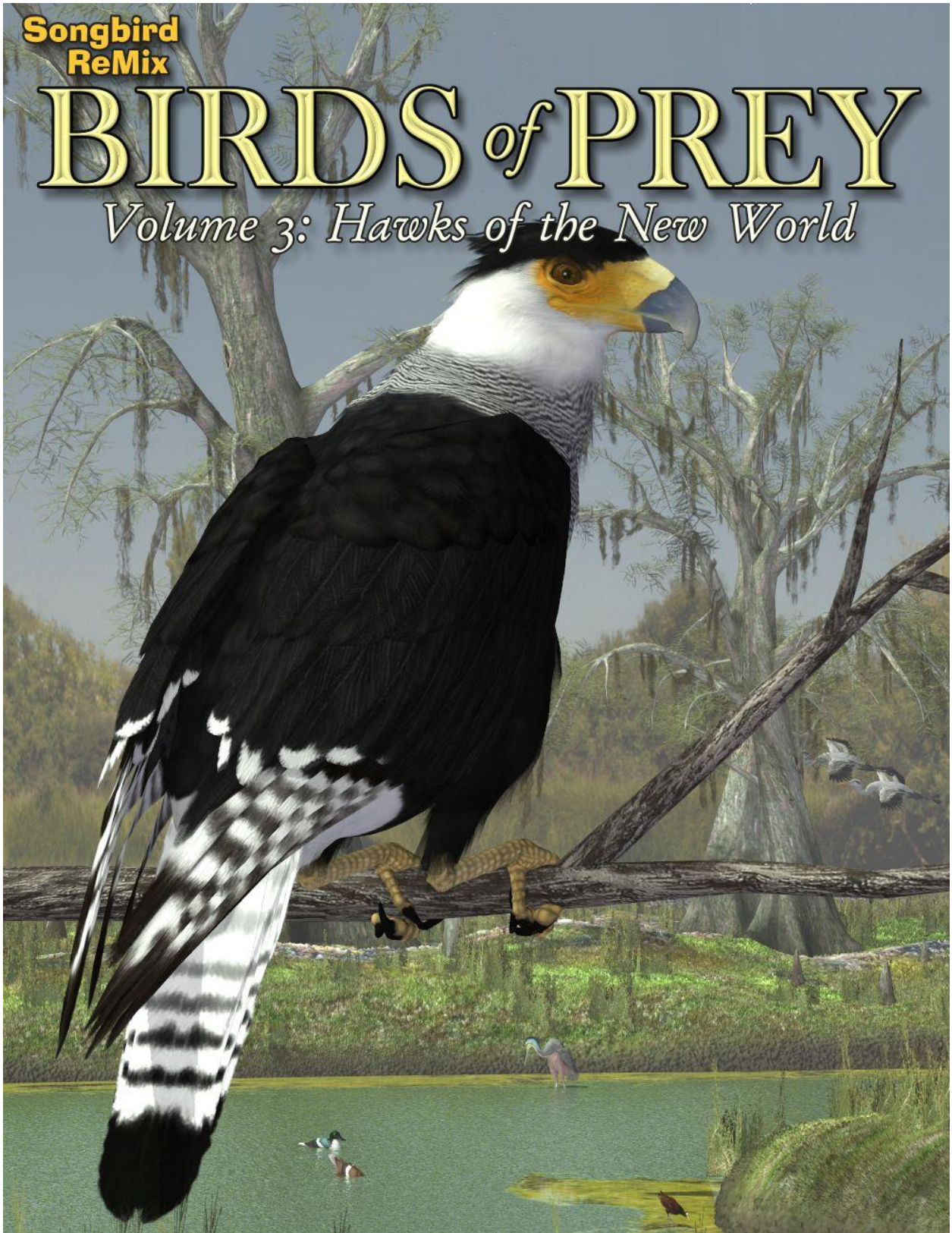


Songbird
ReMix

BIRDS of PREY

Volume 3: Hawks of the New World



Avian Models for 3D Applications

Characters and Texture Mapping by Ken Gilliland

Songbird ReMix

BIRDS of PREY

Volume III: Hawks of the New World

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Songbird ReMix

BIRDS of PREY

Volume III: Hawks of the New World

Introduction

This Songbird ReMix Birds of Prey contains species in the Hawk family. Hawks are small to medium-sized diurnal birds of prey, widely distributed around the world and varying greatly in size. This volume contains hawks from the "new world" (the Americas and parts of Oceania). It is a bookend to Volume II of the series, which contains hawks from the "old world" (Eurasia, Africa and Australia).

Hawks are divided into two groups; buteonine hawks and accipitrine hawks. The term "true" hawk is sometimes used for the accipitrine hawks. Generally they take birds as their primary prey. The term "buzzard" is preferred for the buteonine hawks. They prefer mammals.

Throughout history, culture and myth, Hawks are symbols of courage and strength. Hawking, a form of Falconry, can be traced back to at least 2000 B.C.E. in Asia, and it flourished in Europe and the Middle East from 500 to 1600. It was used for both recreation and to provide food.

Overview

The set is located within the **Animals : Songbird ReMix** folder. Here is where you will find a number of folders, such as **Bird Library**, **Manuals** and **Resources**. Let's look at what is contained in these folders:

- **Bird Library:** This folder holds the actual species and poses for the "premade" birds. Birds are placed into a "type" folder (such as "Birds of Prey (Order Falconiformes)" which for example would hold falcons, hawks and eagles). The birds for this set can be found in the following folder(s):
 - **Birds of Prey (Order Falconiformes)**
- **Manuals:** Contains a link to the online manual for the set.
- **Props:** Contains any props that might be included in the set
- **Resources:** Items in this folder are for creating and customizing your birds
 - **Bird Base Models:** This folder has the blank, untextured model(s) used in this set. These models are primarily for users who wish to experiment with poses or customize their own species of bird. With using physical renderers such as Iray and Superfly, SubD should be turned to at least "3".

Poser Use

Select **Figures** in the **Runtime** Folder and go to the **Animals : Songbird ReMix** folder. Select the bird from the renderer (*Firefly* or *Superfly*) folder you want and simply click it to load. Some birds in the Songbird ReMix series may load with attached parts (*Conformers*) such as tail or crest extensions. Some of these parts have specific morphs. You will need to click on the attached part to

access those controls. Associated poses can be found in the same folder- **Bird Library : (Type) : Poses**.

DAZ Studio Use

Go to the **Animals : Songbird ReMix** folder. Select the bird from the renderer (*3Delight* or *Iray*) folder you want and simply click it to load. Some birds in the Songbird ReMix series may load with attached parts (*Conformers*) such as tail or crest extensions. Some of these parts have specific morphs. You will need to click on the attached part to access those controls. Associated poses can be found in the same folder- **Bird Library : (Type) : Poses**. **Note:** Using the "Apply this Character to the currently selected Figure(s)" option **will not** properly apply the correct scaling to the bird selected. It is better to delete the existing character first and load the one you want to use.

Physical-based Rendering

Physical-based renderers such as **Iray** and **Superfly** require more CPU and memory horsepower than the legacy renderers for DAZ-Studio and Poser because of ray-trace bounces and higher resolution meshes needed for displacement. Superfly, in particular, may crash *especially* when using the GPU-based options. The best solution is to render using one of the CPU-based options. Limiting the number of ray-trace bounces by setting "Pixel Samples" to "2" or "1" will also reduce crashes and speed renders. Of course, upgrading memory and your CPU will also help.

Where to find your birds

Type Folder	Bird Species
Birds of Prey (Order Falconiformes)	Osprey Swallow-tailed Kite Snail Kite Northern or Hen Harrier Northern Goshawk Sharp-shinned Hawk Cooper's Hawk White Hawk Harris Hawk Red-tailed Hawk Red-shouldered Hawk Io (Hawaiian Hawk) Crested Caracara

Where to find your poses

Type Folder	For what species?
Birds of Prey (Order Falconiformes)	All Birds of Prey

Morphs and their Use

All Songbird ReMix models have morphs that change the look of the loaded model to achieve additional movements and expressions that joint movements can't achieve. These are referred to in the Songbird ReMix model as "Action Morphs". Other morphs that are included can subtly or sometimes dramatically, alter the model to resemble specific species. These morphs are referred to as "Creation Morphs".

Here is a brief explanation of where the morphs are found and what they do:

BODY section:

- **Action Morphs**
 - **Common Controls**
 - BeakOpenClose- Controls the opening and closing of the bill
 - EyesFwdBack - Controls the forward and backward movement of the eyes
 - EyesUpDown - Controls the up and down movement of the eyes
 - EyeLidsCloseOpen - Controls the opening and closing of both eyelids. Dialing to -1 will give a rounded eye shape. The individual EyeWink controls should not be used in conjunction with this morph.
 - WingsFold- Puts both Wings into a folded position. Dialing number between 0 and 1 sometimes will give geometry issues (intersections, odd shapes) due to the nature of the complex morph.
 - TailFeathersSpread – Controls the tail feather fanning action.
 - **Wing and Tail Controls**
 - These controls allow both wings and each individual wing to perform numerous wing actions and also allows the Tail feather action of cupping.
 - **Neck Bending**
 - These controls allow global bending, twisting and moving side-to-side of the seven neck sections. Partial bending controls can also be found in each individual neck section. There is also a control to scrunch and stretch the neck.
 - **Head Controls**
 - Exp-Smile- Creates a smile expression.
 - Exp-Frown- Creates a frown expression.
 - **EyeLid Movement Section**- has individual controls for left and right EyeWink. These individual EyeWink controls will not work properly when the master EyeLidsCloseOpen morph is used.
 - **Tongue Movement Section**- various morphs control the movement of the tongue.
 - **Feather Fluff Controls**
 - CrestFluffUp- Pulls the crest up/out.
 - CrestFluffLength- Controls the length of the crest (top of bird's head).
 - CrestFluffHide- Hides the crest.
 - BackHdFluffUp- Pulls the back head feathers up/out.

