



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

Songbird ReMix Owls

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Songbird ReMix Owls

Introduction

Songbird Owls 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 and Use

Select **Figures** in Runtime Folder and go to the **Songbird ReMix** folder. Here you'll find an assortment of files that are easily broken into 2 groups: **Conforming Parts** and **Bird Base models**. Let's look at what they are and how you use them:

- **Bird Base Models**
 - **Owl Base Model** - This model is used with all Songbird ReMix Owls.
- **Conforming Parts** - No conforming parts are needed for or included in this volume. It is possible that with future add-on volumes and/or future free download Birds that they *may* be needed. (All Conforming Crests have alphanumeric icons in the lower right corners such as "**C09**", "**C22**" or "**T03**". This corresponds with characters in the Pose folders. All MAT/MOR files with the same icon use that particular Conforming Part. ***Be sure to read this:*** Most conforming parts are Crests, which cover the head part. When posing the Base Model, the Conforming Part will follow any Bend, Twist or Rotate Commands. It will not obey any **SCALE** or **MORPH** commands you give the Base Model. You must manually scale the Conforming Part and, with morphs such as "OpenBeak" or "Stretch", you must also set its counterpart in the head part of the Conforming Crest.

Preview Mode Holes


OpenGL preview mode in Poser and DAZ Studio make it look like there are holes in the wings and feathers. This has to do with the way the preview mode handles transparencies; once rendered the holes will disappear.

Ear Tufts

Ear Tufts are only present on some owls. The Controls for the Ear Tufts are found in two places. The Main Controls for the Ear Tufts are found in the **Head Section** under “*Creation Morphs : Eye and Ear Shape*”.

- **HideEarTufts** – raises and lower the ear tufts out of the skull. “1” is the OFF position
- **Short Ears** - Actually doesn’t use the Ear Tuft body Part but creates two morphed ear lumps at the head for Short-eared Owls
- **Ear-GreatHorned, Ear-LongEared** and **Ear-Screech** are specific position and shape morphs for the named species. These are to be used in conjunction with “*Fore and Headshape*” morphs.
- **EarTufts-PositionY** and **PositionZ**. These control Z and Y axis positioning of the ear tufts part for customization and the inclusion of future owl species.

Conforming Crest Quick Reference

Load Model(s)	To Create... (apply MAT/MOR files)
	<ul style="list-style-type: none"> • All Owls in this package

Mapping Considerations

Materials are divided into 5 different Transparency Maps

All below use Main Map for Diffuse Colors			Wing Map	Tail Map
Trans1	Trans2	Trans3		
Back Plume1 BeakFluff1 Bodyfeathers BrowFluff1 BrowFluff3 BrowFluff5 FootFluff FootFluffL1 FootFluffL2 FootFluffL3 FootFluffL4 HeadFluff1 HeadFluff2 NeckFluff2 NeckFluff4 UpperNeckFluff2	BackPlume2 BeakFluff2 BrowFluff2 BrowFluff4 NeckFluff1 NeckFluff3 NeckFluff5 ScalpFluff2 Alt Versions of: FootFluff FootFluffL1 FootFluffL2 FootFluffL3 FootFluffL4	BackPlume3 HeadFluff3 Longfeathers NoseFluff1 NoseFluff2 NoseFluff3 ScalpFluff1 ScalpFluff3 UpperNeckFluff1	Wings Wingfeathers1 Wingfeathers2	TailFeathers

