

Avian Models for 3D Applications
Characters and Procedural Maps by Ken Gilliland

Songbird ReMix
Owls of the World
Volume 1

Manual

Introduction	3
Overview	3
Poser and DAZ Studio Use	3
Physical-based Renderers	4
Where to find your birds	4
Morphs and their Use	5

Field Guide

List of Species	9
General Information about Owls	10

Worldwide

Common Barn Owl	12
Long-eared Owl	14

Americas

Great Horned Owl	17
Western Screech-owl	19
Burrowing Owl	22
Spotted Owl	25
Long-whiskered Owlet	28

Polynesia & Australia

Pueo, or the Hawaiian Owl	29
Powerful or Great Hawk Owl	31

Eurasia

Eurasian Eagle-owl	33
--------------------	----

Africa

African Barred Owlet	35
----------------------	----

Arctic Circle

Snowy Owl	36
-----------	----

Resources, Credits and Thanks	39
-------------------------------	----

Copyrighted 2010-18 by Ken Gilliland SongbirdReMix.com
Opinions expressed on this booklet are solely that of the author, Ken Gilliland, and may or may not reflect the opinions of the publisher

Songbird ReMix Owls

Introduction

Songbird ReMix Owls of the World includes 12 owl species found throughout the world. Included in this volume of swift and silent predators are many favorites, the Common Barn Owl, the Great Horned Owl and the Snowy Owl. This volume also has one of the largest owls, the Eurasian Eagle Owl and one of the smallest, the 5-inch tall Long-whiskered Owlet. There's also a diverse selection of American Owls ranging from the Spotted Owl of the old-growth forests to the Western Screech-Owl of the Pacific Northwest to the burrowing owl of America's prairies.

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):
 - **Owls (Order Strigiformes)**
- **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.

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
Owls (Order Strigiformes)	African Barred Owlet Barn Owl Burrowing Owl Eurasian Eagle-owl Great Horned Owl Long-eared Owl Long-whiskered Owlet Powerful Owl Pueo, or the Hawaiian Owl Snowy Owl Spotted Owl Western Screech-owl

Where to find your poses

Type Folder	For what species?
Owls (Order Strigiformes)	All Owls

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. This will make cross-eyed eyes.
 - EyesUpDown - Controls the up and down movement of the eyes
 - EyesSide2Side - Controls the side-to-side 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.
 - HootCall - Expands the throat area to make hooting calls.
 - WingsFold- Puts both Wings into a folded position. Dialing numbers 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.
 - **Neck Bending and Scaling**
 - These controls allow global bending, twisting and moving side-to-side of the three 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.
 - **Expressions**
 - SmileFrown- Creates a smile (+1) or frown (-1) expression.
 - Eyes-Angry- Creates an angry expression.
 - Eyes-Sleepy- Creates a sleepy expression. EyeLidsCloseOpen must be at "0" for this control to work.
 - Eyes-Wince- Creates a wincing expression. EyeLidsCloseOpen must be at "0" for this control to work.
 - BrowLeftDown and BrowRightDown - Controls the eyebrow shape.
 - **Head Controls**
 - **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.

- **Ear Tuft Movement Section**- various morphs control the movement of the ear tufts. Ear Tufts are only present on some owls. Ear Tuft movements will not work on owls without ear tufts.
- **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.
- **Feather Fluff Controls**
 - **Head & Neck Fluff, Breast and Rump Fluff, Back Feathers and Thigh & Ankle Fluff**
 - Controls numerous individual transparency layers throughout the model. Many species use the “Head and Neck Fluff “ morphs to create certain species “looks”. Adjusting these morphs too much may alter the appearance of the specific species.
- **Correction Morphs**
 - BreastIn- Reduces/Adds to breast shapes.
 - ThighsIn4Flight- Makes the thighs more streamlined for flight poses.
 - TopNeckExpand- Adds Bulk across the top of the neck from the head to the hip section for a smoother flight or perch back line.
 - FlattenBack
- **Creation Morphs**
 - **Species Shapes.** These base morphs create a starting point for creating specific types of owls.
 - BarnOwl - Creates a barn owl-like head.
 - CrestedOwl - Repositions the Ear Tufts and angles the Forehead and Facial fluff and reshapes the head to make the distinctive look of the Crested Owl.
 - FishOwl - Raises the Forehead fluffs into the Ear Tufts giving a Fish-owls look.
 - OrientalBayOwl - Creates the very specific Oriental Bay Owl head.
 - Owlet - Creates an owlet-like head.
 - RoundFaceOwl - Combines several morphs into one dial to create generic features found on round-faced owls.
 - **Body Shaping**
 - ThickenNeck - Thickens the three neck sections.
 - BreastCrease- Adds a center crease to the breast.
 - SleekerBody - Thins the torso of the bird.
 - ScaleRump- Reduces/adds to the length of the rump and tail feathers sections.
 - BackPlume3Len - Lengthens the rump feathers over the tail feathers.
 - BackPlume3Width - Adds width to the rump feathers.
 - LegLength- Allows lengthening of the legs.
 - FootSize- Controls the size of the feet.
 - MassiveTalons- Lengthens the talons.
 - **Head Shaping**
 - **Head Shapes**- These morphs control the shape of the head.
 - OriginalOwlsHead-A compatibility base morph for owls created in the 2010 version of “Owls of the World”

- BigHead - Makes the head and neck parts around 30% larger
- WiderHead - Expands the sides of the head.
- TaperHead - Reduces the sides of the head to a more pointed look.
- OblongHead- Stretches the head from top to bottom.
- SquatHead- Squishes the head from top to bottom.
- HeadGroove- Adds a groove in the center-top of head.
- FlattenHead & FlatHead2- Flattens the top of the head.
- CrownDown- Flattens the crown of the head/forehead .
- LowerCrown- Lowers the entire crown of the head, keeping the rounded shape.
- PushForehead, ForeheadExpand and ForeheadOut - Controls the forehead shape. This can be useful in creating expressions.
- TallForehead- Expands the forehead portion.
- RaiseForeheadTufts- Raises both outer edges of the forehead.
- WideBridge- Expands the area between the eyes.
- RaiseCtrForehd- Raises/lowers the center portion of the forehead.
- PullForeheadCnrs- Pulls the top edges of the forehead out to make a more square face.
- LowerJowls- Stretches the lower jaw area.
- SofterBackHead,ReduceBackHead,BackCrown Reduction1 and 2 - Various morphs to soften and reduce the back of the head.
- **Eye Shapes**- These morphs can change the appearance of the eyes.
 - EyesDilate- Controls the pupil size of the eyes.
 - BiggerEyes- Makes eyes about 20% larger.
 - EyesOut- Pulls eyes forward.
- **Beak Shapes**- These morphs can change the appearance of the bill.
 - BeakOut- Controls the length of the beak.
 - BeakNarrower- Controls the width of the beak.
 - BeakFlatter- Controls the height of the beak.
 - BeakDroop- Controls the position of the beak.
- **Nostril Shapes**
 - NostrilCone - Adds bulk around the nostrils.
 - NostrilBulbs- Adds a more dome-like shape to the nostrils.
- **Tongue Shapes**
 - TongueLength- Controls the length of the tongue.
- **Ear Shapes**
 - HideEarTufts - Raises and lower the ear tufts out of the skull. "1" is the OFF position.
 - EarTufts-PositionY and EarTufts-PositionZ - These control Z and Y axis positioning of the ear tufts part for customization and the inclusion of future owl species.
 - EarTufts-Rotate- Allows rotation of the EarTuft part on the X axis.
 - EarTufts-Height- Changes the height of the Ear Tufts.