- BackHdFluffLength- Controls the length of the back head feathers.
 - BackHdFluffHide- Hides the back head feathers.
 - JowlFluffOut- Pulls the feathers under the eye area (jowls) out.
 - JowlFluffLength- Controls the length of the jowl feathers.
 - JowlFluffHide- Hides the jowl feathers.
 - ThroatFluffOut- Pulls the feathers on the throat area out.
 - ThroatFluffLength- Controls the length of the throat feathers.
 - ThroatFluffHide- Hides the throat feathers.
 - NeckFluffLength- Controls the length of the neck feathers.
 - NeckFluffOut- Pulls the neck feathers up/out.
 - NeckFluffDroop- Droops the front facing neck feathers.
 - BreastFeathersOut- Pulls the breast feathers out.
 - BreastFluffSidesIn- Pulls the breast feathers sides in so they don't intersect with folded wings.
 - RaiseBackFeathers- Ruffles the feathers on the back of the bird.
 - FlankFluffLength- Controls the length of the flank feathers.
 - FlankFluffOut- Pulls the flank feathers out (not recommended when wings are folded).
 - ThighFluffBack- Pulls the thigh feathers back on the thighs.
 - ThighFluffOut- Pulls the thigh feathers out to be more fluffy.
 - ThighFluffLength- Controls the length of the thigh fluff.
 - RumpTopFluff- Controls the transparency feathers on the topside rump/tail of the bird.
 - RumpBtmFluff- Controls the transparency feathers on the underside rump/tail of the bird.
 - RumpFluffSides-Reduces the Fluff on the sides of the rump. Useful when wings are folded.
- **Correction Morphs**
 - lThighIn4Flight and rThighIn4Flight - Reduces the thigh lumps caused when legs are brought fully back for flight or perching.
- **Creation Morphs**
 - Sleeker- Thins the trunk of the bird.
 - BreastIn-- Reduces/Adds to breast shapes.
 - BreastCrease- Creates a center crease on the breast.
 - BackFlutter- Reduces the curve on the back.
 - RumpAddBulk- Adds bulk to the lower portion of the rump.
 - RumpSleeker- Streamlines the Hip-to-Tail Sections.
 - RumpShorten- Reduces/adds to the length of the rump and tail sections.
 - RumpTaper- Reduces the width of the rump and tail sections.
 - RumpTopFluffWidth- Controls the width of the feathers on the topside rump/tail of the bird.
 - RumpTopFluffExtend- Controls the length of the feathers on the topside rump/tail of the bird.
 - RumpBtmFluffExtend- Controls the length of the feathers on the underside rump/tail of the bird.
 - LegLength- Allows lengthening of the legs.

- LegThickness- Increases the girth of the shins.
- FootSize- Controls the size of the Feet.
- **Species Shapes**- These morphs create very specific looks to resemble certain species.
 - Crested Eagle and Shape Morphs- These are used with Crested eagles. Shaping morphs will only work if the CrestedEagleUnhide is active.
 - Harpy Crest Morphs- These are used with Harpy Crested-like eagles. Shaping morphs will only work if the HarpyCrestUnhide is active.
 - AfricanHarrierCrest- For use with the African Harrier-hawk.
 - HawkHead- Shapes the head for Hawks.
- **Head Shaping**
 - **Head Shapes**- These morphs control the shape of the head.
 - Hd-BigHead- Makes the head and neck parts around 30% larger
 - Hd-WedgeHead- Tapers the head from bill to back of head.
 - Hd-Rounder- Adds to the width of the head.
 - Hd-ThickenUpperNeck- Adds bulk to the upper neck.
 - Hd-ThickenNeckSides- Adds bulk to the sides of the neck.
 - Hd-FlattenCrown- Flattens the crown of the head.
 - Hd-RaiseCrown- Raises the crown of the head.
 - Hd-ForeheadLow- Reduces the forehead extending to the beak.
 - Hd-NoForehead- Reduces the forehead portion and expands the beak.
 - Hd-ForeheadOut- Adds to the forehead extending to the beak.
 - Hd-NostrilLump- Adds or subtracts from the forehead/beak area.
 - Hd-BackHeadDown- Reduces/slopes the back of the head to neck.
 - Hd-BackHeadUp- Expands/angles the back of the head to neck.
 - Hd-BigBrows- Expands the eyebrow area out.
 - Hd-BrowDownFront- Angles the front of the eyebrow area down.
 - Hd-BigBrowFwd- Expands the entire brow area forward.
 - Hd-ExpandJowls- Thickens the jowl/cheek area.
 - Hd-ForeheadSplit- Adds a center crease to the forehead area.
 - SuperOrbitalRidges- Makes Super-orbital Ridges (common in many Birds of Prey, especially eagles) more pronounced.
 - **Eye Shapes**- These morphs can change the appearance of the eyes.
 - Ey-Dilate- Controls the pupil size of the eyes.
 - Ey-BiggerEyes- Makes eyes about 20% larger.
 - **Beak Shapes**- These morphs can change the appearance of the bill.
 - Bk-Length- Controls the length of the beak.
 - Bk-Height- Controls the height of the beak.
 - Bk-Width- Controls the width of the beak.
 - Bk-SidesIn- Controls the width of the mid-portion of the beak.
 - Bk-UpperRounder- Rounds the top of the upper beak.
 - Bk-UpperFlatter- Flattens/angles the top of the upper beak.
 - Bk-UpperBeakCurve- Adds some curving to the mouth edge of the upper beak.

- Bk-UpperBeakRaiseEnd—Raise the end of the upper beak giving an eagle-like shape.
- Bk-TomialTooth- Adds the tomial tooth found in the falcon family.
- Bk-Notch- Adds a beak notch common in the hawk family.
- Bk-Hook- Extends the hook on the upper beak.
- Bk-CornersBack- Moves the corners of the beak forward or back.
- **Nostril Shapes**
 - Bk-MoveNostrils- Moves the nostrils on the bill forward and back.
 - Bk-ThinNostrils- thins the nostrils.
 - Bk-NostrilLength- makes the nostrils longer.
- **Tongue Shapes**
 - Tng-Length- Controls the length of the tongue.
 - Tng-Width- Controls the width of the tongue.
- **Wing Shapes-** These morphs control the shape of the wings.
 - WingSpan- Allows control of Wing Length.
 - WingWidth- Expands the width of the wings.
 - WingsPoint- Brings the tips of the wings to a point.
 - HawkWingShape1- Controls the shape of the leading primary flight feathers
 - HawkWingShape2- Controls the shape of the secondary flight feathers
- **Tail Shapes-** These morphs control the shape of the tail feathers.
 - TailFanStyle- Creates the shape of the tail spread. 1=Fan, 0=Wedge,
 - OspreyTail- Shrinks the two exterior Tail Feathers as Osprey have,
 - Length- Controls the length of the tail feathers.
 - Width- Controls the width of the tail feathers.
 - Round- Rounds the tail feathers.
 - SplitTailFeathers- Creates a wedge-shape for the tail feathers.
 - GraduatedTail- Graduates the tail feathers length from short (outside) to long (inside).
 - SquareEnds- Makes tail feathers have square ends.
- **Scale-** Controls the size of the model. The scale is proportional to the standard human characters in Poser and DAZ Studio.

There is an additional specialized control in each foot of the Osprey model that allows the Zygodactyl grip (two toes forward, two toes back) that only Osprey possess. This control **should not be used** in conjunction with the normal grip control. They are meant to be used “either/or”.

Songbird ReMix

BIRDS of PREY

Volume III: Hawks of the New World

Field Guide

Osprey
Swallow-tailed Kite
Snail Kite
Northern or Hen Harrier
Northern Goshawk
Sharp-shinned Hawk
Cooper's Hawk
White Hawk
Harris Hawk
Red-tailed Hawk
Red-shouldered Hawk
lo (Hawaiian Hawk)
Crested Caracara

Common Name: Osprey
Scientific Name: *Pandion haliaetus*

Size: 24 inches (60 cm); **Wingspan:** 71 inches (180 cm)

Habitat: Worldwide; it is found on all continents except Antarctica. Individuals in the tropics and subtropics are resident, but others migrate to the lower latitudes of the Amazon Basin, South America's northern coast, or West Africa in the non-breeding season. Migrants begin moving to lower latitudes in August and arrive by October, returning in March and April. Birds are generally solitary and usually migrate alone, but may congregate in small groups at roosts or plentiful food sources. The species migrates on broad fronts and is not dependent on land bridges during migration; birds readily cross bodies of water using flapping flight, but can soar easily over land. It is entirely diurnal.

It inhabits the areas around shallow waters, being sufficiently tolerant of human settlement to persist in suburban and sometimes urban environments.

Status: Least Concern. **Global population:** 500,000 adult individuals with an increasing population trend. Human persecution was the main historical threat, prevalent from the 18th-20th centuries. A combination of deforestation and the collection of eggs and live birds drove the species extinct in Azerbaijan. In the U.S.A. (and to a lesser extent elsewhere), numbers fell significantly from 1950-1970 as a result of pesticide use, although they are now recovering, as they are in Scotland where the species had been extirpated by collection and hunting. Pesticide use has now been reduced to a minor threat, but shooting still affects many birds on migration in the Mediterranean, notably in Malta. A few Australian birds are apparently impacted by local human disturbance. It is very highly vulnerable to the effects of potential wind energy development.

Diet: Fish make up 99% of the osprey's diet. But occasionally they may prey on rodents, rabbits, hares, amphibians, other birds, and small reptiles.

Ospreys have vision that is well adapted to detecting underwater objects from the air. Prey is first sighted when the osprey is 10–40 m above the water, after which the bird hovers momentarily then plunges feet first into the water. Ospreys, however, are unable to dive deeper than 1 m (3 feet) in water so shallow fishing grounds are preferred. Several studies have shown that ospreys caught fish on at least 1 in every 4 dives, with success rates sometimes as high as 70 percent. The average time they spent hunting before making a catch was about 12 minutes.

Nesting: The upperparts are a deep, glossy brown, while the breast is white and sometimes streaked with brown, and the underparts are pure white. The head is white with a dark mask across the eyes, reaching to the sides of the neck. The irises of the eyes are golden to brown, and the transparent nictitating membrane is pale blue. The bill is black, with a blue cere, and the feet are white with black talons. A short tail and



long, narrow wings with four long, finger-like feathers, and a shorter fifth, give it a very distinctive appearance. The sexes appear fairly similar, but the adult male can be distinguished from the female by its slimmer body and narrower wings. The breast band of the male is also weaker than that of the female, or is non-existent, and the underwing coverts of the male are more uniformly pale.

