Greenshank  
*Tringa melanoleuca*, Greater Yellowlegs  
*Tringa flavipes*, Lesser Yellowlegs  
*Tringa stagnatilis*, Marsh Sandpiper  
*Tringa erythropus*, Spotted Redshank  
*Tringa glareola*, Wood Sandpiper  
*Tringa solitaria*, Solitary Sandpiper  
*Catoptrophorus semipalmatus*, Willet  
*Heteroscelus incanus*, Wandering Tattler  
*Heteroscelus brevipes*, Gray-tailed Tattler

*Actitis hypoleucos*, Common Sandpiper  
*Actitis macularia*, Spotted Sandpiper  
*Xenus cinereus*, Terek Sandpiper  
*Bartramia longicauda*, Upland Sandpiper  
*Numenius minutus*, Least Curlew  
*Numenius borealis*, Eskimo Curlew  
*Numenius phaeopus*, Whimbrel  
*Numenius tahitiensis*, Bristle-thighed Curlew

*Numenius madagascariensis*, Far Eastern Curlew

*Numenius americanus*, Long-billed Curlew

*Limosa limosa*, Black-tailed Godwit

*Limosa haemastica*, Hudsonian Godwit

*Limosa lapponica*, Bar-tailed Godwit

*Limosa fedoa*, Marbled Godwit

*Arenaria interpres*, Ruddy Turnstone

*Arenaria melanocephala*, Black Turnstone

*Aphriza virgata*, Surfbird

*Calidris tenuirostris*, Great Knot

*Calidris canutus*, Red Knot

*Calidris alba*, Sanderling

*Calidris pusilla*, Semipalmated Sandpiper

*Calidris mauri*, Western Sandpiper

*Calidris ruficollis*, Rufous-necked Stint

*Calidris minuta*, Little Stint

*Calidris temminckii*, Temminck's Stint

*Calidris subminuta*, Long-toed Stint

*Calidris minutilla*, Least Sandpiper

*Calidris fuscicollis*, White-rumped Sandpiper

*Calidris bairdii*, Baird's Sandpiper

*Calidris melanotos*, Pectoral Sandpiper

*Calidris acuminata*, Sharp-tailed Sandpiper

*Calidris maritima*, Purple Sandpiper

*Calidris ptilocnemis*, Rock Sandpiper

*Calidris alpina*, Dunlin

*Calidris ferruginea*, Curlew Sandpiper

*Calidris himantopus*, Stilt Sandpiper

*Eurynorhynchus pygmeus*, Spoonbill Sandpiper

*Limicola falcinellus*, Broad-billed Sandpiper

*Tryngites subruficollis*, Buff-breasted Sandpiper

*Philomachus pugnax*, Ruff

*Limnodromus griseus*, Short-billed Dowitcher

*Limnodromus scolopaceus*, Long-billed Dowitcher

*Lymnocyptes minimus*, Jack Snipe

*Gallinago gallinago*, Common Snipe

*Gallinago stenura*, Pin-tailed Snipe

*Gallinago megala*, Swinhoe's Snipe

*Scolopax rusticola*, Eurasian Woodcock

*Scolopax minor*, American Woodcock

*Phalaropus tricolor*, Wilson's Phalarope

*Phalaropus lobatus*, Red-necked Phalarope

*Phalaropus fulicaria*, Red Phalarope

FAMILY LARIDAE

*Stercorarius pomarinus*, Pomarine Jaeger

*Stercorarius parasiticus*, Parasitic Jaeger

*Stercorarius longicaudus*, Long-tailed Jaeger

*Catharacta skua*, Great Skua

*Catharacta maccormicki*, South Polar Skua

*Larus atricilla*, Laughing Gull

*Larus pipixcan*, Franklin's Gull

*Larus minutus*, Little Gull



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*Larus ridibundus*, Common Black-headed Gull  
*Larus philadelphia*, Bonaparte's Gull  
*Larus heermanni*, Heermann's Gull  
*Larus canus*, Mew Gull  
*Larus delawarensis*, Ring-billed Gull  
*Larus californicus*, California Gull  
*Larus argentatus*, Herring Gull  
*Larus thayeri*, Thayer's Gull  
*Larus glaucoides*, Iceland Gull  
*Larus fuscus*, Lesser Black-backed Gull  
*Larus schistisagus*, Slaty-backed Gull  
*Larus livens*, Yellow-footed Gull  
*Larus occidentalis*, Western Gull  
*Larus glaucescens*, Glaucous-winged Gull  
*Larus hyperboreus*, Glaucous Gull  
*Larus marinus*, Great Black-backed Gull  
*Rissa tridactyla*, Black-legged Kittiwake  
*Rissa brevirostris*, Red-legged Kittiwake  
*Rhodostethia rosea*, Ross' Gull  
*Xema sabini*, Sabine's Gull  
*Pagophila eburnea*, Ivory Gull  
*Sterna nilotica*, Gull-billed Tern  
*Sterna caspia*, Caspian Tern  
*Sterna maxima*, Royal Tern  
*Sterna elegans*, Elegant Tern  
*Sterna sandvicensis*, Sandwich Tern  
*Sterna dougallii*, Roseate Tern  
*Sterna hirundo*, Common Tern  
*Sterna paradisaea*, Arctic Tern  
*Sterna aleutica*, Aleutian Tern  
*Sterna forsteri*, Forster's Tern  
*Sterna antillarum*, Least Tern  
*Sterna albifrons*, Little Tern  
*Sterna sumatrana*, Black-naped Tern  
*Sterna lunata*, Gray-backed Tern  
*Sterna anaethetus*, Bridled Tern  
*Sterna fuscata*, Sooty Tern  
*Chlidonias leucopterus*, White-winged Tern  
*Chlidonias niger*, Black Tern  
*Anous stolidus*, Brown Noddy  
*Anous minutus*, Black Noddy  
*Anous tenuirostris*, Lesser Noddy  
*Procelsterna cerulea*, Blue-Gray Noddy  
*Gygis alba*, White Tern  
*Rynchops niger*, Black Skimmer

FAMILY ALCIDAE  
*Alle alle*, Dovekie  
*Uria aalge*, Common Murre  
*Uria lomvia*, Thick-billed Murre  
*Alca torda*, Razorbill  
*Cephus grylle*, Black Guillemot  
*Cephus columba*, Pigeon Guillemot  
*Brachyramphus marmoratus*, Marbled Murrelet  
*Brachyramphus brevirostris*, Kittlitz's Murrelet  
*Synthliboramphus hypoleucus*, Xantus' Murrelet  
*Synthliboramphus craveri*, Craveri's Murrelet  
*Synthliboramphus antiquus*, Ancient Murrelet  
*Ptychoramphus aleuticus*, Cassin's Auklet  
*Cyclorhynchus psittacula*, Parakeet Auklet  
*Aethia pusilla*, Least Auklet

*Aethia pygmaea*, Whiskered Auklet  
*Aethia cristatella*, Crested Auklet  
*Cerorhinca monocerata*, Rhinoceros Auklet  
*Fratercula cirrhata*, Tufted Puffin  
*Fratercula arctica*, Atlantic Puffin  
*Fratercula corniculata*, Horned Puffin

ORDER COLUMBIFORMES  
FAMILY COLUMBIDAE  
*Columba squamosa*, Scaly-naped Pigeon  
*Columba leucocephala*, White-crowned Pigeon  
*Columba flavirostris*, Red-billed Pigeon  
*Columba inornata*, Plain Pigeon  
*Columba fasciata*, Band-tailed Pigeon  
*Zenaida asiatica*, White-winged Dove  
*Zenaida aurita*, Zenaida Dove  
*Zenaida macroura*, Mourning Dove  
*Columbina inca*, Inca Dove  
*Columbina passerina*, Common Ground-Dove  
*Columbina talpacoti*, Ruddy Ground-Dove  
*Leptotila verreauxi*, White-tipped Dove  
*Geotrygon chrysis*, Key West Quail-Dove  
*Geotrygon mystacea*, Bridled Quail-Dove  
*Geotrygon montana*, Ruddy Quail-Dove

ORDER CUCULIFORMES  
FAMILY CUCULIDAE  
*Cuculus canorus*, Common Cuckoo  
*Cuculus saturatus*, Oriental Cuckoo  
*Cuculus fugax*, Hodgson's Hawk-Cuckoo  
*Coccyzus erythrophthalmus*, Black-billed Cuckoo  
*Coccyzus americanus*, Yellow-billed Cuckoo  
*Coccyzus minor*, Mangrove Cuckoo  
*Geococcyx californianus*, Greater Roadrunner  
*Saurothera vieillotii*, Puerto Rican Lizard-Cuckoo  
*Crotophaga ani*, Smooth-billed Ani  
*Crotophaga sulcirostris*, Groove-billed Ani

ORDER STRIGIFORMES  
FAMILY TYTONIDAE  
*Tyto alba*, Common Barn-Owl

FAMILY STRIGIDAE  
*Otus flammeolus*, Flammulated Owl  
*Otus asio*, Eastern Screech-Owl  
*Otus kennicottii*, Western Screech-Owl  
*Otus trichopsis*, Whiskered Screech-Owl  
*Otus nudipes*, Puerto Rican Screech-Owl  
*Bubo virginianus*, Great Horned Owl  
*Nyctea scandiaca*, Snowy Owl  
*Surnia ulula*, Northern Hawk-Owl  
*Glaucidium gnoma*, Northern Pygmy-Owl  
*Glaucidium brasilianum*, Ferruginous Pygmy-Owl  
*Micrathene whitneyi*, Elf Owl  
*Athene cunicularia*, Burrowing Owl  
*Strix occidentalis*, Spotted Owl  
*Strix varia*, Barred Owl  
*Strix nebulosa*, Great Gray Owl  
*Asio otus*, Long-eared Owl  
*Asio flammeus*, Short-eared Owl  
*Aegolius funereus*, Boreal Owl  
*Aegolius acadicus*, Northern Saw-whet Owl

ORDER CAPRIMULGIFORMES

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FAMILY CAPRIMULGIDAE

*Chordeiles acutipennis*, Lesser Nighthawk  
*Chordeiles minor*, Common Nighthawk  
*Chordeiles gundlachii*, Antillean Nighthawk  
*Nyctidromus albicollis*, Common Pauraque  
*Phalaenoptilus nuttallii*, Common Poorwill  
*Caprimulgus carolinensis*, Chuck-will's-widow  
*Caprimulgus ridgwayi*, Buff-collared Nightjar  
*Caprimulgus vociferus*, Whip-poor-will  
*Caprimulgus noctitherus*, Puerto Rican Nightjar  
*Caprimulgus indicus*, Jungle Nightjar

ORDER APODIFORMES

FAMILY APODIDAE

*Cypseloides niger*, Black Swift  
*Streptoprocne zonaris*, White-collared Swift  
*Chaetura pelagica*, Chimney Swift  
*Chaetura vauxi*, Vaux's Swift  
*Hirundapus caudacutus*, White-throated Needletail  
*Apus apus*, Common Swift  
*Apus pacificus*, Fork-tailed Swift  
*Aeronautes saxatalis*, White-throated Swift  
*Tachornis phoenicobia*, Antillean Palm Swift

FAMILY TROCHILIDAE

*Colibri thalassinus*, Green Violet-ear  
*Anthracothorax dominicus*, Antillean Mango  
*Anthracothorax viridis*, Green Mango  
*Eulampis holosericeus*, Green-throated Carib  
*Orthorhynchus cristatus*, Antillean Crested Hummingbird  
*Chlorostilbon maugaeus*, Puerto Rican Emerald  
*Cyananthus latirostris*, Broad-billed Hummingbird  
*Hylocharis leucotis*, White-eared Hummingbird  
*Amazilia beryllina*, Berylline Hummingbird  
*Amazilia yucatanensis*, Buff-bellied Hummingbird  
*Amazilia violiceps*, Violet-crowned Hummingbird  
*Lampornis clemenciae*, Blue-throated Hummingbird  
*Eugenes fulgens*, Magnificent Hummingbird  
*Heliomaster constantii*, Plain-capped Starthroat  
*Calliphlox evelynae*, Bahama Woodstar  
*Calothorax lucifer*, Lucifer Hummingbird  
*Archilochus colubris*, Ruby-throated Hummingbird  
*Archilochus alexandri*, Black-chinned Hummingbird  
*Calypte anna*, Anna's Hummingbird  
*Calypte costae*, Costa's Hummingbird  
*Stellula calliope*, Calliope Hummingbird  
*Selasphorus platycercus*, Broad-tailed Hummingbird  
*Selasphorus rufus*, Rufous Hummingbird  
*Selasphorus sasin*, Allen's Hummingbird

ORDER TROGONIFORMES

FAMILY TROGONIDAE

*Trogon elegans*, Elegant Trogon  
*Euptilotus neoxenus*, Eared Trogon

ORDER CORACIIFORMES

FAMILY UPUPIDAE

*Upupa epops*, Hoopoe

FAMILY ALCEDINIDAE

*Ceryle torquata*, Ringed Kingfisher  
*Ceryle alcyon*, Belted Kingfisher  
*Chloroceryle americana*, Green Kingfisher

ORDER PICIFORMES

FAMILY PICIDAE

*Jynx torquilla*, Eurasian Wryneck  
*Melanerpes lewis*, Lewis' Woodpecker  
*Melanerpes erythrocephalus*, Red-headed Woodpecker  
*Melanerpes formicivorus*, Acorn Woodpecker  
*Melanerpes uropygialis*, Gila Woodpecker  
*Melanerpes aurifrons*, Golden-fronted Woodpecker  
*Melanerpes carolinus*, Red-bellied Woodpecker  
*Melanerpes portoricensis*, Puerto Rican Woodpecker  
*Sphyrapicus varius*, Yellow-bellied Sapsucker  
*Sphyrapicus ruber*, Red-breasted Sapsucker  
*Sphyrapicus thyroideus*, Williamson's Sapsucker  
*Picoides scalaris*, Ladder-Backed Woodpecker  
*Picoides nuttallii*, Nuttall's Woodpecker  
*Picoides pubescens*, Downy Woodpecker  
*Picoides villosus*, Hairy Woodpecker  
*Picoides stricklandi*, Strickland's Woodpecker  
*Picoides borealis*, Red-cockaded Woodpecker  
*Picoides albolarvatus*, White-headed Woodpecker  
*Picoides tridactylus*, Three-toed Woodpecker  
*Picoides arcticus*, Black-backed Woodpecker  
*Colaptes auratus*, Northern Flicker  
*Dryocopus pileatus*, Pileated Woodpecker  
*Campephilus principalis*, Ivory-billed Woodpecker

ORDER PASSERIFORMES

FAMILY TYRANNIDAE

*Elaenia martinica*, Caribbean Elaenia  
*Camptostoma imberbe*, Northern Beardless-Tyrannulet  
*Contopus borealis*, Olive-sided Flycatcher  
*Contopus pertinax*, Greater Pewee  
*Contopus sordidulus*, Western Wood-Pewee  
*Contopus virens*, Eastern Wood-Pewee  
*Contopus latirostris*, Lesser Antillean Pewee  
*Empidonax flaviventris*, Yellow-bellied Flycatcher  
*Empidonax virescens*, Acadian Flycatcher  
*Empidonax alnorum*, Alder Flycatcher  
*Empidonax traillii*, Willow Flycatcher  
*Empidonax minimus*, Least Flycatcher  
*Empidonax hammondi*, Hammond's Flycatcher  
*Empidonax oberholseri*, Dusky Flycatcher  
*Empidonax wrightii*, Gray Flycatcher

- Empidonax difficilis*, Western Flycatcher  
*Empidonax fulvifrons*, Buff-breasted Flycatcher  
*Sayornis nigricans*, Black Phoebe  
*Sayornis phoebe*, Eastern Phoebe  
*Sayornis saya*, Say's Phoebe  
*Pyrocephalus rubinus*, Vermilion Flycatcher  
*Myiarchus tuberculifer*, Dusky-capped Flycatcher  
*Myiarchus cinerascens*, Ash-throated Flycatcher  
*Myiarchus nuttingi*, Nutting's Flycatcher  
*Myiarchus crinitus*, Great Crested Flycatcher  
*Myiarchus tyrannulus*, Brown-crested Flycatcher  
*Myiarchus antillarum*, Puerto Rican Flycatcher  
*Pitangus sulphuratus*, Great Kiskadee  
*Myiodynastes luteiventris*, Sulphur-bellied Flycatcher  
*Tyrannus melancholicus*, Tropical Kingbird  
*Tyrannus couchii*, Couch's Kingbird  
*Tyrannus vociferans*, Cassin's Kingbird  
*Tyrannus crassirostris*, Thick-billed Kingbird  
*Tyrannus verticalis*, Western Kingbird  
*Tyrannus tyrannus*, Eastern Kingbird  
*Tyrannus dominicensis*, Gray Kingbird  
*Tyrannus caudifasciatus*, Loggerhead Kingbird  
*Tyrannus forficatus*, Scissor-tailed Flycatcher  
*Tyrannus savana*, Fork-tailed Flycatcher  
*Pachyrhamphus aglaiae*, Rose-throated Becard
- FAMILY ALAUDIDAE  
*Alauda arvensis*, Eurasian Skylark  
*Eremophila alpestris*, Horned Lark
- FAMILY HIRUNDINIDAE  
*Progne subis*, Purple Martin  
*Progne cryptoleuca*, Cuban Martin  
*Progne dominicensis*, Caribbean Martin  
*Progne chalybea*, Gray-breasted Martin  
*Tachycineta bicolor*, Tree Swallow  
*Tachycineta thalassina*, Violet-green Swallow  
*Tachycineta cyaneoviridis*, Bahama Swallow  
*Stelgidopteryx serripennis*, Northern Rough-winged Swallow  
*Riparia riparia*, Bank Swallow  
*Hirundo pyrrhonota*, Cliff Swallow  
*Hirundo fulva*, Cave Swallow  
*Hirundo rustica*, Barn Swallow  
*Delichon urbica*, Common House-Martin
- FAMILY CORVIDAE  
*Perisoreus canadensis*, Gray Jay  
*Cyanocitta stelleri*, Steller's Jay  
*Cyanocitta cristata*, Blue Jay  
*Cyanocorax yncas*, Green Jay  
*Cyanocorax morio*, Brown Jay  
*Aphelocoma coerulescens*, Scrub Jay  
*Aphelocoma ultramarina*, Gray-breasted Jay  
*Gymnorhinus cyanocephalus*, Pinyon Jay  
*Nucifraga columbiana*, Clark's Nutcracker  
*Pica pica*, Black-billed Magpie  
*Pica nuttalli*, Yellow-billed Magpie  
*Corvus brachyrhynchos*, American Crow  
*Corvus caurinus*, Northwestern Crow  
*Corvus leucognaphalus*, White-necked Crow  
*Corvus imparatus*, Mexican Crow  
*Corvus ossifragus*, Fish Crow  
*Corvus hawaiiensis*, Hawaiian Crow  
*Corvus cryptoleucus*, Chihuahuan Raven  
*Corvus corax*, Common Raven
- FAMILY PARIDAE  
*Parus atricapillus*, Black-capped Chickadee  
*Parus carolinensis*, Carolina Chickadee  
*Parus sclateri*, Mexican Chickadee  
*Parus gambeli*, Mountain Chickadee  
*Parus cinctus*, Siberian Tit  
*Parus hudsonicus*, Boreal Chickadee  
*Parus rufescens*, Chestnut-backed Chickadee  
*Parus wollweberi*, Bridled Titmouse  
*Parus inornatus*, Plain Titmouse  
*Parus bicolor*, Tufted Titmouse
- FAMILY REMIZIDAE  
*Auriparus flaviceps*, Verdin
- FAMILY AEGITHALIDAE  
*Psaltriparus minimus*, Bushtit
- FAMILY SITTIDAE  
*Sitta canadensis*, Red-breasted Nuthatch  
*Sitta carolinensis*, White-breasted Nuthatch  
*Sitta pygmaea*, Pygmy Nuthatch  
*Sitta pusilla*, Brown-headed Nuthatch
- FAMILY CERCITHIIDAE  
*Certhia americana*, Brown Creeper
- FAMILY TROGLODYTIDAE  
*Campylorhynchus brunneicapillus*, Cactus Wren  
*Salpinctes obsoletus*, Rock Wren  
*Catherpes mexicanus*, Canyon Wren  
*Thryothorus ludovicianus*, Carolina Wren  
*Thryomanes bewickii*, Bewick's Wren  
*Troglodytes aedon*, House Wren  
*Troglodytes troglodytes*, Winter Wren  
*Cistothorus platensis*, Sedge Wren  
*Cistothorus palustris*, Marsh Wren
- FAMILY CINCLIDAE  
*Cinclus mexicanus*, American Dipper
- FAMILY MUSCICAPIDAE  
SUBFAMILY SYLVIINAE  
*Locustella ochotensis*, Middendorff's Grasshopper-Warbler  
*Phylloscopus borealis*, Arctic Warbler  
*Phylloscopus trochilus*, Willow Warbler  
*Regulus satrapa*, Golden-crowned Kinglet  
*Regulus calendula*, Ruby-crowned Kinglet  
*Polioptila caerulea*, Blue-gray Gnatcatcher  
*Polioptila melanura*, Black-tailed Gnatcatcher  
*Polioptila nigriceps*, Black-capped Gnatcatcher
- SUBFAMILY MUSCICAPINAE  
*Muscicapa griseisticta*, Gray-spotted Flycatcher

*Muscicapa narcissina*, Narcissus Flycatcher

## SUBFAMILY TURDINAE

*Luscinia calliope*, Siberian Rubythroat  
*Luscinia svecica*, Bluethroat  
*Monticola solitarius*, Blue Rock Thrush  
*Oenanthe oenanthe*, Northern Wheatear  
*Sialis sialis*, Eastern Bluebird  
*Sialis mexicana*, Western Bluebird  
*Sialis currucoides*, Mountain Bluebird  
*Myadestes townsendi*, Townsend's Solitaire  
*Phaeornis obscurus*, Hawaiian Thrush  
*Phaeornis palmeri*, Small Kauai Thrush  
*Catharus fuscescens*, Veery  
*Catharus minimus*, Gray-cheeked Thrush  
*Catharus ustulatus*, Swainson's Thrush  
*Catharus guttatus*, Hermit Thrush  
*Hylocichla mustelina*, Wood Thrush  
*Turdus plumbeus*, Red-legged Thrush  
*Turdus obscurus*, Eye-browed Thrush  
*Turdus naumanni*, Dusky Thrush  
*Turdus pilaris*, Fieldfare  
*Turdus grayi*, Clay-colored Robin  
*Turdus rufopalliatus*, Rufous-backed Robin  
*Turdus migratorius*, American Robin  
*Ixoreus naevius*, Varied Thrush  
*Ridgwayia pinicola*, Aztec Thrush

## FAMILY MIMIDAE

*Dumetella carolinensis*, Gray Catbird  
*Mimus polyglottos*, Northern Mockingbird  
*Oreoscoptes montanus*, Sage Thrasher  
*Toxostoma rufum*, Brown Thrasher  
*Toxostoma longirostre*, Long-billed Thrasher  
*Toxostoma bendirei*, Bendire's Thrasher  
*Toxostoma curvirostre*, Curve-billed Thrasher  
*Toxostoma redivivum*, California Thrasher  
*Toxostoma crissale*, Crissal Thrasher  
*Toxostoma lecontei*, Le Conte's Thrasher  
*Margarops fuscatus*, Pearly-eyed Thrasher

## FAMILY PRUNELLIDAE

*Prunella montanella*, Siberian Accentor

## FAMILY MOTACILLIDAE

*Motacilla flava*, Yellow Wagtail  
*Motacilla cinerea*, Gray Wagtail  
*Motacilla alba*, White Wagtail  
*Motacilla lugens*, Black-backed Wagtail  
*Anthus hodgsoni*, Olive Tree-Pipit  
*Anthus gustavi*, Pechora Pipit  
*Anthus cervinus*, Red-throated Pipit  
*Anthus spinoletta*, Water Pipit  
*Anthus spragueii*, Sprague's Pipit

## FAMILY BOMBYCILLIDAE

*Bombycilla garrulus*, Bohemian Waxwing  
*Bombycilla cedrorum*, Cedar Waxwing

## FAMILY PTILOGONATIDAE

*Phainopepla nitens*, Phainopepla

## FAMILY LANIIDAE

*Lanius excubitor*, Northern Shrike  
*Lanius ludovicianus*, Loggerhead Shrike

## FAMILY STURNIDAE

*Sturnus philippensis*, Violet-backed Starling  
*Sturnus cineraceus*, Ashy Starling

## FAMILY VIREONIDAE

*Vireo griseus*, White-eyed Vireo  
*Vireo latimeri*, Puerto Rican Vireo  
*Vireo bellii*, Bells' Vireo  
*Vireo atricapillus*, Black-capped Vireo  
*Vireo vicinior*, Gray Vireo  
*Vireo solitarius*, Solitary Vireo  
*Vireo flavifrons*, Yellow-throated Vireo  
*Vireo huttoni*, Hutton's Vireo  
*Vireo gilvus*, Warbling Vireo  
*Vireo philadelphicus*, Philadelphia Vireo  
*Vireo olivaceus*, Red-eyed Vireo  
*Vireo altiloquus*, Black-whiskered Vireo

## FAMILY EMBERIZIDAE

## SUBFAMILY PARULINAE

*Vermivora bachmanii*, Bachman's Warbler  
*Vermivora pinus*, Blue-winged Warbler  
*Vermivora chrysoptera*, Golden-winged Warbler  
*Vermivora peregrina*, Tennessee Warbler  
*Vermivora celata*, Orange-crowned Warbler  
*Vermivora ruficapilla*, Nashville Warbler  
*Vermivora virginiae*, Virginia's Warbler  
*Vermivora crissalis*, Colima Warbler  
*Vermivora luciae*, Lucy's Warbler  
*Parula americana*, Northern Parula  
*Parula pitiayumi*, Tropical Parula  
*Dendroica petechia*, Yellow Warbler  
*Dendroica pensylvanica*, Chestnut-sided Warbler  
*Dendroica magnolia*, Magnolia Warbler  
*Dendroica tigrina*, Cape May Warbler  
*Dendroica caerulescens*, Black-throated Blue Warbler  
*Dendroica coronata*, Yellow-rumped Warbler  
*Dendroica nigrescens*, Black-throated Gray Warbler  
*Dendroica townsendi*, Townsend's Warbler  
*Dendroica occidentalis*, Hermit Warbler  
*Dendroica virens*, Black-throated Green Warbler  
*Dendroica chrysoparia*, Golden-cheeked Warbler  
*Dendroica fusca*, Blackburnian Warbler  
*Dendroica dominica*, Yellow-throated Warbler  
*Dendroica graciae*, Grace's Warbler  
*Dendroica adelaidae*, Adelaide's Warbler  
*Dendroica pinus*, Pine Warbler  
*Dendroica kirtlandii*, Kirtland's Warbler  
*Dendroica discolor*, Prairie Warbler  
*Dendroica palmarum*, Palm Warbler  
*Dendroica castanea*, Bay-breasted Warbler  
*Dendroica striata*, Blackpoll Warbler  
*Dendroica cerulea*, Cerulean Warbler  
*Dendroica angelae*, Elfin Woods Warbler  
*Mniotilta varia*, Black-and-White Warbler  
*Setophaga ruticilla*, American Redstart  
*Protonotaria citrea*, Prothonotary Warbler  
*Helmitheros vermivorus*, Worm-eating Warbler  
*Limnithlypis swainsonii*, Swainson's Warbler  
*Seiurus aurocapillus*, Ovenbird  
*Seiurus noveboracensis*, Northern Waterthrush  
*Seiurus motacilla*, Louisiana Waterthrush

*Oporornis formosus*, Kentucky Warbler  
*Oporornis agilis*, Connecticut Warbler  
*Oporornis philadelphia*, Mourning Warbler  
*Oporornis tolmiei*, MacGillivray's Warbler  
*Geothlypis trichas*, Common Yellowthroat  
*Geothlypis poliocephala*, Gray-crowned Yellowthroat  
*Wilsonia citrina*, Hooded Warbler  
*Wilsonia pusilla*, Wilson's Warbler  
*Wilsonia canadensis*, Canada Warbler  
*Cardellina rubrifrons*, Red-faced Warbler  
*Myioborus pictus*, Painted Redstart  
*Myioborus miniatus*, Slaty-throated Redstart  
*Basileuterus culicivorus*, Golden-crowned Warbler  
*Basileuterus rufifrons*, Rufous-capped Warbler  
*Icteria virens*, Yellow-breasted Chat  
*Peucedramus taeniatus*, Olive Warbler

## SUBFAMILY THRAUPINAE

*Spindalis zena*, Stripe-headed Tanager  
*Neospingus speculiferus*, Puerto Rican Tanager  
*Piranga flava*, Hepatic Tanager  
*Piranga rubra*, Summer Tanager  
*Piranga olivacea*, Scarlet Tanager  
*Piranga ludoviciana*, Western Tanager  
*Euphonia musica*, Antillean Euphonia

## SUBFAMILY CARDINALINAE

*Rhodothraupis celaeno*, Crimson-collared Grosbeak  
*Cardinalis cardinalis*, Northern Cardinal  
*Cardinalis sinuatus*, Pyrrhuloxia  
*Phoebastria chrysopleura*, Yellow Grosbeak  
*Phoebastria ludovicianus*, Rose-breasted Grosbeak  
*Phoebastria melanocephala*, Black-headed Grosbeak  
*Guiraca caerulea*, Blue Grosbeak  
*Passerina amoena*, Lazuli Bunting  
*Passerina cyanea*, Indigo Bunting  
*Passerina versicolor*, Varied Bunting  
*Passerina ciris*, Painted Bunting  
*Spiza americana*, Dickcissel

## SUBFAMILY EMBERIZINAE

*Arremonops rufivirgatus*, Olive Sparrow  
*Pipilo chlorurus*, Green-tailed Towhee  
*Pipilo erythrophthalmus*, Rufous-sided Towhee  
*Pipilo fuscus*, Brown Towhee  
*Pipilo aberti*, Abert's Towhee  
*Sporophila torqueola*, White-collared Seedeater  
*Tiaris olivacea*, Yellow-faced Grassquit  
*Tiaris bicolor*, Black-faced Grassquit  
*Loxigilla portoricensis*, Puerto Rican Bullfinch  
*Aimophila aestivalis*, Bachman's Sparrow  
*Aimophila botterii*, Botteri's Sparrow  
*Aimophila cassinii*, Cassin's Sparrow  
*Aimophila carpalis*, Rufous-winged Sparrow  
*Aimophila ruficeps*, Rufous-crowned Sparrow  
*Spizella arborea*, American Tree Sparrow

*Spizella passerina*, Chipping Sparrow  
*Spizella pallida*, Clay-colored Sparrow  
*Spizella breweri*, Brewer's Sparrow  
*Spizella pusilla*, Field Sparrow  
*Spizella wortheni*, Worthen's Sparrow  
*Spizella atrogularis*, Black-chinned Sparrow  
*Poocetes gramineus*, Vesper Sparrow  
*Chondestes grammacus*, Lark Sparrow  
*Amphispiza bilineata*, Black-throated Sparrow  
*Amphispiza belli*, Sage Sparrow  
*Amphispiza quinquestriata*, Five-striped Sparrow  
*Calamospiza melanocorys*, Lark Bunting  
*Passerculus sandwichensis*, Savannah Sparrow  
*Ammodramus bairdii*, Baird's Sparrow  
*Ammodramus savannarum*, Grasshopper Sparrow  
*Ammodramus henslowii*, Henslow's Sparrow  
*Ammodramus leconteii*, Le Conte's Sparrow  
*Ammodramus caudacutus*, Sharp-tailed Sparrow  
*Ammodramus maritimus*, Seaside Sparrow  
*Passerella iliaca*, Fox Sparrow  
*Melospiza melodia*, Song Sparrow  
*Melospiza lincolni*, Lincoln's Sparrow  
*Melospiza georgiana*, Swamp Sparrow  
*Zonotrichia albicollis*, White-throated Sparrow  
*Zonotrichia atricapilla*, Golden-crowned Sparrow  
*Zonotrichia leucophrys*, White-crowned Sparrow  
*Zonotrichia querula*, Harris' Sparrow  
*Junco hyemalis*, Dark-eyed Junco  
*Junco phaeonotus*, Yellow-eyed Junco  
*Emberiza rustica*, Rustic Bunting  
*Emberiza pallasii*, Pallas' Reed-Bunting  
*Emberiza schoeniculus*, Common Reed-Bunting  
*Calcarius mccownii*, McCown's Longspur  
*Calcarius lapponicus*, Lapland Longspur  
*Calcarius pictus*, Smith's Longspur  
*Calcarius ornatus*, Chestnut-collared Longspur  
*Plectrophenax nivalis*, Snow Bunting  
*Plectrophenax hyperboreus*, McKay's Bunting

## SUBFAMILY ICTERINAE

*Dolichonyx oryzivorus*, Bobolink  
*Agelaius phoeniceus*, Red-winged Blackbird  
*Agelaius tricolor*, Tricolored Blackbird  
*Agelaius humeralis*, Tawny-shouldered Blackbird  
*Agelaius xanthomus*, Yellow-shouldered Blackbird  
*Sturnella magna*, Eastern Meadowlark  
*Sturnella neglecta*, Western Meadowlark  
*Xanthocephalus xanthocephalus*, Yellow-headed Blackbird  
*Euphagus carolinus*, Rusty Blackbird  
*Euphagus cyanocephalus*, Brewer's Blackbird  
*Quiscalus mexicanus*, Great-tailed Grackle  
*Quiscalus major*, Boat-tailed Grackle

## U.S. Fish and Wildlife Serv., Interior

## § 10.22

*Quiscalus quiscula*, Common Grackle  
*Quiscalus niger*, Greater Antillean Grackle  
*Molothrus bonariensis*, Shiny Cowbird  
*Molothrus aeneus*, Bronzed Cowbird  
*Molothrus ater*, Brown-headed Cowbird  
*Icterus dominicensis*, Black-cowled Oriole  
*Icterus wagleri*, Black-vented Oriole  
*Icterus spurius*, Orchard Oriole  
*Icterus cucullatus*, Hooded Oriole  
*Icterus pustulatus*, Streak-backed Oriole  
*Icterus gularis*, Altamira Oriole  
*Icterus graduacauda*, Audubon's Oriole  
*Icterus galbula*, Northern Oriole  
*Icterus parisorum*, Scott's Oriole

### FAMILY FRINGILLIDAE

#### SUBFAMILY FRINGILLINAE

*Fringilla montifringilla*, Brambling

#### SUBFAMILY CARDUELINAE

*Leucosticte arctoa*, Rosy Finch  
*Pinicola enucleator*, Pine Grosbeak  
*Carpodacus erythrinus*, Common Rosefinch  
*Carpodacus purpureus*, Purple Finch  
*Carpodacus cassinii*, Cassin's Finch  
*Carpodacus mexicanus*, House Finch  
*Loxia curvirostra*, Red Crossbill  
*Loxia leucoptera*, White-winged Crossbill  
*Carduelis flammea*, Common Redpoll  
*Carduelis hornemanni*, Hoary Redpoll  
*Carduelis pinus*, Pine Siskin  
*Carduelis psaltria*, Lesser Goldfinch  
*Carduelis lawrencei*, Lawrence's Goldfinch  
*Carduelis tristis*, American Goldfinch  
*Carduelis sinica*, Oriental Greenfinch  
*Pyrrhula pyrrhula*, Eurasian Bullfinch  
*Coccothraustes vespertinus*, Evening Grosbeak  
*Coccothraustes coccothraustes*, Hawfinch

[50 FR 13710, Apr. 5, 1985]

### Subpart C—Addresses

#### § 10.21 Director.

(a) Mail forwarded to the Director for law enforcement purposes should be addressed: Chief, Division of Law Enforcement, U.S. Fish and Wildlife Service, P.O. Box 3247, Arlington, VA 22203-3247.

(b) Mail sent to the Director regarding permits for the Convention on International Trade in Endangered Species of Wild Fauna and Fauna (CITES), injurious wildlife, Wild Bird Conservation Act species, international movement of all ESA-listed endangered or threatened species, and scientific research on, exhibition of, or interstate commerce in nonnative ESA-listed endangered and threatened species should be addressed to: Director, U.S. Fish and Wildlife Service, (Attention: Office of Management Authority), 4401 N. Fair-

fax Drive, Room 700, Arlington, VA 22203. Address mail for the following permits to the Regional Director. In the address include one of the following: for import/export licenses and exception to designated port permits (Attention: Import/export license); for native endangered and threatened species (Attention: Endangered/threatened species permit); and for migratory birds and eagles (Attention: Migratory bird permit office). You can find addresses for regional offices at 50 CFR 2.2.

[55 FR 48851, Nov. 23, 1990, as amended at 63 FR 52633, Oct. 1, 1998]

#### § 10.22 Law enforcement offices.

Service law enforcement offices and their areas of responsibility follow. Mail should be addressed: "Assistant Regional Director, Division of Law Enforcement, U.S. Fish and Wildlife Service, (appropriate address below)":

##### AREAS OF RESPONSIBILITY AND OFFICE ADDRESSES

California, Hawaii, Idaho, Nevada, Oregon, Washington, American Samoa, Guam, the Marshall Islands, Northern Mariana Islands, and the Trust Territory of the Pacific Islands (District 1):

Eastside Federal Complex, 911 N.E. 11th Avenue, Portland, OR 97232-4181, Telephone: 503-231-6125.

Arizona, New Mexico, Oklahoma, and Texas (District 2):

P.O. Box 329, Albuquerque, NM 87103, Telephone: 505-766-2091

Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin (District 3):

P.O. Box 45—Federal Building, Ft. Snelling, Twin Cities, MN 55111, Telephone: 612-725-3530.

Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Puerto Rico, and the Virgin Islands (District 4):

P.O. Box 4839, Atlanta, GA 30302, Telephone: 404-331-5872

Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia (District 5):

P.O. Box 129, New Town Branch, Boston, MA 02258, Telephone: 617-965-2298

Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming (District 6):

**APPENDIX D**

**FAA Advisory Circular 150/5200-32A, Reporting Wildlife Aircraft Strikes**





U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

# Advisory Circular

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**Subject:** Reporting Wildlife Aircraft Strikes

**Date:** 5/31/2013

**AC No:** 150/5200-32B

**Initiated by:** AAS-300

**Change:**

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## 1. Purpose.

This Advisory Circular (AC) explains the importance of reporting collisions between aircraft and wildlife, more commonly referred to as wildlife strikes. It also explains recent improvements in the Federal Aviation Administration's (FAA's) Bird/Other Wildlife Strike Reporting system, how to report a wildlife strike, what happens to the wildlife strike report data, how to access the FAA National Wildlife Strike Database (NWSD), and the FAA's Feather Identification program.

## 2. Applicability.

The FAA provides the standards and practices in this AC as guidance for all public-use airports, aviation industry personnel (e.g., Air Traffic Control, pilots and airline personnel, and engine manufacturers), and others who possess strike information. The FAA strongly recommends that the above aviation representatives and others possessing strike information participate in reporting.

## 3. Cancellation.

This AC cancels AC 150/5200-32A, Reporting Wildlife Aircraft Strikes, dated December 22, 2004.

## 4. Background.

The FAA has long recognized the threat to aviation safety posed by wildlife strikes. Each year in the United States, wildlife strikes to U.S. civil aircraft cause about \$718 million in damage to aircraft and about 567,000 hours of civil aircraft down time. For the period 1990 to 2011, over 115,000 wildlife strikes were reported to the FAA. About 97 percent of all wildlife strikes reported to the FAA involved birds, about 2 percent involved terrestrial mammals, and less than 1 percent involved flying mammals (bats) and reptiles. Waterfowl (ducks and geese), gulls, and raptors (mainly hawks and vultures) are the bird species that cause the most damage to civil aircraft in the United States, while European starlings are responsible for the greatest loss of human life. Vultures and waterfowl cause the most losses to U.S. military aircraft.

Studies have shown that strike reporting has steadily increased over the past two decades; however, strike reporting is not consistent across all stakeholders (pilots, air carriers, airport operators, air traffic control personnel, etc.) in the National Airspace System. Although larger 14 CFR Part 139 airports and those with well-established wildlife programs have improved strike reporting, there is a wide disparity in overall reporting rates between Part 139 airports and general aviation (GA) airports in the National Plan of Integrated Airport Systems (NPIAS). Less than 6 percent of total strike reports come from NPIAS GA airports, whose reporting rates average less than 1/20<sup>th</sup> the rates at Part 139 airports. Most Part 139 airports (97 percent) have



reported at least one strike into the database through 2011, while only 43 percent of NPIAS GA airports have documented a strike into the database.

While overall reporting rates are much higher for strikes at Part 139 airports than at NPIAS GA airports, there is also a major disparity in reporting rates among Part 139 airports. Larger Part 139 airports, especially those with well-established wildlife hazard management programs, have reporting rates about four times higher on average compared to other Part 139 airports. The pattern of disparity in strike reporting among Part 139 airports is also found in reporting rates for commercial air carriers. However, the FAA believes the current voluntary reporting rate is adequate to track national trends in wildlife strikes, to determine the hazard level of wildlife species that are being struck, and to provide a scientific foundation for FAA policies and guidance about the mitigation of risk from wildlife strikes.

Ultimately, improvements can be made in the quantity and quality of strike reporting. In addition to the above-mentioned gaps in reporting to the NWSD, there is an overall bias toward the reporting of damaging strikes compared to non-damaging strikes, especially for NPIAS GA airports and certain Part 139 airports. The quality of data within a strike report can also be improved by providing as much information as possible, including species struck and cost of strike.