- EarTufts-Width- Changes the width of the Ear Tufts.
- EarTuftsCloser - Move the Ear Tufts closer together.
- ShortEars - Creates tiny ear tufts found on some owls. The HideEarTufts should be in the the “OFF” position when using this.
- Ear-LongEared, Ear-GreatHorned and Ear-Screech - These morphs create a very specific ear shapes for a variety of owl species.
- **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,
 - 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.

Posing Considerations

Owls have a couple of special abilities in movement. In flight, they are able to bend their heads completely forward. The best way to achieve this look is to use the **head section** of the model and bend it backwards (-30). Joint-controlled morphs JCMs) are in place to reduce the back of the head, folding it into the neck.

Owls are also able to turn their heads around 180 degrees. The BODY section “Twist All” control is very limited. To achieve this look, it is better to use the Twist controls in the 3 Neck sections and Head section. Some texture distortions in the front of the neck may occur depending on your settings.

Songbird ReMix Owls

Field Guide

Worldwide

Barn Owl
Long-eared Owl

Americas

Great Horned Owl
Western Screech-owl
Burrowing Owl
Spotted Owl
Long-whiskered Owlet

Polynesia & Australia

Pueo, or the Hawaiian Owl
Powerful Owl

Eurasia

Eurasian Eagle-owl

Africa

African Barred Owlet

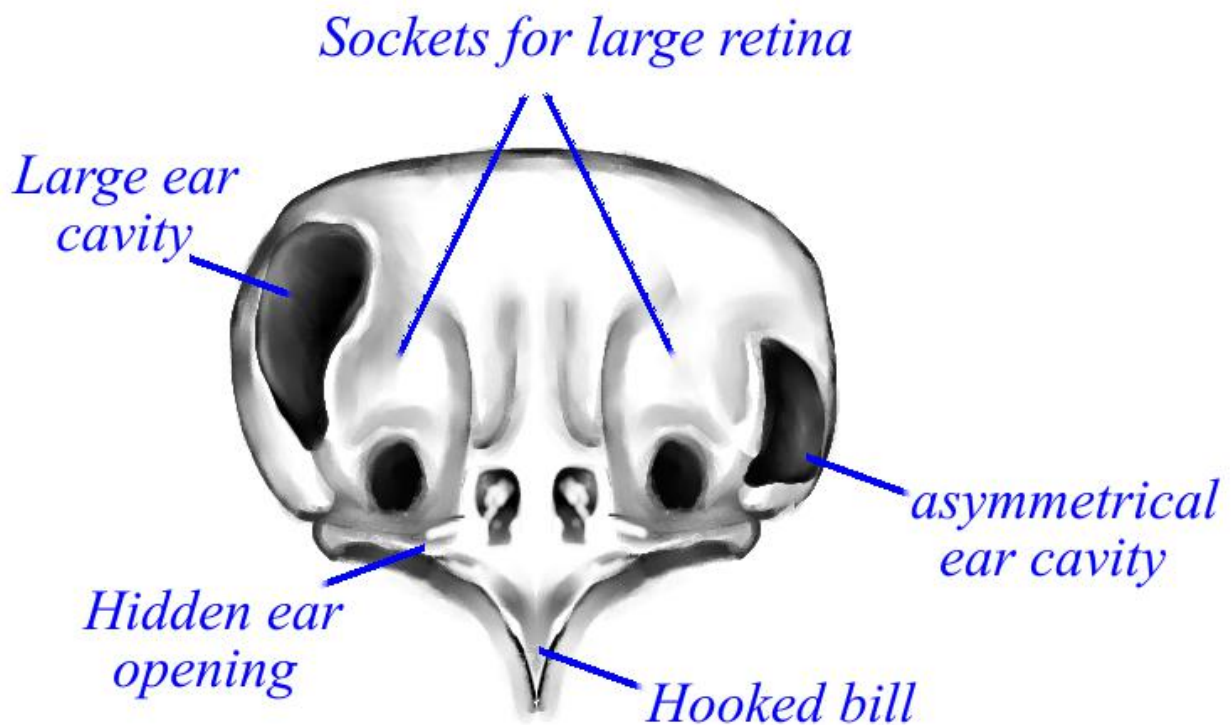
Arctic Circle

Snowy Owl

General Information about Owls

Owls are found on every continent except Antarctica. Owls are a group of mainly nocturnal (active at night) birds classified as belonging to the order Strigiformes, a group which is most closely related to nightjars (Caprimulgiformes). The order is divided into two families: Tytonidae or Barn Owls and related species, and Strigidae or Typical Owls.

The majority of owls hunt at night and feed on live mammals and insects. Many owls have ear openings at different positions. These asymmetrical ear openings help the owl to hear in stereo and pinpoint sounds on a vertical plane. The ear tufts some owls have such as the long-eared owl or great horned owl may look like ears but actually have nothing to do with hearing.



After eating, Owls regurgitate pellets, which contain the indigestible bones, fur and feathers of their victims. These pellets can be collected by researchers to study Owls' eating habits.



Common Name: Common Barn Owl

Scientific Name: *Tyto alba*

Size: 13 ½ - 15 ½ inches (34-40 cm); Wingspan: 43 inches (110 cm)

Habitat: Worldwide; found on all continents (except Antarctica) and large islands and occur over the whole of Australia, including Tasmania. They occur throughout most of Britain and Europe and across many parts of Asia, Africa, and in much of North America. In South America they are found in areas of suitable grassland, as well as on oceanic islands such as the Galapagos. They were introduced to Hawaii in 1958. Preferred habitats include open woodland, fields and moors.

Status: Least Concern. **Global population:** 5,000,000+. Owls are short-lived birds. Most die in their first year of life, with the average life expectancy being 1 to 2 years in the wild. Captive owls live up to 25 years.



Diet: Primarily voles, pocket gophers, shrews, mice and rats. Other prey may include baby rabbits, bats, frogs, lizards, birds and insects. Barn Owls are usually nocturnal, being most active at dusk and dawn. Prey are usually located by quartering up and down likely looking land - particularly open grassland. They also use low perches such as fence posts to seek quarry.

Nesting: Females are slightly larger than males. The facial disc is white with a brown edge, and with a brownish wash between the lower edge of the eyes and the base of the whitish-pink bill. Eyes are brownish-black. The crown and upper parts are yellowish-brown to orange-buff, covered partly by a pale ashy-gray veil marked with scattered white spots surrounded by black. The tail is similar, with a few darker bars and with white dots near the tips of the feathers. The under parts are whitish or pure white with a few small, dark drop-shaped spots (often more on females).

Legs are feathered white nearly to the base of the mostly bare toes, which are pale grayish-brown and dirty yellowish underneath. Claws are brownish-black.

Barn Owls will breed any time during the year, depending on food supply. In a good year, a pair may breed twice. Rodent plagues cause Barn Owl numbers to increase dramatically. During courting, males may circle near the nest tree, giving short screeches and chattering calls. The majority of Barn Owls nest in tree hollows up to 20 m high. They will also nest in old buildings, caves and well shafts. 3 to 6 eggs are laid (occasionally up to 12) at 2 day intervals. The eggs are 38 to 46mm (1.5-1.8") long and 30 to 35mm (1.2-1.4") wide and will be incubated for 30 to 34 days. Chicks are covered in white down and brooded for about 2 weeks, and are fledged in 50 to 55 days. After this, they will remain in the vicinity for a week or so to learn hunting skills and then rapidly disperse from the nest area. Young birds are able to breed at about 10 months.