The juvenile osprey may be identified by buff fringes to the plumage of the upperparts, a buff tone to the underparts, and streaked feathers on the head. During spring, barring on the underwings and flight feathers is a better indicator of a young bird, due to wear on the upperparts.

Ospreys usually mate for life. The breeding season varies according to latitude; spring (September–October) in southern Australia, April to July in northern Australia and winter (June–August) in southern Queensland. In spring the pair begins a five-month period of partnership to raise their young. Breeding areas are near freshwater lakes and rivers, and sometimes on coastal brackish waters. Rocky outcrops just offshore are used in coastal areas. The nest is a large heap of sticks, driftwood and seaweed built in forks of trees, rocky outcrops, utility poles, artificial platforms or offshore islets.

The female lays two to four eggs within a month, and relies on the size of the nest to conserve heat. The eggs are whitish with bold splotches of reddish-brown. The eggs are incubated for about 5 weeks to hatching.

Cool Facts: The osprey is sometimes known as the sea hawk, fish eagle, river hawk or fish hawk. The osprey differs in several respects from other diurnal birds of prey. Its toes are of equal length, its tarsi are reticulate, and its talons are rounded, rather than grooved. The osprey and owls are the only raptors whose outer toe is reversible, allowing them to grasp their prey with two toes in front and two behind. This is particularly helpful when they grab slippery fish.

There are 4 subspecies of Osprey:

- *P. h. haliaetus*, first described by Linnaeus in 1758. The nominate species; found in the Palearctic.
- *P. h. carolinensis*, first described by Gmelin, 1788. Found in North America. This form is larger, darker bodied and has a paler breast than nominate species.
- *P. h. ridgwayi*, first described by Maynard in 1887. Found in the Caribbean islands. This form has a very pale head and breast compared with nominate species, with only a weak eye mask. It is non-migratory.
- *P. h. cristatus*, first described by Vieillot in 1816. The “Eastern Osprey”; found on the coastline and some large rivers of Australia and Tasmania. The smallest and most distinctive subspecies, also non-migratory.

In Greek mythology, Nisos, a king of Megara became an osprey to attack his daughter after she fell in love with Minos, King of Crete.

The osprey is depicted as a white eagle in heraldry, and more recently has become a symbol of positive responses to nature.

An Osprey may log more than 160,000 migration miles during its 15-to-20-year lifetime. Scientists track Ospreys by strapping lightweight satellite transmitters to the birds' backs. The devices pinpoint an Osprey's location to within a few hundred yards and last for 2-3 years. During 13 days in 2008, one Osprey flew 2,700 miles—from Martha's Vineyard, Massachusetts, to French Guiana, South America.

Common Name: Swallow-tailed Kite
Scientific Name: *Elanoides forficatus*

Size: 20-27 inches (50-68 cm); **Wingspan:** 43-52 inches (112-136 cm)

Habitat: The Americas; migratory populations occur in summer from the southeastern United States south through Central America, and also in southern Brazil. Resident populations in much of northern South America are supplemented by migrants both from the north and south.

Swallow-tailed kites inhabit mostly woodland and forested wetlands near nesting locations.



Status: Least Concern to Endangered. **Global population:** Unknown amount of adult individuals with an increasing population trend. While not formally listed as endangered

or threatened by the federal government in the United States, this kite is listed as “endangered” by the state of South Carolina, as “threatened” by the state of Texas and they are listed as “rare” by the state of Georgia. Destruction of habitats is chiefly responsible for the decline in numbers. A key conservation area is the Lower Suwannee National Wildlife Refuge in Florida.

Diet: Small reptiles (snakes, lizards and frogs), large insects (grasshoppers and crickets), small birds and eggs, and sometimes small mammals. Fruit is sometimes eaten in South American populations.

It drinks by skimming the surface and collecting water in its beak and frequently eats while flying.



Nesting: Male and female individuals appear similar. It has a white head, white underparts, and white underwing coverts that contrast sharply with glossy black upperparts and entirely black flight feathers. The tail is long and deeply forked and the wings are long and pointed. Immature kites are duller in color than the adults, and the tail is not as deeply forked.

Mating occurs from March to May, with the female laying 2 to 4 eggs. The twig nest is placed in the canopy of a tall tree, often in the smallest branches to avoid terrestrial predators. Incubation lasts 28 days, and 36 to 42 days to fledge.

Cool Facts: The Swallow-tailed Kite rarely flap its wings while flying, but it almost continuously rotates its tail, often to nearly 90 degrees, in order to hold a heading, make a sharp turn, or trace tight circles while drifting across the sky.

Common Name: Snail Kite

Scientific Name: *Rostrhamus sociabilis*

Size: 14-19 inches (36-48 cm); **Wingspan:** 39-47 inches (99-120 cm)

Habitat: The Americas; breeds in tropical South America, the Caribbean, and central and southern Florida in the United States. It is resident all-year in most of its range, but the southernmost population migrates north in winter and the Caribbean birds disperse widely outside the breeding season.

Their main habitat requirements are open marshes that have been continuously flooded for at least two years, which allows the apple snails to accumulate to a sufficient density. In areas where the snails are abundant the Snail Kite will occur in very high densities and will often congregate in communal roosts numbering up to 1000 individuals.



Status: Least Concern to Endangered. **Global population:** Unknown amount of adult individuals with an increasing population trend. The snail kite is a locally endangered species in the Florida Everglades, with a population of less than 400 breeding pairs. Research has demonstrated that water-level control in the Everglades is depleting the

population of apple snails. However, this species is not generally threatened over its extensive range. But this may change due to this raptors' specialized diet which restricts it to certain habitats and makes it vulnerable if the habitat is destroyed or altered

Diet: Primarily Apple Snails (*Pomacea*). Crayfish (*Procambarus*) and black crappie are alternatives, but only when apple snails become scarce, such as during drought. It flies slowly with its head facing downwards, looking for apple snails.

Nesting: The adult male has dark blue-gray plumage with darker flight feathers. The legs and cere are red. The adult female is about 3% larger, has dark brown upperparts and heavily streaked pale underparts. She has a whitish face with darker areas behind and above the eye. The legs and cere are yellow or orange. The immature is similar to adult female, but the crown is streaked.

It nests in a bush or on the ground, laying 3–4 eggs.

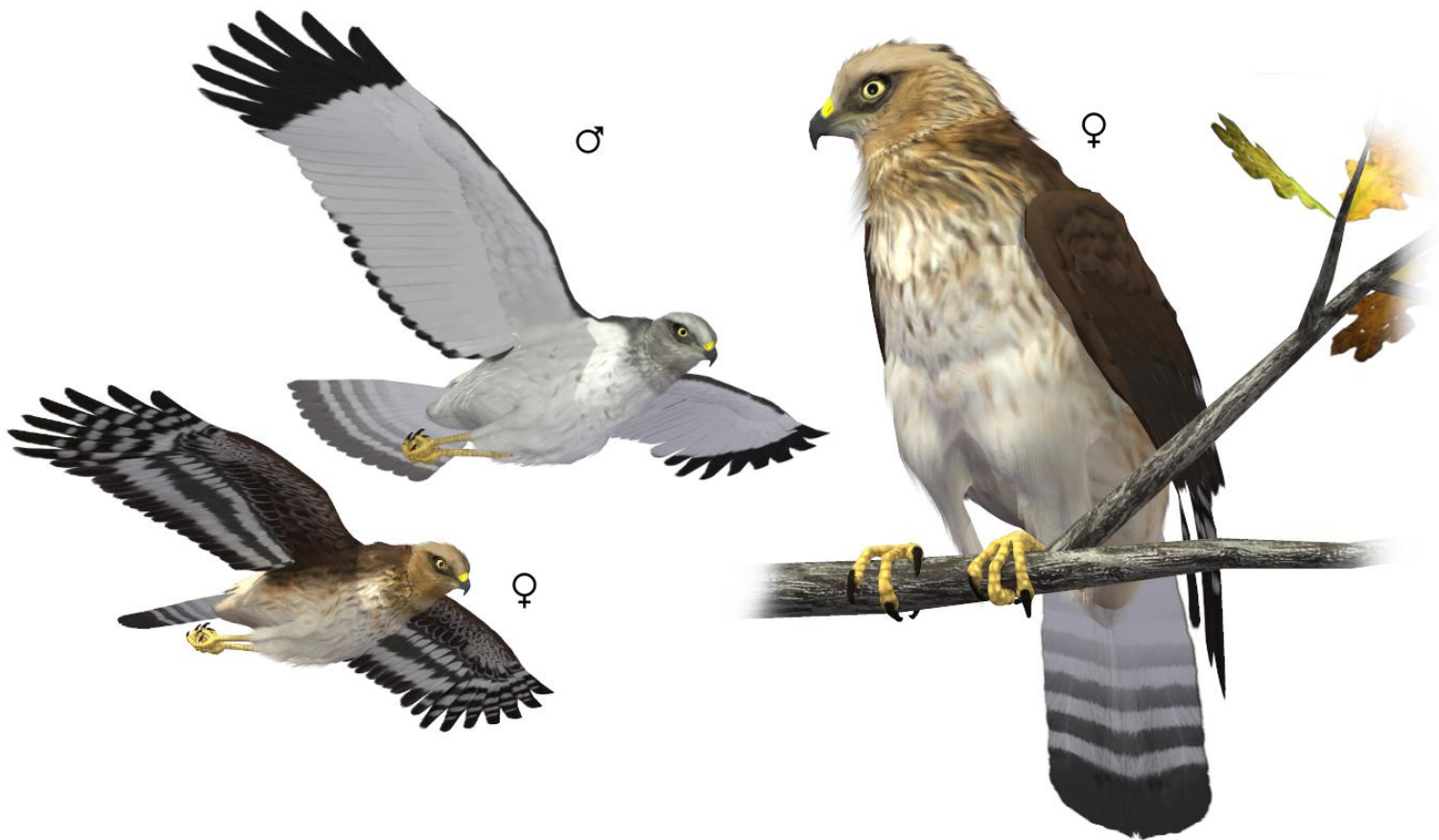
Cool Facts: Of all the birds of prey in the world, the Snail Kite is one of the most specialized feeders. They eat primarily freshwater snails.