The FAA has initiated several programs to address this important safety issue, including the collection, analysis, and dissemination of wildlife strike data. The effectiveness of a Wildlife Hazard Management Plan (WHMP) to reduce wildlife hazards both on and near an airport and the reevaluation of all facets of damaging/non-damaging strikes from year to year requires accurate and consistent reporting. Therefore, every WHMP should include a commitment to document and report to the NWSD all wildlife strikes that occur within the separation distances described in sections 1-2 and 1-3 of Advisory Circular 150/5200-33, Hazardous Attractants On or Near Airports (current version), to better identify, understand, and reduce threats to safe aviation.

## **5. Types of Animals to Report if Involved in a Strike with Aircraft.**

- a. All birds.
- b. All bats.
- c. All terrestrial mammals larger than 1 kg (2.2 lbs) (e.g., report rabbits, muskrats, armadillos, foxes, coyotes, domestic dogs, deer, feral livestock, etc., but not rats, mice, voles, chipmunks, shrews, etc.). If in doubt, report the incident with a note in the comment section, and the Database Manager will determine whether to include the report into the NWSD based on body mass.
- d. Reptiles larger than 1 kg (2.2 lbs).

## **6. When to Report a Wildlife Aircraft Strike.**

A wildlife strike has occurred when:

- a. A strike between wildlife and aircraft has been witnessed.
- b. Evidence or damage from a strike has been identified on an aircraft.
- c. Bird or other wildlife remains, whether in whole or in part, are found:
  - (1) Within 250 feet of a runway centerline or within 1,000 feet of a runway end unless another reason for the animal's death is identified or suspected.

(2) On a taxiway or anywhere else on or off the airport that you have reason to believe was the result of a strike with an aircraft. Examples might be:

- (i) A bird found in pieces from a prop strike on a taxiway.
- (ii) A carcass retrieved within 1 mile of an airport on the final approach or departure path after someone reported the bird falling out of the sky and a report of a probable wildlife strike.

d. The presence of birds or other wildlife on or off the airport had a significant negative effect on a flight (i.e., aborted takeoff, aborted landing, high-speed emergency stop, or the aircraft left pavement area to avoid collision with wildlife).

## 7. How to Report a Bird/Wildlife Strike.

The FAA strongly encourages pilots, airport operations, aircraft maintenance personnel, Air Traffic Control personnel, engine manufacturers, or anyone else who has knowledge of a strike to report it to the NWSD. The FAA makes available an online reporting system at the Airport Wildlife Hazard Mitigation web site (<http://www.faa.gov/go/wildlife>) or via mobile devices at <http://www.faa.gov/mobile>. Anyone reporting a strike can also print the FAA's Bird/Other Wildlife Strike Report Form (Form 5200-7) at the end of this AC or download it from the web site to report strikes. Paper copies of Form 5200-7 may also be obtained from the appropriate Airports District Offices (ADO), Flight Standards District Offices (FSDO), and Flight Service Stations (FSS) or from the Airman's Information Manual (AIM). Paper forms are pre-addressed to the FAA. No postage is needed if the form is mailed in the United States. It is important to include as much information as possible on the strike report.

**Note:** These forms are to be used to report strikes that do not have bird remains associated with them (instructions with addresses for sending remains to the Smithsonian Institute Feather Identification Lab are discussed in Paragraph 11, Instructions for Collecting and Submitting Bird/Wildlife Remains for Identification, of this AC). Please do not send bird remains to the FAA.

## 8. FAA National Wildlife Strike Database Management and Data Analysis.

The FAA NWSD Manager edits all strike reports to ensure consistent, error-free data before entering a single, consolidated report into the database. This information is supplemented with non-duplicated strike reports from other sources. About every six weeks, the FAA posts an updated version of the database on the web site. Annually, the FAA sends a current version of the database to the International Civil Aviation Organization (ICAO) for incorporation into ICAO's Bird Strike Information System (IBIS) Database. Also, the FAA prepares and makes available a report summarizing wildlife strike results from 1990 through the most current year online at [http://www.faa.gov/airports/airport\\_safety/wildlife/](http://www.faa.gov/airports/airport_safety/wildlife/).

Analyses of data from the FAA NWSD have proved invaluable in determining the nature and severity of the aviation wildlife strike hazard. The database provides a scientific basis for identifying risk factors, justifying and implementing corrective actions at airports, and judging the effectiveness of those corrective actions. Table 1 below depicts the ranking of 50 bird and mammal species or groups by their relative hazard to aircraft in airport environments. The data for the analysis are from the NWSD. The database is invaluable to engine manufacturers, aeronautical engineers, and wildlife biologists as they develop new technologies for the aviation industry. Each wildlife strike report contributes to the accuracy and effectiveness of the database. Moreover, each report contributes to the common goal of increasing aviation safety and reducing the cost of wildlife strikes.

## **9. Access to the FAA National Wildlife Strike Database.**

On April 24, 2009, the FAA made the NWSD available to the public. The FAA began systematically analyzing wildlife strike data in the 1990s for use by the FAA's Office of Airports, academia, and researchers as a means of improving airport safety and reducing wildlife hazards. The NWSD web site (<http://www.faa.gov/go/wildlife>) was retooled to make it more user-friendly and to allow more advanced data mining. The site has search fields that enable users to find data on specific airports, airlines, aircraft, and engine types, as well as damage incurred, date of strike, species struck, and state without having to download the entire database.

## **10. Bird/ Wildlife Identification.**

Accurate species identification is critical for wildlife-aircraft strike reduction programs. The identification of the exact species of bird struck (e.g., ring-billed gull, Canada goose, mallard, mourning dove, or red-tailed hawk as opposed to gull, goose, duck, dove, or hawk) is particularly important. This species information is critical for airports and biologists developing and implementing wildlife hazard management programs at airports because a problem that cannot be measured or defined cannot be solved. Wildlife biologists must know what species of wildlife they are dealing with in order to identify local attractants and to make proper management decisions within the framework of the Migratory Bird Treaty Act and state and local regulations. The FAA, the U.S. Air Force, the U.S. Navy, and the U.S. Department of Agriculture – Wildlife Services work closely with the Feather Identification Lab at the Smithsonian Institution, Museum of Natural History, to improve the understanding and prevention of bird-aircraft strike hazards. Bird strike remains that cannot be identified by airport personnel or by a local biologist can be sent (with FAA Form 5200-7) to the Smithsonian Museum for identification. Remains may also be submitted to the Smithsonian for verification of the field identification and for long-term storage of the evidence.

Bird strike identification using feathers, DNA, or other body parts or materials from birds involved in bird-aircraft strikes will be provided free-of-charge to all U.S. airport operators, all U.S. aircraft owners/operators (regardless of where the strike happened), and to any foreign air carrier if the strike occurred at a U.S. airport.

## **11. Instructions for Collecting and Submitting Bird/Wildlife Remains for Identification.**

Please observe the following guidelines for collecting and submitting feathers or other bird/wildlife remains for species identification. These guidelines help maintain species identification accuracy, reduce turn-around time, and ensure a comprehensive FAA National Wildlife Aircraft Strike Database. Many airports have found it beneficial to construct strike reporting kits for use by airport personnel and aircraft operators. Having pre-made kits available improves strike reporting and encourages the sampling of strike remains. A kit suitable for collecting remains from most strikes would include the following materials stored in a 1-quart, re-sealable plastic bag: (1) collection instructions, (2) a pre-packaged alcohol hand-wipe for softening/removing tissue/blood ("snarge"<sup>1</sup>) off of the aircraft, (3) a Whatman FTA® collection card for preserving blood/tissue for DNA identification, and (4) a pair of disposable gloves.

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<sup>1</sup> Snarge is the term used for the residue and feathers left on an aircraft after an animal (typically a bird) collides with it.

**a.** Collect and submit remains from known/suspected bird strikes or strike remains that involved an unknown animal from each impact location as soon as possible and send to the Feather Lab (Smithsonian). If remains are known to be other than those of birds, please contact the Smithsonian before mailing them at (202) 633-0801. Collect remains using the criteria listed in item c below. If you cannot send the remains as soon as possible, refrigerate or freeze them in a sealed plastic bag until you can mail them.

**b.** Provide complete information about the incident.

(1) Fill out FAA Form 5200-7 – Bird/ Other Wildlife Strike Report.

(i) Print a copy of Form 5200-7 at the end of this AC or download a copy at <http://www.faa.gov/go/wildlife>.

(ii) File a report online and print a copy to send with the remains.

(2) Mail the report with feather material (see address below).

(3) Provide your contact information if you wish to be informed of the species identification.

**c.** Collect as much material as possible in a clean plastic/ Ziplock® bag. (Please, do not send whole birds.)

(1) Pluck/pick a variety of many feathers representing color or patterns from the wings, tail, and body.

(2) **Do not** cut off feathers. This removes the downy region needed to aid in identification.

(3) Include any feathers with distinct colors or patterns.

(4) Include any downy “fluff”.

(5) Include beaks, feet, and talons if possible.

(6) Where only a small amount of snarge material is available, such as scrapings from an engine or smears on wings or windshields, send all of it.

(i) **Dry material** – Scrape or wipe off into a clean re-sealable bag **or** wipe the area with pre-packaged alcohol wipe **or** spray with alcohol to loosen material then wipe with clean cloth/gauze. Include the alcohol wipe or piece of cloth in the bag. (Do not use water, bleach, or other cleansers – they destroy or degrade DNA.)

(ii) **Fresh material** – Wipe the area with alcohol wipe and/or clean cloth/gauze **or** apply fresh tissue/blood to an optional Whatman FTA® DNA collecting card.

(1) **Do not** use any sticky substance such as tape or post-it notes to attach feathers.

(2) Collect remains from each impact location and place them in separate, labeled bags. Indicate the location on aircraft from which each sample came (i.e., windshield, radome, etc.) on the bag.

Please send whole feathers (tip and base) whenever possible as diagnostic characteristics are often found in the downy barbules at the feather base. Wings, as well as breast and tail feathers, should be sent whenever possible. Beaks, feet, bones, and talons are also useful diagnostic materials. Even blood smears can provide material for DNA analysis. Do not send entire bird carcasses through the mail. However, photographs of the carcasses can be very useful supplemental documentation.

If you send fresh blood/ tissue samples frequently for DNA identification, you may want to consider getting Whatman FTA<sup>®</sup> DNA cards. The material is sampled with a sterile applicator and placed onto the surface of the card that “fixes” the DNA in the sample. For more information about ordering these items, contact the Feather Lab. Otherwise, if you only occasionally send blood/ tissue samples, consider using a paper towel soaked with alcohol or an alcohol wipe to collect this type of material. Ethanol is the preferred type of alcohol.

Additional information on sending bird remains to the Smithsonian is available at <http://www.faa.gov/go/wildlife>.

d. Mail the Bird/Other Wildlife Strike Report and collected material to the Smithsonian’s Feather Identification Lab. The lab will forward the report to the National Wildlife Strike Database Manager.

<b>For Material Sent via Express Mail Service:</b>	<b>For Material Sent via US Postal Service:</b>
Feather Identification Lab Smithsonian Institution NHB, E600, MRC 116 10 <sup>th</sup> & Constitution Ave NW Washington DC 20560-0116  (This can be identified as “safety investigation material”.)	Feather Identification Lab Smithsonian Institution PO Box 37012 NHB, E600, MRC 116 Washington DC 20013-7012  (Not recommended for priority cases.)

The species identification turn-around time is usually 24 hours from receipt if sufficient material is submitted and unless the sample is submitted for DNA analysis. DNA results usually take 6 to 10 days. Once processed, the lab sends the reports and species identification information to the Database Manager for entry into the FAA National Wildlife Strike Database. Persons wishing to be notified of the species identification must include contact information (e-mail, phone, etc.) on the report.

For more information contact the FAA National Wildlife Biologist at (202) 267-8731 or the Smithsonian’s Feather Identification Lab at (202) 633-0801.



Michael J. O'Donnell  
 Director, Office of Airport Safety and Standard



# BIRD / OTHER WILDLIFE STRIKE REPORT

U.S. Department of Transportation  
**Federal Aviation Administration**

**Paperwork Reduction Act Statement:** The information collected on this form is necessary to allow the Federal Aviation Administration to assess the magnitude and severity of the wildlife-aircraft strike problem in the U.S. The information is used in determining the best management practices for reducing the hazard to aviation safety caused by wildlife-aircraft strikes. A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB Control Number. The OMB Control Number for this information collection is 2120-0045. Public reporting for this collection of information is estimated to be approximately 6 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, completing and reviewing the collection of information. The information collected is voluntary. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the FAA at: 800 Independence Ave. SW, Washington, DC 20591, Attn: Information Collection Clearance Officer, AES-200.

<b>1. Name of Operator</b>		<b>2. Aircraft Make/Model</b>		<b>3. Engine Make/Model</b>																																															
<b>4. Aircraft Registration</b>		<b>5. Date of Incident</b> Month / Day / Year		<b>6. Local Time of Incident</b> <input type="checkbox"/> Dawn <input type="checkbox"/> Dusk    __HR __MIN <input type="checkbox"/> Day <input type="checkbox"/> Night <input type="checkbox"/> AM <input type="checkbox"/> PM																																															
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<b>7. Airport Name/ID</b>		<b>8. Runway Used</b>		<b>9. Location if En Route</b> (Nearest Town/Reference & State/Airport)																																															
<b>10. Height (AGL)</b>		<b>11. Speed (IAS)</b>																																																	
<b>12. Phase of Flight</b> <input type="checkbox"/> A. Parked <input type="checkbox"/> B. Taxi <input type="checkbox"/> C. Take-off Run <input type="checkbox"/> D. Climb <input type="checkbox"/> E. En Route <input type="checkbox"/> F. Descent <input type="checkbox"/> G. Approach <input type="checkbox"/> H. Landing Roll		<b>13. Part(s) of Aircraft Struck or Damaged</b>																																																	
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N. Other: (Specify)	<input type="checkbox"/>	<input type="checkbox"/>																																																	
Bird(s) Ingested? <input type="checkbox"/> Yes		Specify if "N. Other" is checked:																																																	
<b>14. Effect on Flight</b> <input type="checkbox"/> None <input type="checkbox"/> Aborted Take-Off <input type="checkbox"/> Precautionary Landing <input type="checkbox"/> Engines Shut Down <input type="checkbox"/> Other: (Specify)		<b>15. Sky Condition</b> <input type="checkbox"/> No Cloud <input type="checkbox"/> Some Cloud <input type="checkbox"/> Overcast		<b>16. Precipitation</b> <input type="checkbox"/> Fog <input type="checkbox"/> Rain <input type="checkbox"/> Snow <input type="checkbox"/> None																																															
<b>17. Bird/Other Wildlife Species</b>		<b>18. Number of birds seen and/or struck</b>			<b>19. Size of Bird(s)</b> <input type="checkbox"/> Small <input type="checkbox"/> Medium <input type="checkbox"/> Large																																														
		Number of Birds	Seen	Struck																																															
		1	<input type="checkbox"/>	<input type="checkbox"/>																																															
		2-10	<input type="checkbox"/>	<input type="checkbox"/>																																															
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		more than 100	<input type="checkbox"/>	<input type="checkbox"/>																																															
<b>20. Pilot Warned of Birds</b> <input type="checkbox"/> Yes <input type="checkbox"/> No																																																			
<b>21. Remarks</b> (Describe damage, injuries and other pertinent information)																																																			
<b>DAMAGE / COST INFORMATION</b>																																																			
<b>22. Aircraft time out of service</b> _____ hours		<b>23. Estimated cost of repairs or replacement (US \$)</b> \$ _____		<b>24. Estimated other Cost (U.S. \$)</b> (e.g. loss of revenue, fuel, hotels) \$ _____																																															
<b>Reported by</b> (Optional)			<b>Title</b>		<b>Date</b>																																														
<b>Email</b>			<b>Phone</b>																																																

U.S. Department of  
Transportation

**Federal Aviation  
Administration**

800 Independence Ave SW  
Washington DC 20591

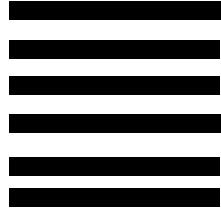
Official Business  
Penalty for Private Use, \$300



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UNITED STATES

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POSTAGE WILL BE PAID BY FEDERAL AVIATION ADMINISTRATION



Federal Aviation Administration  
Office of Airport Safety and Standards, AAS-300  
Attn: Wildlife Strike Report  
800 Independence Avenue SW  
WASHINGTON DC 20591

FOLD AND TAPE HERE

**Directions for FAA Form 5200-7  
Bird/Other Wildlife Strike Report**

1. Name of Operator - This can be an airline (abbreviations okay - UAL, AAL, etc.), business (Coca Cola), government agency (Police Dept., FAA), or if a private pilot, his/her name.
2. Aircraft Make/Model - Abbreviations are okay, but include the model (e.g., B737-200).
3. Engine Make/Model - Abbreviations are allowed (e.g., PW 4060, GECT7, LYC 580).
4. Aircraft Registration - This means the N# (for USA registered aircraft).
5. Date of Incident - Give the local date, not the ZULU or GMT date.
6. Local Time of Incident - Check the appropriate light conditions and fill in the hour and minute local time and check AM or PM or use the 24-hour clock and skip AM/PM.
- 6A. Flight Number - Self-explanatory.
- 6B. Wildlife/Bird Remains - If remains were found at the airport or on the aircraft, check "Collected". If the remains were also sent to the Smithsonian for identification, also check "Sent to Smithsonian".
7. Airport Name - Use the airport name or 3 letter code if a US airport. If a foreign airport, use the full name or 3 letter code and location (city/country).
8. Runway used - Self-explanatory.
9. Location if En Route - Put the name of the nearest city and state.
10. Height AGL - Put the feet above ground level at the time of the strike (if you don't know, use MSL and indicate this). For take-off run and landing roll, it must be 0.
11. Speed (IAS) - Speed at which the aircraft was traveling when the strike occurred.
12. Phase of Flight - Phase of flight during which the strike occurred. Take-off run and landing roll should both be 0 AGL.
13. Part(s) of Aircraft Struck or Damaged - Check which parts were struck and damaged. If a part was damaged but not struck, indicate this with a check on the damaged column only and indicate in comments (#21) why this happened (e.g., the landing gear might be damaged by deer strike, causing the aircraft to flip over and damage parts not struck by deer).
14. Effect on Flight - You can check more than one. If you check "Other", please explain in Comments (#21).
15. Sky condition - Check the one that applies.
16. Precipitation - You may check more than one.
17. Bird/Other Wildlife Species - Try to be accurate. If you don't know, put unknown and some description. Collect feathers or remains for identification for damaging strikes.
18. Number of birds seen and/or struck - check the box in the Seen column with the correct number if you saw the birds/other wildlife before the strike and check the box in the Struck column to show how many were hit. The exact number can be written next to the box.
19. Size of Bird(s) - Check what you think is the correct size (e.g. sparrow = small, gull = medium, and geese = large).
20. Pilot Warned of Birds - Check the correct box (even if it was an ATIS warning or NOTAM).
21. Remarks - Be as specific as you can. Include information about the extent of the damage, injuries, anything you think would be helpful to know (e.g., number of birds ingested).
22. Aircraft time out of service - Record how many hours the aircraft was out of service.
23. Estimated cost of repairs or replacement - This may not be known immediately, but the data can be sent at a later date or put down a contact name and number for this data.
24. Estimated other cost - Include loss of revenue, fuel, hotels, etc. (see directions for #23).
25. Reported by - Although this is optional, it is helpful if questions arise about the information on the form (a phone number could also be included).
26. Title - This can be Pilot, Tower, Airport Operations, Airline Operations, Flight Safety, etc.
27. Date - Date the form was filled out.



Table 1. Composite ranking (1 = most hazardous, 50 = least hazardous) and relative hazard score of 50 wildlife species with at least 100 reported strikes with civil aircraft based on three criteria (damage, major damage, and effect-on-flight). Data were derived from the FAA National Wildlife Strike Database.

Wildlife species	% of strikes with:			Mean hazard level <sup>4</sup>	Composite ranking	Relative hazard score <sup>5</sup>
	Damage <sup>1</sup>	Major damage <sup>2</sup>	Effect on flight <sup>3</sup>			
White-tailed deer	84	36	46	55	1	100
Snow goose	77	41	39	53	2	95
Turkey vulture	51	19	35	35	3	63
Canada goose	50	17	28	31	4	57
Sandhill crane	41	13	27	27	5	48
Bald eagle	41	12	28	27	6	48
D.-crested cormorant	34	15	24	24	7	44
Mallard	23	9	13	15	8	27
Osprey	22	7	15	15	9	26
Great blue heron	21	6	16	15	10	26
American coot	24	7	11	14	11	25
Coyote	9	2	21	11	12	19
Red-tailed hawk	15	5	11	10	13	19
Cattle egret	10	3	15	9	14	17
Great horned owl	15	3	6	8	15	14
Herring gull	10	5	9	8	16	14
Rock pigeon	10	4	10	8	17	14
Ring-billed gull	8	3	8	6	18	11
American crow	8	3	8	6	18	11
Peregrine falcon	8	2	5	5	20	9
Laughing gull	5	2	7	5	21	8
American robin	7	1	4	4	22	7
Snow bunting	1	1	9	4	23	7
Red fox	3	0	8	4	23	7
European starling	4	1	5	3	25	6
Amer. golden-plover	4	2	4	3	26	6
Barn owl	4	2	3	3	27	5
Upland sandpiper	4	1	4	3	27	5
Purple martin	5	1	2	3	29	5

Wildlife species	% of strikes with:			Mean hazard level <sup>4</sup>	Composite ranking	Relative hazard score <sup>5</sup>
	Damage <sup>1</sup>	Major damage <sup>2</sup>	Effect on flight <sup>3</sup>			
Mourning dove	3	1	4	3	30	5
Red-winged blackbird	3	0	5	3	31	5
Woodchuck	2	0	4	2	32	4
Northern harrier	2	1	2	2	33	3
Chimney swift	2	0	2	1	34	2
Killdeer	1	0	2	1	35	2
House sparrow	2	0	1	1	35	2
Blk-tailed jackrabbit	1	1	1	1	37	2
American kestrel	1	<1	2	1	38	2
Eastern meadowlark	1	<1	2	1	38	2
S.-tailed flycatcher	0	0	2	1	40	1
Horned lark	1	<1	1	1	41	1
Pacific golden-plover	1	0	1	1	41	1
Barn swallow	1	0	1	1	43	1
Savannah sparrow	1	0	<1	1	43	1
Common nighthawk	1	0	1	1	45	1
Tree swallow	0	0	1	<1	46	1
Burrowing owl	1	0	0	<1	46	1
Western kingbird	0	0	1	<1	48	0
Virginia opossum	1	0	0	<1	48	0
Striped skunk	0	0	0	0	50	0

<sup>1</sup> Aircraft incurred at least some damage (destroyed, substantial, minor, or unknown) from strike.

<sup>2</sup> Aircraft incurred damage or structural failure, which adversely affected the structure strength, performance, or flight characteristics, and which would normally require major repair or replacement of the affected component, or the damage sustained made it inadvisable to restore aircraft to airworthy condition.

<sup>3</sup> Aborted takeoff, engine shutdown, precautionary landing, or other negative effect on flight.

<sup>4</sup> Based on the mean value for percent of strikes with damage, major damage (substantial damage or destroyed), and negative effect-on-flight.

<sup>5</sup> Mean hazard level (see footnote 4) was scaled down from 100, with 100 as the score for the species with the maximum mean hazard level and thus the greatest potential hazard to aircraft.

## **APPENDIX E**

### **Guidelines for Submitting Bird Remains for Identification to the Smithsonian Institution Feather Lab**



# General Information for Collecting Birdstrike Material

Feather Identification Lab, Smithsonian Institution

## COLLECTING REMAINS

### Feathers:

*Whole Bird:* Pluck a variety of feathers (breast, back, wing, tail)

*Partial Bird:* Collect a variety of feathers with color or pattern

*Feathers only:* Send all materials

Do not cut feathers from the bird (we need the down at the base)

Do not use any sticky substance (no tape or glue)

Place remains in a re-closeable bag

Allow remains to dry before sealing bag.

### Blood / Tissue (“Snarge”):

Place dry snarge in a re-closeable bag

If need, wipe off with alcohol wipe or paper towel sprayed with 70% alcohol

Please do not use water or bleach – it is not compatible with our dna analysis

- Include copy of FAA 5200-7 report
- Include contact information

## SHIPPING

### Routine / Non-Damaging Cases: *US Postal Service*

Feather Identification Lab

Smithsonian Institution

NHB E600, MRC 116

P.O. Box 37012

Washington, DC 20013-7012

### Priority / Damaging Cases: *Overnight Shipping*

Feather Identification Lab

Smithsonian Institution

NHB, E600, MRC 116

10<sup>th</sup> & Constitution Ave., NW

Washington, DC 20560-0116

## WEBSITES

Civil Aviation: <http://wildlife-mitigation.tc.faa.gov>  
Birdstrike Committee: [www.birdstrike.org](http://www.birdstrike.org)

### Feather Lab Contact Information

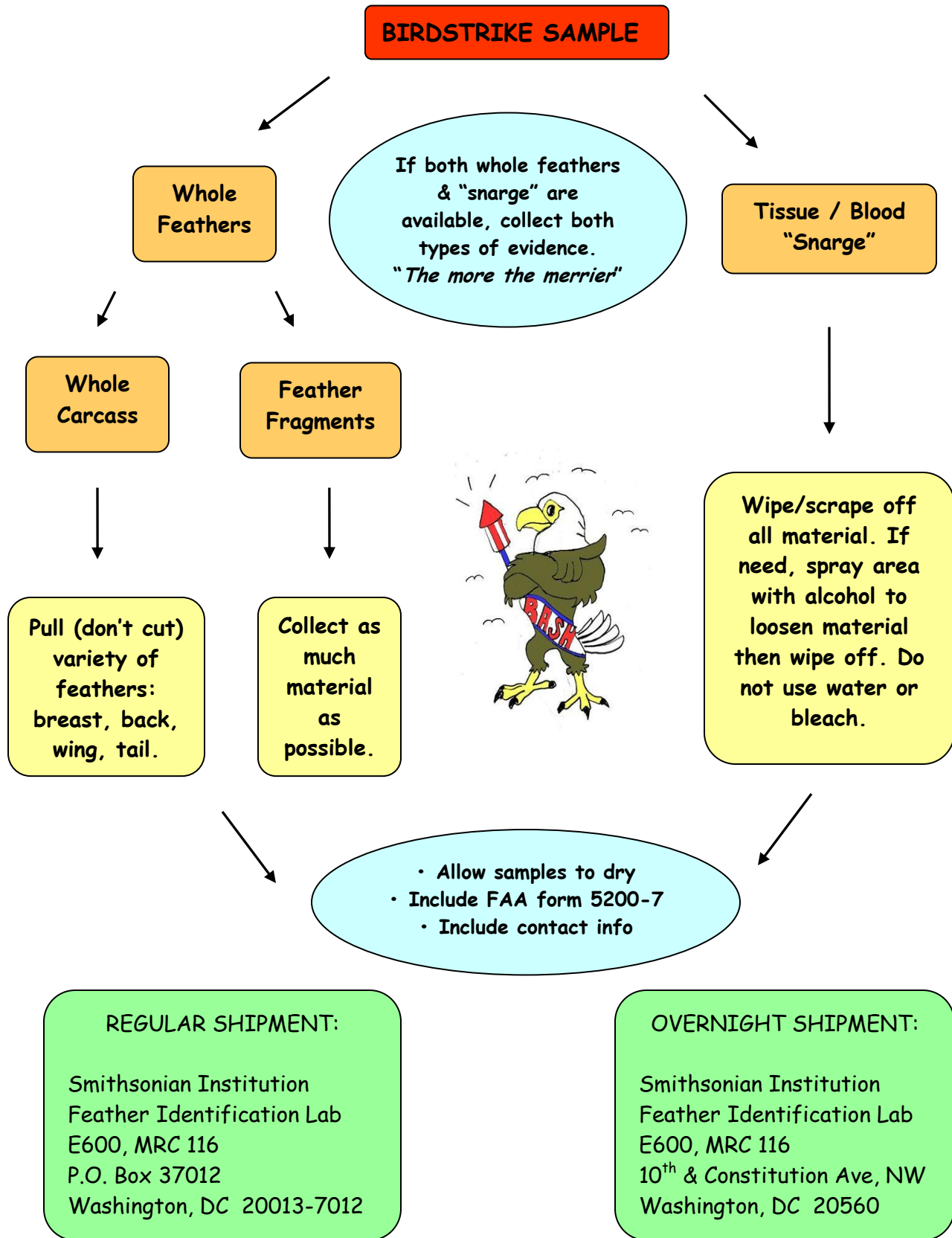
202-633-0801

dovec@si.edu

heackerm@si.edu

\* Basic safety measures and good hygiene when collecting material is encouraged. Use latex gloves, face mask and eye protection; always thoroughly wash hands after handling remains.

# HOW TO COLLECT BIRDSTRIKE EVIDENCE



## "MAKE-YOUR-OWN" - BIRDSTRIKE COLLECTING KITS

*Birdstrike Collecting Kits* are cheap to make and easy to assemble. Having pre-made kits available improves birdstrike reporting and encourages the sampling of birdstrike remains. Most folks assemble the contents into individual bags or envelopes and keep a supply in field vehicles or office supply cabinets for quick access. Below is a list of recommended items to include in your birdstrike collecting kits; mix and match as budgets permit:

### Re-sealable Plastic Bags

A variety of sizes; Re-sealable bags help contain liquids and keeps odors to a minimum.

### Sharpie Markers

Permanent markers are water resistant and used for writing data (date, time, aircraft, etc) directly on the bag of remains.

### Alcohol Wipes

Pre-packaged alcohol hand-wipes can be used to wipe "snarge" off aircraft. Alcohol is better than water at preserving DNA, preventing mold growth, and is more sanitary for humans. Alternatively, use a spray bottle with 70% alcohol to spray the area before wiping with paper towels. Do not use bleach wipes, it destroys DNA. .

### Miscellaneous Items for Birdstrike Collecting

Kitchen shears - good for cutting feet, wings, bills

Tongue depressors, tweezers, cotton swabs/cotton-tipped applicators

Hand cleaners, or other alcohol based gel hand sanitizers.

FTA® DNA collecting cards: If you send a lot of blood/tissue ("snarge") samples for DNA identification, you may want to look into getting Whatman FTA® DNA cards. The material is sampled with a sterile applicator and placed onto the surface of the card that "fixes" the dna in the sample. For more information on ordering these items contact the Feather Lab.

Note: If you only occasionally send blood/tissue samples - a paper towel with alcohol, or alcohol wipe is still a good option for blood/tissue samples.

(collecting kit cont.)

### **Extra Safety Items**

Latex Gloves

Protective Eyewear

Face masks: If avian flu is a concern, the Center for Disease Control recommends NIOSH rated N95 face masks. (These may be referred to as respirators.) There is a disposable version of these masks by 3M that looks similar to the regular "cup" style face masks.

### **Reminders**

Always encourage proper hygiene & provide personnel easy access to cleaning/hygiene supplies

Do not cut off the fluffy down at the bottom of feathers

Do not use bleach on samples

Be sure personnel are briefed on proper carcass disposal protocols

Stay informed to the status of HPAI H5N1 avian flu virus. The following website has excellent coverage:

**The American Ornithologists' Union Ornithological Council**

<http://www.nmnh.si.edu/BIRDNET/OC/avianinfluenza.html>

### **Contact Information**

Feather Identification Lab      202-633-0801

Carla Dove      [dovec@si.edu](mailto:dovec@si.edu)

Marcy Heacker      [heackerm@si.edu](mailto:heackerm@si.edu)

## **APPENDIX F**

### **Inventory of Species and Guilds Observed During the WHA**





Common Name	Scientific Name	Guild
<b>Birds</b>		
American Crow	<i>Corvus brachyrhynchos</i>	Corvid
American Goldfinch	<i>Spinus tristis</i>	Passerine
American Robin	<i>Turdus migratorius</i>	Passerine
Barn Swallow	<i>Hirundo rustica</i>	Aerial Forager
Belted Kingfisher	<i>Megaceryle alcyon</i>	Passerine
Black-capped Chickadee	<i>Poecile atricapillus</i>	Passerine
Blue Jay	<i>Cyanocitta cristata</i>	Passerine
Blue-winged Teal	<i>Anas discors</i>	Waterfowl
Bobwhite Quail	<i>Colinus virginianus</i>	Grassland
Brown-headed Cowbird	<i>Molothrus ater</i>	Blackbird
Canada Goose	<i>Branta Canadensis</i>	Waterfowl
Canvasback	<i>Aythya valisineria</i>	Waterfowl
Chimney Swift	<i>Chaetura pelagica</i>	Aerial Forager
Chipping Sparrow	<i>Spizella passerina</i>	Passerine
Common Grackle	<i>Quiscalus quiscula</i>	Blackbird
Cooper's Hawk	<i>Accipiter cooperii</i>	Raptor
Dark-eyed Junco	<i>Junco hyernalis</i>	Passerine
Downy Woodpecker	<i>Picoides pubescens</i>	Passerine
Eastern Bluebird	<i>Sialia sialis</i>	Passerine
Eastern Meadowlark	<i>Sturnella magna</i>	Passerine
European Starling	<i>Sturnus vulgaris</i>	Blackbird
Field Sparrow	<i>Spizella pusilla</i>	Passerine
Great Blue Heron	<i>Ardea herodias</i>	Shorebird
Horned Grebe	<i>Podiceps auritus</i>	Waterfowl
Horned Lark	<i>Eremophila alpestris</i>	Passerine
House Finch	<i>Carpodacus mexicanus</i>	Passerine
House Sparrow	<i>Passer domesticus</i>	Passerine
Killdeer	<i>Charadrius vociferus</i>	Shorebird
Lapland Longspur	<i>Calcarius lapponicus</i>	Passerine
Mallard	<i>Anas platyrhynchos</i>	Waterfowl

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Mourning Dove	<i>Zenaida macroura</i>	Columbid
Northern Cardinal	<i>Cardinalis cardinalis</i>	Passerine
Northern Flicker	<i>Colaptes auratus</i>	Passerine
Northern Harrier	<i>Circus cyaneus</i>	Raptor
Purple Martin	<i>Progne subis</i>	Aerial Forager
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	Passerine
Red-shafted Flicker	<i>Colaptes a. cafer</i>	Passerine
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Raptor
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Blackbird
Ring-billed Gull	<i>Larus delawarensis</i>	Gull
Ring-necked Duck	<i>Aythya collaris</i>	Waterfowl
Rock Pigeon	<i>Columba livia</i>	Columbid
Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	Aerial Forager
Sandhill Crane	<i>Grus canadensis</i>	Shorebird
Song Sparrow	<i>Melospiza melodia</i>	Passerine
Snow Bunting	<i>Plectrophenax nivalis</i>	Passerine
Snowy Owl	<i>Bubo scandiacus</i>	Raptor
Tree Swallow	<i>Tachycineta bicolor</i>	Aerial Forager
Tufted Titmouse	<i>Baeolophus bicolor</i>	Passerine
Turkey Vulture	<i>Cathartes aura</i>	Raptor
Wild Turkey	<i>Meleagris gallopavo</i>	Shorebird
White-crowned sparrow	<i>Zonotrichia leucophrys</i>	Passerine
Yellow Warbler	<i>Setophaga petechia</i>	Passerine
Unidentified Sparrow		Passerine
Unidentified Passerine		Passerine
<b>Mammals</b>		
Whitetail Deer	<i>Odocoileus virginianus</i>	Mammal
Eastern Coyote	<i>Canis latrans</i>	Mammal
Eastern Mole	<i>Scalopus aquaticus</i>	Mammal
Fox Squirrel	<i>Sciurus niger</i>	Mammal
Meadow Vole	<i>Microtus pennsylvanicus</i>	Mammal
House Mouse	<i>Mus musculus</i>	Mammal
White-footed Mouse	<i>Peromyscus leucopus</i>	Mammal

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**APPENDIX G**

**FAA Advisory Circular 150/5200-33B, Hazardous Wildlife Attractants On or Near  
Airports**

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U.S. Department  
of Transportation

**Federal Aviation  
Administration**

# Advisory Circular

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**Subject: HAZARDOUS WILDLIFE  
ATTRACTANTS ON OR NEAR  
AIRPORTS**

**Date:** 8/28/2007

**AC No:** 150/5200-33B

**Initiated by:** AAS-300

**Change:**

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**1. PURPOSE.** This Advisory Circular (AC) provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near public-use airports. It also discusses airport development projects (including airport construction, expansion, and renovation) affecting aircraft movement near hazardous wildlife attractants. Appendix 1 provides definitions of terms used in this AC.

**2. APPLICABILITY.** The Federal Aviation Administration (FAA) recommends that public-use airport operators implement the standards and practices contained in this AC. The holders of Airport Operating Certificates issued under Title 14, Code of Federal Regulations (CFR), Part 139, Certification of Airports, Subpart D (Part 139), may use the standards, practices, and recommendations contained in this AC to comply with the wildlife hazard management requirements of Part 139. Airports that have received Federal grant-in-aid assistance must use these standards. The FAA also recommends the guidance in this AC for land-use planners, operators of non-certificated airports, and developers of projects, facilities, and activities on or near airports.

**3. CANCELLATION.** This AC cancels AC 150/5200-33A, *Hazardous Wildlife Attractants on or near Airports*, dated July 27, 2004.

**4. PRINCIPAL CHANGES.** This AC contains the following major changes, which are marked with vertical bars in the margin:

- a. Technical changes to paragraph references.
- b. Wording on storm water detention ponds.
- c. Deleted paragraph 4-3.b, *Additional Coordination*.

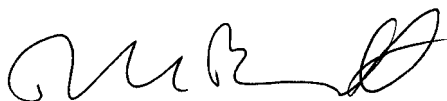
**5. BACKGROUND.** Information about the risks posed to aircraft by certain wildlife species has increased a great deal in recent years. Improved reporting, studies, documentation, and statistics clearly show that aircraft collisions with birds and other wildlife are a serious economic and public safety problem. While many species of wildlife can pose a threat to aircraft safety, they are not equally hazardous. Table 1

ranks the wildlife groups commonly involved in damaging strikes in the United States according to their relative hazard to aircraft. The ranking is based on the 47,212 records in the FAA National Wildlife Strike Database for the years 1990 through 2003. These hazard rankings, in conjunction with site-specific Wildlife Hazards Assessments (WHA), will help airport operators determine the relative abundance and use patterns of wildlife species and help focus hazardous wildlife management efforts on those species most likely to cause problems at an airport.

Most public-use airports have large tracts of open, undeveloped land that provide added margins of safety and noise mitigation. These areas can also present potential hazards to aviation if they encourage wildlife to enter an airport's approach or departure airspace or air operations area (AOA). Constructed or natural areas—such as poorly drained locations, detention/retention ponds, roosting habitats on buildings, landscaping, odor-causing rotting organic matter (putrescible waste) disposal operations, wastewater treatment plants, agricultural or aquaculture activities, surface mining, or wetlands—can provide wildlife with ideal locations for feeding, loafing, reproduction, and escape. Even small facilities, such as fast food restaurants, taxicab staging areas, rental car facilities, aircraft viewing areas, and public parks, can produce substantial attractions for hazardous wildlife.

During the past century, wildlife-aircraft strikes have resulted in the loss of hundreds of lives worldwide, as well as billions of dollars in aircraft damage. Hazardous wildlife attractants on and near airports can jeopardize future airport expansion, making proper community land-use planning essential. This AC provides airport operators and those parties with whom they cooperate with the guidance they need to assess and address potentially hazardous wildlife attractants when locating new facilities and implementing certain land-use practices on or near public-use airports.

**6. MEMORANDUM OF AGREEMENT BETWEEN FEDERAL RESOURCE AGENCIES.** The FAA, the U.S. Air Force, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture - Wildlife Services signed a Memorandum of Agreement (MOA) in July 2003 to acknowledge their respective missions in protecting aviation from wildlife hazards. Through the MOA, the agencies established procedures necessary to coordinate their missions to address more effectively existing and future environmental conditions contributing to collisions between wildlife and aircraft (wildlife strikes) throughout the United States. These efforts are intended to minimize wildlife risks to aviation and human safety while protecting the Nation's valuable environmental resources.



DAVID L. BENNETT  
Director, Office of Airport Safety  
and Standards

Table 1. Ranking of 25 species groups as to relative hazard to aircraft (1=most hazardous) based on three criteria (damage, major damage, and effect-on-flight), a composite ranking based on all three rankings, and a relative hazard score. Data were derived from the FAA National Wildlife Strike Database, January 1990–April 2003.<sup>1</sup>

Species group	Ranking by criteria			Composite ranking <sup>2</sup>	Relative hazard score <sup>3</sup>
	Damage <sup>4</sup>	Major damage <sup>5</sup>	Effect on flight <sup>6</sup>		
Deer	1	1	1	1	100
Vultures	2	2	2	2	64
Geese	3	3	6	3	55
Cormorants/pelicans	4	5	3	4	54
Cranes	7	6	4	5	47
Eagles	6	9	7	6	41
Ducks	5	8	10	7	39
Osprey	8	4	8	8	39
Turkey/pheasants	9	7	11	9	33
Hérons	11	14	9	10	27
Hawks (buteos)	10	12	12	11	25
Gulls	12	11	13	12	24
Rock pigeon	13	10	14	13	23
Owls	14	13	20	14	23
H. lark/s. bunting	18	15	15	15	17
Crows/ravens	15	16	16	16	16
Coyote	16	19	5	17	14
Mourning dove	17	17	17	18	14
Shorebirds	19	21	18	19	10
Blackbirds/starling	20	22	19	20	10
American kestrel	21	18	21	21	9
Meadowlarks	22	20	22	22	7
Swallows	24	23	24	23	4
Sparrows	25	24	23	24	4
Nighthawks	23	25	25	25	1

<sup>1</sup> Excerpted from the *Special Report for the FAA, "Ranking the Hazard Level of Wildlife Species to Civil Aviation in the USA: Update #1, July 2, 2003"*. Refer to this report for additional explanations of criteria and method of ranking.