Cool Facts: Although widely known beforehand, it was in 1769 when the Barn Owl was first officially described by Giovanni Scopoli, an Italian naturalist. Their name derives from their use of barn lofts and church steeples as nesting sites. Other common names include: Monkey-faced Owl, Ghost Owl, Church Owl, Death Owl, Hissing Owl, Hobgoblin or Hobby Owl, Golden Owl, Silver Owl, White Owl, Night Owl, Rat Owl, Scritch Owl, Screech Owl, Straw Owl, Barnyard Owl and Delicate Owl.



Common Name: Long-eared Owl
Scientific Name: *Asio otus*

Size: Males 13 ½ inches (34 cm); **Wingspan:** 38 inches (96 cm)

Habitat: North America, Africa and Eurasia; widely distributed in North America, Eurasia and northern Africa. Found in open woodlands, forest edges, riparian strips along rivers, hedgerows, juniper thickets, woodlots, and wooded ravines and gullies. Breeding habitat must include thickly wooded areas for nesting and roosting with nearby open spaces for hunting. During winter, they need dense conifer groves or brushy thickets to roost in. Roosting sites are usually in the heaviest forest cover available. Unlike most other Owls, during winter they may roost communally with 7 to 50 Owls..

Status: Least Concern.

Global population: 1,500,000 to 5,000,000. Many are killed by shooting and collision with vehicles. Natural enemies of adult birds include Great Horned and Barred Owls. Raccoons are major predators of eggs and nestlings.

Diet: Primarily mammals. In most areas voles are the most common prey, but deer mice are the most important prey in other areas. In southwestern deserts, pocket mice and kangaroo rats are primary foods. Other mammal prey includes squirrels, bats, chipmunks, gophers, shrews, moles, and cottontail rabbits. Birds are also taken, occasionally on the wing. Most bird prey are smaller species that occur on or near the ground. Bird prey includes meadowlarks, blackbirds, juncos, Horned Larks, doves, bluebirds, and thrashers. Larger birds such as grouse and screech-Owls are occasionally taken. Long-eared Owls sometimes eat insects, frogs, and snakes.



Long-eared Owls hunt mainly by ranging over open range-land, clearings, and fallow fields. They rarely hunt in woodlands where they roost and nest. They hunt mainly from late dusk to just before dawn, flying low to the ground, (1 to 2 meters (3 to 7 feet)), with the head canted to one side listening for prey. When prey is spotted, the Owl pounces immediately, pinning the prey to the ground with its powerful talons. Smaller prey is usually swallowed immediately, or carried away in the bill. Larger prey is carried in the talons.

Nesting: Females are larger than Males. The facial disc is pale ochre-tawny with a blackish rim. Eyebrows are short and whitish, eyes are orange to yellowish-orange. The cere is brownish-flesh and the bill is gray. Ear-tufts are prominent and blackish-brown with tawny edges. The upper parts are ochre-tawny, finely peppered with dusky spots and blackish streaks on a grayish 'veil'. The crown is finely mottled dusky, while the nape and hindneck have dusky shaft-streaks. The outer webs of the scapulars are whitish, forming a row across the shoulder. Primaries are uniform ochre-tawny at the base and barred light and dark towards the tip. Secondaries are barred ochre and dusky. The tail is ochre-tawny with a grayish wash, and has 6-8 narrow dark bars. The under parts are pale ochre, the foreneck and upper breast having blackish-brown streaks. The rest of the underparts become paler towards the belly and are marked with dusky shaft-streaks and narrow cross-bars. The underwing has distinct barring and a dark comma-like mark at the wrist. The tarsi and toes are feathered whitish-buff.

Males occupy nesting territories first and may begin their territorial calling in winter. Nesting occurs mainly from mid March through May in North America. During courtship, males perform display flights around nests. Display flights involve erratic gliding and flapping through the trees with occasional single wing claps. Females respond by giving their nest call. The female selects a nest by hopping around it, while the male displays above. She then performs display flights as well, and flies repeatedly to the nest. Leading up to mating, the male approaches the female after calling and performing display flights, then waves his wings as he sidles up to her. Mutual preening and courtship feeding also occur. After pairing, adults roost close together, but the female tends to roost on the nest after it has been selected.

Long-eared Owls nest almost exclusively in old stick nests of crows, magpies, ravens, hawks, or herons. They nest rarely in rock crevices, tree cavities, or on open ground. Nests are almost always located in wooded sites, often screened by shrubbery, vines, or branches and are commonly 5 to 10 meters (16 to 33 feet) above ground.

Long-eared Owls have an impressive nest defense display - the female spreads her wings out widely facing the intruder, flares her flight feathers, and lowers her head. This display makes her appear 2 to 3 times as large as she really is. They also perform a distraction display near nests, where the Owl pretends to capture prey, or feign injury, and flop away from the nest on the ground making various

noises. They will occasionally attack viciously, aiming the talons at the face and throat of the intruder.

Old nests are lined with bark strips, feathers, leaves, and moss before eggs are laid. Clutch sizes range from 3 to 8 eggs, with an average of 4 to 5 eggs. Clutch sizes tend to increase from south to north and from east to west. Eggs are laid irregularly every 1 to 5 days and incubation begins with the first egg laid, so that a clutch of 6 eggs may hatch over a period of 10 to 12 days. The female performs the incubation which lasts 25 to 30 days. Nestlings begin to walk out of the nest onto nearby branches at about 3 weeks, but are not capable of flight until about 5 weeks. Young become independent from parents at about 2 months. Nesting success is strongly linked to food availability and predation.

Long-eared Owls are usually single-brooded, however double-brooding has been observed. If a clutch of eggs is lost, a replacement clutch may be laid about three weeks later.

Densities of breeding birds are relatively low, except when local food and nesting habitat availability allow loosely colonial nesting.

Cool Facts: The Long-eared Owl was first described in 1758 by Carolus Linnaeus (1707-1778). Other common names for Long-eared Owls are American Long-eared Owl, Brush Owl, Cat Owl, Pussy Owl, Lesser Horned Owl, Cedar Owl and Coulee Owl.

The facial disk pale ochre-tawny in Eurasia and Africa, while it is Rufous-colored in North America.

Common Name: Great Horned Owl
Scientific Name: *Bubo virginianus*

Size: 18 -25 inches (46-63.5 cm) **Wingspan:** 36 -60 inches (91-152 cm)

Habitat: North and South America; found throughout North America from the northern treeline and then in Central and South America. They are resident year-round, however, birds living in the northern part of the species' range may migrate south. Found in dense forests, deserts and plains to city parks. They have been known to inhabit the same area as the diurnal red-tailed hawk.

Status: Least Concern. **Global population:** 5,000,000+. Most mortality is related to man - shootings, traps, road kills and electrocutions. The only natural enemies are other Great Horned Owls and, occasionally, Northern Goshawks during disputes over nest sites. Peregrine Falcons have also been observed attacking Great Horned Owls.



Diet: Rabbits and hares are preferred prey; Mammalian prey includes all coexisting rodents, squirrels, mink, skunks, raccoons, armadillos, porcupines, shrews, moles, muskrats, and bats. They will take small domestic dogs and cats. Bird prey includes all other Owls (except Snowy Owl), grouse, woodpeckers, crows, turkeys, pigeons, Red-tailed Hawks, bitterns, Great Blue Heron, ducks, swans, gulls, etc. Reptiles include snakes, turtles, lizards, and young alligators. Amphibians include frogs, toads, and salamanders. Other foods include fish, large insects, scorpions, centipedes, crayfish, worms, spiders, and road killed animals. They hunt by perching on snags and poles and watching for prey, or by gliding slowly above the ground. From high perches they dive down to the ground with wings folded, before snatching prey.