Common Name: Northern or Hen Harrier
Scientific Name: *Circus cyaneus*

Size: 16-20 inches (41-52 cm); **Wingspan:** 38-48 inches (97-122 cm)

Habitat: North America and Eurasia; breeds throughout the northern parts of the northern hemisphere in Canada, the northernmost USA, and in northern Eurasia. It migrates to more southerly areas in winter. American breeders move to the southernmost USA, Mexico, and Central America, while Eurasian birds move to southern Europe and southern temperate Asia. In some places harriers may be present all year, such as the mildest regions of France, Great Britain, and the southern US, although in winter the higher ground in these areas is largely deserted. They breed in wide-open habitats ranging from Arctic tundra, prairie grasslands, farmland, coastal prairies, marshes, to swamps.



Status: Least Concern. **Global population:** 1,400,000 adult individuals. Northern Harriers are fairly common, but their populations are declining. The North American Breeding Bird Survey records a steady decline of 0.8 percent per year from 1966 to 2010, resulting in a cumulative loss of 30 percent, with Canadian populations declining more than U.S. populations. Partners in Flight estimates that 35% of the population

spends some part of the year in the U.S., 17% in Canada, and 10% in Mexico. They rate an 11 out of 20 on the Continental Concern Score and are not on the 2012 Watch List. Habitat loss has contributed to reduced harrier populations as people have drained wetlands, developed land for large-scale agriculture, and allowed old farmland to become reforested. The small mammals that harriers prey upon have been reduced because of overgrazing, pesticides, and reduced shrub cover from crop field expansion. Northern Harriers are susceptible to the direct effects of pesticide buildup, as well as from eating poisoned animals. In the mid-twentieth century their populations declined from contamination by DDT and other organochlorine pesticides, but rebounded after DDT restrictions went into effect in the 1970s. Northern Harriers have been mostly safe from hunting because of their reputation for keeping mouse populations in check, but they are still sometimes shot at communal winter roosts in Texas and the southeastern United States.

Diet: Small mammals (voles, cotton rats and ground squirrels), small birds (mostly hunted by male harriers) and occasionally amphibians (especially frogs), reptiles and insects (especially *orthopterans*). Sometimes larger prey, such as rabbits and adult ducks (that are subdued by drowning) are taken.

Harriers use hearing regularly to find prey-- they have exceptionally good hearing for diurnal raptors. Northern Harriers fly low over the ground when hunting, weaving back and forth over fields and marshes as they watch and listen for small animals. They eat on the ground, and they perch on low posts or trees.

Nesting: The male of the nominate race, *C. c. cyaneus* which breeds in Europe and Asia, is mainly grey above and white below except for the upper breast, which is grey like the upperparts, and the rump, which is white; the wings are grey with black wingtips. The female is brown above with white upper tail coverts, hence females, and the similar juveniles, are often called "ringtails". Their underparts are buff streaked with brown.

On the male of the race, *C. c. hudsonius*, which breeds in North America, plumage is darker grey than that of *C. c. cyaneus* and the female is also darker and more rufous. Juvenile males have pale greenish-yellow eyes, while juvenile females have dark chocolate brown eyes. The eye color of both sexes changes gradually to lemon yellow by the time they reach adulthood.

Northern Harriers are the only hawk-like bird known to practice polygyny – one male mates with several females. Up to five females have been known to mate with one male in a season. Males perform elaborate flying barrel rolls to court females.

The nest is built on the ground or on a mound of dirt or vegetation. Nests are made of sticks and are lined inside with grass and leaves. Four to eight whitish eggs are laid. When incubating eggs, the female sits on the nest while the male hunts and brings food to her and the chicks. The eggs are incubated mostly by the female for 31 to 32 days. The male will help feed chicks after they hatch, but won't usually watch them for a greater period of time than around 5 minutes. The male usually passes off food to the

female, which she then feeds to the young, although later the female will capture food and simply drop into the nest for her nestlings to eat. The chicks fledge at around 36 days old.

Cool Facts: In some parts of Europe people believed that seeing a harrier perched on a house was a sign that three people would die; on a happier note, some Native American tribes believe that seeing a hawk on your wedding day is a sign of a long, happy marriage. Unlike many raptors, harriers have historically been favorably regarded by farmers because they eat predators of quail eggs and mice that damage crops. Harriers are sometimes called "good hawks" because they pose no threat to poultry as some hawks do. Heavy pesticide use in the 1970s and 1980s caused a decline in harrier populations.

Northern Harrier fossils dating from 11,000 to 40,000 years ago have been unearthed in northern Mexico.



Common Name: Northern Goshawk
Scientific Name: *Accipiter gentilis*

Size: 18-27 inches (46-69 cm); **Wingspan:** 36-50 inches (89-127cm)

Habitat: North America and Eurasia; a widespread species that inhabits the temperate parts of the northern hemisphere. It is mainly resident, but birds from colder regions migrate south for the winter. In North America, migratory goshawks are often seen migrating south along mountain ridge tops in September and October.

They can be found in both deciduous and coniferous forests with mature, old-growth woods and are typically found where human activity is relatively low. During nesting season, they favor tall trees with intermediate canopy coverage and small openings below for hunting.



Status: Least Concern. **Global population:** 500,000 adult individuals with a stable population trend. Significant declines in Europe in the 19th-20th centuries are thought to

have resulted from persecution and deforestation, with later declines in the 1950s-1960s a result of poisoning from pesticides and heavy metals. Persecution continues to be a threat, as is nest robbing for falconry. It is also highly vulnerable to the impacts of potential wind farm developments.

Diet: Small mammals and birds. Prey species may be quite diverse, including pigeons and doves, pheasants, partridges, grouse, gulls, assorted waders, woodpeckers, corvids, waterfowl (mostly tree-nesting varieties) and various passerines depending on the region. Mammal prey may include rabbits, hares, tree squirrels, ground squirrels, chipmunks, rats, voles, mice, weasels and shrews. The goshawk is likely a significant predator of other raptors, known prey including European honey buzzards, owls, smaller *Accipiters* and the American kestrel

Nesting: While sexes are alike, females are 10-25% larger than males. Across most of the species' range, it is blue-grey above and barred grey or white below, but Asian subspecies in particular range from nearly white overall to nearly black above. The juvenile is brown above and barred brown below. Juveniles and adults have a barred tail, with dark brown or black barring. Adults always have a white eye stripe. Most of the Eurasian races have much more dark barring on the chest than the American form, but about half of all Siberian goshawks are nearly white.

In North America, juveniles have pale-yellow eyes, and adults develop dark red eyes usually after their second year, although nutrition and genetics may affect eye color as well. In Europe and Asia, juveniles also have pale-yellow eyes while adults develop orange-colored eyes.

Adults return to their nesting territories by March or April. Males perform an undulating flight display to attract females. Breeding pairs will mate for life.

Female begin laying eggs in April or May. Nesting areas are often found in a large, mature or old-growth forest tree. Nests are bulky structures, made of dead twigs, lined with leafy green twigs or bunches of conifer needles and pieces of bark. The clutch size is usually 2 to 4 bluish-white eggs. The female is the primary incubator although the male will sometimes take a shift to give the female a chance to eat. The male does most of the hunting for both the female and the young at the nest. The incubation period can range from 28 to 38 days. Nestling goshawks are highly vocal. They may use a "*whistle-beg*" call as a plea for food. It begins as a *ke-ke-ke* noise, and progresses to a *kakking* sound. The chick may also use a high pitched "contentment-twitter" when it is well fed. The young leave the nest after from 35 to 46 days and start trying to fly another 10 days later. Parent goshawks continue to actively feed their offspring until they are about 70 days of age. The young may remain in their parents' territory for up to a year of age, at which point sexual maturity is reached.

Cool Facts: It is the only species in the *Accipiter* genus found in both Eurasia and North America. The name "goshawk" comes from the Old English words *gos*, meaning goose, and *hafoc* meaning hawk. It is pronounced as if the words are still separate.

without any "sh" sound. Attila the Hun wore an image of a Northern Goshawk on his helmet.

In ancient European falconry literature, goshawks were often referred to as a yeoman's bird or the "cook's bird" due to their utility as a hunting partner catching edible prey, as opposed to the peregrine falcon, also a prized falconry bird, but more associated with noblemen and less adapted to a variety of hunting techniques and prey types found in wooded areas. The northern goshawk has remained equal to the peregrine falcon in its stature and popularity in modern falconry.