Creating a Songbird ReMix Bird

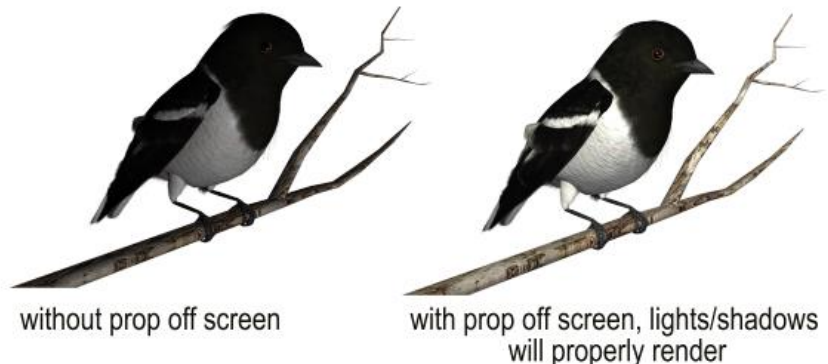
1. Choose what you want to load. For this example, we'll create a Owl species.
2. Load Poser or DAZ Studio and select **FIGURES** and the Songbird ReMix folder. DAZ Studio users will select the "Poser Formats" → "My Library" → "FIGURES" → "Songbird ReMix".
3. Because all of the Owls use the "Owl" base model we'll load that.
4. Go to the **POSES** folder and **Songbird ReMix** Master folder, then select the appropriate Songbird Remix library. This again, for DAZ Studio users will be found in the "Poser Formats" file section.
5. Select one of the Owl Species and load/apply it by clicking the mouse on to our loaded Songbird ReMix base model. This species pose contains morph and texture settings to turn the generic model into the selected Owl. It will automatically apply the correct DAZ Studio material settings if you are using DAZ Studio.

Displacement in Poser 5+

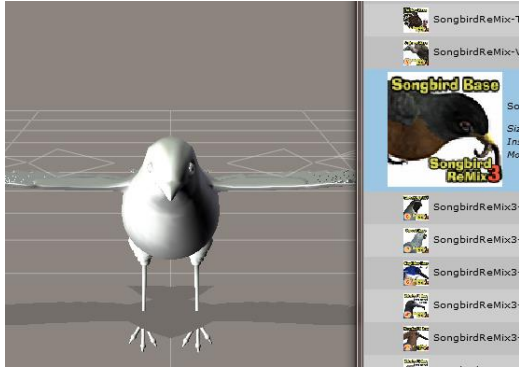
In Poser, several settings will help to bring out the best in this bird set. Under "Render Settings" (CTRL+Y) make sure you check "**Use Displacement Maps**" and (in some rare cases) the "**Remove Backfacing Polys**" boxes. In some poses, the wing morphs will expose backfacing polygons which tend to render black. Clicking the "Remove Backfacing Polys" fixes this.

Scaling and Square Shadows in Poser

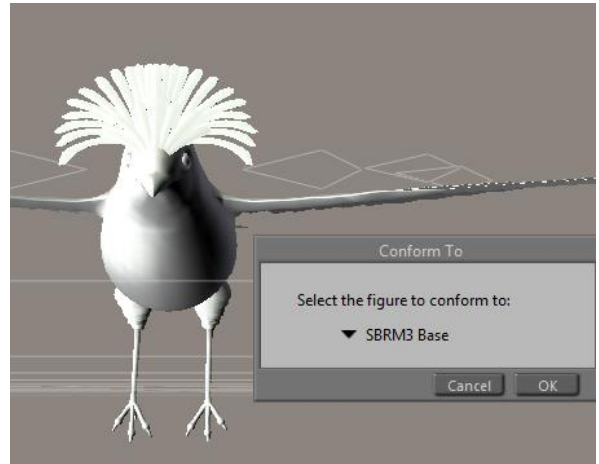
All the birds in this package have to scaled proportionally to DAZ 3D's Victoria and Michael models. The smallest of the included birds **MAY** render with a Square shadow or improper lighting. This is a bug in Poser. Poser can't figure out how to render a shadow for something really small, so it creates a square shadow. The solution is to put a larger item that casts a normal Poser shadow in the scene (even if it is off camera) and the square shadows will be fixed or **BODY** scale the bird to a larger size.