<sup>2</sup> Relative rank of each species group was compared with every other group for the three variables, placing the species group with the greatest hazard rank for  $\geq 2$  of the 3 variables above the next highest ranked group, then proceeding down the list.

<sup>3</sup> Percentage values, from Tables 3 and 4 in Footnote 1 of the *Special Report*, for the three criteria were summed and scaled down from 100, with 100 as the score for the species group with the maximum summed values and the greatest potential hazard to aircraft.

<sup>4</sup> Aircraft incurred at least some damage (destroyed, substantial, minor, or unknown) from strike.

<sup>5</sup> Aircraft incurred damage or structural failure, which adversely affected the structure strength, performance, or flight characteristics, and which would normally require major repair or replacement of the affected component, or the damage sustained makes it inadvisable to restore aircraft to airworthy condition.

<sup>6</sup> Aborted takeoff, engine shutdown, precautionary landing, or other.

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## SECTION 1.

### GENERAL SEPARATION CRITERIA FOR HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS.

**1-1. INTRODUCTION.** When considering proposed land uses, airport operators, local planners, and developers must take into account whether the proposed land uses, including new development projects, will increase wildlife hazards. Land-use practices that attract or sustain hazardous wildlife populations on or near airports can significantly increase the potential for wildlife strikes.

The FAA recommends the minimum separation criteria outlined below for land-use practices that attract hazardous wildlife to the vicinity of airports. Please note that FAA criteria include land uses that cause movement of hazardous wildlife onto, into, or across the airport's approach or departure airspace or air operations area (AOA). (See the discussion of the synergistic effects of surrounding land uses in Section 2-8 of this AC.)

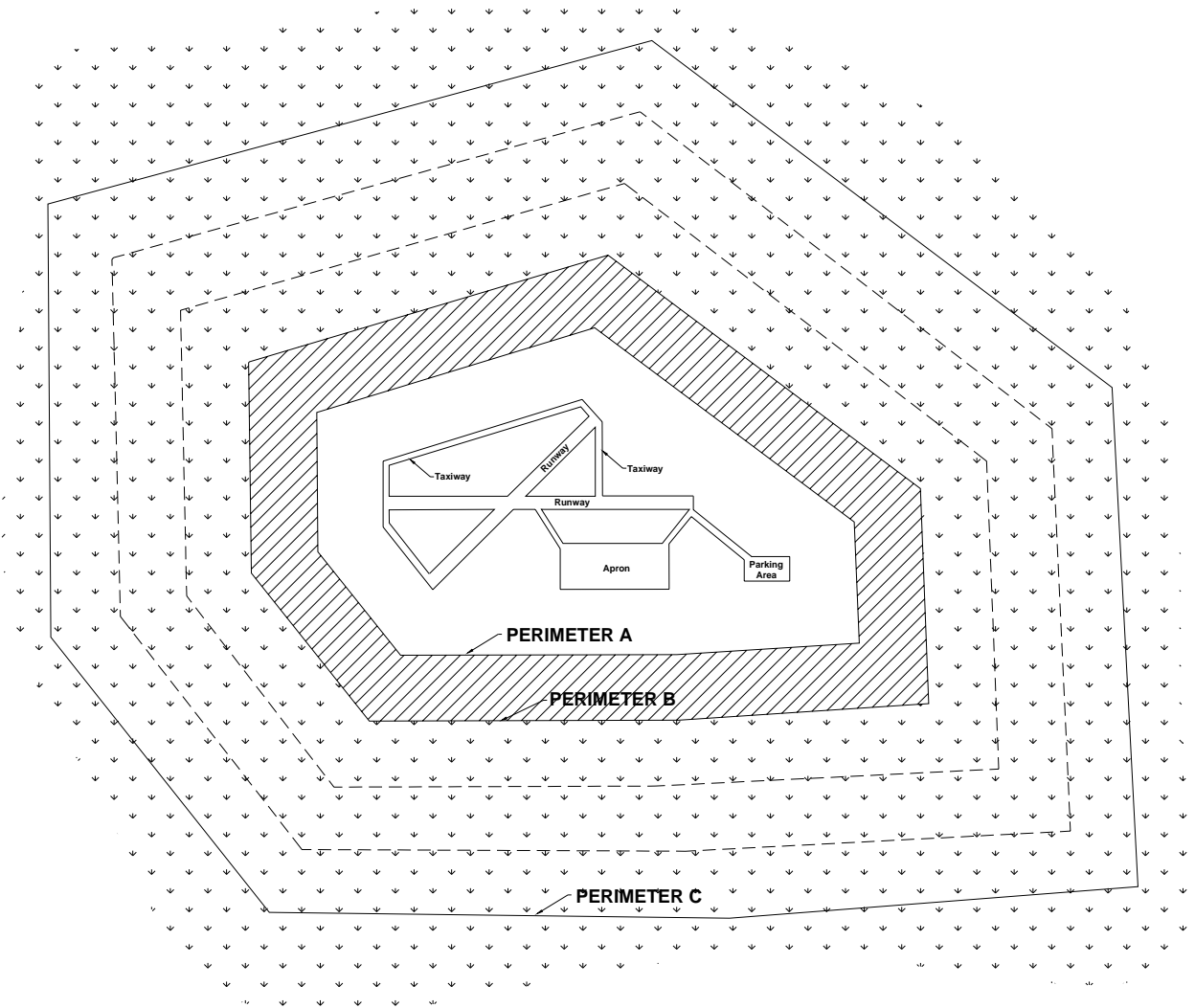
The basis for the separation criteria contained in this section can be found in existing FAA regulations. The separation distances are based on (1) flight patterns of piston-powered aircraft and turbine-powered aircraft, (2) the altitude at which most strikes happen (78 percent occur under 1,000 feet and 90 percent occur under 3,000 feet above ground level), and (3) National Transportation Safety Board (NTSB) recommendations.

**1-2. AIRPORTS SERVING PISTON-POWERED AIRCRAFT.** Airports that do not sell Jet-A fuel normally serve piston-powered aircraft. Notwithstanding more stringent requirements for specific land uses, the FAA recommends a separation distance of 5,000 feet at these airports for any of the hazardous wildlife attractants mentioned in Section 2 or for new airport development projects meant to accommodate aircraft movement. This distance is to be maintained between an airport's AOA and the hazardous wildlife attractant. Figure 1 depicts this separation distance measured from the nearest aircraft operations areas.

**1-3. AIRPORTS SERVING TURBINE-POWERED AIRCRAFT.** Airports selling Jet-A fuel normally serve turbine-powered aircraft. Notwithstanding more stringent requirements for specific land uses, the FAA recommends a separation distance of 10,000 feet at these airports for any of the hazardous wildlife attractants mentioned in Section 2 or for new airport development projects meant to accommodate aircraft movement. This distance is to be maintained between an airport's AOA and the hazardous wildlife attractant. Figure 1 depicts this separation distance from the nearest aircraft movement areas.

**1-4. PROTECTION OF APPROACH, DEPARTURE, AND CIRCLING AIRSPACE.** For all airports, the FAA recommends a distance of 5 statute miles between the farthest edge of the airport's AOA and the hazardous wildlife attractant if the attractant could cause hazardous wildlife movement into or across the approach or departure airspace.

Figure 1. Separation distances within which hazardous wildlife attractants should be avoided, eliminated, or mitigated.



**PERIMETER A:** For airports serving piston-powered aircraft, hazardous wildlife attractants must be 5,000 feet from the nearest air operations area.

**PERIMETER B:** For airports serving turbine-powered aircraft, hazardous wildlife attractants must be 10,000 feet from the nearest air operations area.

**PERIMETER C:** 5-mile range to protect approach, departure and circling airspace.

## SECTION 2.

### LAND-USE PRACTICES ON OR NEAR AIRPORTS THAT POTENTIALLY ATTRACT HAZARDOUS WILDLIFE.

**2-1. GENERAL.** The wildlife species and the size of the populations attracted to the airport environment vary considerably, depending on several factors, including land-use practices on or near the airport. This section discusses land-use practices having the potential to attract hazardous wildlife and threaten aviation safety. In addition to the specific considerations outlined below, airport operators should refer to *Wildlife Hazard Management at Airports*, prepared by FAA and U.S. Department of Agriculture (USDA) staff. (This manual is available in English, Spanish, and French. It can be viewed and downloaded free of charge from the FAA's wildlife hazard mitigation web site: <http://wildlife-mitigation.tc.FAA.gov>.) And, *Prevention and Control of Wildlife Damage*, compiled by the University of Nebraska Cooperative Extension Division. (This manual is available online in a periodically updated version at: [ianrwww.unl.edu/wildlife/solutions/handbook/](http://ianrwww.unl.edu/wildlife/solutions/handbook/).)

**2-2. WASTE DISPOSAL OPERATIONS.** Municipal solid waste landfills (MSWLF) are known to attract large numbers of hazardous wildlife, particularly birds. Because of this, these operations, when located within the separations identified in the siting criteria in Sections 1-2 through 1-4, are considered incompatible with safe airport operations.

**a. Siting for new municipal solid waste landfills subject to AIR 21.** Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (Public Law 106-181) (AIR 21) prohibits the construction or establishment of a new MSWLF within 6 statute miles of certain public-use airports. Before these prohibitions apply, both the airport and the landfill must meet the very specific conditions described below. These restrictions do not apply to airports or landfills located within the state of Alaska.

The airport must (1) have received a Federal grant(s) under 49 U.S.C. § 47101, et. seq.; (2) be under control of a public agency; (3) serve some scheduled air carrier operations conducted in aircraft with less than 60 seats; and (4) have total annual enplanements consisting of at least 51 percent of scheduled air carrier enplanements conducted in aircraft with less than 60 passenger seats.

The proposed MSWLF must (1) be within 6 miles of the airport, as measured from airport property line to MSWLF property line, and (2) have started construction or establishment on or after April 5, 2001. Public Law 106-181 only limits the construction or establishment of some new MSWLF. It does not limit the expansion, either vertical or horizontal, of existing landfills.

NOTE: Consult the most recent version of AC 150/5200-34, *Construction or Establishment of Landfills Near Public Airports*, for a more detailed discussion of these restrictions.

- b. Siting for new MSWLF not subject to AIR 21.** If an airport and MSWLF do not meet the restrictions of Public Law 106-181, the FAA recommends against locating MSWLF within the separation distances identified in Sections 1-2 through 1-4. The separation distances should be measured from the closest point of the airport's AOA to the closest planned MSWLF cell.
- c. Considerations for existing waste disposal facilities within the limits of separation criteria.** The FAA recommends against airport development projects that would increase the number of aircraft operations or accommodate larger or faster aircraft near MSWLF operations located within the separations identified in Sections 1-2 through 1-4. In addition, in accordance with 40 CFR 258.10, owners or operators of existing MSWLF units that are located within the separations listed in Sections 1-2 through 1-4 must demonstrate that the unit is designed and operated so it does not pose a bird hazard to aircraft. (See Section 4-2(b) of this AC for a discussion of this demonstration requirement.)
- d. Enclosed trash transfer stations.** Enclosed waste-handling facilities that receive garbage behind closed doors; process it via compaction, incineration, or similar manner; and remove all residue by enclosed vehicles generally are compatible with safe airport operations, provided they are not located on airport property or within the Runway Protection Zone (RPZ). These facilities should not handle or store putrescible waste outside or in a partially enclosed structure accessible to hazardous wildlife. Trash transfer facilities that are open on one or more sides; that store uncovered quantities of municipal solid waste outside, even if only for a short time; that use semi-trailers that leak or have trash clinging to the outside; or that do not control odors by ventilation and filtration systems (odor masking is not acceptable) do not meet the FAA's definition of fully enclosed trash transfer stations. The FAA considers these facilities incompatible with safe airport operations if they are located closer than the separation distances specified in Sections 1-2 through 1-4.
- e. Composting operations on or near airport property.** Composting operations that accept only yard waste (e.g., leaves, lawn clippings, or branches) generally do not attract hazardous wildlife. Sewage sludge, woodchips, and similar material are not municipal solid wastes and may be used as compost bulking agents. The compost, however, must never include food or other municipal solid waste. Composting operations should not be located on airport property. Off-airport property composting operations should be located no closer than the greater of the following distances: 1,200 feet from any AOA or the distance called for by airport design requirements (see AC 150/5300-13, *Airport Design*). This spacing should prevent material, personnel, or equipment from penetrating any Object Free Area (OFA), Obstacle Free Zone (OFZ), Threshold Siting Surface (TSS), or Clearway. Airport operators should monitor composting operations located in proximity to the airport to ensure that steam or thermal rise does not adversely affect air traffic. On-airport disposal of compost by-products should not be conducted for the reasons stated in 2-3f.

- f. **Underwater waste discharges.** The FAA recommends against the underwater discharge of any food waste (e.g., fish processing offal) within the separations identified in Sections 1-2 through 1-4 because it could attract scavenging hazardous wildlife.
- g. **Recycling centers.** Recycling centers that accept previously sorted non-food items, such as glass, newspaper, cardboard, or aluminum, are, in most cases, not attractive to hazardous wildlife and are acceptable.
- h. **Construction and demolition (C&D) debris facilities.** C&D landfills do not generally attract hazardous wildlife and are acceptable if maintained in an orderly manner, admit no putrescible waste, and are not co-located with other waste disposal operations. However, C&D landfills have similar visual and operational characteristics to putrescible waste disposal sites. When co-located with putrescible waste disposal operations, C&D landfills are more likely to attract hazardous wildlife because of the similarities between these disposal facilities. Therefore, a C&D landfill co-located with another waste disposal operation should be located outside of the separations identified in Sections 1-2 through 1-4.
- i. **Fly ash disposal.** The incinerated residue from resource recovery power/heat-generating facilities that are fired by municipal solid waste, coal, or wood is generally not a wildlife attractant because it no longer contains putrescible matter. Landfills accepting only fly ash are generally not considered to be wildlife attractants and are acceptable as long as they are maintained in an orderly manner, admit no putrescible waste of any kind, and are not co-located with other disposal operations that attract hazardous wildlife.

Since varying degrees of waste consumption are associated with general incineration (not resource recovery power/heat-generating facilities), the FAA considers the ash from general incinerators a regular waste disposal by-product and, therefore, a hazardous wildlife attractant if disposed of within the separation criteria outlined in Sections 1-2 through 1-4.

**2-3. WATER MANAGEMENT FACILITIES.** Drinking water intake and treatment facilities, storm water and wastewater treatment facilities, associated retention and settling ponds, ponds built for recreational use, and ponds that result from mining activities often attract large numbers of potentially hazardous wildlife. To prevent wildlife hazards, land-use developers and airport operators may need to develop management plans, in compliance with local and state regulations, to support the operation of storm water management facilities on or near all public-use airports to ensure a safe airport environment.

- a. **Existing storm water management facilities.** On-airport storm water management facilities allow the quick removal of surface water, including discharges related to aircraft deicing, from impervious surfaces, such as pavement and terminal/hangar building roofs. Existing on-airport detention ponds collect storm water, protect water quality, and control runoff. Because they slowly release water

after storms, they create standing bodies of water that can attract hazardous wildlife. Where the airport has developed a Wildlife Hazard Management Plan (WHMP) in accordance with Part 139, the FAA requires immediate correction of any wildlife hazards arising from existing storm water facilities located on or near airports, using appropriate wildlife hazard mitigation techniques. Airport operators should develop measures to minimize hazardous wildlife attraction in consultation with a wildlife damage management biologist.

Where possible, airport operators should modify storm water detention ponds to allow a maximum 48-hour detention period for the design storm. The FAA recommends that airport operators avoid or remove retention ponds and detention ponds featuring dead storage to eliminate standing water. Detention basins should remain totally dry between rainfalls. Where constant flow of water is anticipated through the basin, or where any portion of the basin bottom may remain wet, the detention facility should include a concrete or paved pad and/or ditch/swale in the bottom to prevent vegetation that may provide nesting habitat.

When it is not possible to drain a large detention pond completely, airport operators may use physical barriers, such as bird balls, wires grids, pillows, or netting, to deter birds and other hazardous wildlife. When physical barriers are used, airport operators must evaluate their use and ensure they will not adversely affect water rescue. Before installing any physical barriers over detention ponds on Part 139 airports, airport operators must get approval from the appropriate FAA Regional Airports Division Office.

The FAA recommends that airport operators encourage off-airport storm water treatment facility operators to incorporate appropriate wildlife hazard mitigation techniques into storm water treatment facility operating practices when their facility is located within the separation criteria specified in Sections 1-2 through 1-4.

- b. New storm water management facilities.** The FAA strongly recommends that off-airport storm water management systems located within the separations identified in Sections 1-2 through 1-4 be designed and operated so as not to create above-ground standing water. Stormwater detention ponds should be designed, engineered, constructed, and maintained for a maximum 48-hour detention period after the design storm and remain completely dry between storms. To facilitate the control of hazardous wildlife, the FAA recommends the use of steep-sided, rip-rap lined, narrow, linearly shaped water detention basins. When it is not possible to place these ponds away from an airport's AOA, airport operators should use physical barriers, such as bird balls, wires grids, pillows, or netting, to prevent access of hazardous wildlife to open water and minimize aircraft-wildlife interactions. When physical barriers are used, airport operators must evaluate their use and ensure they will not adversely affect water rescue. Before installing any physical barriers over detention ponds on Part 139 airports, airport operators must get approval from the appropriate FAA Regional Airports Division Office. All vegetation in or around detention basins that provide food or cover for hazardous wildlife should be eliminated. If soil conditions and other requirements allow, the FAA encourages

the use of underground storm water infiltration systems, such as French drains or buried rock fields, because they are less attractive to wildlife.

- c. Existing wastewater treatment facilities.** The FAA strongly recommends that airport operators immediately correct any wildlife hazards arising from existing wastewater treatment facilities located on or near the airport. Where required, a WHMP developed in accordance with Part 139 will outline appropriate wildlife hazard mitigation techniques. Accordingly, airport operators should encourage wastewater treatment facility operators to incorporate measures, developed in consultation with a wildlife damage management biologist, to minimize hazardous wildlife attractants. Airport operators should also encourage those wastewater treatment facility operators to incorporate these mitigation techniques into their standard operating practices. In addition, airport operators should consider the existence of wastewater treatment facilities when evaluating proposed sites for new airport development projects and avoid such sites when practicable.
- d. New wastewater treatment facilities.** The FAA strongly recommends against the construction of new wastewater treatment facilities or associated settling ponds within the separations identified in Sections 1-2 through 1-4. Appendix 1 defines wastewater treatment facility as “any devices and/or systems used to store, treat, recycle, or reclaim municipal sewage or liquid industrial wastes.” The definition includes any pretreatment involving the reduction of the amount of pollutants or the elimination of pollutants prior to introducing such pollutants into a publicly owned treatment works (wastewater treatment facility). During the site-location analysis for wastewater treatment facilities, developers should consider the potential to attract hazardous wildlife if an airport is in the vicinity of the proposed site, and airport operators should voice their opposition to such facilities if they are in proximity to the airport.
- e. Artificial marshes.** In warmer climates, wastewater treatment facilities sometimes employ artificial marshes and use submergent and emergent aquatic vegetation as natural filters. These artificial marshes may be used by some species of flocking birds, such as blackbirds and waterfowl, for breeding or roosting activities. The FAA strongly recommends against establishing artificial marshes within the separations identified in Sections 1-2 through 1-4.
- f. Wastewater discharge and sludge disposal.** The FAA recommends against the discharge of wastewater or sludge on airport property because it may improve soil moisture and quality on unpaved areas and lead to improved turf growth that can be an attractive food source for many species of animals. Also, the turf requires more frequent mowing, which in turn may mutilate or flush insects or small animals and produce straw, both of which can attract hazardous wildlife. In addition, the improved turf may attract grazing wildlife, such as deer and geese. Problems may also occur when discharges saturate unpaved airport areas. The resultant soft, muddy conditions can severely restrict or prevent emergency vehicles from reaching accident sites in a timely manner.



**2-4. WETLANDS.** Wetlands provide a variety of functions and can be regulated by local, state, and Federal laws. Normally, wetlands are attractive to many types of wildlife, including many which rank high on the list of hazardous wildlife species (Table 1).

**NOTE:** If questions exist as to whether an area qualifies as a wetland, contact the local division of the U.S. Army Corps of Engineers, the Natural Resources Conservation Service, or a wetland consultant qualified to delineate wetlands.

- a. Existing wetlands on or near airport property.** If wetlands are located on or near airport property, airport operators should be alert to any wildlife use or habitat changes in these areas that could affect safe aircraft operations. At public-use airports, the FAA recommends immediately correcting, in cooperation with local, state, and Federal regulatory agencies, any wildlife hazards arising from existing wetlands located on or near airports. Where required, a WHMP will outline appropriate wildlife hazard mitigation techniques. Accordingly, airport operators should develop measures to minimize hazardous wildlife attraction in consultation with a wildlife damage management biologist.
- b. New airport development.** Whenever possible, the FAA recommends locating new airports using the separations from wetlands identified in Sections 1-2 through 1-4. Where alternative sites are not practicable, or when airport operators are expanding an existing airport into or near wetlands, a wildlife damage management biologist, in consultation with the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and the state wildlife management agency should evaluate the wildlife hazards and prepare a WHMP that indicates methods of minimizing the hazards.
- c. Mitigation for wetland impacts from airport projects.** Wetland mitigation may be necessary when unavoidable wetland disturbances result from new airport development projects or projects required to correct wildlife hazards from wetlands. Wetland mitigation must be designed so it does not create a wildlife hazard. The FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the separations identified in Sections 1-2 through 1-4.

**(1) Onsite mitigation of wetland functions.** The FAA may consider exceptions to locating mitigation activities outside the separations identified in Sections 1-2 through 1-4 if the affected wetlands provide unique ecological functions, such as critical habitat for threatened or endangered species or ground water recharge, which cannot be replicated when moved to a different location. Using existing airport property is sometimes the only feasible way to achieve the mitigation ratios mandated in regulatory orders and/or settlement agreements with the resource agencies. Conservation easements are an additional means of providing mitigation for project impacts. Typically the airport operator continues to own the property, and an easement is created stipulating that the property will be maintained as habitat for state or Federally listed species.

Mitigation must not inhibit the airport operator's ability to effectively control hazardous wildlife on or near the mitigation site or effectively maintain other aspects of safe airport operations. Enhancing such mitigation areas to attract hazardous wildlife must be avoided. The FAA will review any onsite mitigation proposals to determine compatibility with safe airport operations. A wildlife damage management biologist should evaluate any wetland mitigation projects that are needed to protect unique wetland functions and that must be located in the separation criteria in Sections 1-2 through 1-4 before the mitigation is implemented. A WHMP should be developed to reduce the wildlife hazards.

**(2) Offsite mitigation of wetland functions.** The FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the separations identified in Sections 1-2 through 1-4 unless they provide unique functions that must remain onsite (see 2-4c(1)). Agencies that regulate impacts to or around wetlands recognize that it may be necessary to split wetland functions in mitigation schemes. Therefore, regulatory agencies may, under certain circumstances, allow portions of mitigation to take place in different locations.

**(3) Mitigation banking.** Wetland mitigation banking is the creation or restoration of wetlands in order to provide mitigation credits that can be used to offset permitted wetland losses. Mitigation banking benefits wetland resources by providing advance replacement for permitted wetland losses; consolidating small projects into larger, better-designed and managed units; and encouraging integration of wetland mitigation projects with watershed planning. This last benefit is most helpful for airport projects, as wetland impacts mitigated outside of the separations identified in Sections 1-2 through 1-4 can still be located within the same watershed. Wetland mitigation banks meeting the separation criteria offer an ecologically sound approach to mitigation in these situations. Airport operators should work with local watershed management agencies or organizations to develop mitigation banking for wetland impacts on airport property.

**2-5. DREDGE SPOIL CONTAINMENT AREAS.** The FAA recommends against locating dredge spoil containment areas (also known as Confined Disposal Facilities) within the separations identified in Sections 1-2 through 1-4 if the containment area or the spoils contain material that would attract hazardous wildlife.

**2-6. AGRICULTURAL ACTIVITIES.** Because most, if not all, agricultural crops can attract hazardous wildlife during some phase of production, the FAA recommends against the used of airport property for agricultural production, including hay crops, within the separations identified in Sections 1-2 through 1-4. . If the airport has no financial alternative to agricultural crops to produce income necessary to maintain the viability of the airport, then the airport shall follow the crop distance guidelines listed in the table titled "Minimum Distances between Certain Airport Features and Any On-Airport Agricultural Crops" found in AC 150/5300-13, *Airport Design*, Appendix 17. The cost of wildlife control and potential accidents should be weighed against the income produced by the on-airport crops when deciding whether to allow crops on the airport.

- a. Livestock production.** Confined livestock operations (i.e., feedlots, dairy operations, hog or chicken production facilities, or egg laying operations) often attract flocking birds, such as starlings, that pose a hazard to aviation. Therefore, The FAA recommends against such facilities within the separations identified in Sections 1-2 through 1-4. Any livestock operation within these separations should have a program developed to reduce the attractiveness of the site to species that are hazardous to aviation safety. Free-ranging livestock must not be grazed on airport property because the animals may wander onto the AOA. Furthermore, livestock feed, water, and manure may attract birds.
- b. Aquaculture.** Aquaculture activities (i.e. catfish or trout production) conducted outside of fully enclosed buildings are inherently attractive to a wide variety of birds. Existing aquaculture facilities/activities within the separations listed in Sections 1-2 through 1-4 must have a program developed to reduce the attractiveness of the sites to species that are hazardous to aviation safety. Airport operators should also oppose the establishment of new aquaculture facilities/activities within the separations listed in Sections 1-2 through 1-4.
- c. Alternative uses of agricultural land.** Some airports are surrounded by vast areas of farmed land within the distances specified in Sections 1-2 through 1-4. Seasonal uses of agricultural land for activities such as hunting can create a hazardous wildlife situation. In some areas, farmers will rent their land for hunting purposes. Rice farmers, for example, flood their land during waterfowl hunting season and obtain additional revenue by renting out duck blinds. The duck hunters then use decoys and call in hundreds, if not thousands, of birds, creating a tremendous threat to aircraft safety. A wildlife damage management biologist should review, in coordination with local farmers and producers, these types of seasonal land uses and incorporate them into the WHMP.

## **2-7. GOLF COURSES, LANDSCAPING AND OTHER LAND-USE CONSIDERATIONS.**

- a. Golf courses.** The large grassy areas and open water found on most golf courses are attractive to hazardous wildlife, particularly Canada geese and some species of gulls. These species can pose a threat to aviation safety. The FAA recommends against construction of new golf courses within the separations identified in Sections 1-2 through 1-4. Existing golf courses located within these separations must develop a program to reduce the attractiveness of the sites to species that are hazardous to aviation safety. Airport operators should ensure these golf courses are monitored on a continuing basis for the presence of hazardous wildlife. If hazardous wildlife is detected, corrective actions should be immediately implemented.
- b. Landscaping and landscape maintenance.** Depending on its geographic location, landscaping can attract hazardous wildlife. The FAA recommends that airport operators approach landscaping with caution and confine it to airport areas not associated with aircraft movements. A wildlife damage management biologist should review all landscaping plans. Airport operators should also monitor all landscaped areas on a continuing basis for the presence of hazardous wildlife. If

hazardous wildlife is detected, corrective actions should be immediately implemented.

Turf grass areas can be highly attractive to a variety of hazardous wildlife species. Research conducted by the USDA Wildlife Services' National Wildlife Research Center has shown that no one grass management regime will deter all species of hazardous wildlife in all situations. In cooperation with wildlife damage management biologist, airport operators should develop airport turf grass management plans on a prescription basis, depending on the airport's geographic locations and the type of hazardous wildlife likely to frequent the airport

Airport operators should ensure that plant varieties attractive to hazardous wildlife are not used on the airport. Disturbed areas or areas in need of re-vegetating should not be planted with seed mixtures containing millet or any other large-seed producing grass. For airport property already planted with seed mixtures containing millet, rye grass, or other large-seed producing grasses, the FAA recommends disking, plowing, or another suitable agricultural practice to prevent plant maturation and seed head production. Plantings should follow the specific recommendations for grass management and seed and plant selection made by the State University Cooperative Extension Service, the local office of Wildlife Services, or a qualified wildlife damage management biologist. Airport operators should also consider developing and implementing a preferred/prohibited plant species list, reviewed by a wildlife damage management biologist, which has been designed for the geographic location to reduce the attractiveness to hazardous wildlife for landscaping airport property.

- c. Airports surrounded by wildlife habitat.** The FAA recommends that operators of airports surrounded by woodlands, water, or wetlands refer to Section 2.4 of this AC. Operators of such airports should provide for a Wildlife Hazard Assessment (WHA) conducted by a wildlife damage management biologist. This WHA is the first step in preparing a WHMP, where required.
- d. Other hazardous wildlife attractants.** Other specific land uses or activities (e.g., sport or commercial fishing, shellfish harvesting, etc.), perhaps unique to certain regions of the country, have the potential to attract hazardous wildlife. Regardless of the source of the attraction, when hazardous wildlife is noted on a public-use airport, airport operators must take prompt remedial action(s) to protect aviation safety.

**2-8. SYNERGISTIC EFFECTS OF SURROUNDING LAND USES.** There may be circumstances where two (or more) different land uses that would not, by themselves, be considered hazardous wildlife attractants or that are located outside of the separations identified in Sections 1-2 through 1-4 that are in such an alignment with the airport as to create a wildlife corridor directly through the airport and/or surrounding airspace. An example of this situation may involve a lake located outside of the separation criteria on the east side of an airport and a large hayfield on the west side of an airport, land uses that together could create a flyway for Canada geese directly across the airspace of the airport. There are numerous examples of such situations;

therefore, airport operators and the wildlife damage management biologist must consider the entire surrounding landscape and community when developing the WHMP.

## SECTION 3.

### PROCEDURES FOR WILDLIFE HAZARD MANAGEMENT BY OPERATORS OF PUBLIC-USE AIRPORTS.

**3.1. INTRODUCTION.** In recognition of the increased risk of serious aircraft damage or the loss of human life that can result from a wildlife strike, the FAA may require the development of a Wildlife Hazard Management Plan (WHMP) when specific triggering events occur on or near the airport. Part 139.337 discusses the specific events that trigger a Wildlife Hazard Assessment (WHA) and the specific issues that a WHMP must address for FAA approval and inclusion in an Airport Certification Manual.

**3.2. COORDINATION WITH USDA WILDLIFE SERVICES OR OTHER QUALIFIED WILDLIFE DAMAGE MANAGEMENT BIOLOGISTS.** The FAA will use the Wildlife Hazard Assessment (WHA) conducted in accordance with Part 139 to determine if the airport needs a WHMP. Therefore, persons having the education, training, and expertise necessary to assess wildlife hazards must conduct the WHA. The airport operator may look to Wildlife Services or to qualified private consultants to conduct the WHA. When the services of a wildlife damage management biologist are required, the FAA recommends that land-use developers or airport operators contact a consultant specializing in wildlife damage management or the appropriate state director of Wildlife Services.

**NOTE:** Telephone numbers for the respective USDA Wildlife Services state offices can be obtained by contacting USDA Wildlife Services Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD, 20737-1234, Telephone (301) 734-7921, Fax (301) 734-5157 (<http://www.aphis.usda.gov/ws/>).

**3-3. WILDLIFE HAZARD MANAGEMENT AT AIRPORTS: A MANUAL FOR AIRPORT PERSONNEL.** This manual, prepared by FAA and USDA Wildlife Services staff, contains a compilation of information to assist airport personnel in the development, implementation, and evaluation of WHMPs at airports. The manual includes specific information on the nature of wildlife strikes, legal authority, regulations, wildlife management techniques, WHAs, WHMPs, and sources of help and information. The manual is available in three languages: English, Spanish, and French. It can be viewed and downloaded free of charge from the FAA's wildlife hazard mitigation web site: <http://wildlife-mitigation.tc.FAA.gov/>. This manual only provides a starting point for addressing wildlife hazard issues at airports. Hazardous wildlife management is a complex discipline and conditions vary widely across the United States. Therefore, qualified wildlife damage management biologists must direct the development of a WHMP and the implementation of management actions by airport personnel.

There are many other resources complementary to this manual for use in developing and implementing WHMPs. Several are listed in the manual's bibliography.

**3-4. WILDLIFE HAZARD ASSESSMENTS, TITLE 14, CODE OF FEDERAL REGULATIONS, PART 139.** Part 139.337(b) requires airport operators to conduct a Wildlife Hazard Assessment (WHA) when certain events occur on or near the airport.

Part 139.337 (c) provides specific guidance as to what facts must be addressed in a WHA.

**3-5. WILDLIFE HAZARD MANAGEMENT PLAN (WHMP).** The FAA will consider the results of the WHA, along with the aeronautical activity at the airport and the views of the airport operator and airport users, in determining whether a formal WHMP is needed, in accordance with Part 139.337. If the FAA determines that a WHMP is needed, the airport operator must formulate and implement a WHMP, using the WHA as the basis for the plan.

The goal of an airport's Wildlife Hazard Management Plan is to minimize the risk to aviation safety, airport structures or equipment, or human health posed by populations of hazardous wildlife on and around the airport.

The WHMP must identify hazardous wildlife attractants on or near the airport and the appropriate wildlife damage management techniques to minimize the wildlife hazard. It must also prioritize the management measures.

**3-6. LOCAL COORDINATION.** The establishment of a Wildlife Hazards Working Group (WHWG) will facilitate the communication, cooperation, and coordination of the airport and its surrounding community necessary to ensure the effectiveness of the WHMP. The cooperation of the airport community is also necessary when new projects are considered. Whether on or off the airport, the input from all involved parties must be considered when a potentially hazardous wildlife attractant is being proposed. Airport operators should also incorporate public education activities with the local coordination efforts because some activities in the vicinity of your airport, while harmless under normal leisure conditions, can attract wildlife and present a danger to aircraft. For example, if public trails are planned near wetlands or in parks adjoining airport property, the public should know that feeding birds and other wildlife in the area may pose a risk to aircraft.

Airport operators should work with local and regional planning and zoning boards so as to be aware of proposed land-use changes, or modification of existing land uses, that could create hazardous wildlife attractants within the separations identified in Sections 1-2 through 1-4. Pay particular attention to proposed land uses involving creation or expansion of waste water treatment facilities, development of wetland mitigation sites, or development or expansion of dredge spoil containment areas. At the very least, airport operators must ensure they are on the notification list of the local planning board or equivalent review entity for all communities located within 5 miles of the airport, so they will receive notification of any proposed project and have the opportunity to review it for attractiveness to hazardous wildlife.

**3-7 COORDINATION/NOTIFICATION OF AIRMEN OF WILDLIFE HAZARDS.** If an existing land-use practice creates a wildlife hazard and the land-use practice or wildlife hazard cannot be immediately eliminated, airport operators must issue a Notice to Airmen (NOTAM) and encourage the land-owner or manager to take steps to control the wildlife hazard and minimize further attraction.

## SECTION 4.

### FAA NOTIFICATION AND REVIEW OF PROPOSED LAND-USE PRACTICE CHANGES IN THE VICINITY OF PUBLIC-USE AIRPORTS

#### 4-1. FAA REVIEW OF PROPOSED LAND-USE PRACTICE CHANGES IN THE VICINITY OF PUBLIC-USE AIRPORTS.

- a. The FAA discourages the development of waste disposal and other facilities, discussed in Section 2, located within the 5,000/10,000-foot criteria specified in Sections 1-2 through 1-4.
- b. For projects that are located outside the 5,000/10,000-foot criteria but within 5 statute miles of the airport's AOA, the FAA may review development plans, proposed land-use changes, operational changes, or wetland mitigation plans to determine if such changes present potential wildlife hazards to aircraft operations. The FAA considers sensitive airport areas as those that lie under or next to approach or departure airspace. This brief examination should indicate if further investigation is warranted.
- c. Where a wildlife damage management biologist has conducted a further study to evaluate a site's compatibility with airport operations, the FAA may use the study results to make a determination.

#### 4-2. WASTE MANAGEMENT FACILITIES.

- a. **Notification of new/expanded project proposal.** Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (Public Law 106-181) limits the construction or establishment of new MSWLF within 6 statute miles of certain public-use airports, when both the airport and the landfill meet very specific conditions. See Section 2-2 of this AC and AC 150/5200-34 for a more detailed discussion of these restrictions.

The Environmental Protection Agency (EPA) requires any MSWLF operator proposing a new or expanded waste disposal operation within 5 statute miles of a runway end to notify the appropriate FAA Regional Airports Division Office and the airport operator of the proposal (40 CFR 258, *Criteria for Municipal Solid Waste Landfills*, Section 258.10, *Airport Safety*). The EPA also requires owners or operators of new MSWLF units, or lateral expansions of existing MSWLF units, that are located within 10,000 feet of any airport runway end used by turbojet aircraft, or within 5,000 feet of any airport runway end used only by piston-type aircraft, to demonstrate successfully that such units are not hazards to aircraft. (See 4-2.b below.)

When new or expanded MSWLF are being proposed near airports, MSWLF operators must notify the airport operator and the FAA of the proposal as early as possible pursuant to 40 CFR 258.



- b. Waste handling facilities within separations identified in Sections 1-2 through 1-4.** To claim successfully that a waste-handling facility sited within the separations identified in Sections 1-2 through 1-4 does not attract hazardous wildlife and does not threaten aviation, the developer must establish convincingly that the facility will not handle putrescible material other than that as outlined in 2-2.d. The FAA strongly recommends against any facility other than that as outlined in 2-2.d (enclosed transfer stations). The FAA will use this information to determine if the facility will be a hazard to aviation.
- c. Putrescible-Waste Facilities.** In their effort to satisfy the EPA requirement, some putrescible-waste facility proponents may offer to undertake experimental measures to demonstrate that their proposed facility will not be a hazard to aircraft. To date, no such facility has been able to demonstrate an ability to reduce and sustain hazardous wildlife to levels that existed before the putrescible-waste landfill began operating. For this reason, demonstrations of experimental wildlife control measures may not be conducted within the separation identified in Sections 1-2 through 1-4.

**4-3. OTHER LAND-USE PRACTICE CHANGES.** As a matter of policy, the FAA encourages operators of public-use airports who become aware of proposed land use practice changes that may attract hazardous wildlife within 5 statute miles of their airports to promptly notify the FAA. The FAA also encourages proponents of such land use changes to notify the FAA as early in the planning process as possible. Advanced notice affords the FAA an opportunity (1) to evaluate the effect of a particular land-use change on aviation safety and (2) to support efforts by the airport sponsor to restrict the use of land next to or near the airport to uses that are compatible with the airport.

The airport operator, project proponent, or land-use operator may use FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, or other suitable documents similar to FAA Form 7460-1 to notify the appropriate FAA Regional Airports Division Office. Project proponents can contact the appropriate FAA Regional Airports Division Office for assistance with the notification process.

It is helpful if the notification includes a 15-minute quadrangle map of the area identifying the location of the proposed activity. The land-use operator or project proponent should also forward specific details of the proposed land-use change or operational change or expansion. In the case of solid waste landfills, the information should include the type of waste to be handled, how the waste will be processed, and final disposal methods.

- a. Airports that have received Federal grant-in-aid assistance.** Airports that have received Federal grant-in-aid assistance are required by their grant assurances to take appropriate actions to restrict the use of land next to or near the airport to uses that are compatible with normal airport operations. The FAA recommends that airport operators to the extent practicable oppose off-airport land-use changes or practices within the separations identified in Sections 1-2 through 1-4 that may attract hazardous wildlife. Failure to do so may lead to noncompliance with applicable grant assurances. The FAA will not approve the placement of airport

development projects pertaining to aircraft movement in the vicinity of hazardous wildlife attractants without appropriate mitigating measures. Increasing the intensity of wildlife control efforts is not a substitute for eliminating or reducing a proposed wildlife hazard. Airport operators should identify hazardous wildlife attractants and any associated wildlife hazards during any planning process for new airport development projects.

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**APPENDIX 1. DEFINITIONS OF TERMS USED IN THIS ADVISORY CIRCULAR.**

1. **GENERAL.** This appendix provides definitions of terms used throughout this AC.

1. **Air operations area.** Any area of an airport used or intended to be used for landing, takeoff, or surface maneuvering of aircraft. An air operations area includes such paved areas or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiways, or apron.
2. **Airport operator.** The operator (private or public) or sponsor of a public-use airport.
3. **Approach or departure airspace.** The airspace, within 5 statute miles of an airport, through which aircraft move during landing or takeoff.
4. **Bird balls.** High-density plastic floating balls that can be used to cover ponds and prevent birds from using the sites.
5. **Certificate holder.** The holder of an Airport Operating Certificate issued under Title 14, Code of Federal Regulations, Part 139.
6. **Construct a new MSWLF.** To begin to excavate, grade land, or raise structures to prepare a municipal solid waste landfill as permitted by the appropriate regulatory or permitting agency.
7. **Detention ponds.** Storm water management ponds that hold storm water for short periods of time, a few hours to a few days.
8. **Establish a new MSWLF.** When the first load of putrescible waste is received on-site for placement in a prepared municipal solid waste landfill.
9. **Fly ash.** The fine, sand-like residue resulting from the complete incineration of an organic fuel source. Fly ash typically results from the combustion of coal or waste used to operate a power generating plant.
10. **General aviation aircraft.** Any civil aviation aircraft not operating under 14 CFR Part 119, Certification: Air Carriers and Commercial Operators.
11. **Hazardous wildlife.** Species of wildlife (birds, mammals, reptiles), including feral animals and domesticated animals not under control, that are associated with aircraft strike problems, are capable of causing structural damage to airport facilities, or act as attractants to other wildlife that pose a strike hazard
12. **Municipal Solid Waste Landfill (MSWLF).** A publicly or privately owned discrete area of land or an excavation that receives household waste and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under 40 CFR § 257.2. An MSWLF may receive

other types wastes, such as commercial solid waste, non-hazardous sludge, small-quantity generator waste, and industrial solid waste, as defined under 40 CFR § 258.2. An MSWLF can consist of either a stand alone unit or several cells that receive household waste.