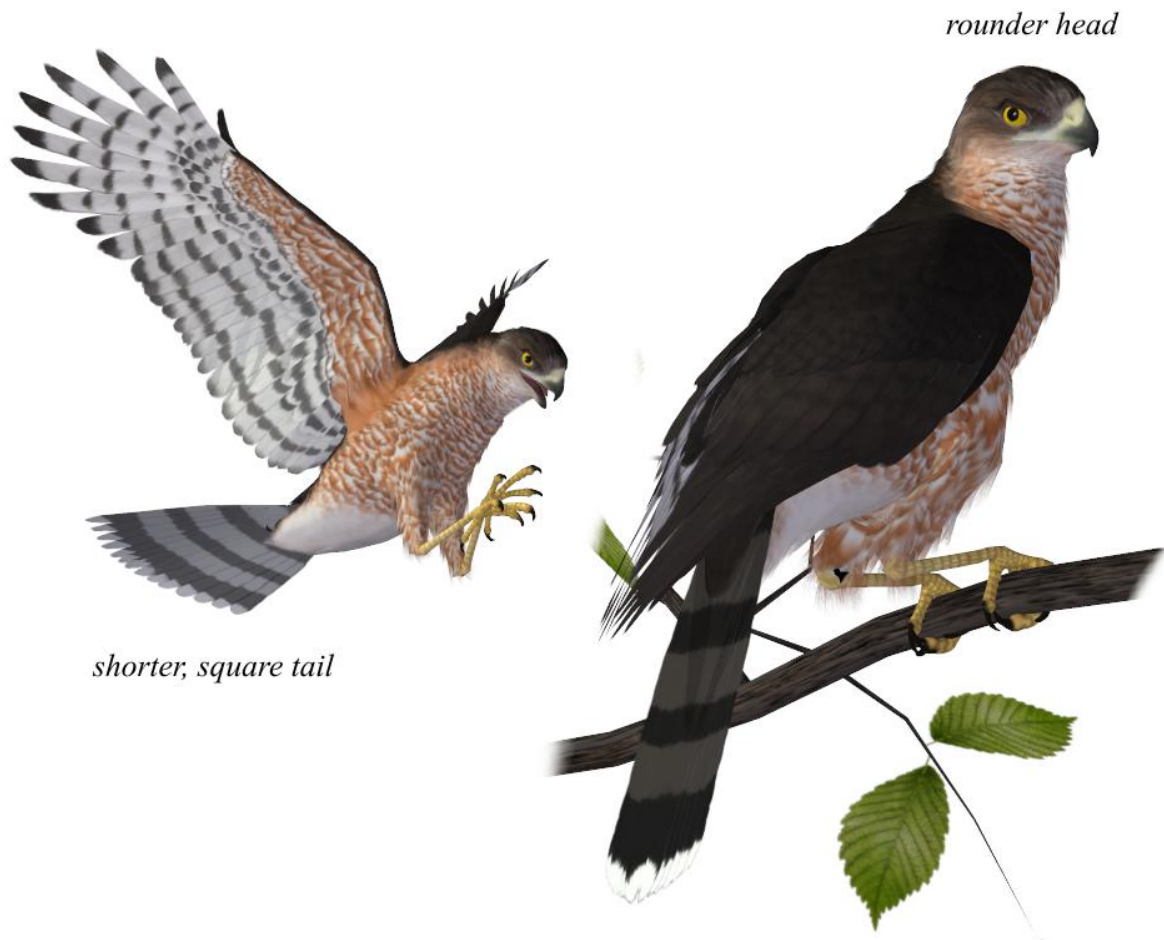


Common Name: Sharp-shinned Hawk
Scientific Name: *Accipiter striatus*

Size: 9.4-13.4 inches (24-34 cm); **Wingspan:** 16.9-22 inches (43-56 cm)

Habitat: North America; a resident to long-distance migrant. Sharp-shinned Hawks of the Appalachians and Western mountains may remain there year-round, whereas birds that breed in the northern U.S. and Canada leave their breeding grounds and may winter in the rest of the continental United States or migrate as far as southern Central America.

Sharp-shinned Hawks are birds of the forest and forest edge, and are not found where trees are scarce or scattered, except on migration. They require dense forest, ideally with a closed canopy, for breeding. While favoring forests that contain conifers, they also nest in stands of aspen in Colorado, oak-hickory forest in Missouri, and the hardwood forests of the East. They occupy a wide range of elevations, from sea level to near treeline. In the winter season, look for Sharp-shinned Hawks at forest edges, in somewhat more open habitats than the dense forests they breed in, as well as in suburban areas with bird feeders.



Status: Least Concern. **Global population:** 700,000 adult individuals. Sharp-shinned Hawk numbers appear to have remained stable from 1966 to 2010. These birds are so solitary and elusive in their deep-forest breeding sites that scientists have little data on their nesting success. However, population estimates are able to be made from yearly migration counts. Partners in Flight estimates 49% percent spending some part of the year in the United States, 40% in Canada, and 14% in Mexico. They breed only in dense stands of trees, and so their fate is intertwined with that of wooded wilderness. Like other birds of prey, these hawks suffered breeding failure when the pesticide DDT was in use in North America. Some carry high levels of this pesticide in their bodies even today, perhaps because much of their songbird prey spends winters in South America, where DDT is still used. Sharp-shinned Hawks were once killed as vermin by bird enthusiasts trying to protect songbirds. These hawks do hunt birds at feeders, and the spread of backyard bird feeding may have helped populations of Sharp-shinned Hawks or allowed them to spend winters farther north than they used to.

Diet: Songbirds make up about 90 percent of the diet. Birds the size of American Robins or smaller (especially warblers, sparrows, and thrushes) are the most frequent prey; bigger birds are at less risk, though they're not completely safe. They will eat small rodents, such as mice and voles, and an occasional moth or grasshopper.

They are "pursuit hunters", often surprising their prey on the wing by bursting out from a hidden perch with a rush of speed. They are versatile: small birds may be taken in the air or on the ground; they may pounce from perches as little as 3 feet above the ground to catch rodents; and they catch some insects on the wing. Sharp-shins make great use of cover and stealth to get close to their prey, surprising it at close range rather than diving from great heights. Sharp-shinned Hawks use their long toes and talons to impale and hold moving prey. They've even been known to reach into wire-mesh bird traps to grab prey with their toes.

Nesting: While sexes are alike, females are 30% larger than males. Adults are slatey blue-gray above, with narrow, horizontal red-orange bars on the breast. Immature birds are mostly brown, with coarse vertical streaks on white underparts. Adults and young have broad dark bands across their long tails.

Throughout their range, Sharp-shinned Hawks favor conifer trees (pine, spruce, or fir) as nesting sites, but may also use aspens and hardwood trees. The nest is always placed under dense forest cover, usually toward the top of a tall tree, but well under the canopy. Most nests are anchored between horizontal limbs and the tree trunk. The nest is a broad, flat mass of dead twigs, usually conifer twigs, sometimes lined with flakes of bark. Both members of the pair bring nesting material to the site, but the female does most or all of the construction. The shallow, platform-like nest is usually 1–2 feet in diameter and 4–6 inches deep. The eggs and young often sit more on than in this wide, open-topped nest.

Cool Facts: The size difference between the sexes in Sharp-shinned Hawks influences the size of prey they can catch. Nestlings feed first on small prey caught mainly by their father, switching as they grow to the larger prey that their mother can bring. Before delivering prey to their mates or young, male Sharp-shinned Hawks typically remove and eat the head.

The Sharp-shinned hawk is easily mistaken for the slightly larger and lankier Cooper's hawk, which match the sharp-shinned in plumage. Female Sharp-shinned hawks approach the size of a male Cooper's hawk. In flight, the Cooper's, with its longer wings and larger head, is sometimes compared to a "flying cross"; whereas the broader-winged and smaller-headed sharp-shinned is described as a "flyingallet".

There are 4 subspecies of Sharp-shinned hawk:

- *A. s. striatus*. The nominate species is widespread in North America, occurring in all of the forested part of USA and Canada, breeding in most of it. Populations in the northern part of the range migrate south and spend the non-breeding season (winter) in the southern USA, Mexico and Central America as far south as Panama, with a smaller number spending the winter in the Greater Antilles. Resident populations exist in temperate parts of the USA, Canada (in a few coastal regions), Mexico (highlands from Sonora to Oaxaca), Cuba, Hispaniola and Puerto Rico.
- *A. a. chionogaster*. The white-breasted hawk occurs in highlands from far southern Mexico (Chiapas and Oaxaca), through Honduras, Guatemala and El Salvador, to Nicaragua. It is, as far as known, resident, but some local movements may occur. Resembles the members of the nominate group, but upperparts darker (often appears almost black), thighs whitish-buff and underparts and cheeks entirely white. Juveniles have darker upperparts and distinctly finer streaking below than juveniles of the nominate group.
- *A. s. ventralis*. The plain-breasted hawk occurs in the coastal mountains of northern Venezuela and Colombia, south through the Andes from western Venezuela, through Colombia, Ecuador and Peru, to central Bolivia. A disjunct population occurs in the Tepuis of southern Venezuela (likely to extend into adjacent parts of Roraima in far northern Brazil, but this remains unconfirmed). It is, as far as known, resident, but some local movements may occur. It is polymorphic. The most common morph has dark grey upperparts (often appears almost black) and white underparts variably barred, shaded, or mottled with rufous or tawny-buff (extensively marked individuals may appear almost entirely rufous or tawny-buff below). Occasionally, the barring to the lower belly and flanks may appear duskier. The white morph has bluish-grey upperparts (similar to the nominate group), but its underparts are all white except for its rufous thighs. The rare dark morph, the only morph which sometimes lacks rufous thighs, is entirely sooty (occasionally with slight white barring to belly and faint grey bands in tail). The underparts of the females average paler than males of the same morph. The iris is typically yellow (contra illustrations in some books), but individuals with a darker iris are occasionally seen. Juveniles have dark brownish

or dusky upperparts with each feather typically edged rufous, giving a rather scaly appearance. The underparts are white streaked brown, and the thighs are rufous barred white. Occasionally, juveniles with underparts extensively rufous streaked blackish are seen.

- *A. s. erythronemius*. The rufous-thighed hawk is widespread in eastern South America in eastern and southern Brazil, Uruguay, Paraguay, north-eastern Argentina and south-eastern Bolivia. It is, as far as known, resident in some regions and migratory in others. The movements are generally poorly understood, but it only occurs seasonally at some localities in Argentina. Resembles the nominate group, but upperparts darker, streaking to underparts rufous or dusky, cheeks typically with a clear rufous patch (occasionally lacking almost entirely) and iris yellow (contra illustrations in some books). Juveniles resemble juveniles of the nominate group, but streaking to underparts typically restricted to throat and central underparts, with flanks scaled or barred (often also belly).

Common Name: Copper's Hawk
Scientific Name: *Accipiter cooperii*

Size: 14-20 inches (35-50 cm); **Wingspan:** 24-37 inches (62-94 cm)

Habitat: North America; its range is from Southern Canada to Northern Mexico. Birds from most of the Canadian and northern U.S. range migrate in winter, and some winter as far south as Panama.

It occurs in various types of mixed deciduous forests and open woodlands, including small woodlots, riparian woodlands in dry country, open and pinyon woodlands, and forested mountainous regions and also now nests in many cities.



