

Black River Audubon Society

WINGTIPS

March 2008



John Koscinski

Editors: Jack Smith/Harry Spencer
Photographer: John Koscinski
Webmistress: Arlene Lengyel

Program

Dead Birds Tell Many Tales: Ornithology Research at the Cleveland Museum of Natural History

Tuesday March 4, 7 PM

Carlisle Visitor's Center

Andy Jones, William A. and Nancy R. Klamm Endowed Chair of Ornithology and Head of Department of Ornithology,
Cleveland Museum of Natural History

Andy Jones has a PhD in ecology, evolution and behavior from the University of Minnesota. His current research interest is using museum specimens and DNA sequences to understand the evolutionary history of birds, including biogeography and taxonomy, with a focus on Appalachian and Philippine bird species.

Young Birders' Hike

Saturday, March 8, 8 AM

French Creek Reservation

Subject: Winter birds visiting feeders

Field Trip

Saturday, March 15, 9 AM

Oberlin Reservoir (meeting place), Wellington Reservoir

Pancakes at Chatham

Board Meeting

Tuesday, March 31, 6:30 PM

Oberlin Depot (across from McDonalds, South Main Street,
Route 58)

January 19 Field Trip

Lorain Harbor and Avon Power Plant

Martin Ackermann reported on eBird the Lorain Harbor bird observations. In 20 degree weather (approximate) twelve birders spent one hour and 15 minutes at various points around the harbor. They identified Canada Goose, Mallard, 1 Greater/Lesser Scaup, 1 Red-breasted Merganser, 1 Pied-billed Grebe, American Coot, Bonaparte's Gull, Herring Gull, Lesser Black-backed Gull, and Great Black-backed Gull.

January 29 Board Meeting

Summary of My Notes

By **Arlene Ryan**, Secretary

- When Harriet went to the Ohio Ornithological Society Symposium, she got 15 orders for our power point program. The Wesleyan Village would like to have our power point program presented on Feb. 27 and Cascade Park would like a presentation on May 3.
- The board voted and accepted the application for a camp scholarship from Lindsay Miller, a naturalist at Mill Hollow. (*Subsequent to the Board Meeting, a second application was approved. See Dick Lee's announcement in this issue of WINGTIPS.*)
- Dick Lee has received info on the Great Backyard Bird count that will be held February 15-18. This info will be distributed to all of Audubon Adventure recipients. He also has 6 new recipients.
- Sandy Ridge will be used for meetings when we can't use Carlisle.
- The Birding by Tram program was approved by the board.
- Bill Krap's plaque will be replaced.
- This year is the 50th anniversary of the founding of Black River Audubon Society. Jack Smith will head a committee to organize a celebration.

Bird Stories Wanted

By **Arlene Lengyel**, Webmistress

Members: Please consider contributing short paragraphs about your bird sightings or birding news for use on our web site at blackriveraudubon.org. Go there for some examples. Many of you offer sightings to eBird.com already, and if you could add a few lines of interest about the sighting, such as the circumstance, weather, companions, etc., it would be of interest to your fellow members. As far as birding news, all the magazines, newspapers, books, and Internet articles you read are sources of information that you could share with others on the Web site.

Email your offerings to arstar50@yahoo.com, either as a Word file, or just type the offerings directly into the body of the email, and I will post them.

Audubon Camp Scholarships

By **Dick Lee**, Education Chair

The Black River Audubon Society Board has been so impressed with the contributions that recent camp scholarship recipients have made in conservation education within our community that the Board decided to award two camp scholarships this year. The potential impact of that decision became abundantly apparent by the applications and letters of recommendations for our two scholarship recipients, Lindsay Miller and David Krasovic.

Lindsay, a Lorain County Metro Parks naturalist, will attend the Educators Workshop. David,

an Elyria High School biology teacher, will be attending the camp on Field Ornithology. Both camps are held on Hog Island off the coast of Maine.

Some of the nation's outstanding environmental educators and naturalists will lead campers in studying a biologically diverse habitat, from the spruce-fir forest and hay-scented meadows of Hog Island to the rocky tidal pools of marine plants and animals. Aboard the *Puffin V* they will tour Eastern Egg Rock Island, where Audubon's Stephen Kress did his pioneering work in restoring Atlantic Puffins to their original nesting grounds. They will learn about the physical factors of the ocean and freshwater and how those factors affect the biotic community. Speakers will present evening programs in their field of expertise.