13. **New MSWLF.** A municipal solid waste landfill that was established or constructed after April 5, 2001.
14. **Piston-powered aircraft.** Fixed-wing aircraft powered by piston engines.
15. **Piston-use airport.** Any airport that does not sell Jet-A fuel for fixed-wing turbine-powered aircraft, and primarily serves fixed-wing, piston-powered aircraft. Incidental use of the airport by turbine-powered, fixed-wing aircraft would not affect this designation. However, such aircraft should not be based at the airport.
16. **Public agency.** A State or political subdivision of a State, a tax-supported organization, or an Indian tribe or pueblo (49 U.S.C. § 47102(19)).
17. **Public airport.** An airport used or intended to be used for public purposes that is under the control of a public agency; and of which the area used or intended to be used for landing, taking off, or surface maneuvering of aircraft is publicly owned (49 U.S.C. § 47102(20)).
18. **Public-use airport.** An airport used or intended to be used for public purposes, and of which the area used or intended to be used for landing, taking off, or surface maneuvering of aircraft may be under the control of a public agency or privately owned and used for public purposes (49 U.S.C. § 47102(21)).
19. **Putrescible waste.** Solid waste that contains organic matter capable of being decomposed by micro-organisms and of such a character and proportion as to be capable of attracting or providing food for birds (40 CFR §257.3-8).
20. **Putrescible-waste disposal operation.** Landfills, garbage dumps, underwater waste discharges, or similar facilities where activities include processing, burying, storing, or otherwise disposing of putrescible material, trash, and refuse.
21. **Retention ponds.** Storm water management ponds that hold water for several months.
22. **Runway protection zone (RPZ).** An area off the runway end to enhance the protection of people and property on the ground (see AC 150/5300-13). The dimensions of this zone vary with the airport design, aircraft, type of operation, and visibility minimum.
23. **Scheduled air carrier operation.** Any common carriage passenger-carrying operation for compensation or hire conducted by an air carrier or commercial

operator for which the air carrier, commercial operator, or their representative offers in advance the departure location, departure time, and arrival location. It does not include any operation that is conducted as a supplemental operation under 14 CFR Part 119 or as a public charter operation under 14 CFR Part 380 (14 CFR § 119.3).

- 24. Sewage sludge.** Any solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and a material derived from sewage sludge. Sewage does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works. (40 CFR 257.2)
- 25. Sludge.** Any solid, semi-solid, or liquid waste generated from a municipal, commercial or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility or any other such waste having similar characteristics and effect. (40 CFR 257.2)
- 26. Solid waste.** Any garbage, refuse, sludge, from a waste treatment plant, water supply treatment plant or air pollution control facility and other discarded material, including, solid liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved materials in domestic sewage, or solid or dissolved material in irrigation return flows or industrial discharges which are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880), or source, special nuclear, or by product material as defined by the Atomic Energy Act of 1954, as amended, (68 Stat. 923). (40 CFR 257.2)
- 27. Turbine-powered aircraft.** Aircraft powered by turbine engines including turbojets and turboprops but excluding turbo-shaft rotary-wing aircraft.
- 28. Turbine-use airport.** Any airport that sells Jet-A fuel for fixed-wing turbine-powered aircraft.
- 29. Wastewater treatment facility.** Any devices and/or systems used to store, treat, recycle, or reclaim municipal sewage or liquid industrial wastes, including Publicly Owned Treatment Works (POTW), as defined by Section 212 of the Federal Water Pollution Control Act (P.L. 92-500) as amended by the Clean Water Act of 1977 (P.L. 95-576) and the Water Quality Act of 1987 (P.L. 100-4). This definition includes any pretreatment involving the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a POTW. (See 40 CFR Section 403.3 (q), (r), & (s)).

- 30. Wildlife.** Any wild animal, including without limitation any wild mammal, bird, reptile, fish, amphibian, mollusk, crustacean, arthropod, coelenterate, or other invertebrate, including any part, product, egg, or offspring thereof (50 CFR 10.12, *Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants*). As used in this AC, wildlife includes feral animals and domestic animals out of the control of their owners (14 CFR Part 139, Certification of Airports).
- 31. Wildlife attractants.** Any human-made structure, land-use practice, or human-made or natural geographic feature that can attract or sustain hazardous wildlife within the landing or departure airspace or the airport's AOA. These attractants can include architectural features, landscaping, waste disposal sites, wastewater treatment facilities, agricultural or aquaculture activities, surface mining, or wetlands.
- 32. Wildlife hazard.** A potential for a damaging aircraft collision with wildlife on or near an airport.
- 33. Wildlife strike.** A wildlife strike is deemed to have occurred when:
- a. A pilot reports striking 1 or more birds or other wildlife;
  - b. Aircraft maintenance personnel identify aircraft damage as having been caused by a wildlife strike;
  - c. Personnel on the ground report seeing an aircraft strike 1 or more birds or other wildlife;
  - d. Bird or other wildlife remains, whether in whole or in part, are found within 200 feet of a runway centerline, unless another reason for the animal's death is identified;
  - e. The animal's presence on the airport had a significant negative effect on a flight (i.e., aborted takeoff, aborted landing, high-speed emergency stop, aircraft left pavement area to avoid collision with animal) (Transport Canada, Airports Group, *Wildlife Control Procedures Manual*, Technical Publication 11500E, 1994).

## 2. RESERVED.

## **APPENDIX H**

**FAA Cert Alert 04-16, Deer Hazard to Aircraft and Deer Fencing**







# Federal Aviation Administration

## National Part 139 CertAlert

\*\*Advisory\*\*Cautionary\*\*Non-Directive\*\*Advisory\*\*Cautionary\*\*Non-Directive\*\*Advisory\*\*Cautionary\*\*Non-Directive\*\*

**Date:** February 26, 2014 **No. 14-01**

**To:** Airport Operators, FAA Airport Certification Safety Inspectors

**Subject:** Seasonal Mitigation of Hazardous Species at Airports:  
Attention to Snowy Owls

**Points of Contact:** John Weller, AAS-300, (202) 267-3778, [John.Weller@FAA.gov](mailto:John.Weller@FAA.gov)  
Amy Anderson, AAS-300, (202) 267-7205, [Amy.Anderson@FAA.gov](mailto:Amy.Anderson@FAA.gov)

- 1. Purpose.** This CertAlert aims to heighten awareness of transient hazardous wildlife such as snowy owls (*Bubo scandiacus*). Although snowy owls at an airport may be a unique event, they should be prevented or discouraged from using airport environments because they pose a serious risk to aviation.
- 2. Background.** Seasonal changes in wildlife populations directly impact safety at airports. These changes can include seasonal migrations, brood rearing and fledging, fawning, calving, and other cyclical events. These variations in wildlife populations often require airports to look for and potentially alter how they mitigate hazardous species to reduce the risk of strikes.

Snowy owls periodically leave their northern breeding grounds en masse in movements called *irruptions* or *invasions*. These movements differ from seasonal migrations because they are unpredictable and not repeated annually. These irruptive migrations can greatly expand the winter distribution of the species. They represent a serious strike risk due to their size, flight characteristics, and behavior.

Snowy owls are rarely observed in the contiguous United States and attract exceptional attention when they arrive. They are large, slow-flying birds that hunt close to the ground. They prefer open, expansive habitats. Snowy owls easily tolerate human activities. Many of their daily movements occur in the same airspace as an aircraft's take-offs and landings.

- 3. Description.** The snowy owl stands almost 2 feet tall. Its wingspan exceeds 5 feet, and it weighs between 3 and 4 pounds. It is North America's heaviest owl and is commonly spotted during daylight hours. The plumage is largely white, with variable amounts of brown barring and spots.

Their diet is predominantly lemmings, when available. In the contiguous United States, their diet includes other small mammals and birds, including rodents, rabbits, squirrels, songbirds, waterfowl, and wading birds.

- 4. Actions.** The snowy owl is protected by the Migratory Bird Treaty Act (MBTA) and as such may be harassed or dispersed from airport environments using non-injurious methods. If federally permitted actions are necessary, such as capture and relocation, then airports must apply for a U.S. Fish and Wildlife Service Depredation Permit. If possible, the snowy owls should be released far from any airport.

Airports should not support the presence of snowy owls even though it may be an uncommon, short-lived event. Airports should not encourage snowy owls to remain on-site through purposeful inaction, or create attractive habitats or feeding opportunities. At no time should anyone feed snowy owls in an airport environment. Such actions can result in hazards to aviation.



Snowy Owl (*Bubo scandiacus*). Photo credit: Christopher Castillo.



Brian Rushforth, Manager  
Airport Safety and Operations Division, AAS-300

## **APPENDIX I**

**FAA Cert Alert 98-05, Grasses Attractive to Hazardous Wildlife**

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# Federal Aviation Administration

## National Part 139 CertAlert

\*\*Advisory\*\*Cautionary\*\*Non-Directive\*\*Advisory\*\*Cautionary\*\*Non-Directive\*\*Advisory\*\*Cautionary\*\*Non-Directive\*\*

**Date:** February 26, 2014 **No. 14-01**

**To:** Airport Operators, FAA Airport Certification Safety Inspectors

**Subject:** Seasonal Mitigation of Hazardous Species at Airports:  
Attention to Snowy Owls

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- 1. Purpose.** This CertAlert aims to heighten awareness of transient hazardous wildlife such as snowy owls (*Bubo scandiacus*). Although snowy owls at an airport may be a unique event, they should be prevented or discouraged from using airport environments because they pose a serious risk to aviation.
- 2. Background.** Seasonal changes in wildlife populations directly impact safety at airports. These changes can include seasonal migrations, brood rearing and fledging, fawning, calving, and other cyclical events. These variations in wildlife populations often require airports to look for and potentially alter how they mitigate hazardous species to reduce the risk of strikes.

Snowy owls periodically leave their northern breeding grounds en masse in movements called *irruptions* or *invasions*. These movements differ from seasonal migrations because they are unpredictable and not repeated annually. These irruptive migrations can greatly expand the winter distribution of the species. They represent a serious strike risk due to their size, flight characteristics, and behavior.

Snowy owls are rarely observed in the contiguous United States and attract exceptional attention when they arrive. They are large, slow-flying birds that hunt close to the ground. They prefer open, expansive habitats. Snowy owls easily tolerate human activities. Many of their daily movements occur in the same airspace as an aircraft's take-offs and landings.

- 3. Description.** The snowy owl stands almost 2 feet tall. Its wingspan exceeds 5 feet, and it weighs between 3 and 4 pounds. It is North America's heaviest owl and is commonly spotted during daylight hours. The plumage is largely white, with variable amounts of brown barring and spots.

Their diet is predominantly lemmings, when available. In the contiguous United States, their diet includes other small mammals and birds, including rodents, rabbits, squirrels, songbirds, waterfowl, and wading birds.

- 4. Actions.** The snowy owl is protected by the Migratory Bird Treaty Act (MBTA) and as such may be harassed or dispersed from airport environments using non-injurious methods. If federally permitted actions are necessary, such as capture and relocation, then airports must apply for a U.S. Fish and Wildlife Service Depredation Permit. If possible, the snowy owls should be released far from any airport.

Airports should not support the presence of snowy owls even though it may be an uncommon, short-lived event. Airports should not encourage snowy owls to remain on-site through purposeful inaction, or create attractive habitats or feeding opportunities. At no time should anyone feed snowy owls in an airport environment. Such actions can result in hazards to aviation.



Snowy Owl (*Bubo scandiacus*). Photo credit: Christopher Castillo.



Brian Rushforth, Manager  
Airport Safety and Operations Division, AAS-300

**APPENDIX J**

**AOU Bird Codes**



**Four-letter (English Name) and Six-letter (Scientific Name) Alpha Codes for 2098 Bird Species (and 98 Non-Species Taxa) in accordance with the 55<sup>th</sup> AOU Supplement (2014), sorted taxonomically**

**Prepared by Peter Pyle and David F. DeSante**  
**The Institute for Bird Populations**  
[www.birdpop.org](http://www.birdpop.org)

<b>ENGLISH NAME</b>	<b>4-LETTER CODE</b>	<b>SCIENTIFIC NAME</b>	<b>6-LETTER CODE</b>
Highland Tinamou	HITI	Nothocercus bonapartei	NOTBON
Great Tinamou	GRTI	Tinamus major	TINMAJ
Little Tinamou	LITI	Crypturellus soui	CRYSOU
Thicket Tinamou	THTI	Crypturellus cinnamomeus	CRYCIN
Slaty-breasted Tinamou	SBTI	Crypturellus boucardi	CRYBOU
Choco Tinamou	CHTI	Crypturellus kerriae	CRYKER
White-faced Whistling-Duck	WFWD	Dendrocygna viduata	DENVID
Black-bellied Whistling-Duck	BBWD	Dendrocygna autumnalis	DENAUT
West Indian Whistling-Duck	WIWD	Dendrocygna arborea	DENARB
Fulvous Whistling-Duck	FUWD	Dendrocygna bicolor	DENBIC
Taiga Bean-Goose	TABG	Anser fabalis	ANSFAB
Tundra Bean-Goose	TUBG	Anser serrirostris	ANSSER
Pink-footed Goose	PFGO	Anser brachyrhynchus	ANSBRA
Greater White-fronted Goose	GWFG	Anser albifrons	ANSALB
Lesser White-fronted Goose	LWFG	Anser erythropus	ANSERY
Graylag Goose	GRGO	Anser anser	ANSANS
Emperor Goose	EMGO	Chen canagica	CHECAN
Snow Goose	SNGO	Chen caerulescens	CHECAE
+ Lesser Snow Goose White-morph	LSGW	Chen c. caerulescens	CHECCA
+ Lesser Snow Goose Intermediate-morph	LSGI	Chen c. caerulescens	CHECCA
+ Lesser Snow Goose Blue-morph	LSGB	Chen c. caerulescens	CHECCA
+ Greater Snow Goose White-morph	GSGW	Chen c. atlantica	CHECAT
+ Greater Snow Goose Intermediate-morph	GSGI	Chen c. atlantica	CHECAT
+ Greater Snow Goose Blue-morph	GSGB	Chen c. atlantica	CHECAT
+ Snow X Ross's Goose Hybrid	SRGH	Chen caerul. x rossii	CHECAR
Ross's Goose	ROGO	Chen rossii	CHEROS
Brant	BRAN	Branta bernicla	BRABER
+ Atlantic Brant	ATBR	Branta b. bernicla	BRABBE
+ Brant Intergrade	BRIN	Branta b. bern. x nigri.	BRABBN
+ Black Brant	BLBR	Branta b. nigricans	BRABNI
Barnacle Goose	BARG*	Branta leucopsis	BRALEU
Cackling Goose	CACG*	Branta hutchinsii	BRAHUT
+ Aleutian Cackling Goose	ACGO	Branta h. leucopareia	BRAHLE
+ Minima Cackling Goose	MCGO	Branta h. minima	BRAHMI
Canada Goose	CANG*	Branta canadensis	BRACAN
+ Large Canada Goose	LCGO	Branta c. moffitti	BRACMO
+ Small Canada Goose	SCGO	Branta c. parvipes	BRACPA
Hawaiian Goose	HAGO	Branta sandvicensis	BRASAN

"+" before English name indicates a non-species taxon

\* Four-letter and six-letter codes that, because of conflicts, are not "1st-order" codes are marked with asterisks. See Pyle and DeSante, North American Bird Bander 28:64-79 (2003) for more information.

<b>ENGLISH NAME</b>	<b>4-LETTER CODE</b>	<b>SCIENTIFIC NAME</b>	<b>6-LETTER CODE</b>
Mute Swan	MUSW	Cygnus olor	CYGOLO
Trumpeter Swan	TRUS*	Cygnus buccinator	CYGBUC
Tundra Swan	TUSW	Cygnus columbianus	CYGCOL
+ Whistling Swan	WHSW	Cygnus c. columbianus	CYGCCO
+ Bewick's Swan	BESW	Cygnus c. bewickii	CYGCBE
Whooper Swan	WHOS*	Cygnus cygnus	CYGCYG
Comb Duck	CODU	Sarkidiornis melanotos	SARMEL
Orinoco Goose	ORGO	Neochen jubata	NEOJUB
Muscovy Duck	MUDU	Cairina moschata	CAIMOS
Wood Duck	WODU	Aix sponsa	AIXSPO
Gadwall	GADW	Anas strepera	ANASTR
Falcated Duck	FADU	Anas falcata	ANAFAL
Eurasian Wigeon	EUWI	Anas penelope	ANAPEN
American Wigeon	AMWI	Anas americana	ANAAME
American Black Duck	ABDU	Anas rubripes	ANARUB
+ American Black Duck X Mallard Hybrid	ABDH	Anas rubripes x platy.	ANARUP
Mallard	MALL	Anas platyrhynchos	ANAPLA
+ Mexican Duck	MEDU	Anas p. diazi	ANAPDI
Mottled Duck	MODU	Anas fulvigula	ANAFUL
Hawaiian Duck	HAWD*	Anas wyvilliana	ANAWYV
Laysan Duck	LAYD*	Anas laysanensis	ANALAY
Eastern Spot-billed Duck	ESBD	Anas zonorhyncha	ANAZON
Blue-winged Teal	BWTE	Anas discors	ANADIS
Cinnamon Teal	CITE	Anas cyanoptera	ANACYA
+ Unidentified Teal	UNTE	Anas (sp)	ANASPE
Northern Shoveler	NSHO*	Anas clypeata	ANACLY
White-cheeked Pintail	WCHP*	Anas bahamensis	ANABAH
Northern Pintail	NOPI	Anas acuta	ANAACU
Garganey	GARG	Anas querquedula	ANAQUE
Baikal Teal	BATE	Anas formosa	ANAFOR
Green-winged Teal	GWTE	Anas crecca	ANACRE
+ American Green-winged Teal	AGWT	Anas c. carolinensis	ANACCA
+ Eurasian Green-winged Teal	EGWT	Anas c. crecca	ANACCR
Canvasback	CANV	Aythya valisineria	AYTVAL
Redhead	REDH	Aythya americana	AYTAME
Common Pochard	COMP*	Aythya ferina	AYTFER
Ring-necked Duck	RNDU	Aythya collaris	AYTCOL
Tufted Duck	TUDU	Aythya fuligula	AYTFUL
Greater Scaup	GRSC	Aythya marila	AYTMAR
Lesser Scaup	LESC	Aythya affinis	AYTAFF
Steller's Eider	STEI	Polysticta stelleri	POLSTE
Spectacled Eider	SPEI	Somateria fischeri	SOMFIS
King Eider	KIEI	Somateria spectabilis	SOMSPE
Common Eider	COEI	Somateria mollissima	SOMMOL
Harlequin Duck	HADU	Histrionicus histrionicus	HISHIS
Labrador Duck	LABD*	Camptorhynchus labradorius	CAMLAB
Surf Scoter	SUSC	Melanitta perspicillata	MELPER



<b>ENGLISH NAME</b>	<b>4-LETTER CODE</b>	<b>SCIENTIFIC NAME</b>	<b>6-LETTER CODE</b>
White-winged Scoter	WWSC	Melanitta fusca	MENFUS*
Black Scoter	BLSC	Melanitta americana	MELAME
Long-tailed Duck	LTDU	Clangula hyemalis	CLAHYE
Bufflehead	BUFF	Bucephala albeola	BUCALB
Common Goldeneye	COGO	Bucephala clangula	BUCCLA
Barrow's Goldeneye	BAGO	Bucephala islandica	BUCISL
Smew	SMEW	Mergellus albellus	MERALB
Hooded Merganser	HOME	Lophodytes cucullatus	LOPCUC
Common Merganser	COME	Mergus merganser	MERMER
Red-breasted Merganser	RBME	Mergus serrator	MERSER
Masked Duck	MADU	Nomonyx dominicus	NOMDOM
Ruddy Duck	RUDU	Oxyura jamaicensis	OXYJAM
+ Unidentified Duck	UNDU	Anatinae (gen, sp)	ANAGSP
Plain Chachalaca	PLCH	Ortalis vetula	ORTVET
Gray-headed Chachalaca	GHEC*	Ortalis cinereiceps	ORTCIN
Rufous-vented Chachalaca	RVCH	Ortalis ruficauda	ORTRUF
Rufous-bellied Chachalaca	RBEC*	Ortalis wagleri	ORTWAG
West Mexican Chachalaca	WMCH	Ortalis poliocephala	ORTPOL
White-bellied Chachalaca	WBCH	Ortalis leucogastra	ORTLEU
Crested Guan	CRGU	Penelope purpurascens	PENPUR
Black Guan	BLAG*	Chamaepetes unicolor	CHAUNI
Highland Guan	HIGU	Penelopina nigra	PENNIG
Horned Guan	HOGU	Oreophasis derbianus	OREDER
Great Curassow	GRCU	Crax rubra	CRARUB
Helmeted Guineafowl	HELG*	Numida meleagris	NUMMEL
Bearded Wood-Partridge	BEWP	Dendrortyx barbatus	DENBAR
Long-tailed Wood-Partridge	LTWP	Dendrortyx macroura	DENMAC
Buffy-crowned Wood-Partridge	BCWP	Dendrortyx leucophrys	DENLEU
Mountain Quail	MOUQ*	Oreortyx pictus	OREPIC
Scaled Quail	SCQU	Callipepla squamata	CALSQU
Elegant Quail	ELQU	Callipepla douglasii	CALDOU
California Quail	CAQU	Callipepla californica	CALCAL
Gambel's Quail	GAQU	Callipepla gambelii	CALGAM
Banded Quail	BAQU	Philortyx fasciatus	PHIFAS
Northern Bobwhite	NOBO	Colinus virginianus	COLVIR
Black-throated Bobwhite	BTBO	Colinus nigrogularis	COLNIG
Crested Bobwhite	CRBO	Colinus cristatus	COLCRI
Marbled Wood-Quail	MAWQ	Odontophorus gujanensis	ODOGUJ
Black-eared Wood-Quail	BEWQ	Odontophorus melanotis	ODOMEL
Tacarcuna Wood-Quail	TAWQ	Odontophorus dialeucos	ODODIA
Black-breasted Wood-Quail	BBWQ	Odontophorus leucolaemus	ODOLEU
Spotted Wood-Quail	SPWQ	Odontophorus guttatus	ODOGUT
Singing Quail	SIQU	Dactylortyx thoracicus	DACTHO
Montezuma Quail	MONQ*	Cyrtonyx montezumae	CYRMON
Ocellated Quail	OCQU	Cyrtonyx ocellatus	CYROCE
Tawny-faced Quail	TFQU	Rhynchortyx cinctus	RHYCIN
Chukar	CHUK	Alectoris chukar	ALECHU

<b>ENGLISH NAME</b>	<b>4-LETTER CODE</b>	<b>SCIENTIFIC NAME</b>	<b>6-LETTER CODE</b>
Gray Francolin	GRAF*	<i>Francolinus pondicerianus</i>	FRAPON
Black Francolin	BLFR	<i>Francolinus francolinus</i>	FRAFRA
Erckel's Francolin	ERFR	<i>Francolinus erckelii</i>	FRAERC
Himalayan Snowcock	HISN	<i>Tetraogallus himalayensis</i>	TETHIM
Gray Partridge	GRAP*	<i>Perdix perdix</i>	PERPER
Japanese Quail	JAQU	<i>Coturnix japonica</i>	COTJAP
Red Junglefowl	REJU	<i>Gallus gallus</i>	GALGAS*
Kalij Pheasant	KAPH	<i>Lophura leucomelanos</i>	LOPLEU
Ring-necked Pheasant	RNEP*	<i>Phasianus colchicus</i>	PHACOL
Indian Peafowl	INPE	<i>Pavo cristatus</i>	PAVCRI
Ruffed Grouse	RUGR	<i>Bonasa umbellus</i>	BONUMB
Greater Sage-Grouse	GRSG	<i>Centrocercus urophasianus</i>	CENURO
Gunnison Sage-Grouse	GUSG	<i>Centrocercus minimus</i>	CENMIN
Spruce Grouse	SPGR	<i>Falcapennis canadensis</i>	FALCAN
Willow Ptarmigan	WIPT	<i>Lagopus lagopus</i>	LAGLAG
Rock Ptarmigan	ROPT	<i>Lagopus muta</i>	LAGMUT
White-tailed Ptarmigan	WTPT	<i>Lagopus leucura</i>	LAGLEU
Dusky Grouse	DUGR	<i>Dendragapus obscurus</i>	DENOBS
Sooty Grouse	SOGR	<i>Dendragapus fuliginosus</i>	DENFUU*
Sharp-tailed Grouse	STGR	<i>Tympanuchus phasianellus</i>	TYMPHA
Greater Prairie-Chicken	GRPC	<i>Tympanuchus cupido</i>	TYMCUP
Lesser Prairie-Chicken	LEPC	<i>Tympanuchus pallidicinctus</i>	TYMPAL
Wild Turkey	WITU	<i>Meleagris gallopavo</i>	MELGAL
Ocellated Turkey	OCTU	<i>Meleagris ocellata</i>	MELOCE
Red-throated Loon	RTLO	<i>Gavia stellata</i>	GAVSTE
Arctic Loon	ARLO	<i>Gavia arctica</i>	GAVARC
Pacific Loon	PALO	<i>Gavia pacifica</i>	GAVPAC
Common Loon	COLO	<i>Gavia immer</i>	GAVIMM
Yellow-billed Loon	YBLO	<i>Gavia adamsii</i>	GAVADA
Least Grebe	LEGR	<i>Tachybaptus dominicus</i>	TACDOM
Pied-billed Grebe	PBGR	<i>Podilymbus podiceps</i>	PODPOD
Atitlan Grebe	ATGR	<i>Podilymbus gigas</i>	PODGIG
Horned Grebe	HOGR	<i>Podiceps auritus</i>	PODAUR
Red-necked Grebe	RNGR	<i>Podiceps grisegena</i>	PODGRI
Eared Grebe	EAGR	<i>Podiceps nigricollis</i>	PODNIG
Western Grebe	WEGR	<i>Aechmophorus occidentalis</i>	AECOCC
Clark's Grebe	CLGR	<i>Aechmophorus clarkii</i>	AECCLA
American Flamingo	AMFL	<i>Phoenicopterus ruber</i>	PHORUB
Yellow-nosed Albatross	YNAL	<i>Thalassarche chlororhynchos</i>	THACHL
White-capped Albatross	WCAL	<i>Thalassarche cauta</i>	THACAU
Salvin's Albatross	SAAL	<i>Thalassarche salvini</i>	THASAL
Black-browed Albatross	BBAL	<i>Thalassarche melanophris</i>	THAMEL
Light-mantled Albatross	LMAL	<i>Phoebastria palpebrata</i>	PHOPAL
Wandering Albatross	WAAL	<i>Diomedea exulans</i>	DIOEXU
Laysan Albatross	LAAL	<i>Phoebastria immutabilis</i>	PHOIMM
+ Laysan X Black-foot. Albatross Hybrid	LBFH	<i>Phoebastria immut. X nigripes</i>	PHOIMN
Black-footed Albatross	BFAL	<i>Phoebastria nigripes</i>	PHONIG

<b>ENGLISH NAME</b>	<b>4-LETTER CODE</b>	<b>SCIENTIFIC NAME</b>	<b>6-LETTER CODE</b>
Short-tailed Albatross	STAL	Phoebastria albatrus	PHOALB
Northern Fulmar	NOFU	Fulmarus glacialis	FULGLA
Great-winged Petrel	GWPE	Pterodroma macroptera	PTEMAC
Providence Petrel	PRPE	Pterodroma solandri	PTESOL
Kermadec Petrel	KEPE	Pterodroma neglecta	PTENEG
Herald Petrel	HEPE	Pterodroma arminjoniana	PTEARM
Murphy's Petrel	MUPE	Pterodroma ultima	PTEULT
Mottled Petrel	MOPE	Pterodroma inexpectata	PTEINE
Bermuda Petrel	BEPE	Pterodroma cahow	PTECAH
Black-capped Petrel	BCPE	Pterodroma hasitata	PTEHAS
Juan Fernandez Petrel	JFPE	Pterodroma externa	PTEEXT
Galapagos Petrel	GAPE	Pterodroma phaeopygia	PTEPHA
Hawaiian Petrel	HAPE	Pterodroma sandwichensis	PTESAN
White-necked Petrel	WNPE	Pterodroma cervicalis	PTECER
Bonin Petrel	BOPE	Pterodroma hypoleuca	PTEHYP
Black-winged Petrel	BWPE	Pterodroma nigripennis	PTENIG
Fea's Petrel	FEPE	Pterodroma feae	PTEFEA
Cook's Petrel	COPE	Pterodroma cookii	PTECOO
Stejneger's Petrel	STPE	Pterodroma longirostris	PTELOH
Tahiti Petrel	TAPE	Pterodroma rostrata	PTEROS
Bulwer's Petrel	BUPE	Bulweria bulwerii	BULBUL
Jouanin's Petrel	JOPE	Bulweria fallax	BULFAL
White-chinned Petrel	WCPE	Procellaria aequinoctialis	PROAEQ
Parkinson's Petrel	PAPE	Procellaria parkinsoni	PROPAR
Streaked Shearwater	STRS*	Calonectris leucomelas	CALLEU
Cory's Shearwater	COSH	Calonectris diomedea	CALDIO
Cape Verde Shearwater	CVSH	Calonectris edwardsii	CALEDW
Pink-footed Shearwater	PFSH	Puffinus creatopus	PUFCRE
Flesh-footed Shearwater	FFSH	Puffinus carneipes	PUFCAR
Great Shearwater	GRSH	Puffinus gravis	PUFGRA
Wedge-tailed Shearwater	WTSH	Puffinus pacificus	PUFPAC
Buller's Shearwater	BULS*	Puffinus bulleri	PUFBUL
Sooty Shearwater	SOSH	Puffinus griseus	PUFGRI
Short-tailed Shearwater	SRTS*	Puffinus tenuirostris	PUFTEN
Christmas Shearwater	CHSH	Puffinus nativitatis	PUFNAT
Galapagos Shearwater	GASH	Puffinus subalaris	PUFSUB
Manx Shearwater	MASH	Puffinus puffinus	PUFPUF
Townsend's Shearwater	TOSH	Puffinus auricularis	PUFAUR
+ Newell's Shearwater	NESH	Puffinus a. newelli	PUFANE
Bryan's Shearwater	BRYS*	Puffinus bryani	PUFBRY
Black-vented Shearwater	BVSH	Puffinus opisthomelas	PUFOPI
Audubon's Shearwater	AUSH	Puffinus lherminieri	PUFLHE
Barolo Shearwater	BASH	Puffinus baroli	PUFBAR
Wilson's Storm-Petrel	WISP	Oceanites oceanicus	OCEOCE
White-faced Storm-Petrel	WFSP	Pelagodroma marina	PELMAR
European Storm-Petrel	EUSP	Hydrobates pelagicus	HYDPEL
Black-bellied Storm-Petrel	BBSP	Fregetta tropica	FRETRO

<b>ENGLISH NAME</b>	<b>4-LETTER CODE</b>	<b>SCIENTIFIC NAME</b>	<b>6-LETTER CODE</b>
Fork-tailed Storm-Petrel	FTSP	<i>Oceanodroma furcata</i>	OCEFUR
Ringed Storm-Petrel	RISP	<i>Oceanodroma hornbyi</i>	OCEHOR
Swinhoe's Storm-Petrel	SSTP	<i>Oceanodroma monorhis</i>	OCEMON
Leach's Storm-Petrel	LESP	<i>Oceanodroma leucorhoa</i>	OCELEU
Ashy Storm-Petrel	ASSP	<i>Oceanodroma homochroa</i>	OCEHOM
Band-rumped Storm-Petrel	BSTP*	<i>Oceanodroma castro</i>	OCECAS
Wedge-rumped Storm-Petrel	WRSP	<i>Oceanodroma tethys</i>	OCEJET
Black Storm-Petrel	BLSP	<i>Oceanodroma melania</i>	OCEMEL
Guadalupe Storm-Petrel	GUSP	<i>Oceanodroma macrodactyla</i>	OCEMAC
Markham's Storm-Petrel	MASP	<i>Oceanodroma markhami</i>	OCEMAR
Tristram's Storm-Petrel	TRSP	<i>Oceanodroma tristrami</i>	OCETRI
Least Storm-Petrel	LSTP*	<i>Oceanodroma microsoma</i>	OCEMIC
White-tailed Tropicbird	WTTR	<i>Phaethon lepturus</i>	PHALEP
Red-billed Tropicbird	RBTR	<i>Phaethon aethereus</i>	PHAAET
Red-tailed Tropicbird	RTTR	<i>Phaethon rubricauda</i>	PHARUB
Maguari Stork	MAST	<i>Ciconia maguari</i>	JCICMA
Jabiru	JABI	<i>Jabiru mycteria</i>	JABMYC
Wood Stork	WOST	<i>Mycteria americana</i>	MYCAME
Magnificent Frigatebird	MAFR	<i>Fregata magnificens</i>	FREMAG
Great Frigatebird	GREF*	<i>Fregata minor</i>	FREMIN
Lesser Frigatebird	LEFR	<i>Fregata ariel</i>	FREARI
Masked Booby	MABO	<i>Sula dactylatra</i>	SULDAC
Nazca Booby	NABO	<i>Sula granti</i>	SULGRA
Blue-footed Booby	BFBO	<i>Sula nebouxii</i>	SULNEB
Peruvian Booby	PEBO	<i>Sula variegata</i>	SULVAR
Brown Booby	BRBO	<i>Sula leucogaster</i>	SULLEU
Red-footed Booby	RFBO	<i>Sula sula</i>	SULSUL
Northern Gannet	NOGA	<i>Morus bassanus</i>	MORBAS
Brandt's Cormorant	BRAC*	<i>Phalacrocorax penicillatus</i>	PHAPEN
Neotropic Cormorant	NECO	<i>Phalacrocorax brasilianus</i>	PHABRA
Double-crested Cormorant	DCCO	<i>Phalacrocorax auritus</i>	PHAAUT*
Great Cormorant	GRCO	<i>Phalacrocorax carbo</i>	PHACAR
Red-faced Cormorant	RFCO	<i>Phalacrocorax urile</i>	PHAURI
Pelagic Cormorant	PECO	<i>Phalacrocorax pelagicus</i>	PHAPEL
Anhinga	ANHI	<i>Anhinga anhinga</i>	ANHANH
American White Pelican	AWPE	<i>Pelecanus erythrorhynchos</i>	PELERY
Brown Pelican	BRPE	<i>Pelecanus occidentalis</i>	PELOCC
Pinnated Bittern	PIBI	<i>Botaurus pinnatus</i>	BOTPIN
American Bittern	AMBI	<i>Botaurus lentiginosus</i>	BOTLEN
Yellow Bittern	YEBI	<i>Ixobrychus sinensis</i>	IXOSIN
Least Bittern	LEBI	<i>Ixobrychus exilis</i>	IXOEXI
Little Bittern	LIBI	<i>Ixobrychus minutus</i>	IXOMIN
Rufescent Tiger-Heron	RTHE	<i>Tigrisoma lineatum</i>	TIGLIN
Fasciated Tiger-Heron	FTHE	<i>Tigrisoma fasciatum</i>	TIGFAS
Bare-throated Tiger-Heron	BTTH	<i>Tigrisoma mexicanum</i>	TIGMEX
Great Blue Heron	GBHE	<i>Ardea herodias</i>	ARDHER
+ Great White Heron	GWHE	<i>Ardea h. occidentalis</i>	ARDHOC

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Gray Heron	GRAH*	<i>Ardea cinerea</i>	ARDCIN
Cocoi Heron	COHE	<i>Ardea cocoi</i>	ARDCOC
Purple Heron	PUHE	<i>Ardea purpurea</i>	ARDPUR
Great Egret	GREG	<i>Ardea alba</i>	ARDALB
Intermediate Egret	INEG	<i>Mesophoyx intermedia</i>	MESINT
Chinese Egret	CHEG	<i>Egretta eulophotes</i>	EGREUL
Little Egret	LIEG	<i>Egretta garzetta</i>	EGRGAR
Western Reef-Heron	WERH	<i>Egretta gularis</i>	EGRGUL
Snowy Egret	SNEG	<i>Egretta thula</i>	EGRTHU
Little Blue Heron	LBHE	<i>Egretta caerulea</i>	EGRCAE
Tricolored Heron	TRHE	<i>Egretta tricolor</i>	EGRTRI
Reddish Egret	REEG	<i>Egretta rufescens</i>	EGRRUF
Cattle Egret	CAEG	<i>Bubulcus ibis</i>	BUBIBI
Chinese Pond-Heron	CHPH	<i>Ardeola bacchus</i>	ARDBAC
Green Heron	GRHE	<i>Butorides virescens</i>	BUTVIR
Striated Heron	STRH*	<i>Butorides striata</i>	BUTSTR
Agami Heron	AGHE	<i>Agamia agami</i>	AGAAGA
Capped Heron	CAHE	<i>Pilherodius pileatus</i>	PILPIL
Black-crowned Night-Heron	BCNH	<i>Nycticorax nycticorax</i>	NYCNYC
Yellow-crowned Night-Heron	YCNH	<i>Nyctanassa violacea</i>	NYCVIO
Boat-billed Heron	BBHE	<i>Cochlearius cochlearius</i>	COCCOL*
White Ibis	WHIB	<i>Eudocimus albus</i>	EUDALB
Scarlet Ibis	SCIB	<i>Eudocimus ruber</i>	EUDRUB
Glossy Ibis	GLIB	<i>Plegadis falcinellus</i>	PLEFAL
White-faced Ibis	WFIB	<i>Plegadis chihi</i>	PLECHI
Green Ibis	GRIB	<i>Mesembrinibis cayennensis</i>	MESCAI
Buff-necked Ibis	BNIB	<i>Theristicus caudatus</i>	THECAU
Eurasian Spoonbill	EURS*	<i>Platalea leucorodia</i>	PLALEU
Roseate Spoonbill	ROSP	<i>Platalea ajaja</i>	PLAAJA
Black Vulture	BLVU	<i>Coragyps atratus</i>	CORATR
Turkey Vulture	TUVU	<i>Cathartes aura</i>	CAEAUR*
Lesser Yellow-headed Vulture	LYHV	<i>Cathartes burrovianus</i>	CATBUR
California Condor	CACO	<i>Gymnogyps californianus</i>	GYMCAL
King Vulture	KIVU	<i>Sarcoramphus papa</i>	SARPAP
Osprey	OSPR	<i>Pandion haliaetus</i>	PANHAL
Gray-headed Kite	GHKI	<i>Leptodon cayanensis</i>	LEPCAY
Hook-billed Kite	HBKI	<i>Chondrohierax uncinatus</i>	CHOUNC
Swallow-tailed Kite	STKI	<i>Elanoides forficatus</i>	ELAFOR
Pearl Kite	PEKI	<i>Gampsonyx swainsonii</i>	GAMSWA
White-tailed Kite	WTKI	<i>Elanus leucurus</i>	ELALEU
Snail Kite	SNKI	<i>Rostrhamus sociabilis</i>	ROSSOC
Slender-billed Kite	SBKI	<i>Helicolestes hamatus</i>	HELHAM
Double-toothed Kite	DTKI	<i>Harpagus bidentatus</i>	HARBID
Mississippi Kite	MIKI	<i>Ictinia mississippiensis</i>	ICTMIS
Plumbeous Kite	PLKI	<i>Ictinia plumbea</i>	ICTPLU
Black Kite	BLAK*	<i>Milvus migrans</i>	MILMIG
Bald Eagle	BAEA	<i>Haliaeetus leucocephalus</i>	HALLEU