Status: Least Concern. **Global population:** 700,000 adult individuals. Cooper's Hawk populations have been roughly stable from 1966-2010. Partners in Flight estimates 8% breeding in Canada, 89% spending some part of the year in the United States, and 22% in Mexico. Cooper's Hawk positive population trends are a turnaround from the mid-twentieth century, when use of the pesticide DDT and widespread shooting greatly reduced their numbers.

Diet: Small and mid-sized birds (mostly American robins, other thrushes, jays, woodpeckers, European starlings, quail, icterids, cuckoos, pigeons and doves). They may supplement their diet with small mammals such as chipmunks, hares, mice, squirrels, and bats.

These birds capture prey from cover or while flying quickly through dense vegetation, relying almost totally on surprise. One study showed that this is a quite dangerous hunting style. More than 300 Cooper's hawk skeletons were investigated and 23% revealed healed fractures in the bones of the chest. Cooper's Hawks capture birds with their feet and kill them by repeated squeezing. They've even been known to drown their prey, holding a bird underwater until it stopped moving.

Nesting: While sexes are alike, females are 30% larger than males. Adults are steely blue-gray above with warm reddish bars on the underparts and thick dark bands on the tail. Juveniles are brown above and crisply streaked with brown on the upper breast, giving them a somewhat hooded look compared with young Sharp-shinned Hawks' more diffuse streaking.

While Cooper's hawks are monogamous, most do not mate for life. Pairs will breed once a year and raise one brood per breeding season. Courtship displays include stylized flights with the wings positioned in a deep arc. During their flight displays the male will begin by diving toward the female. A slow speed-chase follows involving the male flying around the female exposing his expanded under tail coverts to her. The male raises his wings high above the back and flies in a wide arc with slow, rhythmic flapping. Courting usually occurs on bright, sunny days, in midmorning. After pairing has occurred, the males make a bowing display before beginning to build the nest.

Over a two-week period the breeding pair builds a stick nest in large trees. The nests are around 69 cm (27 in) in diameter and 15.2–43 cm (6.0–16.9 in) high with a cup-shaped depression in the middle. Their nests are built in pines, oaks, Douglas firs, beeches, spruces, and other tree species usually on flat ground rather than on a hillside. The nests typically are about 7.6–15.1 m (25–50 ft) high off the ground, halfway up the tree, and out on a horizontal branch. The clutch size is usually 3 to 5 cobalt-blue eggs. The female incubates the eggs between 30 to 36 days. The hatchlings are brooded for about two weeks by the female, while her mate forages for food. The fledging stage is reached at 25 to 34 days of age, though the offspring will return to the nest to be fed until they become independent around 8 weeks.

Cool Facts: The birds found east of the Mississippi River tend to be larger on average than the birds found to the west.

Males tend to be submissive to females and to listen out for reassuring call notes the females make when they're willing to be approached.

Common Name: White Hawk
Scientific Name: *Pseudastur albicollis*

Size: 18-22 inches (46-56 cm); **Wingspan:** 41 inches (103 cm)

Habitat: Central and South America; It ranges from southern Mexico through Central and South America to Peru, Bolivia and Brazil. It also breeds on Trinidad. The white hawk's range in central South America is the entire Amazon basin, from the Andes on the west to the Guianas on the Atlantic to the northeast, and to the transition lands to the south.

It prefers well-watered tropical regions where the dry season is not too long, but it avoids deep, unbroken rain forest, except around swampy areas where the forest is more thinned out.

Status: Least Concern. **Global population:** 20,000-49,999 adult individuals with a decreasing population trend. This species is suspected to lose up to 25% of suitable habitat within its distribution over three generations (23 years), therefore it is suspected



to decline by 25% in that period of time.

Diet: Reptiles (tree snakes and lizards) make up to 70% of their diet. It supplements its diet with some insects and mammals, caught in a sortie from a perch. It associates with foraging groups of tufted capuchin monkeys (*Cebus apella*) and South American coatis (*Nasua nasua*) to snatch prey startled by these animals.

Nesting: While sexes are alike, females are noticeably larger than males. It has very broad wings and a white head, body and underwings. The upper wings are black, and the very short tail is black with a broad white band. The bill is black and the legs are yellow. Immature birds have extensive black spotting on the upperparts and dark-streaked whitish underparts.

White hawks in Guatemala begin courtship displays and nest building in February, and by mid-to-late March egg laying and incubation begins. This species has a spectacular aerial courtship display. Several different species of trees are utilized as nest sites. Only one pair reoccupied a nest tree from a previous breeding season. The nest height averages 22 m above the ground. It builds a large stick platform nest. Clutch size is one dark-blotched blue-white egg. The young fledge in June and July.

Cool Facts: The White Hawk has been reclassified from *Leucopternis* to the *Pseudastur* species recently.

There are four subspecies:

- *P. a. ghiesbreghti*. Found from Southern Mexico to Nicaragua. It is entirely white, except for black markings on the outer primaries, and a black sub-terminal tail bar. The eyes are yellow.
- *P. a. costaricensis*. Found from Honduras to Panama and Colombia. It is similar to *P. a. ghiesbreghti* but with more distinct black markings on the wings and tail. The eyes are brown.
- *P. a. williaminae*. Found locally in north-western Colombia and western Venezuela. The wing feathers are more heavily marked with black, and it has black streaks on the crown and collar. The tail band is broader and the eyes are brown.
- *P. a. albicollis*. The nominate race. Found from Northern Colombia and central Venezuela to Brazil. It is smaller than the northern forms and the wings are mostly black, with white markings. The black tail band extends to the base of the tail and the eyes are brown.

Common Name: Harris Hawk
Scientific Name: *Parabuteo unicinctus*

Size: 18-23 inches (46-59 cm); **Wingspan:** 41-47 inches (103-120 cm)

Habitat: The Americas; breeds from the southwestern United States south to Chile and central Argentina. They are permanent residents and do not migrate.



They live in sparse woodland and semi-desert, as well as marshes that contain some trees, including mangrove swamps in parts of their South American range.

Status: Least Concern.

Global population: Unknown amount of adult individuals. Populations are declining in the United States due to urbanization.

Diet: Birds, lizards, mammals, and large insects. In the Southwestern United States, the most common prey species (in descending order of prevalence) are desert cottontail (*Sylvilagus auduboni*), eastern cottontail (*Sylvilagus floridanus*), black-tailed jackrabbit (*Lepus californicus*), ground squirrels (*Ammopsermophilus spp.* and *Spermophilus spp.*), woodrats (*Neotoma spp.*), kangaroo rats (*Dipodomys spp.*), pocket gophers (*Geomys* and *Thomomys spp.*), Gambel's quail (*Callipepla gambelii*), scaled quail (*C. squamata*), northern bobwhite (*Colinus virginianus*), cactus wren (*Campylorhynchus brunneicapillus*), northern mockingbird (*Mimus polyglottos*), desert spiny lizards (*Sceloporus magister*), and skinks (*Eumeces spp.*). In the tropics, Harris's hawks have

adapted to taking prey of several varieties, including those like chickens and European rabbits introduced by man. In Chile, the Degu (*Octodon degus*) makes up 67.5% of the prey.

While most raptors are solitary, only coming together for breeding and migration, Harris's hawks will hunt in cooperative groups of two to six. This is believed to be an adaptation to the desert climate in which they live. In one hunting technique, a small group flies ahead and scouts, then another group member flies ahead and scouts, and this continues until prey is bagged and shared. In another, all the hawks spread around the prey and one bird flushes it out.

Nesting: While sexes are alike, females are 35% larger than males. They have dark brown plumage with chestnut shoulders, wing linings, and thighs, white on the base and tip of the tail, long, yellow legs and a yellow cere. Juveniles are similar to adults, except their underparts are streaked with cream or buffy coloration, with the amount of light color being variable. Rufous patches are reduced and dullish. The underwing has whitish primaries that are conspicuous in flight and the tail is crossed with many fine dusky bars, with the base and tip white.

They nest in small trees, shrubby growth, or cacti. The nests are often compact, made of sticks, plant roots, and stems, and are often lined with leaves, moss, bark and plant roots. They are built mainly by the female. There are usually two to four white to bluish white eggs sometimes with a speckling of pale brown or gray.

Very often, there will be three hawks attending one nest: two males and one female. Whether or not this is polyandry is debated. The female does most of the incubation. The eggs hatch in 31 to 36 days. The young begin to explore outside the nest at 38 days, and fledge, or start to fly, at 45 to 50 days. The female sometimes breeds two or three times in a year. Young may stay with their parents for up to three years, helping to raise later broods.

Cool Facts: Since about 1980, Harris's hawks have been increasingly used in falconry and are now the most popular hawks in the West (outside of Asia) for that purpose, as they are one of the easiest to train and the most social. Trained Harris's hawks have been used to remove an unwanted pigeon population from London's Trafalgar Square.

There are three subspecies of Harris's hawk:

- *P. u. superior*. Found in Baja California, Arizona, Sonora, and Sinaloa.
- *P. u. harrisi*. Found in Texas, eastern Mexico, and much of Central America.
- *P. u. unicinctus*. Found exclusively in South America. It is smaller than the North American subspecies.