Nesting: General coloration be vary by individual. The facial disc is rusty-brown to ochre-buff, paler around the eyes, with a prominent blackish rim on each side. Eyes are yellow, with

blackish edged eyelids. The bill and cere are grayish. Eyebrows are prominent and whitish. The upper parts are warm brownish-buff, mottled and vermiculated with grayish-brown, black and whitish. The crown is similar in coloration to the mantle, but finely barred dark and light. The outer webs of the scapulars have large whitish areas, irregularly marked with a few dark transverse bars. There is a row of whitish spots across the shoulder which is not very obvious. Flight and tail feathers are distinctly barred dark and light. The outer webs of the primaries are brownish-buff, while the inner webs are much paler. The under parts are brownish-buff, becoming paler towards the belly. The throat is whitish and very prominent when inflated during calling. The upper breast has blackish blotches and some cross-bars, and the rest of the underparts are coarsely barred light and dark. The tarsi and toes are densely feathered, with just a small zone at the end of the toes bare, and colored grayish-brown. Claws are dark horn with blackish tips.

Nesting season is in January or February when the males and females hoot to each other. When close they bow to each other, with drooped wings. Mutual bill rubbing and preening also occurs. They do not build a nest of their own but utilize the nests of other birds such as the hawk, crow and heron. They may also use squirrel nests, hollows in trees, rocky caves, clumps of witches broom, abandoned buildings, or on artificial platforms. They are extremely aggressive when defending the nest and will continue to attack until the intruder is killed or driven off. Normally, two to four eggs are laid and incubated by the female only for 26-35 days. Young start roaming from the nest onto nearby branches at 6 to 7 weeks, when they are called "branchers", but cannot fly well until 9 to 10 weeks old. They are fed for another few weeks as they are slowly weaned. Families remain loosely associated during summer before young disperse in the autumn. Adults tend to remain near their breeding areas year-round while juveniles disperse widely, over 250 km (150 miles) in the autumn. Average home ranges in various studies have been shown to be approximately 2.5 square kms (1 square mile).

Cool Facts: The Great Horned Owl was described in 1788 by Johann Gmelin. Its Latin name comes from where it was first seen, the Virginia colonies (originally named for Queen Elizabeth I, the "Virgin Queen"). Its common name is derived from tufts of feathers that appear to be "horns". It is also known as the Hoot Owl, Cat Owl and Winged Tiger.

The Great Horned Owls' ear tufts have nothing to do with hearing at all. All owls have asymmetrical ears; one located low on the skull, the other toward the top. The position of the ears helps the owl to hear in stereo and easily locate any noise it hears.

A Great Horned Owl is powerful enough to take prey 2 to 3 times heavier than itself. Great Horned Owls have been seen wading into water to snatch frogs and fish. They have been known to walk into chicken coops to take domestic fowl.

Common Name: Western Screech-owl
Scientific Name: *Megascops kennicottii*

Size: Males 8 ¼ inches (22 cm); wingspan: 21 inches (54 cm)

Habitat: North America. This owl is resident from south-coastal and extreme southeastern Alaska, coastal (excluding Queen Charlotte Islands) and southern British Columbia, northern Idaho, western Montana, northwestern Wyoming, Colorado, extreme western Oklahoma, and western Texas south to Baja California.

Western Screech Owls also occur in northern Sinaloa and across the Mexican highlands through Chihuahua and Coahuila as far as the Distrito Federal. They are essentially non-migratory.

Western Screech Owls inhabit a wide variety of habitats. On the northwest coast, they are found in humid Douglas-fir, western hemlock, western red cedar, and Sitka spruce forests along the edges of clearings, rivers, and lakes. Further inland they occupy a narrow ecological niche of lowland deciduous forests, especially riparian woodlands along river bottoms. Southern populations inhabit lowland riparian forests, oak-filled arroyos, desert saguaro and cardon cacti stands, Joshua tree and mesquite groves, and open pine and pinyon-juniper forests. They avoid dense forests because Great Horned Owls use that habitat, and high elevation forests

In general, they require open forests, with an abundance of small mammals and insect prey, and cavities for nesting. They roost mainly in natural or woodpecker



cavities in large trees, but also in dense foliage of deciduous trees, usually on a branch next to the trunk, or in dense conifers.

Status: Least Concern. **Global population:** 700,000. Western Screech Owls are dependent on deciduous woodlands or open mixed forests that have suitable nesting sites and sufficient prey densities. Removal of riparian forest in drier regions will cause population declines because most densities are highest in riparian zones. However, this adaptable Owl can survive in wooded suburban areas and city parks. The removal of dead and dying trees will eliminate this bird as a breeding species from local areas.

Diet: Favorite foods include small rodents such as shrews, kangaroo rats, deer and pocket mice, larger insects (including beetles, larval moths & butterflies), or small birds depending on abundance.

Screech Owls are nocturnal, with activity generally beginning 20-30 minutes after sunset. They hunt mainly from a perch in open woodlands, along the edges of open fields or wetlands, or they make short forays into open fields.. They also capture flying insects on the wing. Small prey is usually swallowed whole on the spot, while larger prey is carried in the bill to a perch and then torn apart.

Nesting: Females are slightly larger. There is much individual variation within the two color morphs. In the gray-phase, birds in the dry southwest are a paler gray, while birds in the humid northwest are darker and browner. The red-phase is very rare and found only in the Pacific Northwest.

Adult (gray phase) - Facial disks are dusky white with fine gray-brown mottling. Overall gray-brown, with gray-brown narrow vertical stripes, bars, and spots on the underparts, and barred wings and tail. The legs have fine buff mottling.

Adult (red phase) - Similar pattern to gray phase except dull cinnamon instead of gray. The face is buff to light cinnamon. There is rufous spotting on the breast with black anchor marks.

During courtship males and females call to each other in a duet as they approach. When together they preen each other's heads and nibble at the other's beaks. The male then changes his call to a rapid tremolo, answered with a short, tremolo from the female.

Western Screech Owls nest almost exclusively in tree cavities. Enlarged natural cavities are preferred but they will also use old Pileated Woodpecker and rotted-out Northern Flicker holes. Nest cavities are usually 6 ½ to 20 feet above the ground. They will readily nest in suitable nest boxes. Nests are almost always in deciduous trees such as oaks, cottonwoods, maples, sycamores and large willows, but also in large cacti, Douglas-fir snags, and junipers. One subspecies in Arizona nests exclusively in saguaro cacti. No nest material is added and

nests are kept cleaner than in Eastern Screech Owls. 2 to 5 eggs are laid on natural sawdust on the floor of the cavity. The average clutch size tends to increase from south to north and from the coast inland. The eggs are laid every 1 to 2 days and incubation begins after laying of the first. The incubation period is about 26 days and the fledging period about 35 days. Females incubate eggs and brood young while males bring food to the nest. The Western Screech Owl is single brooded, but may re-nest if first clutch is lost. Pairs will often reuse nest sites in consecutive years. Pairs mate for life but will accept a new mate if the previous mate is lost. Gray and red color phases will mate together.

Adults tend to remain near their breeding areas year-round while juveniles disperse in the autumn. Small territories around nest sites are vigorously defended by males. In desert riparian areas of the southwest, where these Owls can be quite numerous, territories may be only 50 meters (165 feet) apart. Home ranges are much larger, and range from 3 to 60 hectares (7.5 to 150 acres), but these are not defended and there is much overlap between pairs.

Cool Facts: The western Screech Owl was first discovered in 1867. The species name "kennicotti," was created to honor Robert Kennicott, an American explorer and naturalist (1835-1866) and was originally called "Kennicott's Owl".

This owl is very aggressive when defending a nest site, and may attack humans.