<b>ENGLISH NAME</b>	<b>4-LETTER CODE</b>	<b>SCIENTIFIC NAME</b>	<b>6-LETTER CODE</b>
White-tailed Eagle	WTEA	<i>Haliaeetus albicilla</i>	HALALB
Steller's Sea-Eagle	STSE	<i>Haliaeetus pelagicus</i>	HALPEL
Black-collared Hawk	BCHA	<i>Busarellus nigricollis</i>	BUSNIG
Northern Harrier	NOHA	<i>Circus cyaneus</i>	CIRCYA
Long-winged Harrier	LWHA	<i>Circus buffoni</i>	CIRBUF
Western Marsh Harrier	WMHA	<i>Circus aeruginosus</i>	CIRAER
Gray-bellied Hawk	GBEH*	<i>Accipiter poliogaster</i>	ACCPOL
Chinese Sparrowhawk	CHIS*	<i>Accipiter soloensis</i>	ACCSOL
Tiny Hawk	TIHA	<i>Accipiter superciliosus</i>	ACCSUP
Sharp-shinned Hawk	SSHA	<i>Accipiter striatus</i>	ACCSTR
Cooper's Hawk	COHA	<i>Accipiter cooperii</i>	ACCCOO
Gundlach's Hawk	GUHA	<i>Accipiter gundlachi</i>	ACCGUN
Bicolored Hawk	BIHA	<i>Accipiter bicolor</i>	ACCBIC
Northern Goshawk	NOGO	<i>Accipiter gentilis</i>	ACCGEN
+ Unidentified Accipiter Hawk	UAHA*	<i>Accipiter (sp)</i>	ACCSPE
Crane Hawk	CRHA	<i>Geranospiza caerulescens</i>	GERCAE
Plumbeous Hawk	PLHA	<i>Cryptoleucopteryx plumbea</i>	CRYPLU
Common Black Hawk	COBH	<i>Buteogallus anthracinus</i>	BUTANT
Cuban Black Hawk	CUBH	<i>Buteogallus gundlachii</i>	BUTGUN
Savanna Hawk	SAHA	<i>Buteogallus meridionalis</i>	BUTMER
Great Black Hawk	GBLH*	<i>Buteogallus urubitinga</i>	BUTURU
Solitary Eagle	SOEA	<i>Buteogallus solitarius</i>	BUGSOL*
Barred Hawk	BAHA	<i>Morphnarchus princeps</i>	MORPRI
Harris's Hawk	HASH*	<i>Parabuteo unicinctus</i>	PARUNI
White Hawk	WHHA	<i>Pseudastur albicollis</i>	PSEALB
Semiplumbeous Hawk	SEHA	<i>Leucopternis semiplumbeus</i>	LEUSEL*
Roadside Hawk	ROHA	<i>Buteo magnirostris</i>	BUTMAG
Red-shouldered Hawk	RSHA	<i>Buteo lineatus</i>	BUTLIN
Ridgway's Hawk	RIHA	<i>Buteo ridgwayi</i>	BUTRID
Broad-winged Hawk	BWHA	<i>Buteo platypterus</i>	BUTPLT*
Gray Hawk	GRHA	<i>Buteo plagiatus</i>	BUTPLG*
Gray-lined Hawk	GLHA	<i>Buteo nitidus</i>	BUTNIT
Short-tailed Hawk	STHA	<i>Buteo brachyurus</i>	BUTBRA
Swainson's Hawk	SWHA	<i>Buteo swainsoni</i>	BUTSWA
White-tailed Hawk	WTHA	<i>Buteo albicaudatus</i>	BUTALC*
Zone-tailed Hawk	ZTHA	<i>Buteo albonotatus</i>	BUTALN*
Hawaiian Hawk	HAWH*	<i>Buteo solitarius</i>	BUESOL*
Red-tailed Hawk	RTHA	<i>Buteo jamaicensis</i>	BUTJAM
+ Harlan's Hawk	HALH*	<i>Buteo j. harlani</i>	BUTJHA
Ferruginous Hawk	FEHA	<i>Buteo regalis</i>	BUTREG
Rough-legged Hawk	RLHA	<i>Buteo lagopus</i>	BUTLAG
Crested Eagle	CREA	<i>Morphnus guianensis</i>	MORGUI
Harpy Eagle	HAEA	<i>Harpia harpyja</i>	HARHAR
Golden Eagle	GOEA	<i>Aquila chrysaetos</i>	AQUCHR
Black Hawk-Eagle	BLHE	<i>Spizaetus tyrannus</i>	SPITYR
Ornate Hawk-Eagle	ORHE	<i>Spizaetus ornatus</i>	SPIORN
Black-and-white Hawk-Eagle	BAWH	<i>Spizaetus melanoleucus</i>	SPIMEL

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+ Unidentified Hawk	UNHA	Accipitridae (gen, sp)	ACCGSP
Sunbittern	SUNB	Eurypyga helias	EURHEL
Yellow Rail	YERA	Coturnicops noveboracensis	COTNOV
Ocellated Crake	OCCR	Micropygia schomburgkii	MICSCH
Ruddy Crake	RUCR	Laterallus ruber	LATRUB
White-throated Crake	WTCR	Laterallus albigularis	LATALB
Gray-breasted Crake	GBCR	Laterallus exilis	LATEXI
Black Rail	BLRA	Laterallus jamaicensis	LATJAM
Corn Crake	CORC*	Crex crex	CRECRE
Ridgway's Rail	RIRA	Rallus obsoletus	RALOBS
Aztec Rail	AZRA	Rallus tenuirostris	RALTEN
King Rail	KIRA	Rallus elegans	RALELE
Clapper Rail	CLRA	Rallus crepitans	RALCRE
Virginia Rail	VIRA	Rallus limicola	RALLIM
Rufous-necked Wood-Rail	RUWR*	Aramides axillaris	ARAAXI
Gray-necked Wood-Rail	GNWR	Aramides cajaneus	ARACAJ
Uniform Crake	UNIC*	Amaurolimnas concolor	AMLCON*
Laysan Rail	LARA	Porzana palmeri	PORPAL
Spotted Crake	SPCR	Porzana porzana	PORPOR
Sora	SORA	Porzana carolina	PORCAR
Hawaiian Rail	HARA	Porzana sandwichensis	PORSAN
Yellow-breasted Crake	YBCR	Porzana flaviventer	PORFLN*
Colombian Crake	COLC*	Neocrex colombiana	NEOCOL
Paint-billed Crake	PBCR	Neocrex erythrops	NEOERY
Zapata Rail	ZARA	Cyanolimnas cerverai	CYACER
Spotted Rail	SPRA	Pardirallus maculatus	PARMAS*
Purple Gallinule	PUGA	Porphyrio martinicus	PORMAR
Azure Gallinule	AZGA	Porphyrio flavirostris	PORFLS*
Common Gallinule	COGA	Gallinula galeata	GALGAT*
+ Hawaiian Gallinule	HAGA	Gallinula g. sandvicensis	GALGSA
Common Moorhen	COMO	Gallinula chloropus	GALCHL
Eurasian Coot	EUCO	Fulica atra	FULATR
Hawaiian Coot	HACO	Fulica alai	FULALA
American Coot	AMCO	Fulica americana	FULAME
Caribbean Coot	CARC*	Fulica caribaea	FULCAR
Sungrebe	SUNG	Heliornis fulica	HELFUL
Limpkin	LIMP	Aramus guarauna	ARAGUA
Sandhill Crane	SACR	Grus canadensis	GRUCAN
Common Crane	CCRA*	Grus grus	GRUGRU
Whooping Crane	WHCR	Grus americana	GRUAME
Double-striped Thick-knee	DSTK	Burhinus bistriatus	BURBIS
Black-winged Stilt	BWST	Himantopus himantopus	HIMHIM
Black-necked Stilt	BNST	Himantopus mexicanus	HIMMEX
+ Hawaiian Stilt	HAST	Himantopus m. melanurus	HIMMME
American Avocet	AMAV	Recurvirostra americana	RECAMÉ
Eurasian Oystercatcher	EUOY	Haematopus ostralegus	HAEOST
American Oystercatcher	AMOY	Haematopus palliatus	HAEPAL

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Black Oystercatcher	BLOY	Haematopus bachmani	HAEBAC
Northern Lapwing	NOLA	Vanellus vanellus	VANVAN
Southern Lapwing	SOLA	Vanellus chilensis	VANCHI
Black-bellied Plover	BBPL	Pluvialis squatarola	PLUSQU
European Golden-Plover	EUGP	Pluvialis apricaria	PLUAPR
American Golden-Plover	AMGP	Pluvialis dominica	PLUDOM
+ Lesser Golden-Plover	LEGP	Pluvialis dominica/fulva	PLUDOF
Pacific Golden-Plover	PAGP	Pluvialis fulva	PLUFUL
Lesser Sand-Plover	LSAP*	Charadrius mongolus	CHAMOG*
Greater Sand-Plover	GSAP*	Charadrius leschenaultii	CHALES
Collared Plover	COPL	Charadrius collaris	CHACOL
Snowy Plover	SNPL	Charadrius nivosus	CHANIV
Wilson's Plover	WIPL	Charadrius wilsonia	CHAWIL
Common Ringed Plover	CRPL	Charadrius hiaticula	CHAHIA
Semipalmated Plover	SEPL	Charadrius semipalmatus	CHASEM
Piping Plover	PIPL	Charadrius melodus	CHAMEL
Little Ringed Plover	LRPL	Charadrius dubius	CHADUB
Killdeer	KILL	Charadrius vociferus	CHAVOC
Mountain Plover	MOPL	Charadrius montanus	CHAMOT*
Eurasian Dotterel	EUDO	Charadrius morinellus	CHAMOR
Northern Jacana	NOJA	Jacana spinosa	JACSPI
Wattled Jacana	WAJA	Jacana jacana	JACJAC
Terek Sandpiper	TESA	Xenus cinereus	XENCIN
Common Sandpiper	COSA	Actitis hypoleucos	ACTHYP
Spotted Sandpiper	SPSA	Actitis macularius	ACTMAC
Green Sandpiper	GRSA	Tringa ochropus	TRIOCH
Solitary Sandpiper	SOSA	Tringa solitaria	TRISOL
Gray-tailed Tattler	GTTA	Tringa brevipes	TRIBRE
Wandering Tattler	WATA	Tringa incana	TRIINC
Spotted Redshank	SPRE	Tringa erythropus	TRIERY
Greater Yellowlegs	GRYE	Tringa melanoleuca	TRIMEL
Common Greenshank	COMG*	Tringa nebularia	TRINEB
Willet	WILL	Tringa semipalmata	TRISEM
Lesser Yellowlegs	LEYE	Tringa flavipes	TRIFLA
Marsh Sandpiper	MASA	Tringa stagnatilis	TRISTA
Wood Sandpiper	WOSA	Tringa glareola	TRIGLA
Common Redshank	COMR*	Tringa totanus	TRITOT
Upland Sandpiper	UPSA	Bartramia longicauda	BARLON
Little Curlew	LICU	Numenius minutus	NUMMIN
Eskimo Curlew	ESCU	Numenius borealis	NUMBOR
Whimbrel	WHIM	Numenius phaeopus	NUMPHA
Bristle-thighed Curlew	BTCU	Numenius tahitiensis	NUMTAH
Far Eastern Curlew	FECU	Numenius madagascariensis	NUMMAD
Slender-billed Curlew	SBCU	Numenius tenuirostris	NUMTEN
Eurasian Curlew	EUCU	Numenius arquata	NUMARQ
Long-billed Curlew	LBCU	Numenius americanus	NUMAME
Black-tailed Godwit	BTGD*	Limosa limosa	LIMLIM



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Hudsonian Godwit	HUGO	<i>Limosa haemastica</i>	LIMHAE
Bar-tailed Godwit	BTGO	<i>Limosa lapponica</i>	LIMLAP
Marbled Godwit	MAGO	<i>Limosa fedoa</i>	LIMFED
Ruddy Turnstone	RUTU	<i>Arenaria interpres</i>	AREINT
Black Turnstone	BLTU	<i>Arenaria melanocephala</i>	AREMEL
Great Knot	GRKN	<i>Calidris tenuirostris</i>	CALTEN
Red Knot	REKN	<i>Calidris canutus</i>	CALCAN
Surfbird	SURF	<i>Calidris virgata</i>	CALVIR
Ruff	RUFF	<i>Calidris pugnax</i>	CALPUG
Broad-billed Sandpiper	BBIS*	<i>Calidris falcinellus</i>	CALFAL
Sharp-tailed Sandpiper	SPTS*	<i>Calidris acuminata</i>	CALACU
Stilt Sandpiper	STSA	<i>Calidris himantopus</i>	CALHIM
Curlew Sandpiper	CUSA	<i>Calidris ferruginea</i>	CALFER
Temminck's Stint	TEST	<i>Calidris temminckii</i>	CALTEM
Long-toed Stint	LTST	<i>Calidris subminuta</i>	CALSUM*
Spoon-billed Sandpiper	SBSA	<i>Calidris pygmaea</i>	CALPYG
Red-necked Stint	RNST	<i>Calidris ruficollis</i>	CALRUF
Sanderling	SAND	<i>Calidris alba</i>	CALALB
Dunlin	DUNL	<i>Calidris alpina</i>	CALALP
Rock Sandpiper	ROSA	<i>Calidris ptilocnemis</i>	CALPTI
Purple Sandpiper	PUSA	<i>Calidris maritima</i>	CALMAR
Baird's Sandpiper	BASA	<i>Calidris bairdii</i>	CALBAI
Little Stint	LIST	<i>Calidris minuta</i>	CALMIA*
Least Sandpiper	LESA	<i>Calidris minutilla</i>	CALMIL*
White-rumped Sandpiper	WRSA	<i>Calidris fuscicollis</i>	CALFUS
Buff-breasted Sandpiper	BBSA	<i>Calidris subruficollis</i>	CALSUR*
Pectoral Sandpiper	PESA	<i>Calidris melanotos</i>	CALMET*
Semipalmated Sandpiper	SESA	<i>Calidris pusilla</i>	CALPUS
Western Sandpiper	WESA	<i>Calidris mauri</i>	CALMAU
Short-billed Dowitcher	SBDO	<i>Limnodromus griseus</i>	LIMGRI
+ Unidentified Dowitcher	UNDO	<i>Limnodromus sp.</i>	LIMSPE
Long-billed Dowitcher	LBDO	<i>Limnodromus scolopaceus</i>	LIMSCO
Jack Snipe	JASN	<i>Lymnocyrtus minimus</i>	LYMMIN
Wilson's Snipe	WISN	<i>Gallinago delicata</i>	GALDEL
Common Snipe	COSN	<i>Gallinago gallinago</i>	GALGAN*
Pin-tailed Snipe	PTSN	<i>Gallinago stenura</i>	GALSTE
Solitary Snipe	SOSN	<i>Gallinago solitaria</i>	GALSOL
Eurasian Woodcock	EUWO	<i>Scolopax rusticola</i>	SCORUS
American Woodcock	AMWO	<i>Scolopax minor</i>	SCOMIN
Wilson's Phalarope	WIPH	<i>Phalaropus tricolor</i>	PHATRI
Red-necked Phalarope	RNPH	<i>Phalaropus lobatus</i>	PHALOB
Red Phalarope	REPH	<i>Phalaropus fulicarius</i>	PHAFUL
Collared Pratincole	COPR	<i>Glareola pratincola</i>	GLAPRA
Oriental Pratincole	ORPR	<i>Glareola maldivarum</i>	GLAMAL
Great Skua	GRSK	<i>Stercorarius skua</i>	STESKU
South Polar Skua	SPSK	<i>Stercorarius maccormicki</i>	STEMAC
Pomarine Jaeger	POJA	<i>Stercorarius pomarinus</i>	STEPOM

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Parasitic Jaeger	PAJA	<i>Stercorarius parasiticus</i>	STEPAS*
Long-tailed Jaeger	LTJA	<i>Stercorarius longicaudus</i>	STELON
Dovekie	DOVE	<i>Alle alle</i>	ALLALL
Common Murre	COMU	<i>Uria aalge</i>	URIAAL
Thick-billed Murre	TBMU	<i>Uria lomvia</i>	URILOM
Razorbill	RAZO	<i>Alca torda</i>	ALCTOR
Great Auk	GRAU	<i>Pinguinus impennis</i>	PINIMP
Black Guillemot	BLGU	<i>Cephus grylle</i>	CEPGRY
Pigeon Guillemot	PIGU	<i>Cephus columba</i>	CEPCOL
Long-billed Murrelet	LBMU	<i>Brachyramphus perdix</i>	BRAPER
Marbled Murrelet	MAMU	<i>Brachyramphus marmoratus</i>	BRAMAR
Kittlitz's Murrelet	KIMU	<i>Brachyramphus brevirostris</i>	BRABRE
Scripps's Murrelet	SCMU	<i>Synthliboramphus scrippsi</i>	SYNSCR
Guadalupe Murrelet	GAMU	<i>Synthliboramphus hypoleucus</i>	SYNHYP
Craveri's Murrelet	CRMU	<i>Synthliboramphus craveri</i>	SYNCRA
Ancient Murrelet	ANMU	<i>Synthliboramphus antiquus</i>	SYNANT
Cassin's Auklet	CAAU	<i>Ptychoramphus aleuticus</i>	PTYALE
Parakeet Auklet	PAAU	<i>Aethia psittacula</i>	AETPSI
Least Auklet	LEAU	<i>Aethia pusilla</i>	AETPUS
Whiskered Auklet	WHAU	<i>Aethia pygmaea</i>	AETPYG
Crested Auklet	CRAU	<i>Aethia cristatella</i>	AETCRI
Rhinoceros Auklet	RHAU	<i>Cerorhinca monocerata</i>	CERMON
Atlantic Puffin	ATPU	<i>Fratercula arctica</i>	FRAARC
Horned Puffin	HOPU	<i>Fratercula corniculata</i>	FRACOR
Tufted Puffin	TUPU	<i>Fratercula cirrhata</i>	FRACIR
Swallow-tailed Gull	STGU	<i>Creagrus furcatus</i>	CREFUR
Black-legged Kittiwake	BLKI	<i>Rissa tridactyla</i>	RISTRI
Red-legged Kittiwake	RLKI	<i>Rissa brevirostris</i>	RISBRE
Ivory Gull	IVGU	<i>Pagophila eburnea</i>	PAGEBU
Sabine's Gull	SAGU	<i>Xema sabini</i>	XEMSAB
Bonaparte's Gull	BOGU	<i>Chroicocephalus philadelphia</i>	CHRPHI
Gray-hooded Gull	GHGU	<i>Chroicocephalus cirrocephalus</i>	CHRCIR
Black-headed Gull	BHGU	<i>Chroicocephalus ridibundus</i>	CHRRID
Little Gull	LIGU	<i>Hydrocoloeus minutus</i>	HYDMIN
Ross's Gull	ROGU	<i>Rhodostethia rosea</i>	RHSROS*
Gray Gull	GRGU	<i>Leucophaeus modestus</i>	LEUMOD
Laughing Gull	LAGU	<i>Leucophaeus atricilla</i>	LEUATC*
Franklin's Gull	FRGU	<i>Leucophaeus pipixcan</i>	LEUPIP
Belcher's Gull	BEGU*	<i>Larus belcheri</i>	LARBEL
Black-tailed Gull	BTGU*	<i>Larus crassirostris</i>	LARCRA
Heermann's Gull	HEEG*	<i>Larus heermanni</i>	LARHEE
Mew Gull	MEGU	<i>Larus canus</i>	LARCAN
Ring-billed Gull	RBGU	<i>Larus delawarensis</i>	LARDEL
Western Gull	WEGU	<i>Larus occidentalis</i>	LAROCC
+ Western X Glaucous-winged Gull Hybrid	WGWH	<i>Larus occid. x gluces.</i>	LAROCC
Yellow-footed Gull	YFGU	<i>Larus livens</i>	LARLIV
California Gull	CAGU	<i>Larus californicus</i>	LARCAL

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Herring Gull	HERG*	<i>Larus argentatus</i>	LARARG
Yellow-legged Gull	YLGU	<i>Larus michahellis</i>	LARMIC
Thayer's Gull	THGU	<i>Larus thayeri</i>	LARTHA
Iceland Gull	ICGU	<i>Larus glaucoides</i>	LARGLD*
Lesser Black-backed Gull	LBBG	<i>Larus fuscus</i>	LARFUS
Slaty-backed Gull	SBGU	<i>Larus schistisagus</i>	LARSCH
Glaucous-winged Gull	GWGU	<i>Larus glaucescens</i>	LARGLS*
Glaucous Gull	GLGU	<i>Larus hyperboreus</i>	LARHYP
Great Black-backed Gull	GBBG	<i>Larus marinus</i>	LARMAR
Kelp Gull	KEGU	<i>Larus dominicanus</i>	LARDOM
+ Unidentified Larus Gull	UNLG	<i>Larus (sp)</i>	LARSPE
Brown Noddy	BRNO	<i>Anous stolidus</i>	ANOSTO
Black Noddy	BLNO	<i>Anous minutus</i>	ANOMIN
Blue-gray Noddy	BGNO	<i>Procelsterna cerulea</i>	PROCER
White Tern	WHTT*	<i>Gygis alba</i>	GYGALB
Sooty Tern	SOTE	<i>Onychoprion fuscatus</i>	ONYFUS
Gray-backed Tern	GBAT*	<i>Onychoprion lunatus</i>	ONYLUN
Bridled Tern	BRTE	<i>Onychoprion anaethetus</i>	ONYANA
Aleutian Tern	ALTE	<i>Onychoprion aleuticus</i>	ONYALE
Little Tern	LITE	<i>Sternula albifrons</i>	STEALB
Least Tern	LETE	<i>Sternula antillarum</i>	STEANT
Yellow-billed Tern	YBTE	<i>Sternula superciliaris</i>	STESUP
Large-billed Tern	LBTE	<i>Phaetusa simplex</i>	PHASIM
Gull-billed Tern	GBTE	<i>Gelochelidon nilotica</i>	GELNIL
Caspian Tern	CATE	<i>Hydroprogne caspia</i>	HYDCAS
Inca Tern	INTE	<i>Larosterna inca</i>	LARINC
Black Tern	BLTE	<i>Chlidonias niger</i>	CHLNIG
White-winged Tern	WWTE	<i>Chlidonias leucopterus</i>	CHLLEU
Whiskered Tern	WHST*	<i>Chlidonias hybrida</i>	CHLHYB
Roseate Tern	ROST*	<i>Sterna dougallii</i>	STEDOU
Common Tern	COTE	<i>Sterna hirundo</i>	STEHIR
Arctic Tern	ARTE	<i>Sterna paradisaea</i>	STEPAD*
Forster's Tern	FOTE	<i>Sterna forsteri</i>	STEFOR
Royal Tern	ROYT*	<i>Thalasseus maximus</i>	THAMAX
Great Crested Tern	GCTE	<i>Thalasseus bergii</i>	THABER
Sandwich Tern	SATE	<i>Thalasseus sandvicensis</i>	THASAN
Elegant Tern	ELTE	<i>Thalasseus elegans</i>	THAELE
Black Skimmer	BLSK	<i>Rynchops niger</i>	RYNNIG
Chestnut-bellied Sandgrouse	CBSA	<i>Pterocles exustus</i>	PTEEXU
Rock Pigeon	ROPI	<i>Columba livia</i>	COLLIV
Pale-vented Pigeon	PVPI	<i>Patagioenas cayennensis</i>	PATCAY
Scaled Pigeon	SCPI	<i>Patagioenas speciosa</i>	PATSPE
Scaly-naped Pigeon	SNPI	<i>Patagioenas squamosa</i>	PATSQU
White-crowned Pigeon	WCPI	<i>Patagioenas leucocephala</i>	PATLEU
Red-billed Pigeon	RBPI	<i>Patagioenas flavirostris</i>	PATFLA
Plain Pigeon	PLAP*	<i>Patagioenas inornata</i>	PATINO
Band-tailed Pigeon	BTPI	<i>Patagioenas fasciata</i>	PATFAS

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Ring-tailed Pigeon	RTAP*	<i>Patagioenas caribaea</i>	PATCAR
Plumbeous Pigeon	PLUP*	<i>Patagioenas plumbea</i>	PATPLU
Ruddy Pigeon	RUDP*	<i>Patagioenas subvinacea</i>	PATSUB
Short-billed Pigeon	SBPI	<i>Patagioenas nigrirostris</i>	PATNIG
Oriental Turtle-Dove	ORTD	<i>Streptopelia orientalis</i>	STRORI
African Collared-Dove	AFCD	<i>Streptopelia roseogrisea</i>	STRROS
European Turtle-Dove	EUTD	<i>Streptopelia turtur</i>	STRTUR
Eurasian Collared-Dove	EUCD	<i>Streptopelia decaocto</i>	STRDEC
Spotted Dove	SPDO	<i>Streptopelia chinensis</i>	STRCHI
Zebra Dove	ZEBD*	<i>Geopelia striata</i>	GEOSTR
Passenger Pigeon	PAPI	<i>Ectopistes migratorius</i>	ECTMIG
Inca Dove	INDO	<i>Columbina inca</i>	COLINC
Common Ground-Dove	COGD	<i>Columbina passerina</i>	COLPAS
Plain-breasted Ground-Dove	PBGD	<i>Columbina minuta</i>	COLMIN
Ruddy Ground-Dove	RUGD	<i>Columbina talpacoti</i>	COLTAL
Blue Ground-Dove	BLGD	<i>Claravis pretiosa</i>	CLAPRE
Maroon-chested Ground-Dove	MCGD	<i>Claravis mondetoura</i>	CLAMON
Blue-headed Quail-Dove	BHQD	<i>Starnoenas cyanocephala</i>	STACYA
Crested Quail-Dove	CRQD	<i>Geotrygon versicolor</i>	GEOVER
Ruddy Quail-Dove	RUQD	<i>Geotrygon montana</i>	GEOMON
Violaceous Quail-Dove	VIQD	<i>Geotrygon violacea</i>	GEOVIO
Gray-fronted Quail-Dove	GFQD	<i>Geotrygon caniceps</i>	GEOCAN
White-fronted Quail-Dove	WFRQ*	<i>Geotrygon leucometopia</i>	GEOLEU
Key West Quail-Dove	KWQD	<i>Geotrygon chrysis</i>	GEOCHR
Bridled Quail-Dove	BRQD	<i>Geotrygon mystacea</i>	GEOMYS
Olive-backed Quail-Dove	OBQD	<i>Leptotrygon veraguensis</i>	LEPVEG*
White-tipped Dove	WTDQ	<i>Leptotila verreauxi</i>	LEPVEX*
Caribbean Dove	CADO	<i>Leptotila jamaicensis</i>	LEPJAM
Gray-chested Dove	GCDO	<i>Leptotila cassini</i>	LEPCAS
Gray-headed Dove	GHDO	<i>Leptotila plumbeiceps</i>	LEPPLU
Grenada Dove	GRDO	<i>Leptotila wellsii</i>	LEPWEL
Tuxtla Quail-Dove	TUQD	<i>Zentrygon carrikeri</i>	ZENCAR
Buff-fronted Quail-Dove	BFQD	<i>Zentrygon costaricensis</i>	ZENCOS
Purplish-backed Quail-Dove	PBQD	<i>Zentrygon lawrencii</i>	ZENLAW
White-faced Quail-Dove	WFAQ*	<i>Zentrygon albifacies</i>	ZENALB
Chiriqui Quail-Dove	CHQD	<i>Zentrygon chiriquensis</i>	ZENCHI
Russet-crowned Quail-Dove	RCQD	<i>Zentrygon goldmani</i>	ZENGOL
White-winged Dove	WWDO	<i>Zenaida asiatica</i>	ZENASI
Zenaida Dove	ZEND*	<i>Zenaida aurita</i>	ZENAUT*
Eared Dove	EADO	<i>Zenaida auriculata</i>	ZENAUC*
Mourning Dove	MODO	<i>Zenaida macroura</i>	ZENMAC
Socorro Dove	SODO	<i>Zenaida graysoni</i>	ZENGRA
Common Cuckoo	COCU	<i>Cuculus canorus</i>	CUCCAN
Oriental Cuckoo	ORCU	<i>Cuculus optatus</i>	CUCOPT
Little Cuckoo	LITC*	<i>Coccyzua minuta</i>	COCMIT*
Squirrel Cuckoo	SQCU	<i>Piaya cayana</i>	PIACAY
Dark-billed Cuckoo	DBCUC	<i>Coccyzus melacoryphus</i>	COCMEL

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Yellow-billed Cuckoo	YBCU	<i>Coccyzus americanus</i>	COCAME
Pearly-breasted Cuckoo	PBCU	<i>Coccyzus euleri</i>	COCEUL
Mangrove Cuckoo	MACU	<i>Coccyzus minor</i>	COCMIR*
Cocos Cuckoo	COCC*	<i>Coccyzus ferrugineus</i>	COCFER
Black-billed Cuckoo	BBCU	<i>Coccyzus erythrophthalmus</i>	COCERY
Chestnut-bellied Cuckoo	CBCU	<i>Coccyzus pluvialis</i>	COCPUL
Bay-breasted Cuckoo	BBRC*	<i>Coccyzus ruficularis</i>	COCRUF
Jamaican Lizard-Cuckoo	JALC	<i>Coccyzus vetula</i>	COCVET
Puerto Rican Lizard-Cuckoo	PRLC	<i>Coccyzus vieilloti</i>	COCVIE
Great Lizard-Cuckoo	GRLC	<i>Coccyzus merlini</i>	COCMER
Hispaniolan Lizard-Cuckoo	HILC	<i>Coccyzus longirostris</i>	COCLON
Striped Cuckoo	STCU	<i>Tapera naevia</i>	TAPNAE
Pheasant Cuckoo	PHCU	<i>Dromococcyx phasianellus</i>	DROPHA
Lesser Ground-Cuckoo	LEGC	<i>Morococcyx erythropygus</i>	MORERY
Lesser Roadrunner	LERO	<i>Geococcyx velox</i>	GEOVEL
Greater Roadrunner	GRRO	<i>Geococcyx californianus</i>	GEOCAL
Rufous-vented Ground-Cuckoo	RVGC	<i>Neomorphus geoffroyi</i>	NEOGEO
Greater Ani	GRTA*	<i>Crotophaga major</i>	CROMAJ
Smooth-billed Ani	SBAN	<i>Crotophaga ani</i>	CROANI
Groove-billed Ani	GBAN	<i>Crotophaga sulcirostris</i>	CROSUL
Barn Owl	BANO*	<i>Tyto alba</i>	TYTALB
Ashy-faced Owl	AFOW	<i>Tyto glaucops</i>	TYTGLA
Oriental Scops-Owl	ORSO	<i>Otus sunia</i>	OTUSUN
Flammulated Owl	FLOW	<i>Psiloscopus flammeolus</i>	PSIFLA
Western Screech-Owl	WESO	<i>Megascops kennicottii</i>	MEGKEN
Eastern Screech-Owl	EASO	<i>Megascops asio</i>	MEGASI
Balsas Screech-Owl	BASO	<i>Megascops seductus</i>	MEGSED
Pacific Screech-Owl	PASO	<i>Megascops cooperi</i>	MEGCOO
Whiskered Screech-Owl	WHSO	<i>Megascops trichopsis</i>	MEGTRI
Tropical Screech-Owl	TRSO	<i>Megascops choliba</i>	MEGCHO
Bearded Screech-Owl	BESO	<i>Megascops barbarus</i>	MEGBAR
Vermiculated Screech-Owl	VESO	<i>Megascops guatemalae</i>	MEGGUA
Bare-shanked Screech-Owl	BSSO	<i>Megascops clarkii</i>	MEGCLA
Puerto Rican Screech-Owl	PRSO	<i>Megascops nudipes</i>	MEGNUD
Bare-legged Owl	BLOW	<i>Margarobyas lawrencii</i>	MARLAW
Crested Owl	CROW	<i>Lophostrix cristata</i>	LOPCRI
Spectacled Owl	SPEO*	<i>Pulsatrix perspicillata</i>	PULPER
Great Horned Owl	GHOW	<i>Bubo virginianus</i>	BUBVIR
Snowy Owl	SNOW	<i>Bubo scandiacus</i>	BUBSCA
Northern Hawk Owl	NHOW	<i>Surnia ulula</i>	SURULU
Northern Pygmy-Owl	NOPO	<i>Glaucidium gnoma</i>	GLAGNO
Costa Rican Pygmy-Owl	CRPO	<i>Glaucidium costaricanum</i>	GLACOS
Central American Pygmy-Owl	CAPO	<i>Glaucidium griseiceps</i>	GLAGRI
Tamaulipas Pygmy-Owl	TAPO	<i>Glaucidium sanchezi</i>	GLASAN
Colima Pygmy-Owl	CPYO*	<i>Glaucidium palmarum</i>	GLAPAL
Ferruginous Pygmy-Owl	FEPO	<i>Glaucidium brasilianum</i>	GLABRA
Cuban Pygmy-Owl	CUPO	<i>Glaucidium siju</i>	GLASIJ

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Elf Owl	ELOW	Micrathene whitneyi	MICWHI
Burrowing Owl	BUOW	Athene cunicularia	ATHCUN
Mottled Owl	MOOW	Ciccaba virgata	CICVIR
Black-and-white Owl	BLWO*	Ciccaba nigrolineata	CICNIG
Spotted Owl	SPOW	Strix occidentalis	STROCC
+ Spotted x Barred Owl Hybrid	SBOH	Strix occiden. x varia	STROCV
Barred Owl	BADO*	Strix varia	STRVAR
Fulvous Owl	FUOW	Strix fulvescens	STRFUL
Great Gray Owl	GGOW	Strix nebulosa	STRNEB
Long-eared Owl	LEOW	Asio otus	ASiotu
Stygian Owl	STOW	Asio stygius	ASISTY
Short-eared Owl	SEOW	Asio flammeus	ASIFLA
Striped Owl	STRO*	Pseudoscops clamator	PSECLA
Jamaican Owl	JAOW	Pseudoscops grammicus	PSEGRA
Boreal Owl	BOOW	Aegolius funereus	AEGFUN
Northern Saw-whet Owl	NSWO	Aegolius acadicus	AEGACA
Unspotted Saw-whet Owl	USWO	Aegolius ridgwayi	AEGRID
Northern Boobook	NOBB*	Ninox japonica	NINJAP
+ Unidentified Owl	UNOW	Strigidae (gen, sp)	STRGSP
Short-tailed Nighthawk	SHTN*	Lurocalis semitorquatus	LURSEM
Lesser Nighthawk	LENI	Chordeiles acutipennis	CHOACU
Common Nighthawk	CONI	Chordeiles minor	CHOMIN
Antillean Nighthawk	ANNI	Chordeiles gundlachii	CHOGUN
Common Pauraque	COPA	Nyctidromus albicollis	NYCALB
Common Poorwill	COPO	Phalaenoptilus nuttallii	PHANUT
Jamaican Pauraque	JAPA	Siphonorhis americana	SIPAME
Least Pauraque	LEPA	Siphonorhis brewsteri	SIPBRE
Eared Poorwill	EAPO	Nyctiphrynus mcleodii	NYCMCL
Yucatan Poorwill	YUPO	Nyctiphrynus yucatanicus	NYCYUC
Ocellated Poorwill	OCPO	Nyctiphrynus ocellatus	NYCOCE
Chuck-will's-widow	CWWI	Antrostomus carolinensis	ANTCAR
Rufous Nightjar	RUNI	Antrostomus rufus	ANTRUF
Greater Antillean Nightjar	GANI	Antrostomus cubanensis	ANTCUB
Tawny-collared Nightjar	TCNI	Antrostomus salvini	ANTSAL
Yucatan Nightjar	YUNI	Antrostomus badius	ANTBAD
Buff-collared Nightjar	BCNI	Antrostomus ridgwayi	ANTRID
Eastern Whip-poor-will	EWPW	Antrostomus vociferus	ANTVOC
Dusky Nightjar	DUNI	Antrostomus saturatus	ANTSAT
Mexican Whip-poor-will	MWPW	Antrostomus arizonae	ANTARI
Puerto Rican Nightjar	PRNI	Antrostomus noctitherus	ANTNOC
White-tailed Nightjar	WTNI	Hydropsalis cayennensis	HYDCAY
Spot-tailed Nightjar	SPTN*	Hydropsalis maculicaudus	HYDMAC
Gray Nightjar	GRNI	Caprimulgus indicus	CAPIND
Great Potoo	GRPO	Nyctibius grandis	NYCGRA
Common Potoo	CPOT*	Nyctibius griseus	NYCGRI
Northern Potoo	NORP*	Nyctibius jamaicensis	NYCJAM
Oilbird	OILB	Steatornis caripensis	STECAR

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Black Swift	BLSW	<i>Cypseloides niger</i>	CYPNIG
White-fronted Swift	WFSW	<i>Cypseloides storeri</i>	CYPSTO
White-chinned Swift	WCHS*	<i>Cypseloides cryptus</i>	CYPCRY
Spot-fronted Swift	SFSW	<i>Cypseloides cherriei</i>	CYPCHE
Chestnut-collared Swift	CCSW	<i>Streptoprocne rutila</i>	STRRUT
White-collared Swift	WCSW	<i>Streptoprocne zonaris</i>	STRZON
White-naped Swift	WNSW	<i>Streptoprocne semicollaris</i>	STRSEM
Chimney Swift	CHSW	<i>Chaetura pelagica</i>	CHAPEL
Vaux's Swift	VASW	<i>Chaetura vauxi</i>	CHAVAU
Chapman's Swift	CHAS*	<i>Chaetura chapmani</i>	CHACHA
Short-tailed Swift	STSW	<i>Chaetura brachyura</i>	CHABRA
Sick's Swift	SISW	<i>Chaetura meridionalis</i>	CHAMER
Band-rumped Swift	BRSW	<i>Chaetura spinicaudus</i>	CHASPI
Costa Rican Swift	CRSW	<i>Chaetura fumosa</i>	CHAFUM
Gray-rumped Swift	GRSW	<i>Chaetura cinereiventris</i>	CHACIN
Lesser Antillean Swift	LASW	<i>Chaetura martinica</i>	CHAMAR
White-throated Needletail	WTNE	<i>Hirundapus caudacutus</i>	HIRCAU
Mariana Swiftlet	MASW	<i>Aerodramus bartschi</i>	AERBAR
Common Swift	COSW	<i>Apus apus</i>	APUAPU
Fork-tailed Swift	FTSW	<i>Apus pacificus</i>	APUPAC
Alpine Swift	ALSW	<i>Apus melba</i>	APUMEL
White-throated Swift	WTSW	<i>Aeronautes saxatalis</i>	AERSAX
Lesser Swallow-tailed Swift	LSTS	<i>Panyptila cayennensis</i>	PANCAAY
Great Swallow-tailed Swift	GSTS	<i>Panyptila sanctihieronymi</i>	PANSAN
Antillean Palm-Swift	ANPS	<i>Tachornis phoenicobia</i>	TACPHO
White-necked Jacobin	WNJA	<i>Florisuga mellivora</i>	FLOMEL
White-tipped Sicklebill	WTSI	<i>Eutoxeres aquila</i>	EUTAQU
Bronzy Hermit	BRHE	<i>Glaucis aeneus</i>	GLAAEN
Rufous-breasted Hermit	RBHE	<i>Glaucis hirsutus</i>	GLAHIR
Band-tailed Barbthroat	BTBA	<i>Threnetes ruckeri</i>	THRRUC
Green Hermit	GREH*	<i>Phaethornis guy</i>	PHAGUY
Long-billed Hermit	LBIH*	<i>Phaethornis longirostris</i>	PHALON
Pale-bellied Hermit	PBHE	<i>Phaethornis anthophilus</i>	PHAANT
Stripe-throated Hermit	STHR*	<i>Phaethornis striigularis</i>	PHASTR
Green-fronted Lancebill	GFRL*	<i>Doryfera ludovicae</i>	DORLUD
Brown Violetear	BRVI	<i>Colibri delphinae</i>	COLDEL
Green Violetear	GREV*	<i>Colibri thalassinus</i>	COLTHA
Tooth-billed Hummingbird	TBHU	<i>Androdon aequatorialis</i>	ANDAEQ
Purple-crowned Fairy	PCFA	<i>Heliodytes barroti</i>	HELBAR
Ruby-topaz Hummingbird	RTOH*	<i>Chrysolampis mosquitus</i>	CHRMOS
Green-breasted Mango	GNBM*	<i>Anthracothorax prevostii</i>	ANTPRE
Black-throated Mango	BTMA	<i>Anthracothorax nigricollis</i>	ANTNIG
Veraguan Mango	VEMA	<i>Anthracothorax veraguensis</i>	ANTVER
Antillean Mango	ANMA	<i>Anthracothorax dominicus</i>	ANTDOM
Green Mango	GMAG*	<i>Anthracothorax viridis</i>	ANTVIR
Jamaican Mango	JAMA	<i>Anthracothorax mango</i>	ANTMAN
Purple-throated Carib	PTCA	<i>Eulampis jugularis</i>	EULJUG