Lindsay and David will enjoy the fellowship of eating family style meals and working with others who share their love of nature and their desire to learn more about it. In the future, Lindsay and David will use that knowledge to greatly enhance their skills in teaching the wonders of our natural environment.

CONGRATULATIONS LINDSAY AND DAVID!!

Birders' Alphabet

Z chromosome

By **Carol Leininger**

The chromosomes of all living organisms determine the genus of each organism. Genes, which are bits of DNA, carry the necessary information. Usually these chromosomes occur in pairs, one pair of which is called the sex chromosome. In mammals the sex chromosomes are called either the X chromosome or the Y chromosome. A female has a pair of X chromosomes (XX) while a male has one X and one Y chromosome (XY). The Y chromosome is said to have the genes for the expression of masculine traits while the X chromosome has genes for the expression of female traits.

But birds differ from mammals. The sex chromosomes of birds are called W chromosome and Z chromosome. A male bird has two Z chromosomes (ZZ) while the female has one W chromosome and one Z chromosome (WZ). Apparently the Z chromosome carries genes for masculine traits and the W chromosome carries genes for feminine traits.

In both birds and mammals we find animals with three chromosomes instead of two. Oh, what chaos that can produce!

Utah Avian Cholera Outbreak

The avian cholera outbreak that recently caused the death of thousands of birds on the Great Salt Lake appears to be over. During November and December, 2007, an estimated 17,000 birds, Eared Grebes, Northern Shovelers, California Gulls, and Green-winged Teals, died.

Avian cholera die-offs on the Great Salt Lake are fairly common: in 1994 an estimated 15,000 died; in 1995 1,000 perished; in 1998, 44,000; in 2002, nearly 30,000; and in 2004 nearly 30,000.

Avian cholera in wild birds is primarily caused by one strain of bacteria, Type 1 *Pasteurella multocida*. The species most commonly affected are ducks, geese, coots, gulls, and crows. The bacteria can be transmitted by bird-to-bird contact, contact with secretions or feces of infected birds or ingestion of food or water containing the bacteria.

Large die-offs are seen primarily in wild ducks and geese. Large numbers of dead birds in good body condition with few if any sick birds are observed. Death may be so rapid that birds

literally fall out of the sky. Birds with no previous signs of disease may die while eating.

Avian cholera is highly contagious and can spread rapidly. Prompt action is needed to prevent and minimize the spread of the disease. Careful carcass collection and disposal helps reduce the amount of bacteria in the environment. Contact the National Wildlife Health Center for more information (608-270-2400).

Based upon a USGS National Wildlife Health Center document:
http://www.nwhc.usgs.gov/disease_information/avian_cholera/

Caley Owls

By Harry Spencer

The pine groves of Caley Reservation have sheltered Long-eared Owls and at least one Barred Owl during the 07/08 winter. Up to eleven Long-eared Owls have been reported, six recorded in the Wellington Christmas Bird Count.



Because the owls seem to prefer the thick upper reaches of the closely spaced pines, a successful birder needs to stand fairly close to the trunk of a tree and look nearly overhead, not a comfortable position. If the ground is clear of snow, whitewash and owl pellets may be seen on the pine-straw-covered ground.

Some years ago at different sites, Joe Strong shot these photos of Long-eared and Barred Owls.



January Birds

By Harry Spencer

At seven eBird sites during January 2008, Black River Audubon members filed 51 checklists with identifications of sixty species of birds. The sites and the number of checklists at each site are: Black River Reservation, 4; Caley Reservation, 4; Carlisle Reservation, 21; Lorain Harbor, 15; Oberlin Arboretum/ Cemetery, 4; Sandy Ridge Reservation, 2; and Wellington Upground Reservoir, 1.