Common Name: Burrowing Owl
Scientific Name: *Athene cunicularia*

Size: 8 ½ - 11 inches (21.6-28 cm) Wingspan: 20-24 inches (50.8-61.0 cm)

Habitat: North and South America; present in North America, and breed across the grassland regions of southern Alberta, Saskatchewan and Manitoba. They occur in all states west of the Mississippi Valley, breed south through the western and mid-western States. A separate subspecies is found in Florida and the Caribbean Islands. They extend south into Mexico, Central America and South America but populations have declined in many areas due to human-caused habitat loss or alteration. Birds from the northern part of the U.S. and Canada are migratory.

They are commonly found in open, dry grasslands, agricultural and range lands, and desert habitats often associated with burrowing animals, particularly prairie dogs, ground squirrels and badgers. They can also inhabit grass, forb, and shrub stages of pinyon and ponderosa pine habitats. They commonly perch on fence posts or on top of mounds outside the burrow.



Status: Near-threatened to

Endangered. **Global population:** 2,000,000. The burrowing owl is endangered in Canada, threatened in Mexico, and a species of special concern in Florida and most of the western USA. It is a state endangered species in Colorado. It is common and widespread in open regions of many Neotropical countries, where they sometimes even inhabit fields and parks in cities. While North American populations are in decline, in regions bordering the Amazon Rainforest, they are spreading due to deforestation.

The major reasons for declining populations in North America are control programs for prairie dogs and loss of habitat, although burrowing owls readily inhabit some anthropogenic landscapes, such as airport grasslands or golf courses.

Where the presence of burrowing owls conflicts with development interests, a passive relocation technique has been applied successfully: rather than capturing the birds and transporting them to a new site (which may be stressful and prone to failure), the owls are half-coerced, half-enticed to move on their own accord.

Burrowing owls are protected under the Migratory Bird Treaty Act in Canada, the United States, and Mexico. They are also included in CITES Appendix II.

Diet: Feeding on a wide variety of prey, changing food habits as location and time of year determine availability. Large arthropods, mainly beetles, termites and grasshoppers, comprise a large portion of their diet. Small mammals, especially mice, rats, gophers, and ground squirrels, are also important food items. Unlike other owls, they also eat fruits and seeds, especially the fruit of *Tesajilla* and prickly pear cactus.

Most activity occurs at dawn and dusk. They hunt 24 hours a day when feeding young.

Nesting: Females are usually darker than the males. The facial disc is pale brownish with prominent white eyebrows above the bright yellow eyes. The bill is grayish-olive and the cere grayish-brown. There is a distinct whitish throat band. The upper parts are brown, with the forehead and crown having whitish streaks and dots. Elsewhere is irregularly dotted whitish to pale ochre with relatively large, rounded spots. Flight feathers are barred light and dark, and the tail is brown has 3-4 pale bars. Underparts are whitish to pale buff with dense dusky brown bars. Tarsi are conspicuously long and sparsely feathered. The olive-gray toes are bristled, and the claws are dark horn with blackish tips.

The nesting season begins in late March or April. Burrowing Owls are usually monogamous but occasionally a male will have 2 mates. Courtship displays include flashing white markings, cooing, bowing, scratching and nipping. The male performs display flights, rising quickly to 30 meters (100 feet), hovering for 5 to 10 seconds, then dropping 15 meters (50 feet). This sequence is repeated many times. Circling flights also occur. Burrowing Owls nest underground in abandoned burrows dug by mammals or if soil conditions allow they will dig their own burrows. They will also use man made nest boxes placed underground. They often line their nest with an assortment of dry materials. Adults usually return to the same burrow or a nearby area each year. One or more "satellite" burrows can usually be found near the nest burrow, and are used by adult males during the nesting period and by juvenile Owls for a few weeks after they emerge from the nest. 6 to 9 (sometimes up to 12) white eggs are laid a day apart, which

are incubated for 28-30 days by the female only. The male brings food to the female during incubation, and stands guard near the burrow by day. The care of the young while still in the nest is performed by the male. At 14 days, the young may be seen roosting at the entrance to the burrow, waiting for the adults to return with food. They leave the nest at about 44 days and begin chasing living insects when 49-56 days old.

Cool Facts: The first published report of the Burrowing Owl was in 1782 by Giovanni Iganzio Molina, an Italian Jesuit priest stationed in Chile. The Burrowing Owl has also been known as Ground Owl, Prairie Dog Owl, Rattlesnake Owl, Howdy Owl, Cuckoo Owl, Tunnel Owl, Gopher Owl, and Hill Owl.

They are highly terrestrial, and are often seen perched on a mound of dirt, telegraph or fence post - frequently on one foot. They bob up and down when excited. Flight is with irregular, jerky wing beats and they will frequently make long glides, interspersed with rapid wing beats. They hover during hunting and courtship, and may flap their wings asynchronously (not up and down together).

Carl Hiaasen's young adult novel "Hoot" (2002) is about a group of school kids trying to stop the planned construction of a pancake house that would go hand in hand with the destruction of the burrowing owls' habitat in a small town in Florida was made into a movie called "Hoot" in 2006. Live burrowing owls were featured in the movie adaptation.



Common Name: Spotted Owl
Scientific Name: *Strix occidentalis*

Size: 18 inches (46 cm); Wingspan: 42 inches (106 cm)

Habitat: North America; found from Canada to Mexico mostly in dense, dark, old-growth or mixed mature and old-growth coniferous forests. Forests are usually dominated by firs or Douglas-fir, but they also use mature hardwood forests of cottonwoods, alders, oak, and sycamore, especially along steep-walled river valleys. They prefer an uneven and multi-layered canopy. They prefer shaded

mountain slopes and canyons over flat plateau areas. *S.o. lucida* also occurs in heavily logged secondary pine-oak forest, warmer and drier conditions and even bare rocky canyons.



Status: Near Threatened to Critically Endangered.

Global population: 15,000 with a decreasing trend. Degradation and fragmentation of its habitat through clear felling and selective logging is the primary threat to the species. **This species require old-growth forests to survive.** This has been compounded by the removal of a requirement that contractors assess the viability of wildlife on U.S. Department of Agriculture Forest Service lands. It faces strong competition from Barred Owl (*Strix varia*) which is gradually

displacing Spotted Owls from much of the northern part of their range, out competing it for food and space and occasionally hybridizing. The extent to which Barred Owls have been responsible for recent continuing declines in Northern Spotted Owl populations remains uncertain.

Mexican populations may be stable because habitat tolerance is combined with forestry activities that typically modify rather than destroy habitat. Most other populations are declining and, in some, the decline is accelerating because of clear-felling and selective logging. The species is close to extinction in Canada.

They are protected under the Migratory Bird Treaty Act in Canada, the United States, and Mexico. They are also included in CITES Appendix II. The Northern and southern spotted owl populations are currently listed as threatened in the United States under the Endangered Species Act.

Diet: Spotted Owls feed mainly on flying squirrels and wood rats. These prey are necessary for successful breeding. Other major prey include gophers, rabbits and hares. Summer diets are more varied with deer mice and voles being important foods. They also eat small birds, snakes, crickets, beetles, and moths.

Hunting is done mainly at night, usually beginning just after sunset and ending a half hour before sunrise. Spotted Owls use a perch to "sit and wait" to dive down onto prey. They rarely forage in flight. Prey is sometimes cached for later use. Prey taken to the nest by the male is often decapitated first. During the day, a Spotted Owl may take the odd prey that passes by its day roost, fly to a food cache, or fly to a nearby stream to drink.