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Green-throated Carib	GTCA	<i>Eulampis holosericeus</i>	EULHOL
Green Thorntail	GRET*	<i>Discosura conversii</i>	DISCON
Short-crested Coquette	SCCO	<i>Lophornis brachylophus</i>	LOPBRA
Rufous-crested Coquette	RCRC*	<i>Lophornis delattrei</i>	LOPDEL
Black-crested Coquette	BCCO	<i>Lophornis helenae</i>	LOPHEL
White-crested Coquette	WCCO	<i>Lophornis adorabilis</i>	LOPADO
Greenish Puffleg	GRPU	<i>Haplophaedia aureliae</i>	HAPAUH
Green-crowned Brilliant	GCBR	<i>Heliodoxa jacula</i>	HELJAC
Magnificent Hummingbird	MAHU	<i>Eugenes fulgens</i>	EUGFUL
Fiery-throated Hummingbird	FTHU	<i>Panterpe insignis</i>	PANINS
Long-billed Starthroat	LBST	<i>Heliomaster longirostris</i>	HELLON
Plain-capped Starthroat	PCST	<i>Heliomaster constantii</i>	HELCON
Green-throated Mountain-gem	GTMG	<i>Lampornis viridipallens</i>	LAMVIR
Green-breasted Mountain-gem	GBMG	<i>Lampornis sybillae</i>	LAMSYB
Amethyst-throated Hummingbird	ATHU	<i>Lampornis amethystinus</i>	LAMAME
Blue-throated Hummingbird	BTHH*	<i>Lampornis clemenciae</i>	LAMCLE
White-bellied Mountain-gem	WBMG	<i>Lampornis hemileucus</i>	LAMHEM
Purple-throated Mountain-gem	PTMG	<i>Lampornis calolaemus</i>	LAMCAL
White-throated Mountain-gem	WTMG	<i>Lampornis castaneiventris</i>	LAMCAS
Garnet-throated Hummingbird	GATH*	<i>Lamprolaima rhami</i>	LAMRHA
Bahama Woodstar	BAWO	<i>Calliphlox evelynae</i>	CALEVE
Magenta-throated Woodstar	MTWO	<i>Calliphlox bryantae</i>	CALBRY
Purple-throated Woodstar	PTWO	<i>Calliphlox mitchellii</i>	CALMIT
Slender Sheartail	SLSH	<i>Doricha enicura</i>	DORENI
Mexican Sheartail	MESH	<i>Doricha eliza</i>	DORELI
Sparkling-tailed Hummingbird	SKTH*	<i>Tilmatura dupontii</i>	TILDUP
Lucifer Hummingbird	LUHU	<i>Calothorax lucifer</i>	CALLUC
Beautiful Hummingbird	BEAH*	<i>Calothorax pulcher</i>	CALPUL
Ruby-throated Hummingbird	RTHU	<i>Archilochus colubris</i>	ARCCOL
Black-chinned Hummingbird	BCHU	<i>Archilochus alexandri</i>	ARCALE
Vervain Hummingbird	VEHU	<i>Mellisuga minima</i>	MELMIN
Bee Hummingbird	BEEH*	<i>Mellisuga helenae</i>	MELHEL
Anna's Hummingbird	ANHU	<i>Calypte anna</i>	CALANN
Costa's Hummingbird	COHU	<i>Calypte costae</i>	CALCOS
Bumblebee Hummingbird	BUHU	<i>Atthis heloisa</i>	ATTHEL
Wine-throated Hummingbird	WTHH*	<i>Atthis ellioti</i>	ATTELL
Broad-tailed Hummingbird	BTAH*	<i>Selasphorus platycercus</i>	SELPLA
Rufous Hummingbird	RUHU	<i>Selasphorus rufus</i>	SELRUF
Allen's Hummingbird	ALHU	<i>Selasphorus sasin</i>	SELSAS
Volcano Hummingbird	VOHU	<i>Selasphorus flammula</i>	SELFLA
Glow-throated Hummingbird	GLTH*	<i>Selasphorus ardens</i>	SELARD
Scintillant Hummingbird	SCHU	<i>Selasphorus scintilla</i>	SELSCI
Calliope Hummingbird	CAHU	<i>Selasphorus calliope</i>	SELCAL
+ Unidentified <i>Selasphorus</i> Hummingbird	USHU	<i>Selasphorus</i> (sp)	SELSPS*
Golden-crowned Emerald	GCEM	<i>Chlorostilbon auriceps</i>	CHLAUR
Cozumel Emerald	COEM	<i>Chlorostilbon forficatus</i>	CHLFOR
Canivet's Emerald	CAEM	<i>Chlorostilbon canivetii</i>	CHLCAV*



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Garden Emerald	GAEM	<i>Chlorostilbon assimilis</i>	CHLASS
Cuban Emerald	CUEM	<i>Chlorostilbon ricordii</i>	CHLRIC
Brace's Emerald	BREM	<i>Chlorostilbon bracei</i>	CHLBRA
Hispaniolan Emerald	HIEM	<i>Chlorostilbon swainsonii</i>	CHLSWA
Puerto Rican Emerald	PREM	<i>Chlorostilbon maugaeus</i>	CHLMAU
Dusky Hummingbird	DUHU	<i>Cynanthus sordidus</i>	CYNSOR
Broad-billed Hummingbird	BBIH*	<i>Cynanthus latirostris</i>	CYNLAT
Blue-headed Hummingbird	BHHU	<i>Cyanophaia bicolor</i>	CYABIC
Violet-headed Hummingbird	VHHU	<i>Klais guimeti</i>	KLAGUI
Emerald-chinned Hummingbird	ECHU	<i>Abeillia abeillei</i>	ABEABE
Antillean Crested Hummingbird	ANCH*	<i>Orthorhyncus cristatus</i>	ORTCRI
Scaly-breasted Hummingbird	SBRH*	<i>Phaeochroa cuvierii</i>	PHACUV
Wedge-tailed Sabrewing	WTSA	<i>Campylopterus curvipennis</i>	CAMCUR
Long-tailed Sabrewing	LTSA	<i>Campylopterus excellens</i>	CAMEXC
Rufous Sabrewing	RUSA	<i>Campylopterus rufus</i>	CAMRUS*
Violet Sabrewing	VISA	<i>Campylopterus hemileucurus</i>	CAMHEM
Stripe-tailed Hummingbird	STHM*	<i>Eupherusa eximia</i>	EUPEXI
Blue-capped Hummingbird	BCAH*	<i>Eupherusa cyanophrys</i>	EUPCYP*
White-tailed Hummingbird	WTAH*	<i>Eupherusa poliocerca</i>	EUPPOL
Black-bellied Hummingbird	BLBH*	<i>Eupherusa nigriventris</i>	EUPNIG
White-tailed Emerald	WTEM	<i>Elvira chionura</i>	ELVCHI
Coppery-headed Emerald	CHEM	<i>Elvira cupreiceps</i>	ELVCUP
Snowcap	SNOC*	<i>Microchera albocoronata</i>	MICALB
White-vented Plumeleteer	WVPL	<i>Chalybura buffonii</i>	CHABUF
Bronze-tailed Plumeleteer	BTPL	<i>Chalybura urochrysia</i>	CHAURO
Mexican Woodnymph	MEWO	<i>Thalurania ridgwayi</i>	THARID
Crowned Woodnymph	CRWO	<i>Thalurania colombica</i>	THACOL
White-bellied Emerald	WBEM	<i>Amazilia candida</i>	AMACAN
Honduran Emerald	HOEM	<i>Amazilia luciae</i>	AMALUC
Blue-chested Hummingbird	BCHH*	<i>Amazilia amabilis</i>	AMAAMB*
Charming Hummingbird	CHHU	<i>Amazilia decora</i>	AMADEC
Mangrove Hummingbird	MANH*	<i>Amazilia boucardi</i>	AMABOU
Azure-crowned Hummingbird	AZCH*	<i>Amazilia cyanocephala</i>	AMACYC*
Berylline Hummingbird	BEHU	<i>Amazilia beryllina</i>	AMABER
Blue-tailed Hummingbird	BTLH*	<i>Amazilia cyanura</i>	AMACYR*
Steely-vented Hummingbird	SVHU	<i>Amazilia saucerrottei</i>	AMASAU
Snowy-bellied Hummingbird	SBEH*	<i>Amazilia edward</i>	AMAEDW
Rufous-tailed Hummingbird	RTAH*	<i>Amazilia tzacatl</i>	AMATZA
Buff-bellied Hummingbird	BBEH*	<i>Amazilia yucatanensis</i>	AMAYUC
Cinnamon Hummingbird	CIHU	<i>Amazilia rutila</i>	AMARUT
Violet-crowned Hummingbird	VCHU	<i>Amazilia violiceps</i>	AMAVIO
Green-fronted Hummingbird	GFHU	<i>Amazilia viridifrons</i>	AMAVIF*
Streamertail	STRM*	<i>Trochilus polytmus</i>	TROPOL
Pirre Hummingbird	PIHU	<i>Goethalsia bella</i>	GOEBEL
Violet-capped Hummingbird	VCAH*	<i>Goldmania violiceps</i>	GOLVIO
Sapphire-throated Hummingbird	SHTH*	<i>Lepidopyga coeruleogularis</i>	LEPCOE
Violet-bellied Hummingbird	VBHU	<i>Damophila julie</i>	DAMJUL

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Humboldt's Sapphire	HUSA*	<i>Hylocharis humboldtii</i>	HYLHUM
Blue-throated Goldentail	BTRG*	<i>Hylocharis eliciae</i>	HYLELI
White-eared Hummingbird	WEHU	<i>Hylocharis leucotis</i>	HYLLEU
Xantus's Hummingbird	XAHU	<i>Hylocharis xantusii</i>	HYLXAN
+ Unidentified Hummingbird	UNHU	Trochilidae (gen, sp)	TRCGSP*
Cuban Trogon	CUTR	<i>Priotelus temnurus</i>	PRITEM
Hispaniolan Trogon	HITR	<i>Priotelus roseigaster</i>	PRIROS
Lattice-tailed Trogon	LTTR	<i>Trogon clathratus</i>	TROCLA
Slaty-tailed Trogon	STTR	<i>Trogon massena</i>	TROMAS
Black-tailed Trogon	BTAT*	<i>Trogon melanurus</i>	TROMER*
Black-headed Trogon	BHTR	<i>Trogon melanocephalus</i>	TROMECS*
Citreoline Trogon	CITR	<i>Trogon citreolus</i>	TROCIT
White-tailed Trogon	WTAT*	<i>Trogon chionurus</i>	TROCHI
Baird's Trogon	BATR	<i>Trogon bairdii</i>	TROBAI
Gartered Trogon	GATR	<i>Trogon caligatus</i>	TROCAL
Black-throated Trogon	BHTT*	<i>Trogon rufus</i>	TROBUS*
Elegant Trogon	ELTR	<i>Trogon elegans</i>	TROELE
Mountain Trogon	MOTR	<i>Trogon mexicanus</i>	TROMEX
Collared Trogon	COTR	<i>Trogon collaris</i>	TROCOL
Orange-bellied Trogon	OBTR	<i>Trogon aurantiiventris</i>	TROAUR
Eared Quetzal	EAQU	<i>Euptilotis neoxenus</i>	EUPNEO
Golden-headed Quetzal	GHQU	<i>Pharomachrus auriceps</i>	PHAAUC*
Resplendent Quetzal	REQU	<i>Pharomachrus mocinno</i>	PHAMOC
Eurasian Hoopoe	EHOO*	<i>Upupa epops</i>	UPUEPO
Cuban Tody	CUTO	<i>Todus multicolor</i>	TODMUL
Broad-billed Tody	BBTO	<i>Todus subulatus</i>	TODSUB
Narrow-billed Tody	NBTO	<i>Todus angustirostris</i>	TODANG
Jamaican Tody	JATO	<i>Todus todus</i>	TODTOD
Puerto Rican Tody	PRTO	<i>Todus mexicanus</i>	TODMEX
Tody Motmot	TOMO	<i>Hylomanes momotula</i>	HYLMOM
Blue-throated Motmot	BTMO	<i>Aspatha gularis</i>	ASPGUL
Russet-crowned Motmot	RCMO	<i>Momotus mexicanus</i>	MOMMEX
Blue-crowned Motmot	BCMO	<i>Momotus momota</i>	MOMMOM
Rufous Motmot	RMOT*	<i>Baryphthengus martii</i>	BARMAR
Keel-billed Motmot	KBMO	<i>Electron carinatum</i>	ELECAR
Broad-billed Motmot	BBMO	<i>Electron platyrhynchum</i>	ELEPLA
Turquoise-browed Motmot	TBMO	<i>Eumomota superciliosa</i>	EUMSUP
Ringed Kingfisher	RIKI	<i>Megaceryle torquata</i>	MEGTOR
Belted Kingfisher	BEKI	<i>Megaceryle alcyon</i>	MEGALC
Amazon Kingfisher	AMKI	<i>Chloroceryle amazona</i>	CHLAMA
Green Kingfisher	GKIN*	<i>Chloroceryle americana</i>	CHLAME
Green-and-rufous Kingfisher	GARK	<i>Chloroceryle inda</i>	CHLIND
American Pygmy Kingfisher	APKI	<i>Chloroceryle aenea</i>	CHLAEN
Barred Puffbird	BAPU	<i>Nystalus radiatus</i>	NYSRAD
White-necked Puffbird	WNPU	<i>Notharchus hyperrhynchus</i>	NOTHYP
Black-breasted Puffbird	BBPU	<i>Notharchus pectoralis</i>	NOTPEC
Pied Puffbird	PIPU	<i>Notharchus tectus</i>	NOTTEC

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White-whiskered Puffbird	WWPU	Malacoptila panamensis	MALPAN
Lanceolated Monklet	LAMO	Micromonacha lanceolata	MICLAN
Gray-cheeked Nunlet	GCNU	Nonnula frontalis	NONFRO
White-fronted Nunbird	WFNU	Monasa morphoeus	MONMOR
Dusky-backed Jacamar	DBJA	Brachygalba salmomi	BRASAL
Rufous-tailed Jacamar	RTJA	Galbula ruficauda	GALRUF
Great Jacamar	GJAC*	Jacamerops aureus	JACAUR
Spot-crowned Barbet	SCBA	Capito maculicoronatus	CAPMAC
Red-headed Barbet	RHBA	Eubucco bourcierii	EUBBOU
Prong-billed Barbet	PBBA	Semnornis frantzii	SEMFRA
Emerald Toucanet	EMTO	Aulacorhynchus prasinus	AULPRA
Collared Aracari	COAR	Pteroglossus torquatus	PTETOR
Fiery-billed Aracari	FBAR	Pteroglossus frantzii	PTEFRA
Yellow-eared Toucanet	YETO	Selenidera spectabilis	SELSPT*
Keel-billed Toucan	KBTO	Ramphastos sulfuratus	RAMSUL
Black-mandibled Toucan	BMTO	Ramphastos ambiguus	RAMAMB
Eurasian Wryneck	EUWR	Jynx torquilla	JYNTOR
Olivaceous Piculet	OLPI	Picumnus olivaceus	PICOLI
Antillean Piculet	ANPI	Nesocittes micromegas	NESMIC
Lewis's Woodpecker	LEWO	Melanerpes lewis	MELLEW
Guadeloupe Woodpecker	GUWO	Melanerpes herminieri	MELHER
Puerto Rican Woodpecker	PRWO	Melanerpes portoricensis	MELPOR
Red-headed Woodpecker	RHWO	Melanerpes erythrocephalus	MELERY
Acorn Woodpecker	ACWO	Melanerpes formicivorus	MELFOR
Golden-naped Woodpecker	GNWO	Melanerpes chrysauchen	MELCHC*
Black-cheeked Woodpecker	BCWO	Melanerpes pucherani	MELPUC
Hispaniolan Woodpecker	HIWO	Melanerpes striatus	MELSTR
Jamaican Woodpecker	JAWO	Melanerpes radiolatus	MELRAD
Golden-cheeked Woodpecker	GCHW*	Melanerpes chrysogenys	MELCHG*
Gray-breasted Woodpecker	GBWO	Melanerpes hypopolius	MELHYI*
Yucatan Woodpecker	YUWO	Melanerpes pygmaeus	MELPYG
Red-crowned Woodpecker	RCRW*	Melanerpes rubricapillus	MELRUB
Gila Woodpecker	GIWO	Melanerpes uropygialis	MELURO
Hoffmann's Woodpecker	HOWO	Melanerpes hoffmannii	MELHOF
Golden-fronted Woodpecker	GFWO	Melanerpes aurifrons	MELAUR
Red-bellied Woodpecker	RBWO	Melanerpes carolinus	MELCAR
West Indian Woodpecker	WIWO	Melanerpes superciliaris	MELSUP
Williamson's Sapsucker	WISA	Sphyrapicus thyroideus	SPHTHY
Yellow-bellied Sapsucker	YBSA	Sphyrapicus varius	SPHVAR
Red-naped Sapsucker	RNSA	Sphyrapicus nuchalis	SPHNUC
+ Red-naped X Red-breasted Saps. Hybrid	RRSH	Sphyrapicus nuchalis x ruber	SPHNUR
Red-breasted Sapsucker	RBSA	Sphyrapicus ruber	SPHRUB
+ Unidentified Sapsucker	UNSA	Sphyrapicus (sp)	SPHSPE
Cuban Green Woodpecker	CGWO	Xiphidiopicus percussus	XIPPER
Great Spotted Woodpecker	GSWO	Dendrocopos major	DENMAJ
Ladder-backed Woodpecker	LBWO	Picoides scalaris	PICSCA
Nuttall's Woodpecker	NUWO	Picoides nuttallii	PIDNUT*

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Downy Woodpecker	DOWO	Picoides pubescens	PICPUB
Smoky-brown Woodpecker	SMBW*	Picoides fumigatus	PICFUM
Hairy Woodpecker	HAWO	Picoides villosus	PICVIL
Arizona Woodpecker	ARWO	Picoides arizonae	PICARI
Strickland's Woodpecker	STCW*	Picoides stricklandi	PICSTR
Red-cockaded Woodpecker	RCWO	Picoides borealis	PICBOR
White-headed Woodpecker	WHWO	Picoides albolarvatus	PICALB
American Three-toed Woodpecker	ATTW	Picoides dorsalis	PICDOR
Black-backed Woodpecker	BBWO	Picoides arcticus	PICARC
Red-rumped Woodpecker	RRWO	Veniliornis kirkii	VENKIR
Rufous-winged Woodpecker	RWWO	Piculus simplex	PICSIM
Stripe-cheeked Woodpecker	SCHW*	Piculus callopterus	PICCAL
Golden-green Woodpecker	GGWO	Piculus chrysochloros	PICCHR
Golden-olive Woodpecker	GOWO	Colaptes rubiginosus	COLRUB
Gray-crowned Woodpecker	GRCW*	Colaptes auricularis	COLAUC*
Spot-breasted Woodpecker	SBWP*	Colaptes punctigula	COLPUN
Northern Flicker	NOFL	Colaptes auratus	COLAUT*
+ Yellow-shafted Flicker	YSFL	Colaptes a. auratus	COLAAU
+ Northern Flicker Intergrade	NFIN	Colaptes a.auratus x cafer	COLAAC
+ Red-shafted Flicker	RSFL	Colaptes a. cafer	COLACA
Gilded Flicker	GIFL	Colaptes chrysoides	COLCHR
Fernandina's Flicker	FEFL	Colaptes fernandinae	COLFER
Cinnamon Woodpecker	CIWO	Celeus loricatus	CELLOR
Chestnut-colored Woodpecker	CCOW*	Celeus castaneus	CELCAS
Lineated Woodpecker	LIWO	Dryocopus lineatus	DRYLIN
Pileated Woodpecker	PIWO	Dryocopus pileatus	DRYPIL
Crimson-bellied Woodpecker	CBWO	Campephilus haematogaster	CAMHAE
Crimson-crested Woodpecker	CCRW*	Campephilus melanoleucos	CAMMEL
Pale-billed Woodpecker	PBIW*	Campephilus guatemalensis	CAMGUA
Ivory-billed Woodpecker	IBWO	Campephilus principalis	CAMPRI
Imperial Woodpecker	IMWO	Campephilus imperialis	CAMIMP
+ Unidentified Woodpecker	UNWO	Picadae (gen, sp)	PICGSP
Barred Forest-Falcon	BAFF	Micrastur ruficollis	MICRUF
Slaty-backed Forest-Falcon	SBFF	Micrastur mirandollei	MICMIR
Collared Forest-Falcon	COFF	Micrastur semitorquatus	MICSEM
Red-throated Caracara	RTCA	Ibycter americanus	IBYAME
Crested Caracara	CRCA	Caracara cheriway	CARCHC
Guadalupe Caracara	GUCA	Caracara lutosa	CARLUT
Yellow-headed Caracara	YHCA	Milvago chimachima	MILCHI
Laughing Falcon	LAFAL	Herpetotheres cachinnans	HERCAC
Eurasian Kestrel	EUKE	Falco tinnunculus	FALTIN
American Kestrel	AMKE	Falco sparverius	FALSPA
Red-footed Falcon	RFFA	Falco vespertinus	FALVES
Merlin	MERL	Falco columbarius	FALCOL
Eurasian Hobby	EHOB*	Falco subbuteo	FALSUB
Aplomado Falcon	APFA	Falco femoralis	FALFEM
Bat Falcon	BAFA	Falco ruficularis	FALRUF

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Orange-breasted Falcon	OBFA	Falco deiroleucus	FALDEI
Gyrfalcon	GYRF	Falco rusticolus	FALRUS
Peregrine Falcon	PEFA	Falco peregrinus	FALPER
Prairie Falcon	PRFA	Falco mexicanus	FALMEX
Budgerigar	BUDG	Melopsittacus undulatus	MELUND
Rose-ringed Parakeet	RRPA	Psittacula krameri	PSIKRA
Rosy-faced Lovebird	RFLO	Agapornis roseicollis	AGAROS
Painted Parakeet	PAIP*	Pyrrhura picta	PYRPIC
Sulphur-winged Parakeet	SWPA	Pyrrhura hoffmanni	PYRHOF
Monk Parakeet	MOPA	Myiopsitta monachus	MYIMON
Carolina Parakeet	CAPA	Conuropsis carolinensis	CONCAL*
Olive-throated Parakeet	OTPA	Eupsittula nana	EUPNAN
Orange-fronted Parakeet	OFPA	Eupsittula canicularis	EUPCAN
Brown-throated Parakeet	BTPA	Eupsittula pertinax	EUPPER
Nanday Parakeet	NAPA	Aratinga nenday	NANNEN
Chestnut-fronted Macaw	CFMA	Ara severus	ARASEV
Military Macaw	MIMA	Ara militaris	ARAMIL
Great Green Macaw	GGMA	Ara ambiguus	ARAAMB
Red-and-green Macaw	RAGM	Ara chloropterus	ARACHL
Scarlet Macaw	SCMA	Ara macao	ARAMAC
Cuban Macaw	CUBM*	Ara tricolor	ARATRI
Blue-and-yellow Macaw	BAYM	Ara ararauna	ARAARA
Green Parakeet	GREP*	Psittacara holochlora	PSIHOL
Pacific Parakeet	PACP*	Psittacara strenua	PSISTR
Crimson-fronted Parakeet	CFPA	Psittacara finschi	PSIFIN
Cuban Parakeet	CPAK*	Psittacara euops	PSIEUO
Hispaniolan Parakeet	HPAK*	Psittacara chloroptera	PSICHL
Mitred Parakeet	MIPA	Psittacara mitrata	PSIMIT
Thick-billed Parrot	TBPA	Rhynchopsitta pachyrhyncha	RHPYAC
Maroon-fronted Parrot	MFPA	Rhynchopsitta terrisi	RHYTER
Barred Parakeet	BAPA	Bolborhynchus lineola	BOLLIN
Green-rumped Parrotlet	GRUP*	Forpus passerinus	FORPAS
Mexican Parrotlet	MEXP*	Forpus cyanopygius	FORCYA
Spectacled Parrotlet	SPPA	Forpus conspicillatus	FORCON
Orange-chinned Parakeet	OCPA	Brotogeris jugularis	BROJUG
White-winged Parakeet	WWPA	Brotogeris versicolurus	BROVER
Red-fronted Parrotlet	RFPA	Touit costaricensis	TOUCOS
Blue-fronted Parrotlet	BFPA	Touit dilectissimus	TOUDIL
Brown-hooded Parrot	BHOP*	Pyrilia haematotis	PYRHAE
Saffron-headed Parrot	SHPA	Pyrilia pyrilia	PYRPYI*
Blue-headed Parrot	BHEP*	Pionus menstruus	PIOMEN
White-crowned Parrot	WCPA	Pionus senilis	PIOSEN
White-fronted Parrot	WFPA	Amazona albifrons	AMAALB
Yellow-lored Parrot	YLPA	Amazona xantholora	AMAXAN
Cuban Parrot	CPAT*	Amazona leucocephala	AMALEU
Yellow-billed Parrot	YBPA	Amazona collaria	AMACOL
Hispaniolan Parrot	HPAT*	Amazona ventralis	AMAVEN

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Puerto Rican Parrot	PRPA	<i>Amazona vittata</i>	AMAVIT
Black-billed Parrot	BBPA	<i>Amazona agilis</i>	AMAAGI
Red-crowned Parrot	RCPA	<i>Amazona viridigenalis</i>	AMAVIG*
Lilac-crowned Parrot	LCPA	<i>Amazona finschi</i>	AMAFIN
Red-lored Parrot	RLPA	<i>Amazona autumnalis</i>	AMAAUT
Mealy Parrot	MEAP*	<i>Amazona farinosa</i>	AMAFAR
Yellow-headed Parrot	YHPA	<i>Amazona oratrix</i>	AMAORA
Yellow-naped Parrot	YNPA	<i>Amazona auropalliata</i>	AMAAUR
Yellow-crowned Parrot	YCPA	<i>Amazona ochrocephala</i>	AMAOCH
Red-necked Parrot	RNPA	<i>Amazona arausiaca</i>	AMAARA
St. Lucia Parrot	SLPA	<i>Amazona versicolor</i>	AMAVER
St. Vincent Parrot	SVPA	<i>Amazona guildingii</i>	AMAGUI
Imperial Parrot	IMPA	<i>Amazona imperialis</i>	AMAIMP
Sapayoa	SAPA	<i>Sapayoa aenigma</i>	SAPAEN
Fasciated Antshrike	FAAN	<i>Cymbilaimus lineatus</i>	CYMLIN
Great Antshrike	GANT*	<i>Taraba major</i>	TARMAJ
Barred Antshrike	BAAN	<i>Thamnophilus doliatus</i>	THADOL
Black Antshrike	BLAN	<i>Thamnophilus nigriceps</i>	THANIG
Black-hooded Antshrike	BHOA*	<i>Thamnophilus bridgesi</i>	THABRI
Black-crowned Antshrike	BCAS*	<i>Thamnophilus atrinucha</i>	THAATR
Spiny-faced Antshrike	SFAN	<i>Xenornis setifrons</i>	XENSET
Russet Antshrike	RUAN	<i>Thamnistes anabatinus</i>	THAANA
Plain Antvireo	PLAN	<i>Dysithamnus mentalis</i>	DYSMEN
Streak-crowned Antvireo	STCA*	<i>Dysithamnus striaticeps</i>	DYSSTR
Spot-crowned Antvireo	SPCA*	<i>Dysithamnus puncticeps</i>	DYSPUN
Moustached Antwren	MOAN	<i>Myrmotherula ignota</i>	MYRIGN
Pacific Antwren	PAAN	<i>Myrmotherula pacifica</i>	MYRPAC
White-flanked Antwren	WFLA*	<i>Myrmotherula axillaris</i>	MYRAXI
Slaty Antwren	SLAN	<i>Myrmotherula schisticolor</i>	MYRSCH
Checker-throated Antwren	CTAN	<i>Epinecrophylla fulviventris</i>	EPIFUL
Rufous-winged Antwren	RWAN	<i>Herpsilochmus rufimarginatus</i>	HERRUF
Dot-winged Antwren	DWAN	<i>Microrhopias quixensis</i>	MICQUI
White-fringed Antwren	WFRA*	<i>Formicivora grisea</i>	FORGRI
Rufous-rumped Antwren	RRAN	<i>Euchrepomis callinota</i>	EUCCAL
Dusky Antbird	DUAN	<i>Cercomacra tyrannina</i>	CERTYR
Jet Antbird	JEAN	<i>Cercomacra nigricans</i>	CERNIG
Bare-crowned Antbird	BACA*	<i>Gymnocichla nudiceps</i>	GYMNUD
White-bellied Antbird	WBEA*	<i>Myrmeciza longipes</i>	MYRLON
Chestnut-backed Antbird	CBAN	<i>Myrmeciza exsul</i>	MYREXS
Dull-mantled Antbird	DMAN	<i>Myrmeciza laemosticta</i>	MYRLAE
Zeledon's Antbird	IMAN	<i>Myrmeciza zeledoni</i>	MYRZEL
Spotted Antbird	SPAN	<i>Hylophylax naevioides</i>	HYLNAE
Wing-banded Antbird	WBAA*	<i>Myrmornis torquata</i>	MYRTOR
Bicolored Antbird	BIAN	<i>Gymnopithys bicolor</i>	GYMBIC
Ocellated Antbird	OCAN	<i>Phaenostictus mcleannani</i>	PHAMCL
Black-crowned Antpitta	BCAP*	<i>Pittasoma michleri</i>	PITMIC
Scaled Antpitta	SCAA*	<i>Grallaria guatimalensis</i>	GRAGUA

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Streak-chested Antpitta	SCHA*	<i>Hylopezus perspicillatus</i>	HYLPER
Thicket Antpitta	THAN	<i>Hylopezus dives</i>	HYLDIV
Ochre-breasted Antpitta	OBAN	<i>Grallaricula flavirostris</i>	GRAFLA
Tacarcuna Tapaculo	TATA	<i>Scytalopus panamensis</i>	SCYPAN
Choco Tapaculo	CHOT*	<i>Scytalopus chocoensis</i>	SCYCHO
Silvery-fronted Tapaculo	SFTA	<i>Scytalopus argentifrons</i>	SCYARG
Black-faced Antthrush	BFAN	<i>Formicarius analis</i>	FORANA
Black-headed Antthrush	BHEA*	<i>Formicarius nigricapillus</i>	FORNIG
Rufous-breasted Antthrush	RBAN	<i>Formicarius rufipectus</i>	FORRUF
Tawny-throated Leaftosser	TTLE	<i>Sclerurus mexicanus</i>	SCLMEX
Gray-throated Leaftosser	GTLE	<i>Sclerurus albigularis</i>	SCLALB
Scaly-throated Leaftosser	STLE	<i>Sclerurus guatemalensis</i>	SCLGUA
Olivaceous Woodcreeper	OLWO	<i>Sittasomus griseicapillus</i>	SITGRI
Long-tailed Woodcreeper	LTWO	<i>Deconychura longicauda</i>	DECLON
Ruddy Woodcreeper	RUWO	<i>Dendrocincla homochroa</i>	DENHOM
Tawny-winged Woodcreeper	TWWO	<i>Dendrocincla anabatina</i>	DENANA
Plain-brown Woodcreeper	PBRW*	<i>Dendrocincla fuliginosa</i>	DENFUA*
Wedge-billed Woodcreeper	WBWO	<i>Glyphorhynchus spirurus</i>	GLYSPI
Northern Barred-Woodcreeper	NOBW	<i>Dendrocolaptes sanctithomae</i>	DENSAN
Black-banded Woodcreeper	BBNW*	<i>Dendrocolaptes picumnus</i>	DENPIM*
Strong-billed Woodcreeper	SNBW*	<i>Xiphocolaptes promeropirhynchus</i>	XIPPRO
Cocoa Woodcreeper	COWO	<i>Xiphorhynchus susurrans</i>	XIPSUS
Ivory-billed Woodcreeper	IBIW*	<i>Xiphorhynchus flavigaster</i>	XIPFLA
Black-striped Woodcreeper	BSWO	<i>Xiphorhynchus lachrymosus</i>	XIPLAC
Spotted Woodcreeper	SPWO	<i>Xiphorhynchus erythropygius</i>	XIPERY
Straight-billed Woodcreeper	SGBW*	<i>Dendroplex picus</i>	DENPIS*
Red-billed Scythebill	RBSC	<i>Campylorhamphus trochilirostris</i>	CAMTRO
Brown-billed Scythebill	BBSC	<i>Campylorhamphus pusillus</i>	CAMPUS
White-striped Woodcreeper	WSWO	<i>Lepidocolaptes leucogaster</i>	LEPLEU
Streak-headed Woodcreeper	SHWO	<i>Lepidocolaptes souleyetii</i>	LEPSOU
Spot-crowned Woodcreeper	SCRW*	<i>Lepidocolaptes affinis</i>	LEPAFF
Plain Xenops	PLXE	<i>Xenops minutus</i>	XENMIT*
Streaked Xenops	STXE	<i>Xenops rutilans</i>	XENRUT
Buffy Tuftedcheek	BUTU	<i>Pseudocolaptes lawrencii</i>	PSELAW
Sharp-tailed Streamcreeper	STST	<i>Lochmias nematura</i>	LOCNEM
Slaty-winged Foliage-gleaner	SWFG	<i>Philydor fuscipenne</i>	PHIFUS
Buff-fronted Foliage-gleaner	BFFG	<i>Philydor rufum</i>	PHIRUF
Scaly-throated Foliage-gleaner	STFG	<i>Anabacerthia variegaticeps</i>	ANAVAR
Lineated Foliage-gleaner	LIFG	<i>Syndactyla subalaris</i>	SYNSUB
Ruddy Foliage-gleaner	RUFG	<i>Clibanornis rubiginosus</i>	CLIRUB
Streak-breasted Treehunter	SBTR	<i>Thripadectes rufobrunneus</i>	THRRUB*
Buff-throated Foliage-gleaner	BTFG	<i>Automolus ochrolaemus</i>	AUTOCH
Striped Woodhaunter	STPW*	<i>Automolus subulatus</i>	AUTSUB
Spotted Barbtail	SPBA	<i>Premnoplex brunnescens</i>	PREBRU
Beautiful Treerunner	BETR	<i>Margarornis bellulus</i>	MARBEL
Ruddy Treerunner	RUTR	<i>Margarornis rubiginosus</i>	MARRUB
Double-banded Graytail	DBGR	<i>Xenerpestes minlosi</i>	XENMIL*

<b>ENGLISH NAME</b>	<b>4-LETTER CODE</b>	<b>SCIENTIFIC NAME</b>	<b>6-LETTER CODE</b>
Red-faced Spinetail	RFSP	<i>Cranioleuca erythroptera</i>	CRAERY
Rusty-backed Spinetail	RBAS*	<i>Cranioleuca vulpina</i>	CRAVUL
Pale-breasted Spinetail	PBSP	<i>Synallaxis albescens</i>	SYNALB
Slaty Spinetail	SLSP	<i>Synallaxis brachyura</i>	SYNBRA
Rufous-breasted Spinetail	RBRSP*	<i>Synallaxis erythrothorax</i>	SYNERY
Yellow-bellied Tyrannulet	YBTY	<i>Ornithion semiflavum</i>	ORNSEM
Brown-capped Tyrannulet	BCTY	<i>Ornithion brunneicapillus</i>	ORNBRU
Northern Beardless-Tyrannulet	NOBT	<i>Camptostoma imberbe</i>	CAMIMB
Southern Beardless-Tyrannulet	SOBT	<i>Camptostoma obsoletum</i>	CAMOBS
Mouse-colored Tyrannulet	MCTY	<i>Phaeomyias murina</i>	PHAMUR
Cocos Flycatcher	COCF*	<i>Nesotriccus ridgwayi</i>	NESRID
Yellow Tyrannulet	YETY	<i>Capsiempis flaveola</i>	CAPFLA
Yellow-crowned Tyrannulet	YCTY	<i>Tyrannulus elatus</i>	TYRELA
Forest Elaenia	FOEL	<i>Myiopagis gaimardii</i>	MYIGAI
Gray Elaenia	GRAE*	<i>Myiopagis caniceps</i>	MYICAN
Jamaican Elaenia	JAEL	<i>Myiopagis cotta</i>	MYICOT
Greenish Elaenia	GREL	<i>Myiopagis viridicata</i>	MYIVIR
Caribbean Elaenia	CAEL	<i>Elaenia martinica</i>	ELAMAR
Yellow-bellied Elaenia	YBEL	<i>Elaenia flavogaster</i>	ELAFLA
White-crested Elaenia	WCEL	<i>Elaenia albiceps</i>	ELAALB
Lesser Elaenia	LEEL	<i>Elaenia chiriquensis</i>	ELACHI
Mountain Elaenia	MOEL	<i>Elaenia frantzii</i>	ELAFRA
Greater Antillean Elaenia	GAEL	<i>Elaenia fallax</i>	ELAFAL
Torrent Tyrannulet	TOTY	<i>Serpophaga cinerea</i>	SERCIN
Olive-striped Flycatcher	OSTF*	<i>Mionectes olivaceus</i>	MIOOLI
Ochre-bellied Flycatcher	OBFL	<i>Mionectes oleagineus</i>	MIOOLE
Sepia-capped Flycatcher	SECF*	<i>Leptopogon amaurocephalus</i>	LEPAMA
Slaty-capped Flycatcher	SLCF*	<i>Leptopogon superciliaris</i>	LEPSUP
Yellow-green Tyrannulet	YGTY	<i>Phylloscartes flavovirens</i>	PHYFLA
Rufous-browed Tyrannulet	RBTY	<i>Phylloscartes superciliaris</i>	PHYSUP
Rough-legged Tyrannulet	RLTY	<i>Phyllomyias burmeisteri</i>	PHYBUR
Sooty-headed Tyrannulet	SHTY	<i>Phyllomyias griseiceps</i>	PHYGRI
Paltry Tyrannulet	PATY	<i>Zimmerius vilissimus</i>	ZIMVIL
Northern Scrub-Flycatcher	NOSF	<i>Sublegatus arenarum</i>	SUBARE
Bronze-olive Pygmy-Tyrant	BOPT	<i>Pseudotriccus pelzelni</i>	PSEPEL
Black-capped Pygmy-Tyrant	BPYT*	<i>Myiornis atricapillus</i>	MYIATP*
Scale-crested Pygmy-Tyrant	SCPT	<i>Lophotriccus pileatus</i>	LOPPIT*
Pale-eyed Pygmy-Tyrant	PEPT	<i>Lophotriccus pilaris</i>	LOPPIR*
Northern Bentbill	NOBE	<i>Oncostoma cinereigulare</i>	ONCCIN
Southern Bentbill	SOBE	<i>Oncostoma olivaceum</i>	ONCOLI
Slate-headed Tody-Flycatcher	SHTF	<i>Poecilatriccus sylvia</i>	POESYL
Common Tody-Flycatcher	COTF	<i>Todirostrum cinereum</i>	TODCIN
Black-headed Tody-Flycatcher	BHTF	<i>Todirostrum nigriceps</i>	TODNIG
Brownish Twistwing	BRTW	<i>Cnipodectes subbrunneus</i>	CNISUB
Eye-ringed Flatbill	ERFL	<i>Rhynchocyclus brevirostris</i>	RHYBRE
Olivaceous Flatbill	OLFL	<i>Rhynchocyclus olivaceus</i>	RHYOLI
Yellow-olive Flycatcher	YOFL	<i>Tolmomyias sulphureus</i>	TOLSUL



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Yellow-margined Flycatcher	YMFL	<i>Tolmomyias assimilis</i>	TOLASS
Yellow-breasted Flycatcher	YBRF*	<i>Tolmomyias flaviventris</i>	TOLFLA
Stub-tailed Spadebill	STTS*	<i>Platyrinchus cancrominus</i>	PLACAN
White-throated Spadebill	WTRS*	<i>Platyrinchus mystaceus</i>	PLAMYS
Golden-crowned Spadebill	GCRS*	<i>Platyrinchus coronatus</i>	PLACOR
Royal Flycatcher	ROFL	<i>Onychorhynchus coronatus</i>	ONYCOR
Ruddy-tailed Flycatcher	RDTF*	<i>Terentotriccus erythrurus</i>	TERERY
Tawny-breasted Flycatcher	TBFL	<i>Myiobius villosus</i>	MYIVIL
Sulphur-rumped Flycatcher	SRFL	<i>Myiobius sulphureipygius</i>	MYISUL
Black-tailed Flycatcher	BTFL	<i>Myiobius atricaudus</i>	MYIATD*
Bran-colored Flycatcher	BCOF*	<i>Myiophobus fasciatus</i>	MYIFAS
Euler's Flycatcher	EUFL	<i>Lathrotriccus euleri</i>	LATEUL
Tawny-chested Flycatcher	TCFL	<i>Aphanotriccus capitalis</i>	APHCAP
Black-billed Flycatcher	BLBF*	<i>Aphanotriccus audax</i>	APHAUD
Belted Flycatcher	BEFL	<i>Xenotriccus callizonus</i>	XENCAL
Pileated Flycatcher	PILF*	<i>Xenotriccus mexicanus</i>	XENMEX
Tufted Flycatcher	TUFL	<i>Mitrephanes phaeocercus</i>	MITPHA
Olive-sided Flycatcher	OSFL	<i>Contopus cooperi</i>	CONCOO
Greater Pewee	GRPE	<i>Contopus pertinax</i>	CONPER
Dark Pewee	DAPE	<i>Contopus lugubris</i>	CONLUG
Ochraceous Pewee	OCPE	<i>Contopus ochraceus</i>	CONOCH
Western Wood-Pewee	WEWP	<i>Contopus sordidulus</i>	CONSOR
Eastern Wood-Pewee	EAWP	<i>Contopus virens</i>	CONVIR
Tropical Pewee	TRPE	<i>Contopus cinereus</i>	CONCIN
Cuban Pewee	CUPE	<i>Contopus caribaeus</i>	CONCAB*
Jamaican Pewee	JAPE	<i>Contopus pallidus</i>	CONPAL
Hispaniolan Pewee	HIPE	<i>Contopus hispaniolensis</i>	CONHIS
Lesser Antillean Pewee	LAPE	<i>Contopus latirostris</i>	CONLAT
Yellow-bellied Flycatcher	YBFL	<i>Empidonax flaviventris</i>	EMPFLT*
Acadian Flycatcher	ACFL	<i>Empidonax virescens</i>	EMPVIR
Alder Flycatcher	ALFL	<i>Empidonax alnorum</i>	EMPALN
+ Traill's Flycatcher	TRFL	<i>Empidonax alnorum/traillii</i>	EMPALT
Willow Flycatcher	WIFL	<i>Empidonax traillii</i>	EMPTRA
+ Southwestern Willow Flycatcher	SWFL	<i>Empidonax t. extimus</i>	EMPTEX
White-throated Flycatcher	WTFL	<i>Empidonax albigularis</i>	EMPALB
Least Flycatcher	LEFL	<i>Empidonax minimus</i>	EMPMIN
Hammond's Flycatcher	HAFL	<i>Empidonax hammondii</i>	EMPHAM
+ Hammond's/Dusky Flycatcher	HDFL	<i>Empidonax hammondii/oberho.</i>	EMPHAO
Gray Flycatcher	GRFL	<i>Empidonax wrightii</i>	EMPWRI
Dusky Flycatcher	DUFL	<i>Empidonax oberholseri</i>	EMPOBE
Pine Flycatcher	PINF*	<i>Empidonax affinis</i>	EMPAFF
Pacific-slope Flycatcher	PSFL	<i>Empidonax difficilis</i>	EMPDIF
+ Western Flycatcher	WEFL	<i>Empidonax difficilis/occid.</i>	EMPDIO
Cordilleran Flycatcher	COFL	<i>Empidonax occidentalis</i>	EMPOCC
Yellowish Flycatcher	YEFL	<i>Empidonax flavescens</i>	EMPFLC*
Buff-breasted Flycatcher	BBFL	<i>Empidonax fulvifrons</i>	EMPFUL
Black-capped Flycatcher	BCAF*	<i>Empidonax atriceps</i>	EMPATR