Common Name: Red-tailed Hawk
Scientific Name: *Buteo jamaicensis*

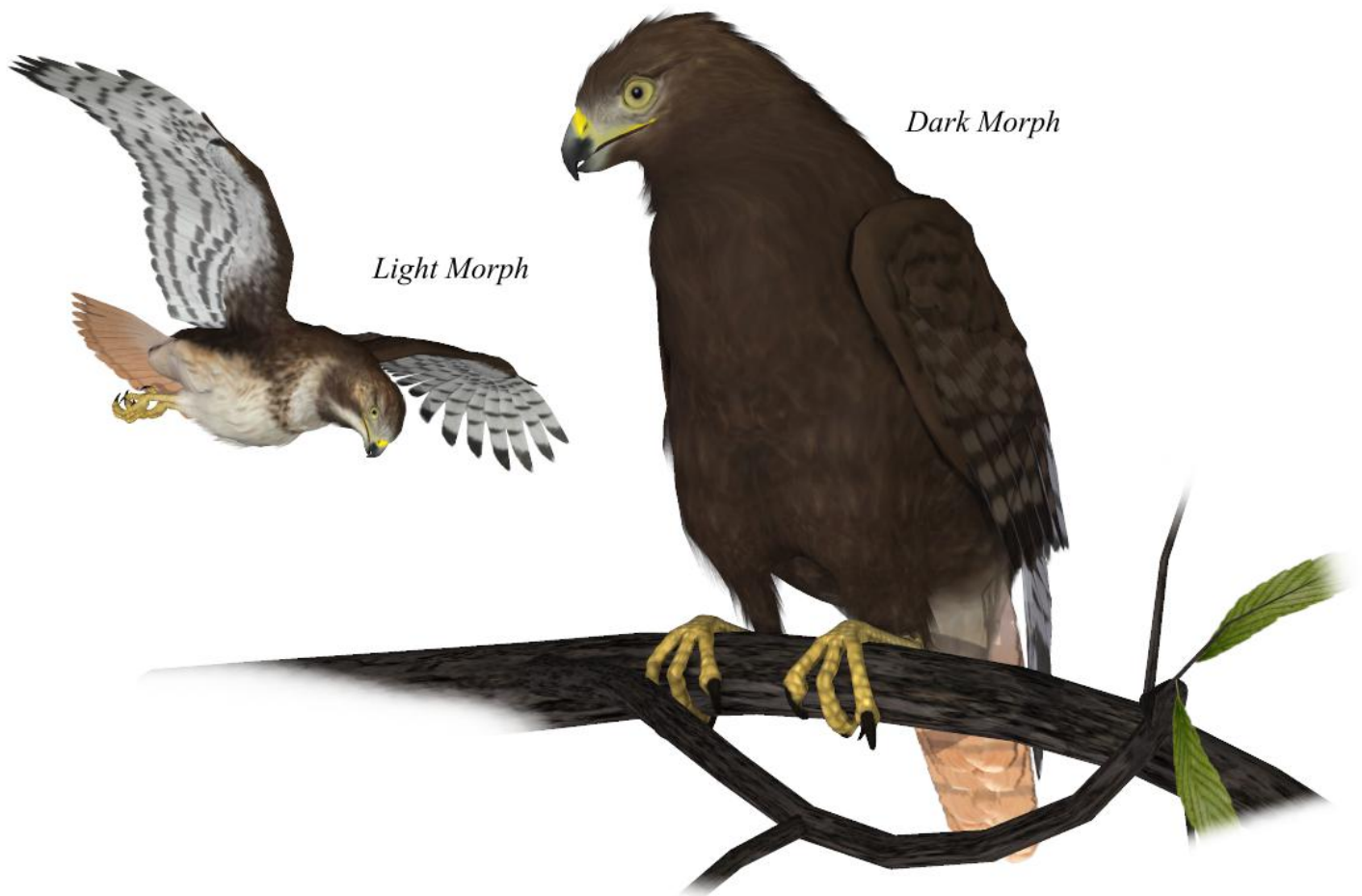
Size: 17.7-25.6 inches (45-65 cm); **Wingspan:** 44.9-52.4 inches (114-133 cm)

Habitat: North America; Northern Canada to Central America and the Caribbean. Northern populations migrate south for the winter.

The Red-tailed Hawk is a bird of open country. It is found along the edges of fields where it perches on telephone poles, fence posts, or trees.

Status: Least Concern. **Global population:** 2,300,000 adult individuals. This species has undergone a large and statistically significant increase over the last 40 years in North America (177% increase over 40 years, equating to a 29% increase per decade). Wind farms present significant threats.

Diet: Voles, mice, wood rats, rabbits, snowshoe hares, jackrabbits, and ground squirrels. The hawks also eat birds, including pheasants, bobwhite, starlings, and blackbirds; as



well as snakes and carrion. Individual prey items can weigh anywhere from less than an ounce to more than 5 pounds.

Prey are located by circling from above, and then, diving at a speed of 195 km/h (121 mph). The force of the strike generally kills the prey.

Nesting: While sexes are alike, females are noticeably larger than males. Most Red-tailed Hawks are rich brown above and pale below, with a streaked belly and, on the wing underside, a dark bar between shoulder and wrist. The tail is usually pale below and cinnamon-red above, though in young birds it's brown and banded. "Dark-morph" birds are all chocolate-brown with a warm red tail. "Rufous-morph" birds are reddish-brown on the chest with a dark belly.

Courting Red-tailed Hawks put on a display in which they soar in wide circles at a great height. The male dives steeply, then shoots up again at an angle nearly as steep. After several of these swoops he approaches the female from above, extends his legs, and touches her briefly. Sometimes, the pair grab onto one other, clasp talons, and plummet in spirals toward the ground before pulling away. Mated pairs typically stay together until one of the pair dies.

Red-tailed Hawks typically put their nests in the crowns of tall trees where they have a commanding view of the landscape. They may also nest on a cliff ledge or on artificial structures such as window ledges and billboard platforms. Both members build the nest, or simply refurbish one of the nests they've used in previous years. Nests are tall piles of dry sticks up to 6.5 feet high and 3 feet across. The inner cup is lined with bark strips, fresh foliage, and dry vegetation. Construction of the nest usually takes 4-7 days.

Cool Facts: There are at least 14 recognized subspecies of *Buteo jamaicensis*, which vary in range and in coloration:

- *B. j. jamaicensis*, the nominate subspecies, occurs in the northern West Indies, including Jamaica, Hispaniola, Puerto Rico and the Lesser Antilles but not the Bahamas or Cuba. El Yunque National Forest, Puerto Rico holds the highest known density of red-tailed hawks anywhere. The bird is referred to as "Guaraguao" in the island.
- *B. j. alascensis* (probably resident) breeds from southeastern coastal Alaska to the Queen Charlotte Islands and Vancouver Island in British Columbia.
- *B. j. borealis* (eastern red-tailed hawk) breeds from southeast Canada and Maine south through eastern Texas and east to northern Florida. It winters from southern Ontario east to southern Maine and south to the Gulf coast and Florida.
- *B. j. calurus* (western red-tailed hawk) breeds from central interior Alaska, through western Canada south to Baja California. It winters from southwestern British Columbia southwest to Guatemala and northern Nicaragua. Paler individuals of northern Mexico may lack the dark wing marking.
- *B. j. costaricensis* is resident from Nicaragua to Panama. This subspecies is dark brown above with cinnamon flanks, wing linings and sides, and some birds have

rufous underparts. The chest is much less heavily streaked than in northern migrants (*B. j. calurus*) to Central America.

- *B. j. fuertesii* (southwestern red-tailed hawk) breeds from northern Chihuahua to southern Texas. It winters in Arizona, New Mexico, and southern Louisiana. The belly is unstreaked or only lightly streaked, and the tail is pale.
- *B. j. fumosus* occurs in Islas Marías, Mexico
- *B. j. hadropu* occurs in the Mexican Highlands
- *B. j. harlani* (Harlan's red-tailed hawk, sometimes classified as its own species, *B. harlani*, Harlan's hawk is markedly different from all other red-tails. In both color morphs, the plumage is blackish and white, lacking warm tones (save the tail). The tail may be reddish, dusky, whitish, or gray and can be longitudinally streaked, mottled, or barred. Shorter primaries result in wingtips that don't reach the tail in perched birds. It breeds in Alaska and northwestern Canada and winters from Nebraska and Kansas to Texas and northern Louisiana. This population may well be a separate species.
- *B. j. kemsiesi* is a dark subspecies resident from Chiapas to Nicaragua. The dark wing marking may not be distinct in paler birds.
- *B. j. kriderii* (Kriger's red-tailed hawk) is paler than other red-tails, especially on the head; the tail may be pinkish or white. In the breeding season, it occurs from southern Alberta, southern Saskatchewan, southern Manitoba, and extreme western Ontario south to south-central Montana, Wyoming, western Nebraska, and western Minnesota. In winter, it occurs from South Dakota and southern Minnesota south to Arizona, New Mexico, Texas and Louisiana.
- *B. j. socorroensis* occurs on Socorro Island, Mexico
- *B. j. solitudinus* occurs in the Bahamas and Cuba
- *B. j. umbrinus* occurs year-round in peninsular Florida north to Tampa Bay and the Kissimmee Prairie. It is similar in appearance to *B. j. calurus*.

Common Name: Red-shouldered Hawk
Scientific Name: *Buteo lineatus*

Size: 15-24 inches (38-61cm); **Wingspan:** 35-50 inches (90-127 cm)

Habitat: North America; the eastern population ranges west through southern Canada, from southern New Brunswick and western Ontario, to the eastern edge of the United States, the Great Plains, south to Florida, the Gulf Coast, and eastern Mexico. Only the northernmost populations are migratory. The Eastern population winters from southern Wisconsin, Oklahoma, Ohio and southern New England, south to the Gulf Coast and occasionally throughout its breeding range. In winter, it is reported south to Jalisco and Veracruz in Mexico. Eastern birds occasionally wander west in migration (e.g., Colorado, Kansas, West Texas, Manitoba, North Dakota); Western birds have strayed east to Arizona, Nevada, Idaho, and Utah, and north to Washington.



The western population breeds west of Sierra Nevada from North California to North Baja California, and has recently expanded into Oregon and Arizona, and east of the

Sierra Mountains in California. Western populations are largely non-migratory. Throughout its winter range, this species avoids higher elevations.

Red-shouldered hawks are forest raptors. In the East, they live in bottomland hardwood stands, flooded deciduous swamps, and upland mixed deciduous–conifer forests. They tend to live in stands with an open sub-canopy, which makes it easier for them to hunt. They are not exclusively birds of deep forest, though; one can find red-shouldered hawks in some suburban areas where houses or other buildings are mixed into woodlands. In the West, they live in riparian and oak woodlands, and also in eucalyptus groves and some residential areas.

Status: Least Concern. **Global population:** 1,100,000 adult individuals. Red-shouldered Hawk populations increased throughout most of their range between 1966 and 2010. Partners in Flight estimates that 97% spend some part of the year in the United States, 1% breeding in Canada, and 17% wintering in Mexico. The biggest threat to Red-shouldered Hawks is continued clearing of their wooded habitat. They also showed some sensitivity to pesticides such as DDT in the middle of the 20th century.