Nesting: Females are slightly larger. The facial disc is pale buffish-brown with some darker concentric lines and a dark rim that is not very prominent. The crown is dark brown, slightly tinged rufous with whitish flecks and small spots. Eyes are blackish-brown. The cere is yellowish-horn and the bill pale greenish-yellow. The upper parts are dark brown with many transverse or arrow-shaped white spots. Some scapulars have relatively large areas of white, and are dark barred on the outer webs. Flight feathers are barred light and dark with fine vermiculations on the light bars. Tail feathers are dark brown with several narrow whitish bars and a whitish terminal band. The throat is whitish. The upper breast is barred whitish and dark brown, while the lower breast and belly are boldly marked dark brown and white. Individual feathers in this region are dusky at the base, along the shaft, and bordering the tip, with a large rounded white spot at each side of the central streak. This gives the owl its white spotted appearance to the underparts. The belly is boldly barred dark brown and white. The tarsi are densely feathered to the toes, colored pale grayish-brown with yellowish soles and the claws are dusky horn.

The breeding season is from March to September. Timing and success in producing offspring are strongly linked to the availability of prey, and not all pairs breed every year. Spotted owl pairs mate for life, but a new mate is readily taken if the other disappears. They probably begin breeding at two to three years of age.

Spotted Owls primarily nest in old growth forests. They nest primarily in abandoned stick nests of Northern Goshawks, on clumps of mistletoe, in large tree cavities, on broken tops of large trees, on large branches, or cavities in banks and rock faces. Old nests are not repaired before eggs are laid, and tend to be reused year after year. Clutch size ranges from 2 to 4 eggs, but averages 2 to 3 eggs. Eggs are laid every 3 to 4 days, usually in April. The female does all incubation and the male delivers food to the nest. The incubation period is about 28 to 32 days. Unlike most other owls, Spotted Owls may not defend their eggs and young from predators, watching nearby as the nest is destroyed. Young are brooded constantly by the female for 2 weeks, then she begins to hunt as well. The male brings food to the nest and passes it to the female to feed to the young. Young start roaming from the nest onto nearby branches at about 5 weeks, but some flutter to the ground before climbing up into trees. They can fly weakly at about 6 weeks. At 9 to 10 weeks young can capture insect prey by themselves. Families remain loosely associated during summer before young disperse in the autumn. Adults tend to remain near their traditional nesting territories, while juveniles disperse widely, as much as 100 to 200 km (60 to 125 miles).

Juvenile Spotted Owls have an average survival rate of 11%, with an average birth rate of .58 owls per pair.

Cool Facts: The spotted has four subspecies: *S.o. caurina* has a minimum of 3,778 pairs and 1,001 territorial individuals from south-west British Columbia, Canada, to north California, USA; *S.o. nominate* has a minimum of 3,050 individuals in central and south California, USA, and (formerly) Baja California, Mexico; *S.o. lucida* has a minimum of 777-1,554 individuals from Utah and Colorado to Arizona, New Mexico and extreme west Texas, USA, and also occurs in Sonora, Chihuahua and Nuevo León to Jalisco, Durango, Michoacán and Guanajuato, Mexico; and *S.o. juanaphillipsae* has been recently described from the State of México.

Spotted owls roost in deep shade during the day.

Common Name: Long-whiskered Owlet
Scientific Name: *Xenoglaux loweryi*

Size: 5 – 5.5 inches (13-14 cm) Wingspan: 14.5 inches (37 cm)

Habitat: South America. Found in two localities on isolated ridges in the eastern Andes of Amazonas and San Martín, north Peru. It apparently inhabits the under-story and mid-story of very wet Elfin forest and tall forest at 1,890-2,350 m (but potentially heard down to 1,800 m), with abundant epiphytes, bamboo thickets and scattered palms and tree ferns.



Status: Endangered. **Global population:** 250 to 999 with decreasing trend. The remaining areas of suitable habitat are being cleared for timber, agriculture and to secure ownership of the land, gradually around Abra Patricia, but more rapidly in the Cordillera de Colán, where locals estimated in 1994 that all the forest on the Cordillera de Colán could be cleared by 2004. More recent surveys have confirmed that habitat destruction in the region continues unabated. Abra Patricia is under pressure owing to road improvements and recent immigration and population growth in the area.

Diet: Feeding habits are unknown but it is conjectured

that insects (beetles, butterflies, moths) and very small mammals are its probable diet

Nesting: Nesting habits are unknown.

Cool Facts: This species was discovered in 1976 and wasn't seen again in the wild until 2007. At Abra Patricia, the birds were seen three times in daylight hours, and an individual was also captured in a mist-net. With their diminutive size, bright orange eyes, and wild, wispy facial feathers, these dainty birds belong to their own genus, dubbed *Xenoglaux*, or "strange owl."

Common Name: Pueo, or Hawaiian Owl
Scientific Name: *Asio flammeus sandwichensis*

Size: Males 13 – 17 inches (33-43 cm) Wingspan 41 inches (105 cm)

Habitat: Polynesia. Endemic to the Hawaiian Islands. Pueo occupy a variety of habitats, including wet and dry forests, but are most common in open habitats such as grasslands, shrublands, and montane parklands, including urban areas and those actively managed for conservation.

Status: Endangered. **Global population:** unknown.

They are strongly affected by light pollution. They are often killed in vehicular accidents in which they dive toward the headlights of cars, possibly in an attempt to hunt. Populations have dropped dramatically around newly-built roadways.

While the Pueo appears to be somewhat resistant to the avian malaria they have recently become victim to a mysterious "Sick Owl Syndrome", or SOS, in which large numbers of Pueo have been found walking dazedly on roads, leading to death by collision. The cause of Sick Owl Syndrome is unknown; it is suspected that pesticide toxicity may be responsible, particularly through secondary rodenticide poisoning. However, it has also been hypothesized that the cause may be an infectious agent, seizure-like confusion due to light pollution, or a variety of other causes.

Pueo nest on the ground, which makes their eggs and young susceptible to predation by the introduced Small Asian Mongoose and other predators, as well as by bulldozers.



State listed as Endangered on O‘ahu.

Diet: Small mammals

Nesting: Adult males and females look alike. Adults are brownish-white in color with darker brown streaks. They have yellow eyes and a black bill. Their feet and legs are feathered.

Males perform aerial displays known as a sky dancing display to prospective females. Nests are constructed by females and are comprised of simple scrapes in the ground lined with grasses and feather down. Females also perform all incubating and brooding. Males feed females and defend nests. Chicks hatch synchronously and are fed by female with food delivered by male. Young may fledge from nest on foot before they are able to fly and depend on their parents for approximately two months.

Cool Facts: This taxon was first named by Andrew Bloxam (as the species *Strix sandwichensis*). He saw it in 1825 as the naturalist on board HMS Blonde. Later the owl was reclassified as a subspecies of the Short-eared Owl (*Asio flammeus*).

Unlike most owls, Pueo are active during the day, and are commonly seen hovering or soaring over open areas. Their relatively recent establishment on Hawai‘i may have been tied to the rats (*Rattus exulans*) that Polynesians brought to the islands.

Common Name: Powerful or Great Hawk Owl
Scientific Name: *Ninox strenua*

Size: Males 19 - 25 ½ inches (48-65 cm) Wingspan: 45 - 53 inches (115-135 cm)

Habitat: Australia. This species occurs in open forest and woodlands in eastern Australia, from south-west Victoria to at least Eungella, and possibly Bowen, Queensland. Large areas of the species' range are now unsuitable as a result of clearing for agriculture and pastures, although the species now occupies suburban Brisbane, Sydney and Melbourne.

Found in typically wet and hilly sclerophyll forest with dense gullies adjacent to more open forest. Will also occur in smaller, drier forest, provided that there are some large tree hollows and an adequate supply of prey.