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+ Unidentified Empidonax Flycatcher	UEFL	Empidonax (sp)	EMPSPE
Black Phoebe	BLPH	Sayornis nigricans	SAYNIG
Eastern Phoebe	EAPH	Sayornis phoebe	SAYPHO
Say's Phoebe	SAPH	Sayornis saya	SAYSAY
Vermilion Flycatcher	VEFL	Pyrocephalus rubinus	PYRRUB
Pied Water-Tyrant	PIWT	Fluvicola pica	FLUPIC
Long-tailed Tyrant	LTTY	Colonia colonus	COLCOL
Cattle Tyrant	CATY	Machetornis rixosa	MACRIX
Bright-rumped Attila	BRAT	Attila spadiceus	ATTSPA
Sirystes	SIRY	Sirystes sibilator	SIRSIB
Rufous Mourner	RMOU*	Rhytipterna holerythra	RHYHOL
Yucatan Flycatcher	YUFL	Myiarchus yucatanensis	MYIYUC
Sad Flycatcher	SAFL	Myiarchus barbirostris	MYIBAR
Dusky-capped Flycatcher	DCFL	Myiarchus tuberculifer	MYITUB
Panama Flycatcher	PAFL	Myiarchus panamensis	MYIPAN
Ash-throated Flycatcher	ATFL	Myiarchus cinerascens	MYICIN
Nutting's Flycatcher	NUFL	Myiarchus nuttingi	MYINUT
Great Crested Flycatcher	GCFL	Myiarchus crinitus	MYICRI
Brown-crested Flycatcher	BCFL	Myiarchus tyrannulus	MYITYR
Grenada Flycatcher	GFLY*	Myiarchus nugator	MYINUG
Rufous-tailed Flycatcher	RFTF*	Myiarchus validus	MYIVAL
La Sagra's Flycatcher	LSFL	Myiarchus sagrae	MYISAG
Stolid Flycatcher	STOF*	Myiarchus stolidus	MYISTO
Puerto Rican Flycatcher	PRFL	Myiarchus antillarum	MYIANT
Lesser Antillean Flycatcher	LAFL	Myiarchus oberi	MYIOBE
Flammulated Flycatcher	FLFL	Deltarhynchus flammulatus	DELFLA
Lesser Kiskadee	LEKI	Pitangus lictor	PITLIC
Great Kiskadee	GKIS*	Pitangus sulphuratus	PITSUL
Boat-billed Flycatcher	BOBF*	Megarynchus pitangua	MEGPIT
Rusty-margined Flycatcher	RMFL	Myiozetetes cayanensis	MYICAY
Social Flycatcher	SOFL	Myiozetetes similis	MYISIM
Gray-capped Flycatcher	GCAF*	Myiozetetes granadensis	MYIGRA
White-ringed Flycatcher	WRFL	Conopias albobittatus	CONALB
Golden-bellied Flycatcher	GBFL	Miodynastes hemichrysus	MYIHEM
Golden-crowned Flycatcher	GOCF*	Miodynastes chrysocephalus	MYICHR
Streaked Flycatcher	STRF*	Miodynastes maculatus	MYIMAC
Sulphur-bellied Flycatcher	SBFL	Miodynastes luteiventris	MYILUT
Piratic Flycatcher	PIFL	Legatus leucophaeus	LEGLEU
Variiegated Flycatcher	VAFL	Empidonomus varius	EMPVAR
Crowned Slaty Flycatcher	CSFL	Empidonomus aurantioatrocristatus	EMPAUR
Tropical Kingbird	TRKI	Tyrannus melancholicus	TYRMEL
Couch's Kingbird	COKI	Tyrannus couchii	TYRCOU
Cassin's Kingbird	CAKI	Tyrannus vociferans	TYRVOG
Thick-billed Kingbird	TBKI	Tyrannus crassirostris	TYRCRA
Western Kingbird	WEKI	Tyrannus verticalis	TYRVER
Eastern Kingbird	EAKI	Tyrannus tyrannus	TYRTYR
Gray Kingbird	GRAK*	Tyrannus dominicensis	TYRDOM

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Loggerhead Kingbird	LOKI	<i>Tyrannus caudifasciatus</i>	TYRCAU
Giant Kingbird	GIKI	<i>Tyrannus cubensis</i>	TYRCUB
Scissor-tailed Flycatcher	STFL	<i>Tyrannus forficatus</i>	TYRFOR
Fork-tailed Flycatcher	FTFL	<i>Tyrannus savana</i>	TYRSAV
+ Unidentified Flycatcher	UNFL	Tyrannidae (gen, sp)	TYRGEN
Gray-headed Piprites	GHPI	<i>Piprites griseiceps</i>	PIPGRI
Northern Schiffornis	NOSC	<i>Schiffornis veraepacis</i>	SCHVER
Russet-winged Schiffornis	RWSC	<i>Schiffornis stenorhyncha</i>	SCHSTE
Speckled Mourner	SPMO	<i>Laniocera rufescens</i>	LANRUF
Masked Tityra	MATI	<i>Tityra semifasciata</i>	TITSEM
Black-crowned Tityra	BCRT*	<i>Tityra inquisitor</i>	TITINQ
Barred Becard	BABE	<i>Pachyramphus versicolor</i>	PACVER
Cinereous Becard	CIRB*	<i>Pachyramphus rufus</i>	PACRUF
Cinnamon Becard	CIMB*	<i>Pachyramphus cinnamomeus</i>	PACCIN
White-winged Becard	WWBE	<i>Pachyramphus polychopterus</i>	PACPOL
Black-and-white Becard	BAWB	<i>Pachyramphus albogriseus</i>	PACALB
Gray-collared Becard	GCBE	<i>Pachyramphus major</i>	PACMAJ
Rose-throated Becard	RTBE	<i>Pachyramphus aglaiae</i>	PACAGL
One-colored Becard	OCBE	<i>Pachyramphus homochrous</i>	PACHOM
Jamaican Becard	JABE	<i>Pachyramphus niger</i>	PACNIG
Purple-throated Fruitcrow	PTFR	<i>Querula purpurata</i>	QUEPUR
Bare-necked Umbrellabird	BNUM	<i>Cephalopterus glabricollis</i>	CEPGLA
Lovely Cotinga	LOCO	<i>Cotinga amabilis</i>	COTAMA
Turquoise Cotinga	TUCO	<i>Cotinga ridgwayi</i>	COTRID
Blue Cotinga	BLCO	<i>Cotinga nattererii</i>	COTNAT
Rufous Piha	RUFP*	<i>Lipaugus unirufus</i>	LIPUNI
Three-wattled Bellbird	TWBE	<i>Procnias tricarunculatus</i>	PROTRI
Black-tipped Cotinga	BTCO	<i>Carpodectes hopkei</i>	CARHOP
Yellow-billed Cotinga	YBCO	<i>Carpodectes antoniae</i>	CARANT
Snowy Cotinga	SNCO	<i>Carpodectes nitidus</i>	CARNIT
White-ruffed Manakin	WRMA	<i>Corapipo altera</i>	CORALT
Lance-tailed Manakin	LATM*	<i>Chiroxiphia lanceolata</i>	CHILAN
Long-tailed Manakin	LOTM*	<i>Chiroxiphia linearis</i>	CHILIN
Green Manakin	GMAK*	<i>Xenopipo holochlora</i>	XENHOL
White-crowned Manakin	WCRM*	<i>Dixiphia pipra</i>	DIXPIP
Red-capped Manakin	RCMA	<i>Ceratopipra mentalis</i>	CERMEN
Golden-headed Manakin	GHMA	<i>Ceratopipra erythrocephala</i>	CERERY
White-collared Manakin	WCOM*	<i>Manacus candei</i>	MANCAN
Orange-collared Manakin	OCMA	<i>Manacus aurantiacus</i>	MANAUR
Golden-collared Manakin	GCOM	<i>Manacus vitellinus</i>	MANVIT
Blue-crowned Manakin	BCRM*	<i>Lepidothrix coronata</i>	LEPCOR
Sharpbill	SHAR	<i>Oxyruncus cristatus</i>	OXYCRI
Brown Shrike	BROS*	<i>Lanius cristatus</i>	LANCRI
Loggerhead Shrike	LOSH	<i>Lanius ludovicianus</i>	LANLUD
Northern Shrike	NSHR*	<i>Lanius excubitor</i>	LANEXC
Slaty Vireo	SLVI	<i>Vireo brevipennis</i>	VIRBRE
White-eyed Vireo	WEVI	<i>Vireo griseus</i>	VIRGRI

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Thick-billed Vireo	TBVI	<i>Vireo crassirostris</i>	VIRCRA
Mangrove Vireo	MAVI	<i>Vireo pallens</i>	VIRPAL
Cozumel Vireo	COVI	<i>Vireo bairdi</i>	VIRBAI
San Andres Vireo	SAVI	<i>Vireo caribaeus</i>	VIRCAB*
Jamaican Vireo	JAVI	<i>Vireo modestus</i>	VIRMOD
Cuban Vireo	CUVI	<i>Vireo gundlachii</i>	VIRGUN
Puerto Rican Vireo	PRVI	<i>Vireo latimeri</i>	VIRLAT
Flat-billed Vireo	FBVI	<i>Vireo nanus</i>	VIRNAN
Bell's Vireo	BEVI	<i>Vireo bellii</i>	VIRBEL
+ Least Bell's Vireo	LBVI	<i>Vireo b. pusillus</i>	VIRBPU
Black-capped Vireo	BCVI	<i>Vireo atricapilla</i>	VIRATR
Dwarf Vireo	DWVI	<i>Vireo nelsoni</i>	VIRNEL
Gray Vireo	GRVI	<i>Vireo vicinior</i>	VIRVIC
Blue Mountain Vireo	BMVI	<i>Vireo osburni</i>	VIROSB
Yellow-throated Vireo	YTVI	<i>Vireo flavifrons</i>	VIRFLF*
Plumbeous Vireo	PLVI	<i>Vireo plumbeus</i>	VIRPLU
+ Solitary Vireo	SOVI	<i>Vireo (sp)</i>	VIRSPE
Cassin's Vireo	CAVI	<i>Vireo cassinii</i>	VIRCAS
Blue-headed Vireo	BHVI	<i>Vireo solitarius</i>	VIRSOL
Yellow-winged Vireo	YWVI	<i>Vireo carmioli</i>	VIRCAM*
Hutton's Vireo	HUVI	<i>Vireo huttoni</i>	VIRHUT
Golden Vireo	GOVI	<i>Vireo hypochryseus</i>	VIRHYP
Warbling Vireo	WAVI	<i>Vireo gilvus</i>	VIRGIL
Brown-capped Vireo	BCAV*	<i>Vireo leucophrys</i>	VIRLEU
Philadelphia Vireo	PHVI	<i>Vireo philadelphicus</i>	VIRPHI
Red-eyed Vireo	REVI	<i>Vireo olivaceus</i>	VIROLI
Yellow-green Vireo	YGVI	<i>Vireo flavoviridis</i>	VIRFLD*
Black-whiskered Vireo	BWVI	<i>Vireo altiloquus</i>	VIRALT
Yucatan Vireo	YUVI	<i>Vireo magister</i>	VIRMAG
Scrub Greenlet	SCRG*	<i>Hylophilus flavipes</i>	HYLFLA
Tawny-crowned Greenlet	TCGR	<i>Hylophilus ochraceiceps</i>	HYLOCH
Golden-fronted Greenlet	GFGR	<i>Hylophilus aurantiifrons</i>	HYLAUR
Lesser Greenlet	LESG*	<i>Hylophilus decurtatus</i>	HYLDEC
Chestnut-sided Shrike-Vireo	CSSV	<i>Vireolanius melitophrys</i>	VIRMEL
Green Shrike-Vireo	GRSV	<i>Vireolanius pulchellus</i>	VIRPUL
Yellow-browed Shrike-Vireo	YBSV	<i>Vireolanius eximius</i>	VIREXI
Rufous-browed Peppershrike	RBPE	<i>Cyclarhis gujanensis</i>	CYCGUJ
Gray Jay	GRAJ*	<i>Perisoreus canadensis</i>	PERCAN
White-throated Jay	WTJA	<i>Cyanolyca mirabilis</i>	CYAMIR
Dwarf Jay	DWJA	<i>Cyanolyca nana</i>	CYANAN
Black-throated Jay	BTJA	<i>Cyanolyca pumilo</i>	CYAPUM
Silvery-throated Jay	STHJ*	<i>Cyanolyca argentigula</i>	CYAARG
Azure-hooded Jay	AHJA	<i>Cyanolyca cucullata</i>	CYACUC
Black-throated Magpie-Jay	BTMJ	<i>Calocitta colliei</i>	CALCOL
White-throated Magpie-Jay	WTMJ	<i>Calocitta formosa</i>	CALFOR
Brown Jay	BRJA	<i>Psilorhinus morio</i>	PSIMOR
Tufted Jay	TUJA	<i>Cyanocorax dickeyi</i>	CYADIC

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Black-chested Jay	BCHJ*	Cyanocorax affinis	CYAAFF
Green Jay	GREJ*	Cyanocorax yncas	CYAYNC
Bushy-crested Jay	BCRJ*	Cyanocorax melanocyaneus	CYAMEL
San Blas Jay	SBJA	Cyanocorax sanblasianus	CYASAN
Yucatan Jay	YUJA	Cyanocorax yucatanicus	CYAYUC
Purplish-backed Jay	PBJA	Cyanocorax beecheii	CYABEE
Pinyon Jay	PIJA	Gymnorhinus cyanocephalus	GYMCYA
Steller's Jay	STJA	Cyanocitta stelleri	CYASTE
Blue Jay	BLJA	Cyanocitta cristata	CYACRI
Florida Scrub-Jay	FLSJ	Aphelocoma coerulescens	APHCOE
Island Scrub-Jay	ISSJ	Aphelocoma insularis	APHINS
Western Scrub-Jay	WESJ	Aphelocoma californica	APHCAL
Transvolcanic Jay	TRJA	Aphelocoma ultramarina	APHULT
Mexican Jay	MEJA	Aphelocoma wollweberi	APHWOL
Unicolored Jay	UNJA	Aphelocoma unicolor	APHUNI
Clark's Nutcracker	CLNU	Nucifraga columbiana	NUCCOL
Black-billed Magpie	BBMA	Pica hudsonia	PICHUD
Yellow-billed Magpie	YBMA	Pica nuttalli	PIANUT*
Eurasian Jackdaw	EUJA	Corvus monedula	CORMON
American Crow	AMCR	Corvus brachyrhynchos	CORBRA
Northwestern Crow	NOCR	Corvus caurinus	CORCAU
Palm Crow	PACR	Corvus palmarum	CORPAL
Cuban Crow	CUCR	Corvus nasicus	CORNAS
White-necked Crow	WNCR	Corvus leucognaphalus	CORLEU
Jamaican Crow	JACR	Corvus jamaicensis	CORJAM
Tamaulipas Crow	TACR	Corvus imparatus	CORIMP
Sinaloa Crow	SICR	Corvus sinaloae	CORSIN
Fish Crow	FICR	Corvus ossifragus	COROSS
Hawaiian Crow	HCRO*	Corvus hawaiiensis	CORHAW
+ Unidentified Crow	UNCR	Corvus (sp)	CORSPE
Chihuahuan Raven	CHRA	Corvus cryptoleucus	CORCRY
Common Raven	CORA	Corvus corax	CORCOR
Kauai Elepaio	KAEL	Chasiempis sclateri	CHASCL
Oahu Elepaio	OAEL	Chasiempis ibidis	CHAIBI
Hawaii Elepaio	HAEL	Chasiempis sandwichensis	CHASAN
Sky Lark	SKLA	Alauda arvensis	ALAARV
Horned Lark	HOLA	Eremophila alpestris	EREALP
Purple Martin	PUMA	Progne subis	PROSUB
Cuban Martin	CUMA	Progne cryptoleuca	PROCRY
Caribbean Martin	CAMA	Progne dominicensis	PRODOM
Sinaloa Martin	SIMA	Progne sinaloae	PROSIN
Gray-breasted Martin	GYBM*	Progne chalybea	PROCHA
Southern Martin	SOMA	Progne elegans	PROELE
Brown-chested Martin	BCMA	Progne tapera	PROTAP
Tree Swallow	TRES*	Tachycineta bicolor	TACBIC
Mangrove Swallow	MANS*	Tachycineta albilinea	TACALB
Golden Swallow	GOSW	Tachycineta euchrysea	TACEUC

<b>ENGLISH NAME</b>	<b>4-LETTER CODE</b>	<b>SCIENTIFIC NAME</b>	<b>6-LETTER CODE</b>
Violet-green Swallow	VGSW	Tachycineta thalassina	TACTHA
Bahama Swallow	BAHS*	Tachycineta cyaneoviridis	TACCYA
Blue-and-white Swallow	BAWS	Pygochelidon cyanoleuca	PYGCYA
Black-capped Swallow	BCSW	Notiochelidon pileata	NOTPIL
White-thighed Swallow	WTGS*	Neochelidon tibialis	NEOTIB
Northern Rough-winged Swallow	NRWS	Stelgidopteryx serripennis	STESER
Southern Rough-winged Swallow	SRWS	Stelgidopteryx ruficollis	STERUF
Bank Swallow	BANS*	Riparia riparia	RIPRIP
Cliff Swallow	CLSW	Petrochelidon pyrrhonota	PETPYR
Cave Swallow	CASW	Petrochelidon fulva	PETFUL
Barn Swallow	BARS*	Hirundo rustica	HIRRUS
Common House-Martin	COHM	Delichon urbicum	DELURB
+ Unidentified Swallow	UNSW	Hirundidae (gen, sp)	HIRGSP
Carolina Chickadee	CACH	Poecile carolinensis	POECAR
+ Carolina X Black-c. Chickadee Hybrid	CBCC*	Poecile caroli. x atrica.	POECAA
Black-capped Chickadee	BCCH	Poecile atricapillus	POEATR
Mountain Chickadee	MOCH	Poecile gambeli	POEGAM
Mexican Chickadee	MECH	Poecile sclateri	POESCL
Chestnut-backed Chickadee	CBCH	Poecile rufescens	POERUF
Boreal Chickadee	BOCH	Poecile hudsonicus	POEHUD
Gray-headed Chickadee	GHCH	Poecile cinctus	POECIN
+ Unidentified Poecile Chickadee	UPCH	Poecile (sp)	POESPE
Bridled Titmouse	BRTI	Baeolophus wollweberi	BAEWOL
Oak Titmouse	OATI	Baeolophus inornatus	BAEINO
Juniper Titmouse	JUTI	Baeolophus ridgwayi	BAERID
Tufted Titmouse	TUTI	Baeolophus bicolor	BAEBIC
Black-crested Titmouse	BCTI	Baeolophus atricristatus	BAEATR
Verdin	VERD	Auriparus flaviceps	AURFLA
Bushtit	BUSH	Psaltriparus minimus	PSAMIN
Red-breasted Nuthatch	RBNU	Sitta canadensis	SITCAN
White-breasted Nuthatch	WBNU	Sitta carolinensis	SITCAR
Pygmy Nuthatch	PYNU	Sitta pygmaea	SITPYG
Brown-headed Nuthatch	BHNU	Sitta pusilla	SITPUS
Brown Creeper	BRCR	Certhia americana	CERAME
Rock Wren	ROWR	Salpinctes obsoletus	SALOBS
Nightingale Wren	NIWR	Microcerculus philomela	MICPHI
Scaly-breasted Wren	SCBW*	Microcerculus marginatus	MICMAR
Canyon Wren	CANW*	Catherpes mexicanus	CAPMEX*
Sumichrast's Wren	SUWR	Hylorchilus sumichrasti	HYLSUM
Nava's Wren	NAWR	Hylorchilus navai	HYLNAV
Zapata Wren	ZAWR	Ferminia cerverai	FERCER
House Wren	HOWR	Troglodytes aedon	TROAED
+ Southern House-Wren	SOHW	Troglodytes a. musculus	TROAMU
Socorro Wren	SOCW*	Troglodytes sissonii	TROSIS
Clarion Wren	CLWR	Troglodytes tanneri	TROTAN
Rufous-browed Wren	RBWW*	Troglodytes rufociliatus	TROruc*
Ochraceous Wren	OCWR	Troglodytes ochraceus	TROOCH

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Pacific Wren	PAWR	Troglodytes pacificus	TROPAC
Winter Wren	WIWR	Troglodytes hiemalis	TROHIE
Timberline Wren	TIWR	Thryorchilus browni	THR BRO
Sedge Wren	SEWR	Cistothorus platensis	CISPLA
Marsh Wren	MAWR	Cistothorus palustris	CISPAL
Carolina Wren	CARW*	Thryothorus ludovicianus	THRLUD
Bewick's Wren	BEWR	Thryomanes bewickii	THRBEW
White-headed Wren	WHWR	Campylorhynchus albobrunneus	CAMALB
Band-backed Wren	BABW*	Campylorhynchus zonatus	CAMZON
Gray-barred Wren	GBWR	Campylorhynchus megalopterus	CAMMEG
Giant Wren	GIWR	Campylorhynchus chiapensis	CAMCHI
Rufous-naped Wren	RNAW*	Campylorhynchus rufinucha	CAMRUN*
Spotted Wren	SPWR	Campylorhynchus gularis	CAMGUL
Boucard's Wren	BOWR	Campylorhynchus jocosus	CAMJOC
Yucatan Wren	YUWR	Campylorhynchus yucatanicus	CAMYUC
Cactus Wren	CACW*	Campylorhynchus brunneicapillus	CAMBRU
Sooty-headed Wren	SHWR	Pheugopedius spadix	PHESPA
Black-throated Wren	BTWR	Pheugopedius atrogularis	PHEATR
Rufous-breasted Wren	RBSW*	Pheugopedius rutilus	PHERUT
Spot-breasted Wren	SBSW*	Pheugopedius maculipectus	PHEMAC
Happy Wren	HAWR	Pheugopedius felix	PHEFEL
Black-bellied Wren	BBEW*	Pheugopedius fasciatoventris	PHEFAS
Rufous-and-white Wren	RAWW	Thryophilus rufalbus	THRRUL*
Sinaloa Wren	SIWR	Thryophilus sinaloa	THRSIN
Banded Wren	BANW*	Thryophilus pleurostictus	THRPLE
Stripe-throated Wren	STWR	Cantorchilus leucopogon	CANLEP*
Stripe-breasted Wren	SIBW*	Cantorchilus thoracicus	CANTHO
Plain Wren	PLWR	Cantorchilus modestus	CANMOD
Bay Wren	BAYW*	Cantorchilus nigricapillus	CANNIG
Riverside Wren	RIWR	Cantorchilus semibadius	CANSEM
Buff-breasted Wren	BBRW*	Cantorchilus leucotis	CANLET*
White-bellied Wren	WBWR	Uropsila leucogastra	UROLEU
White-breasted Wood-Wren	WBWW	Henicorhina leucosticta	HENLES*
Gray-breasted Wood-Wren	GBWW	Henicorhina leucophrys	HENLEP*
Song Wren	SONW*	Cyphorhinus phaeocephalus	CYPPHA
+ Unidentified Wren	UNWR	Troglodytidae (gen, sp)	TRGGSP*
Tawny-faced Gnatwren	TFGN	Microbates cinereiventris	MICGIN
Long-billed Gnatwren	LBGN	Ramphocaenus melanurus	RAMMEL
Blue-gray Gnatcatcher	BGGN	Polioptila caerulea	POLCAE
Cuban Gnatcatcher	CUGN	Polioptila lembeyei	POLLEM
California Gnatcatcher	CAGN	Polioptila californica	POLCAL
Black-tailed Gnatcatcher	BTGN	Polioptila melanura	POLMEL
Black-capped Gnatcatcher	BCGN	Polioptila nigriceps	POLNIG
White-lored Gnatcatcher	WLGN	Polioptila albiloris	POLALB
Tropical Gnatcatcher	TRGN	Polioptila plumbea	POLPLU
Slate-throated Gnatcatcher	STGN	Polioptila schistaceigula	POLSCH
American Dipper	AMDI	Cinclus mexicanus	CINMEX

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Red-vented Bulbul	RVBU	<i>Pycnonotus cafer</i>	PYCCAF
Red-whiskered Bulbul	RWBU	<i>Pycnonotus jocosus</i>	PYCJOC
Golden-crowned Kinglet	GCKI	<i>Regulus satrapa</i>	REGSAT
Ruby-crowned Kinglet	RCKI	<i>Regulus calendula</i>	REGCAL
Japanese Bush-Warbler	JABW	<i>Cettia diphone</i>	CETDIP
Willow Warbler	WILW*	<i>Phylloscopus trochilus</i>	PHYTRO
Common Chiffchaff	CCHI*	<i>Phylloscopus collybita</i>	PHYCOL
Wood Warbler	WOWA	<i>Phylloscopus sibilatrix</i>	PHYSIB
Dusky Warbler	DUWA	<i>Phylloscopus fuscatus</i>	PHYFUS
Pallas's Leaf Warbler	PLEW*	<i>Phylloscopus proregulus</i>	PHYPRO
Yellow-browed Warbler	YBWA	<i>Phylloscopus inornatus</i>	PHYINO
Arctic Warbler	ARWA	<i>Phylloscopus borealis</i>	PHYBOR
Kamchatka Leaf Warbler	KLWA	<i>Phylloscopus examinandus</i>	PHYEXA
Lesser Whitethroat	LEWH	<i>Sylvia curruca</i>	SYLCUR
Wrentit	WREN	<i>Chamaea fasciata</i>	CHAFAS
Japanese White-eye	JAWE	<i>Zosterops japonicus</i>	ZOSJAP
Greater Necklaced Laughingthrush	GNLA	<i>Garrulax pectoralis</i>	GARPEC
Hwamei	HWAM	<i>Garrulax canorus</i>	GARCAN
Red-billed Leiothrix	RBLE	<i>Leiothrix lutea</i>	LEILUT
Millerbird	MILL	<i>Acrocephalus familiaris</i>	ACRFAM
Sedge Warbler	SEWA	<i>Acrocephalus schoenobaenus</i>	ACRSCH
Black-capped Donacobius	BCDO	<i>Donacobius atricapilla</i>	DONATR
Middendorff's Grasshopper-Warbler	MIGW	<i>Locustella ochotensis</i>	LOCOCH
Lanceolated Warbler	LANW*	<i>Locustella lanceolata</i>	LOCLAN
Gray-streaked Flycatcher	GSFL	<i>Muscicapa griseisticta</i>	MUSGRI
Asian Brown Flycatcher	ABFL	<i>Muscicapa dauurica</i>	MUSDAU
Spotted Flycatcher	SPFL	<i>Muscicapa striata</i>	MUSSTR
Dark-sided Flycatcher	DSFL	<i>Muscicapa sibirica</i>	MUSSIB
White-rumped Shama	WRSH	<i>Copsychus malabaricus</i>	COPMAL
Rufous-tailed Robin	RTRO	<i>Luscinia sibilans</i>	LUSSIB
Siberian Rubythroat	SIRU	<i>Luscinia calliope</i>	LUSCAL
Bluethroat	BLUE	<i>Luscinia svecica</i>	LUSSVE
Siberian Blue Robin	SBRO	<i>Luscinia cyane</i>	LUSCYA
Red-flanked Bluetail	RFBL	<i>Tarsiger cyanurus</i>	TARCYA
Narcissus Flycatcher	NAFL	<i>Ficedula narcissina</i>	FICNAR
Mugimaki Flycatcher	MUFL	<i>Ficedula mugimaki</i>	FICMUG
Taiga Flycatcher	TAFL	<i>Ficedula albicilla</i>	FICALB
Northern Wheatear	NOWH	<i>Oenanthe oenanthe</i>	OENOEN
Stonechat	STON	<i>Saxicola torquatus</i>	SAXTOR
Eastern Bluebird	EABL	<i>Sialia sialis</i>	SIASIA
Western Bluebird	WEBL	<i>Sialia mexicana</i>	SIAMEX
+ Western X Mountain Bluebird Hybrid	WMBH	<i>Sialia mex. x curruroid.</i>	SIAMEC
Mountain Bluebird	MOBL	<i>Sialia currucoides</i>	SIACUR
Townsend's Solitaire	TOSO	<i>Myadestes townsendi</i>	MYATOW
Brown-backed Solitaire	BBSO	<i>Myadestes occidentalis</i>	MYAOCC
Cuban Solitaire	CUSO	<i>Myadestes elisabeth</i>	MYAELI
Rufous-throated Solitaire	RTSO	<i>Myadestes genibarbis</i>	MYAGEN



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Black-faced Solitaire	BFSO	<i>Myadestes melanops</i>	MYAMEL
Varied Solitaire	VASO	<i>Myadestes coloratus</i>	MYACOL
Slate-colored Solitaire	SCSO	<i>Myadestes unicolor</i>	MYAUNI
Kamoa	KAMA	<i>Myadestes myadestinus</i>	MYAMYA
Amaui	AMAU	<i>Myadestes woahensis</i>	MYAWOA
Olomao	OLOM	<i>Myadestes lanaiensis</i>	MYALAN
Omao	OMAO	<i>Myadestes obscurus</i>	MYAOBS
Puaiohi	PUAI	<i>Myadestes palmeri</i>	MYAPAL
Black-billed Nightingale-Thrush	BBNT	<i>Catharus gracilirostris</i>	CATGRA
Orange-billed Nightingale-Thrush	OBNT	<i>Catharus aurantiirostris</i>	CATAUN*
Slaty-backed Nightingale-Thrush	SBNT	<i>Catharus fuscater</i>	CATFUT*
Russet Nightingale-Thrush	RUNT	<i>Catharus occidentalis</i>	CATOCC
Ruddy-capped Nightingale-Thrush	RCNT	<i>Catharus frantzii</i>	CATFRA
Black-headed Nightingale-Thrush	BHNT	<i>Catharus mexicanus</i>	CASMEX*
Spotted Nightingale-Thrush	SPNT	<i>Catharus dryas</i>	CATDRY
Veery	VEER	<i>Catharus fuscescens</i>	CATFUN*
Gray-cheeked Thrush	GCTH	<i>Catharus minimus</i>	CATMIN
+ Gray-cheeked/Bicknell's Thrush	GCBT	<i>Catharus minimus x bickn.</i>	CATMIB
Bicknell's Thrush	BITH	<i>Catharus bicknelli</i>	CATBIC
Swainson's Thrush	SWTH	<i>Catharus ustulatus</i>	CATUST
Hermit Thrush	HETH	<i>Catharus guttatus</i>	CATGUT
Wood Thrush	WOTH	<i>Hylocichla mustelina</i>	HYLMUS
+ Unidentified Thrush	UNTH	<i>Turdidae (gen, sp)</i>	TURGSP
Eurasian Blackbird	EUBL	<i>Turdus merula</i>	TURMER
Eyebrowed Thrush	EYTH	<i>Turdus obscurus</i>	TUROBC*
Dusky Thrush	DUTH	<i>Turdus naumanni</i>	TURNAU
Fieldfare	FIEL	<i>Turdus pilaris</i>	TURPIL
Redwing	REDW	<i>Turdus iliacus</i>	TURILI
Song Thrush	SOTH*	<i>Turdus philomelos</i>	TURPHI
Sooty Thrush	SOOT*	<i>Turdus nigrescens</i>	TURNIG
Black Thrush	BLTH	<i>Turdus infuscatus</i>	TURINF
Mountain Thrush	MOTH	<i>Turdus plebejus</i>	TURPLE
Cocoa Thrush	COCT*	<i>Turdus fumigatus</i>	TURFUM
Pale-vented Thrush	PVTH	<i>Turdus obsoletus</i>	TUROBL*
Clay-colored Thrush	CCTH	<i>Turdus grayi</i>	TURGRA
Spectacled Thrush	SPTH	<i>Turdus nudigenis</i>	TURNUD
White-eyed Thrush	WETH	<i>Turdus jamaicensis</i>	TURJAM
White-throated Thrush	WTHH	<i>Turdus assimilis</i>	TURASS
Rufous-backed Robin	RBRO	<i>Turdus rufopalliatu</i>	TURRUP*
Rufous-collared Robin	RCRO	<i>Turdus rufitorques</i>	TURRUT*
American Robin	AMRO	<i>Turdus migratorius</i>	TURMIG
La Selle Thrush	LSTH	<i>Turdus swalesi</i>	TURSWA
White-chinned Thrush	WCTH	<i>Turdus aurantius</i>	TURAU
Grand Cayman Thrush	GCAT*	<i>Turdus ravidus</i>	TURRAV
Red-legged Thrush	RLTH	<i>Turdus plumbeus</i>	TURPLU
Forest Thrush	FOTH	<i>Turdus lherminieri</i>	TURLHE
Varied Thrush	VATH	<i>Ixoreus naevius</i>	IXONAE

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Aztec Thrush	AZTH	Ridgwayia pinicola	RIDPIN
Blue Mockingbird	BLMO	Melanotis caerulescens	MELCAE
Blue-and-white Mockingbird	BAWM	Melanotis hypoleucus	MELHYC*
Black Catbird	BLCA	Melanoptila glabrirostris	MELGLA
Gray Catbird	GRCA	Dumetella carolinensis	DUMCAR
White-breasted Thrasher	WBTH	Ramphocinclus brachyurus	RAMBRA
Scaly-breasted Thrasher	SBTH	Allenia fusca	ALLFUC
Pearly-eyed Thrasher	PETH	Margarops fuscatus	MARFUS
Brown Trembler	BRTR	Cinclocerthia ruficauda	CINRUF
Gray Trembler	GRTR	Cinclocerthia gutturalis	CINGUT
Curve-billed Thrasher	CBTH	Toxostoma curvirostre	TOXCUR
Ocellated Thrasher	OCTH	Toxostoma ocellatum	TOXOCE
Brown Thrasher	BRTH	Toxostoma rufum	TOXRUF
Long-billed Thrasher	LBTH	Toxostoma longirostre	TOXLON
Cozumel Thrasher	COZT*	Toxostoma guttatum	TOXGUT
Bendire's Thrasher	BETH	Toxostoma bendirei	TOXBEN
Gray Thrasher	GRAT*	Toxostoma cinereum	TOXCIN
California Thrasher	CATH	Toxostoma redivivum	TOXRED
Le Conte's Thrasher	LCTH	Toxostoma lecontei	TOXLEC
Crissal Thrasher	CRTH	Toxostoma crissale	TOXCRI
Sage Thrasher	SATH	Oreoscoptes montanus	OREMON
Bahama Mockingbird	BAMO	Mimus gundlachii	MIMGUN
Socorro Mockingbird	SOMO	Mimus graysoni	MIMGRA
Tropical Mockingbird	TRMO	Mimus gilvus	MIMGIL
Northern Mockingbird	NOMO	Mimus polyglottos	MIMPOL
European Starling	EUST	Sturnus vulgaris	STUVUL
Common Myna	COMY	Acridotheres tristis	ACRTRI
Hill Myna	HIMY	Gracula religiosa	GRAREL
Siberian Accentor	SIAC	Prunella montanella	PRUMON
Eastern Yellow Wagtail	EYWA	Motacilla tschutschensis	MOTTSC
Citrine Wagtail	CIWA	Motacilla citreola	MOTCIT
Gray Wagtail	GRAW*	Motacilla cinerea	MOTCIN
White Wagtail	WHWA	Motacilla alba	MOTALB
Tree Pipit	TRPI	Anthus trivialis	ANTRRI
Olive-backed Pipit	OBPI	Anthus hodgsoni	ANTHOD
Pechora Pipit	PEPI	Anthus gustavi	ANTGUS
Red-throated Pipit	RTPI	Anthus cervinus	ANTCER
American Pipit	AMPI	Anthus rubescens	ANTRUB
Sprague's Pipit	SPPI	Anthus spragueii	ANTSPR
Yellowish Pipit	YEPI	Anthus lutescens	ANLUT
Bohemian Waxwing	BOWA	Bombycilla garrulus	BOMGAR
Cedar Waxwing	CEDW*	Bombycilla cedrorum	BOMCED
Kauai Oo	KAOO	Moho braccatus	MOHBRA
Oahu Oo	OAOO	Moho apicalis	MOHAPI
Bishop's Oo	BIOO	Moho bishopi	MOHBIS
Hawaii Oo	HAOO	Moho nobilis	MOHNOB
Kioea	KIOE	Chaetoptila angustipluma	CHAANG

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Black-and-yellow Silky-flycatcher	BAYS	Phainoptila melanoxantha	PHAMEL
Gray Silky-flycatcher	GRSF	Ptiliogonys cinereus	PTICIN
Long-tailed Silky-flycatcher	LTSF	Ptiliogonys caudatus	PTICAU
Phainopepla	PHAI	Phainopepla nitens	PHANIT
Palmchat	PALM	Dulus dominicus	DULDOM
Olive Warbler	OLWA	Peucedramus taeniatus	PEUTAE
Lapland Longspur	LALO	Calcarius lapponicus	CALLAP
Chestnut-collared Longspur	CCLO	Calcarius ornatus	CALORN
Smith's Longspur	SMLO	Calcarius pictus	CALPIC
McCown's Longspur	MCLO	Rhynchophanes mccownii	RHYMCC
Snow Bunting	SNBU	Plectrophenax nivalis	PLENIV
McKay's Bunting	MKBU	Plectrophenax hyperboreus	PLEHYP
Ovenbird	OVEN	Seiurus aurocapilla	SEIAUR
Worm-eating Warbler	WEWA	Helminthos vermivorum	HELVER
Louisiana Waterthrush	LOWA	Parkesia motacilla	PARMOT
Northern Waterthrush	NOWA	Parkesia noveboracensis	PARNOV
Bachman's Warbler	BAWA	Vermivora bachmanii	VERBAC
Golden-winged Warbler	GWWA	Vermivora chrysoptera	VERCHR
Blue-winged Warbler	BWWA	Vermivora cyanoptera	VERCYA
+ Brewster's Warbler	BRWA	Vermivora chrysoptera x chrysoptera	VERCCY
+ Lawrence's Warbler	LAWA	Vermivora cyanoptera x chrysoptera	VERCCH
Black-and-white Warbler	BAWW	Mniotilta varia	MNIVAR
Prothonotary Warbler	PROW*	Protonotaria citrea	PROCIT
Swainson's Warbler	SWWA	Limnolophus swainsonii	LIMSWA
Crescent-chested Warbler	CCWA	Oreothlypis superciliosa	ORESUP
Flame-throated Warbler	FTHW*	Oreothlypis gutturalis	OREGUT
Tennessee Warbler	TEWA	Oreothlypis peregrina	OREPER
Orange-crowned Warbler	OCWA	Oreothlypis celata	ORECEL
Colima Warbler	COLW*	Oreothlypis crissalis	ORECRI
Lucy's Warbler	LUWA	Oreothlypis luciae	ORELUC
Nashville Warbler	NAWA	Oreothlypis ruficapilla	ORERUF
Virginia's Warbler	VIWA	Oreothlypis virginiae	OREVIR
Semper's Warbler	SEMW*	Leucopeza semperi	LEUSER*
Connecticut Warbler	CONW*	Oporornis agilis	OPOAGI
Gray-crowned Yellowthroat	GCYE	Geothlypis poliocephala	GEOPOL
Masked Yellowthroat	MAYE	Geothlypis aequinoctialis	GEOAEQ
MacGillivray's Warbler	MGWA	Geothlypis tolmiei	GEOTOL
Mourning Warbler	MOWA	Geothlypis philadelphia	GEOPHI
Kentucky Warbler	KEWA	Geothlypis formosa	GEOFOR
Olive-crowned Yellowthroat	OCYE	Geothlypis semiflava	GEOSEM
Black-poll'd Yellowthroat	BPYE	Geothlypis speciosa	GEOSPE
Belding's Yellowthroat	BEYE	Geothlypis beldingi	GEOBEL
Bahama Yellowthroat	BAYE	Geothlypis rostrata	GEOROS
Altamira Yellowthroat	ALYE	Geothlypis flavovelata	GEOFLA
Common Yellowthroat	COYE	Geothlypis trichas	GEOTRI
Hooded Yellowthroat	HOYE	Geothlypis nelsoni	GEONEL
Whistling Warbler	WHIW*	Catharopeza bishopi	CATBIS