Diet: Small mammals (Voles, gophers, mice, moles and chipmunks) make up most of their diet. Slightly larger mammals, such as rabbits and tree squirrels, are also occasionally preyed. Other prey can include amphibians, reptiles (especially small snakes), small birds, and large insects. They will attack birds as large as pigeons.

Red-shouldered hawks search for prey while perched on a treetop or soaring over woodlands. When they sight prey, they kill it by dropping directly onto it from the air. They may cache food near their nest for later consumption.

Nesting: While sexes are alike, females are slightly larger than males. Adults are colorful hawks with dark-and-white checkered wings and warm reddish barring on the breast. The tail is black with narrow white bands. Immatures are brown above and white below streaked with brown. All ages show narrow, pale crescents near the wingtips in flight.

The breeding habitats of the red-shouldered hawk are deciduous and mixed wooded areas, often near water. Red-shouldered hawks select sites with greater tree species richness for nesting. While courting or defending territories, the distinctive, repeated *kee-aah* call is heard. Courtship displays occur on the breeding grounds, and involve soaring together in broad circles while calling, or soaring and diving toward one another. Males may also perform the "sky-dance" by soaring high in the air, and then making a series of steep dives, each followed by a wide spiral and rapid ascent. These courtship flights usually occur in late morning and early afternoon.

Red-shouldered hawks' mating season is between April and July, with activity usually peaking between April and mid-June. The breeding pair builds a stick nest in a major fork of a large tree. They often use the same nest year after year, refurbishing it annually with sticks in the spring. The clutch size is typically three to four brown to

lavender blotchy-marked eggs. The incubation period can range from 28 to 33 days. The male more often captures food but will also incubate and brood occasionally. The young leave the nest at about six weeks of age, but remain dependent on the parents until they are 17 to 19 weeks old. They may continue to roost near the nest site until the following breeding season. Breeding maturity is usually attained at 1 or 2 years of age.

Cool Facts: Although the American Crow often mobs the Red-shouldered Hawk, sometimes the relationship is not so one-sided. They may chase each other and try to steal food from each other. They may also both attack a Great Horned Owl and join forces to chase the owl out of the hawk's territory.

There are five recognized subspecies, which vary in range and in coloration:

- *B. l. lineatus*, first described by Gmelin in 1788. The nominate species. Found in the Eastern United States.
- *B. l. alleni*. Found from South central Texas to South Carolina and north Florida.
- *B. l. elegans*. The Californian subspecies. Darker and redder than the nominate species.
- *B. l. extimus*. The Florida subspecies. Paler than the nominate species
- *B. l. texanus*. Found from south Texas to South-eastern Mexico (Veracruz).

Hawaiian Name: 'Io

Common Name: Hawaiian Hawk

Scientific Name: *Buteo solitarius*

Size: 16-18 inches (40-46 cm); **Wingspan:** 37-41 inches (95-103 cm)

Habitat: Oceania; endemic to Hawai'i in the Hawaiian Islands with vagrants recorded on Maui, O'ahu and Kaua'i.

It occurs in a broad range of habitats up to 2,700 m, from lowland agricultural areas to all types of forest.



Status: Near Threatened to Endangered. **Global population:** 1,100 adult individuals. While the current population is stable, continuing threats include the conversion of land used for pasture and sugar-cane to eucalyptus plantations, residential development in extensive areas of subdivided land, mainly in the Puna District, forest clearance for agricultural and other developments, logging, repeated nest disturbance, perhaps road-

kills and the very significant threat caused by the introduction of ungulates that degrade native forests and inhibit their regeneration, which facilitates the spread of exotic plants that then out-compete remaining native plants. Most successful nesting of the Hawaiian Hawk is confined to higher elevation native forest with 'ohi'a trees. But this nesting habitat in particular has been reduced due to competition from exotic plants. Formerly it suffered extensively from shooting and may come into conflict with future efforts to reintroduce the Critically Endangered Hawaiian Crow (*Corvus hawaiiensis*) and other endangered songbirds, which it preys upon.

It benefits from some anthropogenic changes, for example, it feeds on introduced game-birds, passerines and rodents, and uses edge habitat around sugar-cane fields and orchards for hunting.

The species is protected as an endangered species in the United States. However, the IUCN classifies the species as Near Threatened.

Diet: Rats, small birds, stream animals, crickets, praying mantises, millipedes, centipedes, lizards, and occasionally worms. It also fed on the Hawaiian crow, which is now extinct in the wild.

The 'lo usually hunts from a stationary position, but can also dive on prey from the air.

Nesting: While sexes are alike, females are noticeably larger than males. Two color phases exist: a dark phase (dark brown head, breast, and underwings), and a light color phase (dark head, light breast and light underwings). Feet and legs are yellowish in adults and greenish in juveniles. During breeding season one of the pair, possibly the female, has a distinctive yellow forecap area just above the upper mandible.

The most successful nesting is restricted to native 'ohi'a trees (*Metrosideros polymorpha*), which are slow growing and generally in decline.

They nest from March through September, and usually lay only one egg but sometimes they could lay up to three in their clutch. The female does the majority of sitting during the 38 days of incubation, while the male does the majority of the hunting. After the egg is hatched, the female only allows the male to visit when delivering food to the nest. The chick fledges at seven or eight weeks. Parents feed nestlings with mostly mammalian and avian prey.

Cool Facts: The Hawaiian hawk was a royal symbol in Hawaiian legend, and it is sometimes called "iolani," or "exalted hawk", which was the name of Kamehameha IV and the Iolani Palace.

The adaptation of the Hawaiian hawk is that their body colors blend within trees and plants, and they have big talons to catch fish.

Common Name: Crested Caracara
Scientific Name: *Caracara cheriway*

Size: 19–23 inches (49–58 cm); **Wingspan:** 42-51 inches (107-130 cm)

Habitat: The Americas; a resident in Cuba, northern South America (south to northern Peru and northern Amazonian Brazil) and most of Central America and Mexico, just reaching the southernmost parts of the United States, including Florida, where it is resident. It can also be in the Southern Caribbean (Curaçao and Bonaire).

They typically live in lowlands but can live to mid-elevation in the Northern Andes. The species is most common in cattle ranches with scattered trees, shelterbelts and small woods, as long as there is a somewhat limited human presence. They can also be found in other varieties of agricultural land, as well as prairies, coastal woodlands (including mangroves), coconuts plantations, scrub along beach dunes and open uplands.



Status: Least Concern to Threatened. **Global population:** Unknown amount of adult individuals. Populations in the United States have declined historically, but currently

appear stable or slightly increasing. It is classified as "threatened" in Florida, but common and widespread throughout Neotropics.

Diet: Small mammals, amphibians, reptiles (snakes, lizards and small turtles), fish, crabs, insects, their larvae, earthworms, shellfish and young birds.

They hunt alone, in pairs or family parties of 3–5 birds. Caracaras, are one of the few raptors that hunts on foot, often turning over branches and cow dung to reach food. In addition to hunting its own food on the ground, the northern caracara will steal from other birds, including vultures, other hawks, pelicans, ibises and spoonbills.

Nesting: The adult has a black body, wings, crest and crown. The neck, rump, and conspicuous wing patches are white, and the tail is white with black barring and a broad terminal band. The breast is white, finely barred with black. The bill is thick, grey and hooked, and the legs are yellow. The cere and facial skin are deep yellow to orange-red depending on age and mood. Sexes are similar, but immature birds are browner, have a buff neck and throat, a pale breast streaked/mottled with brown, greyish-white legs and greyish or dull pinkish-purple facial skin and cere.

The nesting season is from December to May and is a bit earlier the closer the birds live to the tropics. They build large stick nests in trees such as mesquites and palms, cacti, or on the ground as a last resort. The nests are bulky and untidy; often made of grasses, sticks and hay, spotted with much animal matter. The female lays 2 to 3 pinkish-brown eggs with darker blotches, which are incubated for 28–32 days.

Cool Facts: It is also known as the Northern Crested Caracara and the Mexican Eagle. Although the Caracara looks like a long-legged hawk and associates with vultures, the Crested Caracara is actually closer to the Falcon family and is lumped within it.

The Northern Caracara can be identified from the Southern Caracara by their less extensive and more spotty barring to the chest, more uniform blackish scapulars (brownish and often lightly mottled/barring in the southern), and blackish lower back (pale with dark barring in the southern).

The state of Florida is home to a relict population of northern caracaras that dates to the last glacial period, which ended around 12,500 BP. At that point in time, Florida and the rest of the Gulf Coast was covered in an oak savanna. As temperatures increased, the savanna between Florida and Texas disappeared. Caracaras were able to survive in the prairies of central Florida as well as in the marshes along the St. Johns River. Cabbage palmettos are a preferred nesting site, although they will also nest in southern live oaks. Their historical range on the modern-day Florida peninsula included Okeechobee, Osceola, Highlands, Glades, Polk, Indian River, St. Lucie, Hardee, DeSoto, Brevard, Collier, and Martin counties. They are currently most common in DeSoto, Glades, Hendry, Highlands, Okeechobee and Osceola counties. Loss of adequate habitat caused the Florida caracara population to decline, and it was listed as threatened by the United States Fish and Wildlife Service in 1987.

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Species Accuracy and Reference Materials

The author-artist has tried to make these species as accurate to their real life counterparts as possible. Birds of the same species vary considerably, just as all others do in nature. The birds were created using the correct field markings and the most common similarities.

With the use of one generic model to create dozens of unique bird species, some give and take is bound to occur. In addition, 3D-models have many technical challenges, which make exact representations difficult, if not impossible. It's best to think of these birds represented as resembling the particular species, and they may not, in some cases, be 100% scientifically accurate.

The model and morphs were created using Luxology's Modo. The texture maps were created in Corel's Painter. The model was rigged in Smith-Micro's Poser and adapted for use in DAZ's DAZ Studio.

Field Guide Sources:

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- **The Peregrine Fund** (<http://www.peregrinefund.org>)
- **Arkive.org** (<http://www.arkive.org>)

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