Status: Least Concern. **Global population:** 3,300 to 4,250. Although populations in remaining forest may eventually be affected by a reduction in the availability of suitable nest hollows as a result of intensive forestry practices, studies indicate birds persist in mosaics of unlogged forest, in which they nest, and logged forest, in which they forage. There was no difference in density between heavily logged, lightly logged and unlogged forest. Intense wildfire can result in local loss but, if suitable habitat remains nearby, they may return to forage. Poisoning, disturbance and predation by foxes may also cause nest failure and some mortality, but are unlikely to be

significant. The Powerful Owl is listed as threatened on the Victorian Flora and Fauna Guarantee Act (1988) and listed as "Vulnerable" on the list of threatened vertebrate fauna in Victoria.

Diet: Slow-moving arboreal mammals and large birds. Most hunting is done at dusk and dawn from perches. Large prey is often not eaten until the night after capture and Owl roosts with one foot on prey which is draped over branch.



Nesting: Males are usually considerably bigger than females with broader heads and flatter crowns. The facial disc is dark brown, and surrounds bright yellow eyes with prominent eyebrows and a powerful, bluish-horn bill with bristly feathers at its base. The color of the upper parts varies from gray-brown to dark brown and may appear bluish in dull light. The forehead is creamy white and the crown and nape finely spotted creamy white. The back and wings are irregularly barred, also in creamy white. There are approximately six narrow creamy white bars across the tail. Under parts are dull white with broad brown chevrons from throat to vent, arranged in irregular bars. The tail is broadly barred brown and white. Tarsi are feathered to the base of the toes and the claws are dusky horn with blackish tips.

Breeds during winter, with each female typically laying on almost the same date each year. Most eggs are laid from the second week in May to the third week June. Males begin calling in late February or early March. Around this time, pairs begin to roost closer together, at first in same tree and then on same branch, often still some distance from the potential nest site. The nest is a large hollow, nearly always in the trunk or broken off top of a big eucalypt. In tall forest this is usually at the head of a gully or on a hillside at heights from 20-45 metres (65.5-147.5 feet). Where tall trees are not available, the nest may be in open forest or among part-cleared timber at levels as low as 6 metres (19.5 feet). Usually 2 eggs, rarely 1, are laid at 4 day intervals. They are almost spherical and are dull white, measuring 49-56mm (1.9-2.2") by 43-46mm (1.7-1.8"). Incubation is about 38 days with the male rarely visiting the nest after laying - the female leaves the hollow to take food from him. The young have first and second downs of white, becoming stained in the nest. The Beak and feet seem disproportionately huge in early weeks. They are brooded constantly by the female until about 4 weeks when she abruptly ceases to brood by day and her visits become progressively shorter at night. First flight is at 7 to 8 weeks while still partially downy. After fledging, the young remain with their parents for weeks or months, roosting near or with one of them, sometimes remaining with parents in late autumn and this may inhibit them from breeding in the following season.

Powerful Owls have always been thought to be shy and not aggressive at the nest but this needs considerable qualification. Females are certainly shy and may desert a nest after minimal human disturbance, particularly early in the season. Some males, however, may be extremely aggressive in the breeding season, attacking humans with great ferocity even at a considerable distance from the nest. This is most likely when there are young in the nest but may occur even before laying and occasionally when juveniles are roosting nearby.

Cool Facts: Lives permanently in pairs. Roosts by day singly, in pairs or in family groups of 3-4, in foliage or open tree in forest or woodland. They will often roost with the remains of prey clutched in their talons. May be easily approached during the day, but is shy and difficult to observe at night.

Common Name: Eurasian Eagle-owl
Scientific Name: *Bubo bubo*

Size: 22 ¾ - 28 inches (58-71cm); Wingspan: 55-79 inches (138–200 cm)

Habitat: Eurasia; North Africa, Europe, Asia, Middle East. Found in a variety of habitats, from coniferous forests to warm deserts. Rocky landscapes are often favored. Adequate food supply and nesting sites seem to be the most important prerequisites.

Status: Least Concern.

Global population:

250,000 to 2,500,000.

They have no real natural enemies; electrocution, collision with traffic, and shooting are the main causes of death.

Diet: The most common type of prey depends largely on relative availability, but are mostly mammals (Voles, rats, mice, foxes, hares). Birds are also taken, including crows, ducks, grouse, seabirds, and other birds of prey (such as small hawks and other owls). Prey can also include snakes, lizards, frogs, fish, and crabs.

Eagle Owls have various hunting techniques, and will take prey on the ground or in full flight. They may hunt in forests, but prefer open spaces. Active mainly at dusk to dawn

Nesting: The facial disc is tawny-buff and speckled with black-brown. A narrow buff band, freckled with brown buff, runs up from the base of the bill, above the inner part of the eye and along the inner edge of the black-brown ear-tufts. The



bill is blackish, the cere grayish-olive, and the eyes are bright orange-red to golden-yellow. The chin and throat are white continuing down the center of the upper breast. The upper parts are brown-black and tawny-buff, showing as dense freckling on the forehead and crown, stripes on the nape, sides and back of the neck, and dark splotches on the pale ground colour of the back, mantle and scapulars. The rump and upper tail-coverts are delicately patterned with dark vermiculations and fine wavy barring. The tail is tawny-buff, mottled dark grey-brown with about six black-brown bars.

The Male and Female duet during courtship, the Male advertising potential breeding sites by scratching a shallow depression at the site and emitting staccato notes and clucking sounds. Favored nest sites are sheltered cliff ledges, crevices between rocks and cave entrances in cliffs. They will also use abandoned nests of other large birds. If no such sites are available, they may nest on the ground between rocks, under fallen trunks, under a bush, or even at the base of a tree trunk. No nesting material is added. Often several potential depressions are offered to the female, who selects one; this is quite often used again in subsequent years. Very often pairs for life. They are territorial, but territories of neighboring pairs may partly overlap.

Nesting generally begins in late winter, sometimes later. One clutch per year of 1-4 white eggs are laid, measuring 56-73mm x 44.2- 53mm (2.2- 2.9" x 1.7- 2.1") and weighing 75- 80g (2.6- 2.8oz). They are normally laid at 3 days intervals and are incubated by the female alone, starting from the first egg, for 31-36 days. During this time, she is fed at the nest by her mate.

Once hatched, the young are brooded for about 2 weeks; the female stays with them at the nest for 4-5 weeks. For the first 2-3 weeks the male brings food to the nest or deposits it nearby, and the female feeds small pieces to the young. At 5 weeks the young walk around the nesting area, and at 52 days are able to fly a few meters. They may leave ground nests as early as 22-25 days old, while elevated nests are left at an age of 5-7 weeks.

Fledged young are cared for by both parents for about 20-24 weeks. They become independent between September and November in Europe, and leave the parents' territory (or are driven out by them). At this time the male begins to sing again and inspect potential future nesting sites. Young reach maturity in the following year, but normally breed when 2-3 years old.

Cool Facts: When threatened, Eagle Owls may bark and growl. Each member of an Eagle Owl population can be identified by means of its vocalizations.

Eagle Owls have been known to take small deer (up to 22 lb/10kg)

Common Name: African Barred Owlet
Scientific Name: *Glaucidium capense*

Size: 7 $\frac{3}{4}$ - 8 $\frac{1}{4}$ inches (20-21 cm); Wingspan: 15 $\frac{3}{4}$ inches (40 cm)

Habitat: Africa; found in Angola, Botswana, Central African Republic, Republic of the Congo, Democratic Republic of the Congo, Kenya, Malawi, Mozambique, Namibia, Somalia, South Africa, Swaziland, Tanzania, Uganda, Zambia, and Zimbabwe. Most frequently found in woodland and forests, and on forest edges. It may also occur in more open savannah and along rivers. Prefers woodlands, with sparse undergrowth, usually with a river or stream nearby.



Status: Least Concern.

Global population:
Unknown. Locally threatened, in the Eastern Cape of Africa.