The species identified are: Canada Goose, Gadwall, American Black Duck, Mallard, Lesser Scaup, Bufflehead, Common Goldeneye, Hooded Merganser, Red-breasted Merganser, Ruddy Duck, Pied-billed Grebe, Great Blue Heron, Bald Eagle, Northern Harrier, Cooper's Hawk, Red-shouldered Hawk, Red-tailed Hawk, American Kestrel, American Coot, Bonaparte's Gull, Ring-billed Gull, Herring Gull, Lesser Black-backed Gull, Great Black-backed Gull, Rock Pigeon, Mourning Dove, Great Horned Owl, Barred Owl, Long-eared Owl, Belted Kingfisher, Red-headed Woodpecker, Red-bellied Woodpecker, Yellow-bellied Sapsucker, Downy Woodpecker, Hairy Woodpecker, Northern Flicker, Blue Jay, American Crow, Black-capped Chickadee, Tufted Titmouse, White-breasted Nuthatch, Carolina Wren, Eastern Bluebird, American Robin, European Starling, Cedar Waxwing, Yellow-rumped Warbler, Eastern Towhee, American Tree Sparrow, Field Sparrow, Song Sparrow, Swamp Sparrow, White-throated Sparrow, Dark-eyed Junco, Northern Cardinal, House Finch, Common Redpoll, American Goldfinch, House Sparrow

Eagles Aplenty in Ohio This Winter

Adapted from the January 28, 2008 *Audubon Ohio E-News*.

Observers counted 649 birds during the recent Mid-Winter Bald Eagle survey. The previous record count was 554 in 2006.

This year's total includes 426 mature and 223 immature birds. Last winter's count was 480 Bald Eagles, including 359 mature and 121 immature birds. Immature Bald Eagles are those without a completely white head and are generally less than 5-years old.

In 2007, 194 eaglets fledged from 116 Ohio nests.

Bald Eagles were observed in 70 of Ohio's 88 counties during this year's survey, conducted January 2 –15. Sandusky, Ottawa, Erie, Trumbull, and Wyandot counties continued to report the largest number of birds. Sandusky County had the largest number of sightings with 76 reports.

Good concentrations of Bald Eagles were sighted along the western Lake Erie shore, around the mouth of the Sandusky River, and along the Kokosing, Mohican, Scioto, Grand, and Muskingum Rivers. The southern-most sighting-locations were in Brown, Clermont, Scioto, and Hamilton counties along the Ohio River.

The Ohio Department of Natural Resources Division of Wildlife conducts the annual study, and assessment includes both a standardized aerial survey and ground observations.

State wildlife officials and volunteers conduct the mid-winter survey each January as part of a national effort coordinated by the U.S. Fish and Wildlife Service. The survey documents trends in wintering population of both Bald and Golden Eagles in the lower 48 states.

Although rarely seen in Ohio, two immature Golden Eagles were spotted this year.

Snow Goose

Chen caerulescens

By **Jack Smith**

Snow Geese are occasional migrants in Ohio. They breed in the far north above the Arctic Circle and winter in the south, some along the Atlantic Coast, some along the Gulf Coast, some in Kansas, Missouri, and nearby areas, and some in the West and Southwest. Migration routes are to the east and west of Ohio. Usually we see only a few stragglers in Ohio. During the last century large numbers have been recorded only a few times.

John Koscinski photographed the bird shown on the front cover at Avon Lake. Because of the gregarious nature of the species, the birds often associate with Canada Geese as shown in the photograph.

On the 2006-2007 Christmas Bird Count, a flock of eight Snow Geese were observed flying south in U formation, rather than the typical V formation.

Snow Geese feed almost entirely on plant materials. In their southern United States wintering grounds along the Gulf Coast from the Mississippi River into Mexico, and along the Rio Grand in New Mexico to the Central Valley in California, huge flocks of geese browse in fields of winter wheat and in fields of waste grain in stubble fields. I imagine that southern farmers do not always have kind words for the birds.

On their summer home in the far north, the birds dig with their bills bulbous roots from the thawing tundra.



They also eat sedges, rushes, marsh grass, and aquatic plants.

How do Snow Geese get life-sustaining nutrients from these seemingly indigestible plant sources?

With the aid of bacteria both Snow and Canada Geese convert the cellulosic component of plants into sugars. In an end of the small intestine of these birds is a well developed blind pouch, called the *caecum* that harbors bacteria. Some mammals, such as the rabbit, have a similar bacteria-containing blind pouch. The human appendix may be a vestigial structure that in an ancient time served the same function.

In their nesting areas in the Arctic, Snow Geese nest in colonies of up to 1200 nests per square mile. The bird is monogamous and may mate for life.

In early June after mating, the female selects a raised hummock on a small island in a pond or along the shoreline. There she creates a depression and lines it with mosses, grasses, and large amounts of down. On average she lays 4-6 white eggs.

The male fiercely protects the nest.