<b>ENGLISH NAME</b>	<b>4-LETTER CODE</b>	<b>SCIENTIFIC NAME</b>	<b>6-LETTER CODE</b>
Plumbeous Warbler	PLUW*	<i>Setophaga plumbea</i>	SETPLU
Elfin-woods Warbler	EWWA	<i>Setophaga angelae</i>	SETANG
Arrowhead Warbler	ARRW*	<i>Setophaga pharetra</i>	SETPHA
Hooded Warbler	HOWA	<i>Setophaga citrina</i>	SETCIT
American Redstart	AMRE	<i>Setophaga ruticilla</i>	SETRUT
Kirtland's Warbler	KIWA	<i>Setophaga kirtlandii</i>	SETKIR
Cape May Warbler	CMWA	<i>Setophaga tigrina</i>	SETTIG
Cerulean Warbler	CERW*	<i>Setophaga cerulea</i>	SETCER
Northern Parula	NOPA	<i>Setophaga americana</i>	SETAME
+ Sutton's Warbler	SUWA	<i>Setophaga americana x dominica</i>	SETAMD
Tropical Parula	TRPA	<i>Setophaga pitiayumi</i>	SETPIM*
Magnolia Warbler	MAWA	<i>Setophaga magnolia</i>	SETMAG
Bay-breasted Warbler	BBWA	<i>Setophaga castanea</i>	SETCAS
Blackburnian Warbler	BLBW*	<i>Setophaga fusca</i>	SETFUS
Yellow Warbler	YEWA	<i>Setophaga petechia</i>	SETPET
+ Mangrove Warbler	MANW*	<i>Setophaga petechia erithachorides</i>	SETPER
Chestnut-sided Warbler	CSWA	<i>Setophaga pensylvanica</i>	SETPEN
Blackpoll Warbler	BLPW*	<i>Setophaga striata</i>	SETSTR
Black-throated Blue Warbler	BTBW	<i>Setophaga caerulescens</i>	SETCAE
Palm Warbler	PAWA	<i>Setophaga palmarum</i>	SETPAL
+ Western Palm Warbler	WPWA	<i>Setophaga palmarum palmarum</i>	SETPPA
+ Yellow Palm Warbler	YPWA	<i>Setophaga palmarum hypochrysea</i>	SETPHY
Olive-capped Warbler	OCAW*	<i>Setophaga pityophila</i>	SETPIP*
Pine Warbler	PIWA	<i>Setophaga pinus</i>	SETPIN
Yellow-rumped Warbler	YRWA	<i>Setophaga coronata</i>	SETCOR
+ Myrtle Warbler	MYWA	<i>Setophaga coronata coronata</i>	SETCCO
+ Audubon's Warbler	AUWA	<i>Setophaga coronata auduboni</i>	SETCAU
Yellow-throated Warbler	YTWA	<i>Setophaga dominica</i>	SETDOM
Bahama Warbler	BAHW*	<i>Setophaga flavescens</i>	SETFLA
Vitelline Warbler	VITW*	<i>Setophaga vitellina</i>	SETVIT
Prairie Warbler	PRAW*	<i>Setophaga discolor</i>	SETDIS
Adelaide's Warbler	ADWA	<i>Setophaga adelaidae</i>	SETADE
Barbuda Warbler	BARW*	<i>Setophaga subita</i>	SETSUB
St. Lucia Warbler	SLWA	<i>Setophaga delicata</i>	SETDEL
Grace's Warbler	GRWA	<i>Setophaga graciae</i>	SETGRA
Black-throated Gray Warbler	BTYW*	<i>Setophaga nigrescens</i>	SETNIG
Townsend's Warbler	TOWA	<i>Setophaga townsendi</i>	SETTOW
+ Townsend's x Hermit Warbler Hybrid	THWH	<i>Setophaga townsendi x occidentalis</i>	SETTOO
Hermit Warbler	HEWA	<i>Setophaga occidentalis</i>	SETOCC
Golden-cheeked Warbler	GCWA	<i>Setophaga chrysoparia</i>	SETCHR
Black-throated Green Warbler	BTNW*	<i>Setophaga virens</i>	SETVIR
Buff-rumped Warbler	BURW*	<i>Myiothlypis fulvicauda</i>	MYIFUL
Fan-tailed Warbler	FTWA	<i>Basileuterus lachrymosus</i>	BASLAC
Rufous-capped Warbler	RCWA	<i>Basileuterus rufifrons</i>	BASRUF
Black-cheeked Warbler	BCWA	<i>Basileuterus melanogenys</i>	BASMEL
Pirre Warbler	PIRW*	<i>Basileuterus ignotus</i>	BASIGN
Golden-browed Warbler	GBWA	<i>Basileuterus belli</i>	BASBEL

<b>ENGLISH NAME</b>	<b>4-LETTER CODE</b>	<b>SCIENTIFIC NAME</b>	<b>6-LETTER CODE</b>
Golden-crowned Warbler	GCRW*	<i>Basileuterus culicivorus</i>	BASCUL
Three-striped Warbler	TSWA	<i>Basileuterus tristriatus</i>	BASTRI
Canada Warbler	CAWA	<i>Cardellina canadensis</i>	CADCAN
Wilson's Warbler	WIWA	<i>Cardellina pusilla</i>	CARPUS
Red-faced Warbler	RFWA	<i>Cardellina rubrifrons</i>	CARRUF*
Red Warbler	REWA	<i>Cardellina rubra</i>	CARRUA*
Pink-headed Warbler	PHWA	<i>Cardellina versicolor</i>	CARVER
Painted Redstart	PARE	<i>Myioborus pictus</i>	MYIPIC
Slate-throated Redstart	STRE	<i>Myioborus miniatus</i>	MYIMIN
Collared Redstart	COLR*	<i>Myioborus torquatus</i>	MYITOR
Wrenthrush	WRET*	<i>Zeledonia coronata</i>	ZELCOR
Yellow-breasted Chat	YBCH	<i>Icteria virens</i>	ICTVIR
White-winged Warbler	WWWA	<i>Xenoligea montana</i>	XENMON
Green-tailed Warbler	GTWA	<i>Microligea palustris</i>	MICPAL
Yellow-headed Warbler	YHWA	<i>Teretistris fernandinae</i>	TERFER
Oriente Warbler	ORWA	<i>Teretistris fornsi</i>	TERFOR
+ Unidentified Warbler	UNWA	Parulidae (gen, sp)	PARGSP
Bananaquit	BANA	<i>Coereba flaveola</i>	COEFLA
Red-crested Cardinal	RCCA	<i>Paroaria coronata</i>	PARCOR
Yellow-billed Cardinal	YBCA	<i>Paroaria capitata</i>	PARCAP
White-eared Conebill	WECO	<i>Conirostrum leucogenys</i>	CONLEU
Puerto Rican Tanager	PRTA	<i>Nesospingus speculiferus</i>	NESSPE
Yellow-backed Tanager	YBTA	<i>Hemithraupis flavicollis</i>	HEMFLC*
Black-and-yellow Tanager	BAYT	<i>Chrysothlypis chrysomelas</i>	CHRCHR
Black-crowned Palm-Tanager	BPLT*	<i>Phaenicophilus palmarum</i>	PHAPAL
Gray-crowned Palm-Tanager	GCPT	<i>Phaenicophilus poliocephalus</i>	PHAPOL
Western Chat-Tanager	WECT	<i>Calyptophilus tertius</i>	CALTER
Eastern Chat-Tanager	EACT	<i>Calyptophilus frugivorus</i>	CALFRU
Rosy Thrush-Tanager	ROTT	<i>Rhodinocichla rosea</i>	RHNROS*
Dusky-faced Tanager	DFTA	<i>Mitrospingus cassinii</i>	MITCAS
Gray-headed Tanager	GHET*	<i>Eucometis penicillata</i>	EUCPEN
Black-throated Shrike-Tanager	BTST	<i>Lanio aurantius</i>	LANAUR
White-throated Shrike-Tanager	WTST	<i>Lanio leucothorax</i>	LANLEU
Sulphur-rumped Tanager	SRTA	<i>Heterospingus rubrifrons</i>	HETRUB
Scarlet-browed Tanager	SBTA	<i>Heterospingus xanthopygius</i>	HETXAN
White-shouldered Tanager	WSTA	<i>Tachyphonus luctuosus</i>	TACLUC
Tawny-crested Tanager	TCTA	<i>Tachyphonus delatrii</i>	TACDEL
White-lined Tanager	WLTA	<i>Tachyphonus rufus</i>	TACRUF
Crimson-collared Tanager	CCTA	<i>Ramphocelus sanguinolentus</i>	RAMSAN
Crimson-backed Tanager	CBTA	<i>Ramphocelus dimidiatus</i>	RAMDIM
Passerini's Tanager	PAST*	<i>Ramphocelus passerinii</i>	RAMPAS
Cherrie's Tanager	CHET*	<i>Ramphocelus costaricensis</i>	RAMCOS
Flame-rumped Tanager	FRTA	<i>Ramphocelus flammigerus</i>	RAMFLA
Western Spindalis	WESP	<i>Spindalis zena</i>	SPIZEN
Jamaican Spindalis	JAMS*	<i>Spindalis nigricephala</i>	SPINIG
Hispaniolan Spindalis	HISP	<i>Spindalis dominicensis</i>	SPDDOM*
Puerto Rican Spindalis	PRSP	<i>Spindalis portoricensis</i>	SPIPOR

<b>ENGLISH NAME</b>	<b>4-LETTER CODE</b>	<b>SCIENTIFIC NAME</b>	<b>6-LETTER CODE</b>
Blue-gray Tanager	BGTA	<i>Thraupis episcopus</i>	THREPI
Yellow-winged Tanager	YWTA	<i>Thraupis abbas</i>	THRABB
Palm Tanager	PALT*	<i>Thraupis palmarum</i>	THRPAL
Blue-and-gold Tanager	BAGT	<i>Bangsia arcaei</i>	BANARC
Gray-and-gold Tanager	GAGT	<i>Tangara palmeri</i>	TANPAL
Azure-rumped Tanager	ARTA	<i>Tangara cabanisi</i>	TANCAB
Lesser Antillean Tanager	LATA	<i>Tangara cucullata</i>	TANCUC
Golden-hooded Tanager	GHOT*	<i>Tangara larvata</i>	TANLAR
Speckled Tanager	SPTA	<i>Tangara guttata</i>	TANGUT
Green-naped Tanager	GNTA	<i>Tangara fucosa</i>	TANFUC
Spangle-cheeked Tanager	SCHT*	<i>Tangara dowii</i>	TANDOW
Plain-colored Tanager	PCTA	<i>Tangara inornata</i>	TANINO
Rufous-winged Tanager	RWTA	<i>Tangara lavinia</i>	TANLAV
Bay-headed Tanager	BHTA	<i>Tangara gyrola</i>	TANGYR
Emerald Tanager	EMTA	<i>Tangara florida</i>	TANFLO
Silver-throated Tanager	STTA	<i>Tangara icterocephala</i>	TANICT
Scarlet-thighed Dacnis	STDA	<i>Dacnis venusta</i>	DACVEN
Blue Dacnis	BLDA	<i>Dacnis cayana</i>	DACCAY
Viridian Dacnis	VIDA	<i>Dacnis viguieri</i>	DACVIG
Green Honeycreeper	GRHO	<i>Chlorophanes spiza</i>	CHLSPI
Shining Honeycreeper	SHHO	<i>Cyanerpes lucidus</i>	CYALUC
Purple Honeycreeper	PUHO	<i>Cyanerpes caeruleus</i>	CYACAE
Red-legged Honeycreeper	RLHO	<i>Cyanerpes cyaneus</i>	CYACYU*
Swallow Tanager	SWTA	<i>Tersina viridis</i>	TERVIR
Black-headed Saltator	BHSA	<i>Saltator atriceps</i>	SALATR
Buff-throated Saltator	BTSA	<i>Saltator maximus</i>	SALMAX
Slate-colored Grosbeak	SCOG*	<i>Saltator grossus</i>	SALGRO
Lesser Antillean Saltator	LASA	<i>Saltator albicollis</i>	SALALB
Grayish Saltator	GRAS*	<i>Saltator coerulescens</i>	SALCOE
Streaked Saltator	SSAL*	<i>Saltator striatipectus</i>	SALSTR
Blue-black Grassquit	BGRA*	<i>Volatinia jacarina</i>	VOLJAC
Ruddy-breasted Seedeater	RBSE	<i>Sporophila minuta</i>	SPOMIN
Thick-billed Seed-Finch	TBSF	<i>Sporophila funerea</i>	SPOFUN
Nicaraguan Seed-Finch	NISF	<i>Sporophila nuttingi</i>	SPONUT
Large-billed Seed-Finch	LBSF	<i>Sporophila crassirostris</i>	SPOCRA
Variable Seedeater	VASE	<i>Sporophila corvina</i>	SPOCOR
White-collared Seedeater	WCSE	<i>Sporophila torqueola</i>	SPOTOR
Yellow-bellied Seedeater	YBSE	<i>Sporophila nigricollis</i>	SPONIG
Lined Seedeater	LISE	<i>Sporophila lineola</i>	SPOLIN
Slate-colored Seedeater	SCSE	<i>Sporophila schistacea</i>	SPOSCH
Cuban Bullfinch	CUBU	<i>Melopyrrha nigra</i>	MELNIG
Cuban Grassquit	CUGR	<i>Tiaris canorus</i>	TIACAN
Yellow-faced Grassquit	YFGR	<i>Tiaris olivaceus</i>	TIAOLI
Black-faced Grassquit	BFGR	<i>Tiaris bicolor</i>	TIABIC
Yellow-shouldered Grassquit	YSGR	<i>Loxipasser anoxanthus</i>	LOXANO
Puerto Rican Bullfinch	PRBU	<i>Loxigilla portoricensis</i>	LOXPOR
Greater Antillean Bullfinch	GABU	<i>Loxigilla violacea</i>	LOXVIO

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Lesser Antillean Bullfinch	LANB*	<i>Loxigilla noctis</i>	LOXNOC
Barbados Bullfinch	BABU	<i>Loxigilla barbadensis</i>	LOXBAD
Orangequit	ORAN	<i>Euneornis campestris</i>	EUNCAM
St. Lucia Black Finch	SLBF	<i>Melanospiza richardsoni</i>	MELRIC
Cocos Finch	COFI	<i>Pinaroloxias inornata</i>	PININO
Slaty Finch	SLFI	<i>Haplospiza rustica</i>	HAPRUS
Peg-billed Finch	PBFI	<i>Acanthidops bairdi</i>	ACABAI
Cinnamon-bellied Flowerpiercer	CBFL	<i>Diglossa baritula</i>	DIGBAR
Slaty Flowerpiercer	SLFL	<i>Diglossa plumbea</i>	DIGPLU
Saffron Finch	SAFI	<i>Sicalis flaveola</i>	SICFLA
Grassland Yellow-Finch	GRYF	<i>Sicalis luteola</i>	SICLUT
Wedge-tailed Grass-Finch	WTGF	<i>Emberizoides herbicola</i>	EMHER
Yellow-thighed Finch	YTFI	<i>Pselliophorus tibialis</i>	PSETIB
Yellow-green Finch	YGFI	<i>Pselliophorus luteoviridis</i>	PSELUT
Large-footed Finch	LFFI	<i>Pezopetes capitalis</i>	PEZCAP
Orange-billed Sparrow	OBSP	<i>Arremon aurantirostris</i>	ARRAUR
Sooty-faced Finch	SFFI	<i>Arremon crassirostris</i>	ARRCRA
Chestnut-capped Brush-Finch	CCBF	<i>Arremon brunneinucha</i>	ARRBRU
Green-striped Brush-Finch	GSBF	<i>Arremon virenticeps</i>	ARRVIR
Costa Rican Brush-Finch	CRBF	<i>Arremon costaricensis</i>	ARRCOS
Black-headed Brush-Finch	BHBF	<i>Arremon atricapillus</i>	ARRATR
Olive Sparrow	OLSP	<i>Arremonops rufivirgatus</i>	ARRRUF
Green-backed Sparrow	GBSP	<i>Arremonops chloronotus</i>	ARRCHL
Black-striped Sparrow	BSTS*	<i>Arremonops conirostris</i>	ARRCON
White-naped Brush-Finch	WNBF	<i>Atlapetes albinucha</i>	ATLALB
Rufous-capped Brush-Finch	RCBF	<i>Atlapetes pileatus</i>	ATLPIL
Collared Towhee	COTO	<i>Pipilo ocai</i>	PIPOCA
Green-tailed Towhee	GTTO	<i>Pipilo chlorurus</i>	PIPCHL
Spotted Towhee	SPTO	<i>Pipilo maculatus</i>	PIPMAC
+ Rufous-sided Towhee	RSTO	<i>Pipilo maculatus/erythr.</i>	PIPMAE
Eastern Towhee	EATO	<i>Pipilo erythrophthalmus</i>	PIPERY
Rusty Sparrow	RUSP	<i>Aimophila rufescens</i>	AIMRUS*
Rufous-crowned Sparrow	RCSP	<i>Aimophila ruficeps</i>	AIMRUP*
Oaxaca Sparrow	OASP	<i>Aimophila notosticta</i>	AIMNOT
White-eared Ground-Sparrow	WEGS	<i>Melozone leucotis</i>	MELLEU
Prevost's Ground-Sparrow	PRGS	<i>Melozone biarcuata</i>	MELBIA
Rusty-crowned Ground-Sparrow	RCGS	<i>Melozone kieneri</i>	MELKIE
Canyon Towhee	CANT*	<i>Melozone fusca</i>	MEZFUS*
White-throated Towhee	WTTO	<i>Melozone albicollis</i>	MELALB
California Towhee	CALT*	<i>Melozone crissalis</i>	MELCRI
Abert's Towhee	ABTO	<i>Melozone aberti</i>	MELABE
Cinnamon-tailed Sparrow	CTSP	<i>Peucaea sumichrasti</i>	PEUSUM
Rufous-winged Sparrow	RWSP	<i>Peucaea carpalis</i>	PEUCAR
Stripe-headed Sparrow	SHSP	<i>Peucaea ruficauda</i>	PEURUF
Black-chested Sparrow	BCHS*	<i>Peucaea humeralis</i>	PEUHUM
Bridled Sparrow	BRIS*	<i>Peucaea mystacalis</i>	PEUMYS
Botteri's Sparrow	BOSP	<i>Peucaea botterii</i>	PEUBOT

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Cassin's Sparrow	CASP	<i>Peucaea cassinii</i>	PEUCAS
Bachman's Sparrow	BACS*	<i>Peucaea aestivalis</i>	PEUAES
Striped Sparrow	SSPA*	<i>Oriturus superciliosus</i>	ORISUP
Zapata Sparrow	ZASP	<i>Torreornis inexpectata</i>	TORINE
American Tree Sparrow	ATSP	<i>Spizella arborea</i>	SPIARB
Chipping Sparrow	CHSP	<i>Spizella passerina</i>	SPIPAS
Clay-colored Sparrow	CCSP	<i>Spizella pallida</i>	SIPAL
Brewer's Sparrow	BRSP	<i>Spizella breweri</i>	SPIBRE
Field Sparrow	FISP	<i>Spizella pusilla</i>	SPIPUS
Worthen's Sparrow	WOSP	<i>Spizella wortheni</i>	SPIWOR
Black-chinned Sparrow	BCSP	<i>Spizella atrogularis</i>	SPIATG*
Vesper Sparrow	VESP	<i>Poocetes gramineus</i>	POOGRA
Lark Sparrow	LASP	<i>Chondestes grammacus</i>	CHOGRA
Five-striped Sparrow	FSSP	<i>Amphispiza quinquestriata</i>	AMPQUI
Black-throated Sparrow	BTSP	<i>Amphispiza bilineata</i>	AMPBIL
Sagebrush Sparrow	SABS*	<i>Artemisospiza nevadensis</i>	ARTNEV
+ Sage Sparrow	SAGS*	<i>Artemisospiza nevadensis/bell</i>	ARTNEB
Bell's Sparrow	BESP*	<i>Artemisospiza belli</i>	ARTBEL
Lark Bunting	LARB*	<i>Calamospiza melanocorys</i>	CALMEC*
Savannah Sparrow	SAVS*	<i>Passerculus sandwichensis</i>	PASSAN
+ Ipswich Sparrow	IPSP	<i>Passerculus s. princeps</i>	PASSPR
+ Belding's Savannah Sparrow	BSSP	<i>Passerculus s. beldingi</i>	PASSBE
+ Large-billed Sparrow	LBSP	<i>Passerculus s. rostratus</i>	PASSRO
Grasshopper Sparrow	GRSP	<i>Ammodramus savannarum</i>	AMMSAV
+ Florida Grasshopper Sparrow	FGSP	<i>Ammodramus s. floridanus</i>	AMMSFL
Baird's Sparrow	BAIS*	<i>Ammodramus bairdii</i>	AMMBAI
Henslow's Sparrow	HESP	<i>Ammodramus henslowii</i>	AMMHEN
Le Conte's Sparrow	LCSP	<i>Ammodramus leconteii</i>	AMMLEC
Nelson's Sparrow	NESP	<i>Ammodramus nelsoni</i>	AMMNEL
+ Sharp-tailed Sparrow	STSP	<i>Ammodramus nelsoni/caudacut.</i>	AMMNEC
Saltmarsh Sparrow	SALS*	<i>Ammodramus caudacutus</i>	AMMCAU
Seaside Sparrow	SESP	<i>Ammodramus maritimus</i>	AMMMAR
+ Dusky Seaside-Sparrow	DUSS	<i>Ammodramus m. nigrescens</i>	AMMMNI
+ Cape Sable Seaside-Sparrow	CSSS	<i>Ammodramus m. mirabilis</i>	AMMMMI
Sierra Madre Sparrow	SMSP	<i>Xenospiza baileyi</i>	XENBAI
Fox Sparrow	FOSP	<i>Passerella iliaca</i>	PASILI
Song Sparrow	SOSP	<i>Melospiza melodia</i>	MELMEL
Lincoln's Sparrow	LISP	<i>Melospiza lincolnii</i>	MELLIN
Swamp Sparrow	SWSP	<i>Melospiza georgiana</i>	MELGEO
Rufous-collared Sparrow	RCOS*	<i>Zonotrichia capensis</i>	ZONCAP
White-throated Sparrow	WTSP	<i>Zonotrichia albicollis</i>	ZONALB
Harris's Sparrow	HASP	<i>Zonotrichia querula</i>	ZONQUE
White-crowned Sparrow	WCSP	<i>Zonotrichia leucophrys</i>	ZONLEU
+ Eastern White-crowned Sparrow	EWCS	<i>Zonotrichia l. leucophrys</i>	ZONLLE
+ Mountain White-crowned Sparrow	MWCS	<i>Zonotrichia l. oriantha</i>	ZONLOR
+ Gambel's White-crowned Sparrow	GWCS	<i>Zonotrichia l. gambelii</i>	ZONLGA
+ Puget Sound White-crowned Sparrow	PSWS	<i>Zonotrichia l. pugetensis</i>	ZONLPU



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+ Nuttall's White-crowned Sparrow	NWCS	Zonotrichia l. nuttalli	ZONLNU
+ White-cr. X Golden-cr. Sparrow Hybrid	WGSB	Zonotrichia leuc. x atricap.	ZONLEA
Golden-crowned Sparrow	GCSP	Zonotrichia atricapilla	ZONATR
Volcano Junco	VOJU	Junco vulcani	JUNVUL
Dark-eyed Junco	DEJU	Junco hyemalis	JUNHYE
+ Slate-colored Junco	SCJU	Junco h. hyemalis	JUNHHY
+ White-winged Junco	WWJU	Junco h. aikeni	JUNHAI
+ Oregon Junco	ORJU	Junco h. oregonus	JUNHOR
+ Gray-headed Junco	GHJU	Junco h. caniceps	JUNNCA
Guadalupe Junco	GUJU	Junco insularis	JUNINS
Yellow-eyed Junco	YEJU	Junco phaeonotus	JUNPHA
Common Chlorospingus	COCL*	Chlorospingus flavopectus	CHLFLP*
Tacarcuna Chlorospingus	TACH	Chlorospingus tacarcunae	CHLTAC
Pirre Chlorospingus	PICH	Chlorospingus inornatus	CHLINO
Sooty-capped Chlorospingus	SCCH	Chlorospingus pileatus	CHLPIL
Yellow-throated Chlorospingus	YTCH	Chlorospingus flavigularis	CHLFLG*
Ashy-throated Chlorospingus	ATCH	Chlorospingus canigularis	CHLCAG*
Pine Bunting	PIBU	Emberiza leucocephalos	EMBLEU
Yellow-browed Bunting	YBWB*	Emberiza chrysophrys	EMBCHR
Little Bunting	LIBU	Emberiza pusilla	EMBPUS
Rustic Bunting	RUBU	Emberiza rustica	EMBRUS
Yellow-throated Bunting	YTBU	Emberiza elegans	EMBELE
Yellow-breasted Bunting	YBSB*	Emberiza aureola	EMBAUR
Gray Bunting	GRBU	Emberiza variabilis	EMBVAR
Pallas's Bunting	PALB*	Emberiza pallasi	EMBPAL
Reed Bunting	REBU	Emberiza schoeniclus	EMBSCH
+ Unidentified Sparrow	UNSP	Emberizidae (gen, sp)	EMBGSP
Rose-throated Tanager	RTTA	Piranga roseogularis	PIRROS
Hepatic Tanager	HETA	Piranga flava	PIRFLA
Summer Tanager	SUTA	Piranga rubra	PIRRUB
Scarlet Tanager	SCTA	Piranga olivacea	PIROLI
Western Tanager	WETA	Piranga ludoviciana	PIRLUD
Flame-colored Tanager	FCTA	Piranga bidentata	PIRBID
White-winged Tanager	WWTA	Piranga leucoptera	PIRLEU
Red-headed Tanager	RHTA	Piranga erythrocephala	PIRERY
+ Unidentified Piranga Tanager	UPTA	Piranga (sp)	PIRSPE
Red-crowned Ant-Tanager	RCAT	Habia rubica	HABRUB
Red-throated Ant-Tanager	RTAT	Habia fuscicauda	HABFUS
Black-cheeked Ant-Tanager	BCAT	Habia atrimaxillaris	HABATR
Carmioli's Tanager	CATA	Chlorothraupis carmioli	CHLCAR
Lemon-spectacled Tanager	LSTA	Chlorothraupis olivacea	CHLOLI
Black-faced Grosbeak	BFAG*	Caryothraustes poliogaster	CARPOL
Yellow-green Grosbeak	YGGR	Caryothraustes canadensis	CATCAN
Crimson-collared Grosbeak	CCGR	Rhodothraupis celaeno	RHOCEL
Northern Cardinal	NOCA	Cardinalis cardinalis	CARCAI*
Pyrrhuloxia	PYRR	Cardinalis sinuatus	CARSIN
Yellow Grosbeak	YEGR	Pheucticus chrysopeplus	PHECHR

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Black-thighed Grosbeak	BTGG*	<i>Pheucticus tibialis</i>	PHETIB
Rose-breasted Grosbeak	RBGR	<i>Pheucticus ludovicianus</i>	PHELUD
Black-headed Grosbeak	BHGR	<i>Pheucticus melanocephalus</i>	PHEMEL
Red-breasted Chat	RBRC*	<i>Granatellus venustus</i>	GRAVEN
Gray-throated Chat	GTCH	<i>Granatellus sallaei</i>	GRASAL
Blue Seed eater	BLSE	<i>Amaurospiza concolor</i>	AMSCON*
Blue-black Grosbeak	BGRO*	<i>Cyanocompsa cyanoides</i>	CYACYD*
Blue Bunting	BLBU	<i>Cyanocompsa parellina</i>	CYAPAR
Blue Grosbeak	BLGR	<i>Passerina caerulea</i>	PASCAE
Lazuli Bunting	LAZB*	<i>Passerina amoena</i>	PASAMO
+ Lazuli x Indigo Bunting Hybrid	LIBH	<i>Passerina amoena x cyanea</i>	PASAMC
Indigo Bunting	INBU	<i>Passerina cyanea</i>	PASCYA
Rose-bellied Bunting	RBBU	<i>Passerina rositae</i>	PASROS
Orange-breasted Bunting	OBBU	<i>Passerina leclancherii</i>	PASLEC
Varied Bunting	VABU	<i>Passerina versicolor</i>	PASVER
Painted Bunting	PABU	<i>Passerina ciris</i>	PASCIR
Dickcissel	DICK	<i>Spiza americana</i>	SPIAME
Bobolink	BOBO	<i>Dolichonyx oryzivorus</i>	DOLORY
Red-winged Blackbird	RWBL	<i>Agelaius phoeniceus</i>	AGEPHO
Red-shouldered Blackbird	RSBL	<i>Agelaius assimilis</i>	AGEASS
Tricolored Blackbird	TRBL	<i>Agelaius tricolor</i>	AGETRI
Tawny-shouldered Blackbird	TSBL	<i>Agelaius humeralis</i>	AGEHUM
Yellow-shouldered Blackbird	YSBL	<i>Agelaius xanthomus</i>	AGEXAN
Jamaican Blackbird	JABL	<i>Nesopsar nigerrimus</i>	NESNIG
Yellow-hooded Blackbird	YHOB*	<i>Chrysomus icterocephalus</i>	CHRICT
Red-breasted Blackbird	RBBL	<i>Sturnella militaris</i>	STUMIL
Eastern Meadowlark	EAME	<i>Sturnella magna</i>	STUMAG
Western Meadowlark	WEME	<i>Sturnella neglecta</i>	STUNEG
Yellow-headed Blackbird	YHBL	<i>Xanthocephalus xanthocephalus</i>	XANXAN
Melodious Blackbird	MEBL	<i>Dives dives</i>	DIVDIV
Cuban Blackbird	CUBL	<i>Dives atrovioleaceus</i>	DIVATR
Rusty Blackbird	RUBL	<i>Euphagus carolinus</i>	EUPCAR
Brewer's Blackbird	BRBL	<i>Euphagus cyanocephalus</i>	EUPCYC*
Common Grackle	COGR	<i>Quiscalus quiscula</i>	QUIQUI
Boat-tailed Grackle	BTGR	<i>Quiscalus major</i>	QUIMAJ
Great-tailed Grackle	GTGR	<i>Quiscalus mexicanus</i>	QUIMEX
Slender-billed Grackle	SBGR	<i>Quiscalus palustris</i>	QUIPAL
Nicaraguan Grackle	NIGR	<i>Quiscalus nicaraguensis</i>	QUINIC
Greater Antillean Grackle	GAGR	<i>Quiscalus niger</i>	QUINIG
Carib Grackle	CAGR	<i>Quiscalus lugubris</i>	QUILUG
Shiny Cowbird	SHCO	<i>Molothrus bonariensis</i>	MOLBON
Bronzed Cowbird	BROC*	<i>Molothrus aeneus</i>	MOLAEN
Brown-headed Cowbird	BHCO	<i>Molothrus ater</i>	MOLATE
Giant Cowbird	GICO	<i>Molothrus oryzivorus</i>	MOLORY
+ Unidentified Blackbird	UNBL	Icteridae (gen, sp)	ICTGSP
Bahama Oriole	BAHO	<i>Icterus northropi</i>	ICTNOR
Cuban Oriole	CUOR	<i>Icterus melanopsis</i>	ICTMEL

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Hispaniolan Oriole	HIOR	<i>Icterus dominicensis</i>	ICTDOM
Puerto Rican Oriole	PROR	<i>Icterus portoricensis</i>	ICTPOR
St. Lucia Oriole	SLOR	<i>Icterus laudabilis</i>	ICTLAU
Montserrat Oriole	MORI*	<i>Icterus oberi</i>	ICTOBE
Martinique Oriole	MAOR	<i>Icterus bonana</i>	ICTBON
Black-vented Oriole	BVOR	<i>Icterus wagleri</i>	ICTWAG
Bar-winged Oriole	BWOR	<i>Icterus maculialatus</i>	ICTMAC
Black-cowled Oriole	BCOR	<i>Icterus prothemelas</i>	ICTPRO
Orchard Oriole	OROR	<i>Icterus spurius</i>	ICTSPU
Hooded Oriole	HOOR	<i>Icterus cucullatus</i>	ICTCUC
Yellow-backed Oriole	YBOR	<i>Icterus chrysater</i>	ICTCHR
Orange-crowned Oriole	OCOR	<i>Icterus auricapillus</i>	ICTAUC*
Yellow-tailed Oriole	YTOR	<i>Icterus mesomelas</i>	ICTMES
Venezuelan Troupial	VETR	<i>Icterus icterus</i>	ICTICT
Streak-backed Oriole	SBAO*	<i>Icterus pustulatus</i>	ICTPUS
Bullock's Oriole	BUOR	<i>Icterus bullockii</i>	ICTBUL
+ Bullock's x Baltimore Oriole Hybrid	BBOH	<i>Icterus bullockii x galb.</i>	ICTBUG
Orange Oriole	ORAO*	<i>Icterus auratus</i>	ICTAUT*
Jamaican Oriole	JAOR	<i>Icterus leucopteryx</i>	ICTLEU
Spot-breasted Oriole	SBOR	<i>Icterus pectoralis</i>	ICTPEC
Altamira Oriole	ALOR	<i>Icterus gularis</i>	ICTGUL
Audubon's Oriole	AUOR	<i>Icterus graduacauda</i>	ICTGRA
Baltimore Oriole	BAOR	<i>Icterus galbula</i>	ICTGAL
Black-backed Oriole	BBOR	<i>Icterus abeillei</i>	ICTABE
Scott's Oriole	SCOR	<i>Icterus parisorum</i>	ICTPAR
Yellow-billed Cacique	YBIC*	<i>Amblycercus holosericeus</i>	AMBHOL
Yellow-winged Cacique	YWCA	<i>Cassiculus melanicterus</i>	CASMEL
Scarlet-rumped Cacique	SRCA	<i>Cacicus uropygialis</i>	CACURO
Yellow-rumped Cacique	YRCA	<i>Cacicus cela</i>	CACCEL
Crested Oropendola	CROR	<i>Psarocolius decumanus</i>	PSADEC
Chestnut-headed Oropendola	CHOR	<i>Psarocolius wagleri</i>	PSAWAG
Montezuma Oropendola	MORO*	<i>Psarocolius montezuma</i>	PSAMON
Black Oropendola	BLOR	<i>Psarocolius guatimozinus</i>	PSAGUA
Common Chaffinch	CCHA*	<i>Fringilla coelebs</i>	FRICOE
Brambling	BRAM	<i>Fringilla montifringilla</i>	FRIMON
Jamaican Euphonia	JAEU	<i>Euphonia jamaica</i>	EUPJAM
Scrub Euphonia	SEUP*	<i>Euphonia affinis</i>	EUPAFF
Yellow-crowned Euphonia	YCEU	<i>Euphonia luteicapilla</i>	EUPLUT
Thick-billed Euphonia	TBEU	<i>Euphonia laniirostris</i>	EUPLAN
Yellow-throated Euphonia	YTEU	<i>Euphonia hirundinacea</i>	EUPHIR
Antillean Euphonia	ANEU	<i>Euphonia musica</i>	EUPMUS
Elegant Euphonia	ELEU	<i>Euphonia elegantissima</i>	EUPELE
Fulvous-vented Euphonia	FVEU	<i>Euphonia fulvicrissa</i>	EUPFUL
Spot-crowned Euphonia	SPCE*	<i>Euphonia imitans</i>	EUPIMI
Olive-backed Euphonia	OBAE*	<i>Euphonia gouldi</i>	EUPGOU
White-vented Euphonia	WVEU	<i>Euphonia minuta</i>	EUPMIN
Tawny-capped Euphonia	TCEU	<i>Euphonia anaeae</i>	EUPANN

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Orange-bellied Euphonia	OBEE*	Euphonia xanthogaster	EUPXAN
Yellow-collared Chlorophonia	YCCH	Chlorophonia flavirostris	CHPFLA*
Blue-crowned Chlorophonia	BCRC*	Chlorophonia occipitalis	CHLOCC
Golden-browed Chlorophonia	GBCH	Chlorophonia callophrys	CHLCAL
Asian Rosy-Finch	ASRF	Leucosticte arctoa	LEUARC
Gray-crowned Rosy-Finch	GCRF	Leucosticte tephrocotis	LEUTEP
Black Rosy-Finch	BLRF	Leucosticte atrata	LEUATT*
Brown-capped Rosy-Finch	BCRF	Leucosticte australis	LEUAUS
Pine Grosbeak	PIGR	Pinicola enucleator	PINENU
Eurasian Bullfinch	EUBU	Pyrrhula pyrrhula	PYRPYH*
Laysan Finch	LAFI	Telespiza cantans	TELCAN
Nihoa Finch	NIFI	Telespiza ultima	TELULT
Ou	OU	Psittirostra psittacea	PSIPSI
Lanai Hookbill	LAHO	Dysmorodrepanis munroi	DYSMUN
Palila	PALI	Loxioides bailleui	LOXBAI
Maui Parrotbill	MAPA	Pseudonestor xanthophrys	PSEXAN
Lesser Koa-Finch	LEKF	Rhodacanthis flaviceps	RHOFLA
Greater Koa-Finch	GRKF	Rhodacanthis palmeri	RHOPAL
Kona Grosbeak	KOGR	Chloridops kona	CHLKON
Hawaii Amakihi	HAAM	Hemignathus virens	HEMVIR
Oahu Amakihi	OAAM	Hemignathus flavus	HEMFLS*
Kauai Amakihi	KAAM	Hemignathus kauaiensis	HEMKAU
Greater Amakihi	GRAM	Hemignathus sagittirostris	HEMSAG
Lesser Akialoa	LEAK	Hemignathus obscurus	HEMOBS
Greater Akialoa	GAKI*	Hemignathus ellisianus	HEMELL
Nukupuu	NUKU	Hemignathus lucidus	HEMLUC
Akiapolaau	AKIA	Hemignathus munroi	HEMMUN
Anianiau	ANIA	Magumma parva	MAGPAR
Akikiki	AKIK	Oreomystis bairdi	OREBAI
Oahu Alauahio	OAAL	Paroreomyza maculata	PAMMAC*
Kakawahie	KAKA	Paroreomyza flammea	PARFLA
Maui Alauahio	MAAL	Paroreomyza montana	PARMON
Hawaii Creeper	HCRE*	Loxops mana	LOXMAN
Akekee	AKEK	Loxops caeruleirostris	LOXCAE
Akepa	AKEP	Loxops coccineus	LOXCOC
Ula-ai-hawane	UAIH*	Ciridops anna	CIRANN
Iiwi	IIWI	Vestiaria coccinea	VESCOC
Hawaii Mamo	HAMA	Drepanis pacifica	DREPAC
Black Mamo	BLMA	Drepanis funerea	DREFUN
Akohekohe	AKOH	Palmeria dolei	PALDOL
Apapane	APAP	Himatione sanguinea	HIMSAN
Poo-uli	POUL	Melamprosops phaeosoma	MELPHA
Common Rosefinch	CORO	Carpodacus erythrinus	CARERY
House Finch	HOFI	Haemorhous mexicanus	HAEMEX
Purple Finch	PUFI	Haemorhous purpureus	HAEPUR
Cassin's Finch	CAFI	Haemorhous cassinii	HAECAS
+ Unidentified Haemorhous Finch	UHFI	Haemorhous (sp)	HAESPE

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Red Crossbill	RECR	<i>Loxia curvirostra</i>	LOXCUR
Hispaniolan Crossbill	HICR	<i>Loxia megaplaga</i>	LOXMEG
White-winged Crossbill	WWCR	<i>Loxia leucoptera</i>	LOXLEU
Common Redpoll	CORE	<i>Acanthis flammea</i>	ACAFLA
+ Common/Hoary Redpoll	CHRE	<i>Acanthis flamm./hornemanni</i>	ACAFLH
Hoary Redpoll	HORE	<i>Acanthis hornemanni</i>	ACAHOR
Eurasian Siskin	EUSI	<i>Spinus pinus</i>	SPISPI
Pine Siskin	PISI	<i>Spinus pinus</i>	SPIPIN
Black-capped Siskin	BCSI	<i>Spinus atriceps</i>	SPIATC*
Black-headed Siskin	BHSI	<i>Spinus notatus</i>	SPINOT
Yellow-bellied Siskin	YBSI	<i>Spinus xanthogastrus</i>	SPIXAN
Red Siskin	RESI	<i>Spinus cucullatus</i>	SPICUC
Antillean Siskin	ANSI	<i>Spinus dominicensis</i>	SPUDOM*
Lesser Goldfinch	LEGO	<i>Spinus psaltria</i>	SPIPSA
Lawrence's Goldfinch	LAGO	<i>Spinus lawrencei</i>	SPILaw
American Goldfinch	AMGO	<i>Spinus tristis</i>	SPITRI
European Goldfinch	EUGO	<i>Carduelis carduelis</i>	CARCAU*
Oriental Greenfinch	ORGR	<i>Chloris sinica</i>	CHLSIN
Yellow-fronted Canary	YFCA	<i>Serinus mozambicus</i>	SERMOZ
Island Canary	ISCA	<i>Serinus canaria</i>	SERCAN
Hooded Grosbeak	HOOG*	<i>Coccothraustes abeillei</i>	COCABE
Evening Grosbeak	EVGR	<i>Coccothraustes vespertinus</i>	COCVES
Hawfinch	HAWF	<i>Coccothraustes coccothraustes</i>	COCCOT*
House Sparrow	HOSP	<i>Passer domesticus</i>	PASDOM
Eurasian Tree Sparrow	ETSP	<i>Passer montanus</i>	PASMON
Village Weaver	VIWE	<i>Ploceus cucullatus</i>	PLOCUC
Orange Bishop	ORBI	<i>Euplectes franciscanus</i>	EUPFRA
Yellow-crowned Bishop	YCBI	<i>Euplectes afer</i>	EUPAFE
Red-cheeked Cordonbleu	RCCO	<i>Uraeginthus bengalus</i>	URABEN
Lavender Waxbill	LAVW*	<i>Estrilda caerulescens</i>	ESTCAE
Orange-cheeked Waxbill	OCHW*	<i>Estrilda melpoda</i>	ESTMEL
Black-rumped Waxbill	BRUW*	<i>Estrilda troglodytes</i>	ESTTRO
Common Waxbill	COMW*	<i>Estrilda astrild</i>	ESTAST
Red Avadavat	REAV	<i>Amandava amandava</i>	AMAAMN*
Bronze Mannikin	BRMA	<i>Spermestes cucullata</i>	SPECUC
Indian Silverbill	INSI	<i>Euodice malabarica</i>	EUOMAB
African Silverbill	AFSI	<i>Euodice cantans</i>	EUOCAN
Java Sparrow	JASP	<i>Lonchura oryzivora</i>	LONORY
Scaly-breasted Munia	SBMU	<i>Lonchura punctulata</i>	LONPUN
Tricolored Munia	TRMU	<i>Lonchura malacca</i>	LONMAL
Chestnut Munia	CHMU	<i>Lonchura atricapilla</i>	LONATR
Pin-tailed Whydah	PTWH	<i>Vidua macroura</i>	VIDMAC
+ Unidentified Bird	UNBI	Aves (gen, sp)	AVEGSP

**CHIA**