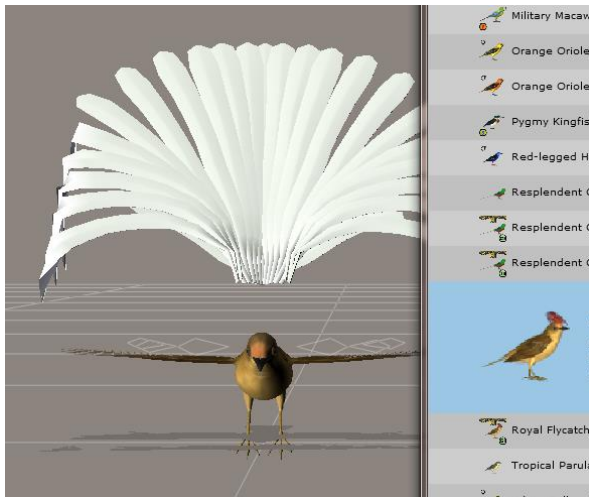
How to build a Songbird ReMix Character with a Conforming Crest in Poser



1. In the Figures section, load a Bird base Model. Then load the appropriate conforming part for the bird you're trying to create.
2. **Conform it** to the bird base model.



3. Select the Base Model and go to **POSES**. Select and apply the appropriate Character/Material pose setting for the bird you're creating.



4. The Conforming part will look wrong. That's okay—we're going to fix that now. Select the conforming part and apply appropriate Character/Material pose for the part.

5. Voila! Your bird is done. Just remember to select the bird base when posing and often there are additional morphs in the conforming part you can use.



Updates and Freebies

The Songbird ReMix series is constantly growing and improving. New morphs and additions to upcoming and future products often end up benefiting existing sets with new geometry, morphs and textures.

Songbirdremix.com always has the latest updates and additions to existing Songbird ReMix products (often months before they are updated at DAZ), plus the latest digital and real bird news, tutorials, videos, all the Field Guides, free bird characters, props and much more...

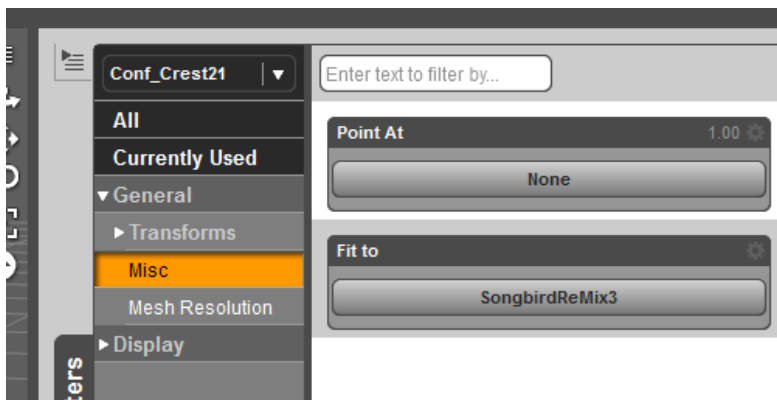
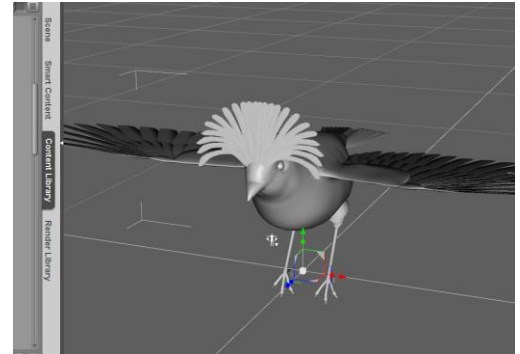
[Songbird ReMix.com](http://SongbirdReMix.com)



How to build a Songbird ReMix Character with a Conforming Crest in DAZ Studio

In the **Runtime** folder, select **Figures** and load the Songbird ReMix Model and the appropriate Conforming Crest in Studio. Select the Conforming Crest by selecting on the screen or in the **Scene** Tab.