After the last egg is laid, incubation begins and lasts for 24 to 27 days. Within hours of hatching the precocial goslings walk and swim under close parental supervision. To obtain needed protein, the goslings consume many insects.

In 50 to 60 days the young fledge and are ready to join their parents in migration. The family stays together as a unit for several months.

Avian experts theorize that the migrating flocks and nesting colonies provide safety and comfort to the birds.

Two races of Snow Geese, Lesser and Greater, are recognized. The Greater Snow Goose nests in far eastern regions of Canada and winters on the Atlantic Coast from Virginia to South Carolina. Many spend their winter on Pea Island, North Carolina. The slightly smaller Lesser Snow Goose occasionally is blown off course and visits Ohio.

Both Lesser and Greater Snow Geese have two color morphs, blue phase and white phase. The blue phase of Greater Snow Goose is rare. Birds of the two phases occasionally interbreed, but the two phases separate into colonies.

Conservationists are not too concerned about the expanding populations of Snow Geese, but they are concerned about the birds' effect upon the arctic tundra because the birds dig bulbous plant-roots. After a summer's breeding the birds leave a devastated area, which takes decades to recover. And the birds colonize in a new area each year.

References: See the list after the following article about Canada Geese.

The Case of the "Noble" Canada Goose

Branta Canadensis

By Jack Smith

Instead of vocalizing an expletive if you step on a messy plop while walking near a pond or on a golf course populated by Canada Geese, think how noble is this species. Pairs mate for life compared to the approximate 70% divorce rate of our society. If one bird is injured or sick, the mate will continue to accompany the injured or sick one. Only with the death of a mate, will a bird seek another one.

When I began birding in the late forties, the only flying Canada Geese that I can remember were those flying in V-formation during the spring and fall migrations. Occasionally I would see birds in apparent resting-feeding areas, farmers' fields, and wetlands and marshes

along Lake Erie or inland lakes. Then the breeding areas of the birds extended from east to west in Canada, including the northern tundra.

Now Canada Geese are ubiquitous in our area. In down town Elyria, I hear them “ahonking” and “hinking” as birds fly over. Year around, Canada Geese can be seen in open water, in farmer’s fields, golf courses, parks and elsewhere.

Between 1953 and 1970 The Ohio Division of Wild Life and the U.S. Fish and Wildlife organization sponsored highly successful programs to increase the population of resident Canada



Geese. Now the birds are so numerous that they have become a major nuisance. In some of the parks, naturalists have resorted to “shaking of the eggs” to destroy the egg viability in an effort to control population numbers.

Canada Geese are most interesting birds with intelligence we usually associate only with humans. Wild birds are wary of humans, but the usual geese that we encounter are really semi-domesticated. This characteristic provides us with the perfect opportunity to observe the way that the birds communicate and react to each other by the

use of visual and auditory displays.

In *A Guide to Bird Behavior*, Volume I, Donald Stokes describes the intricate visual displays of Canada Geese, and I recommend highly Stokes’ description.

I recommend also that you observe the behavior of this now-common species, and apply the Stokes descriptions in an effort to interpret the meaning of the displays.

In one of the displays, a bird with head and neck held straight forward while charging forward hisses loudly. Once at North Ridge Cemetery I experienced that display, not with a Canada Goose, but with a Mute Swan.

I stood my ground, and the bird assaulted me by snapping his wings and grabbing my pant leg. Instinctively I kicked him back into the water. He made no attempt to come at me again.

That night when I removed my pants, I noticed quite a bruise on my leg where he had snapped me with a wing.

A male Canada Goose while defending a nest site uses the same tactics, including the visual displays, hissing, and wing snapping.

In wintering flocks unconnected individual Canada Geese begin pairing. A new pair commits their lifetime devotion to each other by the “Greeting Ceremony” (Stokes’ term). This “Greeting Ceremony” also is repeated whenever the pair meets after being separated for any length of time.

The “Greeting Ceremony” begins with the male giving a drawn-out grating-call much like a human snore. Stokes calls it the “Snore call”. The male’s head and neck are extended horizontally, and he rolls his head from side to side while using his “Ahonk” voice. Simultaneously, she holds her head in a diagonal position and gives her higher pitched “Hink” call.

Except for a slight difference in sizes, males and females look alike, but they can be more easily differentiated by their calls. The female pitch is higher than that of a male. For example, when a pair of birds is flying, often they call to each other, the male with his “Ahonk” call and

the female with her higher pitched “Hink” call.