Diet: Mostly insects, although small rodents and birds may also be eaten.

Nesting: It normally uses natural hollows in trees as nests, which can be as high as 6 m above ground. It sometimes visits the nest by day, carrying feathers and leaves, which are presumed to be lining for the nest. It lays 2-3 eggs, in August-October.

Incubation is presumed to be done solely by the female, for 28-34 days. It can be

extremely stubborn about not leaving the nest, so much so that one can stroke and touch it without protest.

The chicks are brooded for 14 days by the female, after which both sexes hunt. They are sometimes fed as many as 40 meals in 6 hours, by both parents. The brood leave the nest after 32-33 days, after which they live in the vicinity of the nest. At 42 days, they have learned to fly.

Cool Facts: This owl is often confused with the Pearl-spotted owlet which it differs from by being larger and having a barred head; Pearl-spotted Owlets have a spotted head.

Common Name: Snowy Owl
Scientific Name: *Bubo scandiacus*

Size: 20 -27 inches (51-68.5 cm); Wingspan: 54-65 inches (137-164 cm)

Habitat: Arctic Circle; Circumpolar regions of the old and new worlds. Found on the Arctic tundra or in open grasslands and fields.



Status: Least Concern. **Global population:** 300,000. Natural enemies are few - Arctic foxes and wolves prey upon them on their tundra breeding grounds, while skuas and jaegers may take eggs or chicks.

Diet: Mostly lemmings and voles; Some mammal prey include mice, hares, muskrats, marmots, squirrels, rabbits, prairie dogs, rats, moles, and entrapped furbearers. Birds include ptarmigan, ducks, geese, shorebirds, Ring-necked Pheasants, grouse, American coots, grebes, gulls, songbirds, and Short-eared Owls. Snowy Owls will also take fish and carrion.

Most hunting is done in the "sit and wait" style. These Owls are highly diurnal, although they may hunt at night as well. Prey are captured on the ground, in the air, or snatched off the surface of water bodies. When taking snowshoe hares, a Snowy Owl will sink its talons into the back and backflap until the hare is exhausted. The Owl will then break its neck with its beak.

Nesting: Sexes are dimorphic. The male's facial disc is white and ill-defined. The eyes are bright yellow, rimmed by blackish eyelid edges. The cere is dark gray, and is normally concealed by dense feathering. The bill is blackish and the ear-tufts are so small, they are not visible. The upper parts are plain white, with a few dusky spots on the tiny ear-tufts, the alula and at the tips of some primaries and secondaries. The tail feathers are nearly all white, sometimes with indistinct terminal bars. The under parts are all white and the tarsi and toes are thickly feathered white. The claws are black in color. The female is spotted and slightly barred brown on the crown and upper parts. The flight and tail feathers are faintly barred brown. The underparts are white, with brown spotting and barring on the flanks and upper breast. Juveniles are dark grayish-brown and resemble females.

Courtship behavior can begin in midwinter through to March and April, well away from breeding areas. Males will fly in undulating, moth-like flight when females are visible. On the ground males will bow, fluff feathers, and strut around with wings spread and dragging on the ground. Males kill and display prey in caches to impress females, often feeding the female. The Snowy Owl nests almost exclusively on the ground, where the female makes a shallow scrape with her talons on top of an elevated rise, mound, or boulder. Abandoned eagle nests and gravel bars are used occasionally. Nests may be lined with scraps of vegetation and Owl feathers. Nest sites must be near good hunting areas, be snow-free, and command a view of surroundings. There is little breeding site-faithfulness between years or mates in some areas, but in other areas, a pair of Owls may nest in the same spot for several years. Territories around nests range from 1.5 to 6.5 square km (0.6 to 2.5 square miles), and overlap with other pairs.

Breeding occurs in May, Clutch and brood sizes are heavily dependent on food supply. Snowy Owls may not nest at all during years of low lemming numbers. Clutch sizes normally range from 5 to 8 white eggs but may be as many as 14 eggs during high lemming years. They are laid at approximately 2 day intervals and average about 57 x 45 mm. The female incubates while the male brings her food and guards the nest. Eggs hatch in 32-34 days at two day intervals, leading to large age differences in nests with large clutch sizes. Young are covered in

white down. Young begin to leave the nest after about 25 days, well before they can fly. They are fledged at 50 to 60 days. Both parents feed and tend the young, and are fiercely protective and may attack intruders up to 1 km (0.6 miles) from the nest! Nestling Owls require about 2 lemmings/day and a family of Snowy Owls may eat as many as 1,500 lemmings before the young disperse. Snowy Owls are single brooded and likely do not lay replacement clutches if their first clutch is lost. Almost 100% nesting success can be achieved during good vole years.

Numbers fluctuate wildly, usually in concert with lemming and vole numbers. For Example, Banks Island may have 15,000 to 20,000 Snowy Owls during good lemming years and only 2,000 during low lemming years with densities ranging from 1 Owl per 2.6 square km (1 Owl per square mile) in good lemming years to 1 Owl per 26 square km (1 Owl per 10 square miles) in low lemming years.

Cool Facts: The Snowy Owl was first classified in 1758 by Carolus Linnaeus, the Swedish naturalist who developed binomial nomenclature to classify and organize plants and animals. The name "scandiacas" is a Latinized word referring to Scandinavia, as the Owl was first observed in the northern parts of Europe. Other common names for the Snowy Owl are Snow Owl, Arctic Owl, Great White Owl, Ghost Owl, Ermine Owl, Tundra Ghost, Ookpik, Scandinavian Nightbird, White Terror of the North, and Highland Tundra Owl.

During hot weather, they can thermo-regulate by panting and spreading their wings.

The Snowy Owl is the official bird of Quebec and Harry Potter's owl from the J.K. Rowling book series.

Special Thanks to...

....my **beta testers** (Bea, FlintHawk, Jan, Kelvin, Nancy, Rhonda, Sandra and Walter)

Species Accuracy and Reference Materials

Many birds of the same species do vary considerably in color. This package tries to emulate the colors and markings in the most commonly found variants.

The author-artist has tried to make these species as accurate to their real life counterparts as possible. With the use of one generic model to create dozens of unique bird species, some give and take is bound to occur. The texture maps were created in Painter with as much accuracy as possible. Photographic references from photographs from various Internet searches and several field guides were used.

Field Guide Sources:

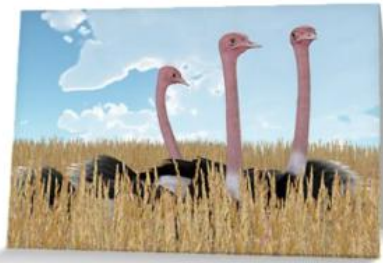
- **“The Sibley Guide to Birds”** by David Allen Sibley
- **Birds of Australia** by Ken Simpson and Nicolas Day. Princeton University Press
- **Birds of Southern Africa** by Ian Sinclair, Phil Hockey, and Warwick Tarboton. Princeton University Press
- **Birds of East Asia** by Mark Brazil. Princeton University Press
- **Birds of Peru** by Thomas S. Schullenberg, Douglas F. Stotz, Daniel F. Lane, John P. O’Neil and Theodore A. Parker III. Princeton University Press
- **All About Birds/Cornell** (<http://www.birds.cornell.edu/AllAboutBirds/>)
- **Wikipedia** (<http://www.wikipedia.com>)
- **Birdlife International** (<http://www.birdlife.org>)
- **The Owl Pages** (<http://www.owlpages.com>)

Other Resources:

- [Songbird ReMix.com](http://SongbirdReMix.com)
- [Songbird ReMix on Facebook](#)

**Songbird
ReMix**

Merchandise



www.empken.com/store