The “Greeting Ceremony” sounds like a duet.

Before copulation a pair may neck-dip in which both dip their heads in the water before flipping water over their backs. After mating both perform the “heads up” display with neck and head straight vertical.

With the female in the lead, they begin searching for a nesting site. When it is located, the female climbs onto it and explores. If the site is already claimed, the new male attempts to force the occupying female from the nest. If he is successful, the new pair has a nest site, but if he is unsuccessful, the new pair continues to search for an appropriate site.

Usually the site is at water’s edge, but may be a hummock island, atop a musk rat house, or in an artificial nesting box.

Only the female builds the nest. She hollows a shallow depression and reaches for any material nearby. She brings in leaves, grasses, and lining of feathers and down.

Perhaps one hour after completing the nest, the female lays the first egg followed by adding one each day until, on average, her total is five white eggs.

After laying the last egg, she begins incubation. This delay until the last egg is laid is common for many avian species, and the entire clutch of eggs hatches nearly simultaneously. Thereby all goslings will leave the nest nearly simultaneously.

Incubation lasts about 28 days. During this time the male aggressively protects the nest from any intruder.

Brooding lasts only one day before the goslings venture in small excursions to feed. To reach new feeding areas the male leads the goslings in single file with the female guarding the rear.

Over the next few weeks the goslings grow rapidly, and after eight or nine weeks they are able to fly.

A family group forms strong bonds and remains as a unit for almost a year.

In our area incubation usually begins in late March or early April, and by July goslings are able to fly. About this time the adults begin their annual molt in which they lose all primary flight and tail feathers and the ability to fly. The family unit then moves to some remote area until the new feathers grow sometime in early August.

There are several subspecies of Canada Goose currently recognized: Aleutian, Richardson’s, Lesser, Dusky, and the Common one that we often encounter. Another former subspecies, Cackling Goose, is now recognized as a separate species.

Canada Geese are prodigious flyers with ability to attain speeds of about 50 miles per hour. The common V-formation of their flights provides efficiency in flying. In the V, the following birds benefit from the slip stream of the leader. This necessitates occasional changing the leader during long flights.

Increased populations of Canada Geese can be expected to be documented in the new Ohio Breeding Bird Atlas now under preparation.

References: *The Encyclopedia of Birds*, Vol. 1, Kenny Clements; *The Audubon Society Encyclopedia of North American Birds*, John K. Terres; *Lives of North American Birds*, Kenn Kaufman; *A Guide to Bird Behavior*, Volume I, Donald W. Stokes; *The Ohio Breeding Bird Atlas*, Bruce G. Peterjohn and Daniel L Rice; *Birds of Ohio*, Bruce G. Peterjohn; *Smithsonian Birds of North America*, Fred J. Alsop III; *Manual of Ornithology: Avian Structure and Function*, Noble S. Proctor and Patrick J. Lynch.

Rock Pigeons

Columba Livia

By **Jack Smith**

During my high school days in the early 40s, my brother, Tom, and I had a menagerie of birds and animals in an old barn diagonally back of my present-day home. And during the World War II rationing years, we provided eggs, rabbit, and squab for the family table.

Among our menagerie were homing pigeons, a variety of Rock Pigeons. We kept them in a loft on the barn's second floor and raced them in a local club.

From time to time with fascination we watched the homers' shenanigans – or behavior in Stokes' terms.

One of the pigeon displays that I remember vividly is called the “Driving Display” by Stokes.



Male pigeons select the nesting site and provide much of the nesting material. In our loft the nesting site was one of the many nesting boxes that Tom and I provided and fastened to the walls of the loft.

Soon after mating, a male in our loft began driving his mate by pecking her on the head.

I remember one male following a female to a roof nearby continuously pecking at her head. When she finally returned to the loft he followed her to the nesting box he had selected. He perched at the edge of the box and prevented her escape. I am sure that he was telling her “Damn it's about time you laid an egg!”

Photos by Harry Spencer

Reference: *A Guide to Bird Behavior*, Volume I, Donald W. Stokes.

Key West Quail-Dove A Whale of a Find

By **Joe Strong**

In March of 1979, Jack Smith and I took a trip to the Everglades National Park and spent a week birding and studying nature. We took Florida Rt. 27 from Homestead to the park entrance and stopped at the visitors center to get some maps and talk with the naturalist. He informed us that a Key West Quail-Dove had been seen in January and was still in the area. This was exciting news since this was only the fifth confirmed sighting in the U.S. since the beginning of the century.

Route 27 continues through the park for about 35 miles and ends at Flamingo. At that time Flamingo consisted of yacht basin, restaurant, motel and camp ground. It was the perfect base for our explorations. Unfortunately these accommodations are no longer available in Flamingo.



One day we decided to explore the Snake Bight Trail that extends through a swamp of

Red and Black Mangroves. Our *Birder's Guide to Florida* indicated that it was possibly a good trail to see a Mangrove Cuckoo.

After a few hours of exploring, we arrived back near the trail head about dusk and heard a rustling in the dry leaves about 10-12 feet off the trail. We could hardly believe our eyes when we saw a Key West Quail-Dove nonchalantly scratching around in the leaves and paying no attention to us. Fortunately we had a camera with a 300-mm. telephoto lens and flash available, so we were able to get a reasonably good photo of the rarest bird either of us had ever seen. Shown here is a black-and-white copy of the original color photo.

The Key West Quail-Dove (*Geotrygon chrysie*) is a bird of the West Indies. It is primarily found in Hispaniola (Haiti and Dominican Republic) and surrounding islands. It is also found in Cuba, Isle of Pines, and the Cayman Islands. It is rare in the Bahamas and the island south of Hispaniola.

James Audubon discovered the birds breeding in Key West in 1832, but by the mid-1800s the birds had been eliminated from the area.

Quail-Doves get their name from their resemblance to quails and their somewhat-similar ground-dwelling lifestyle.

The Key West Quail-Dove is usually found in low, dry scrub and semi-arid woods. They nest in low undergrowth or occasionally on the ground. A nest has one or two buff-colored eggs.

The bird is 11 to 12-inches in length. The head, back, wings, and tail are chestnut, and the males have a glossiness of green and purple on the crown of the head, neck, and upper back. The most striking marking is the white stripe below the eyes. The bill is brownish-red with a black tip. The breast is whitish. The female is somewhat duller in color and lacks the iridescence of the male.

The similar Ruddy Quail-Dove is a rare visitor to southern Florida. It is about 9 ¾-inches in length and has a cinnamon-colored breast. It also has a stripe under the eye, but the stripe is buff colored. In addition it lacks the green and purple iridescence and has a shorter tail.

I haven't seen many rare birds, but in 1979 I was in the right place at the right time and had my camera.

References: *A Birder's Guide to Florida*, James A. Lane, 1984; *Birds of the West Indies*, Fifth edition, James Bond, 1985; *Field guide to the Birds of North America*, National Geographic, Fifth Edition.

Hawaii's Endangered Birds

Submitted by **Dick Lee**

Of the 71 bird species and subspecies that are endemic to Hawaii- found nowhere else in the world- 30 are endangered. Evidence suggest that many of 35 or more species known only from fossil records became extinct after the Islands were settled by the Polynesians. Since the arrival of the Europeans with Captain Cook, two centuries ago, another 23 species or subspecies have become extinct.

Lying nearly 2400 miles from the nearest continental land mass, Hawaii has no native reptiles, amphibians or mammals other than the Hawaiian Hoary Bat. This absence of predation and competition allowed the early native species to evolve and adapt to specific ecological niches, much in the ways of Darwin's finches.

The Polynesians brought pigs, dog and rats to the 1500 mile-long archipelago. Thus began the unnatural invasion of alien species that continues today. With Captain Cook came goats and European pigs. Other explorers brought sheep, cattle, horses, cats and other rodent

species. Ecosystems were drastically changed by development of ranches and plantations for growth of sugar cane and pineapple. Rat populations exploded with the increased agricultural growth. Mongooses were brought to control the rats. Mongooses are diurnal, rats are nocturnal. The plan not only didn't work, it compounded the problem, especially for ground-nesting birds.

In addition to the mammal invasion, over 150 species of alien birds have been introduced to the Islands. Some have established breeding populations and pose a threat to native birds through competition for food and nest sites, transmission of diseases and parasites and dispersal of alien plant seeds.

Control of alien species is essential to avert the march toward extinction for Hawaii's native birds. Seventy-one species and subspecies are found only in this state. Thirty of these are in danger of facing extinction.

Source: *Hawaii's Birds*, by Hawaii Audubon Society