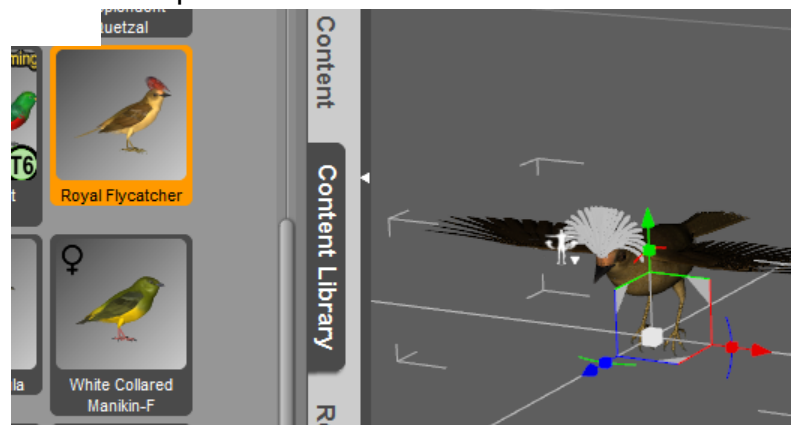
Now, using the “FIT TO” command in the Parameters Tab, Select the Songbird ReMix Model. Go back to the **Scene** Tab and select the Songbird ReMix Model.



Select the Studio **Content** Folder and go to the **Animals : SBRM : !CreateYour Own : Characters** folder and select the appropriate Songbird Remix library. Apply the Character setting to the bird base. It will probably reduce the size significantly and change the shape of the bird.

Now that the bird is sized, select the conforming part and apply the conforming part character settings.

Voila! Your bird is done. Just remember to select the bird base when posing and often there are additional morphs in the conforming part you can use.

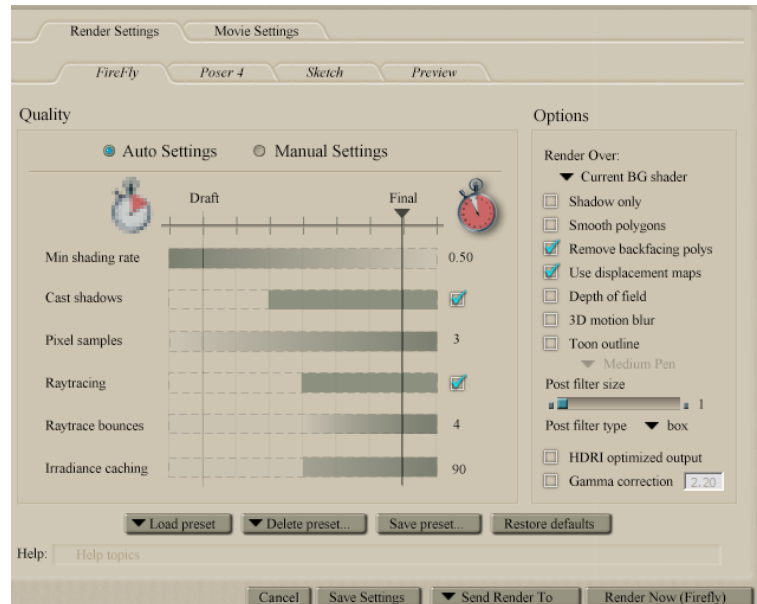


Rendering & Posing Tips

Displacement in Poser 5+

In Poser, several settings will help to bring out the best in this bird set.

Under “Render Settings” (CTRL+Y) make sure you check “**Use Displacement Maps**” and (in some rare cases) the “**Remove Backfacing Polys**” boxes. In some poses, the wing morphs will expose backfacing polygons which tend to render black. Clicking the “Remove Backfacing Polys” fixes this.



In VUE...

Vue has trouble with back-facing polygons which tend to show-up in certain wing and “Fluff” poses. The easiest and fast solution is to limit the amount of bending in the Forearm, Hand and Feather controllers and the hide or limit the ‘Fluff’ used

Bake it! The better (but much slower solution) is to in “Polygon Mesh Options”, **bake the model**. You might also click “Force double-sided baking” as well as playing with the Max smoothing angle and checking Dynamic Subdivison. Put Quality boost into the + area. Then bake it—“baking” will take hours on most computers.

The “Eye” material uses a Poser reflection map; since Vue has a built-in environment, it’s better to use the Vue one and cut down the reflection to 20-50% depending on light in the scene.

I also often find in better to also cut down the “Highlight Global Intensity” to 40% and “Highlight Global Size” to 50% on Plumage, Wings and Beak materials in the “Highlights” section.

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

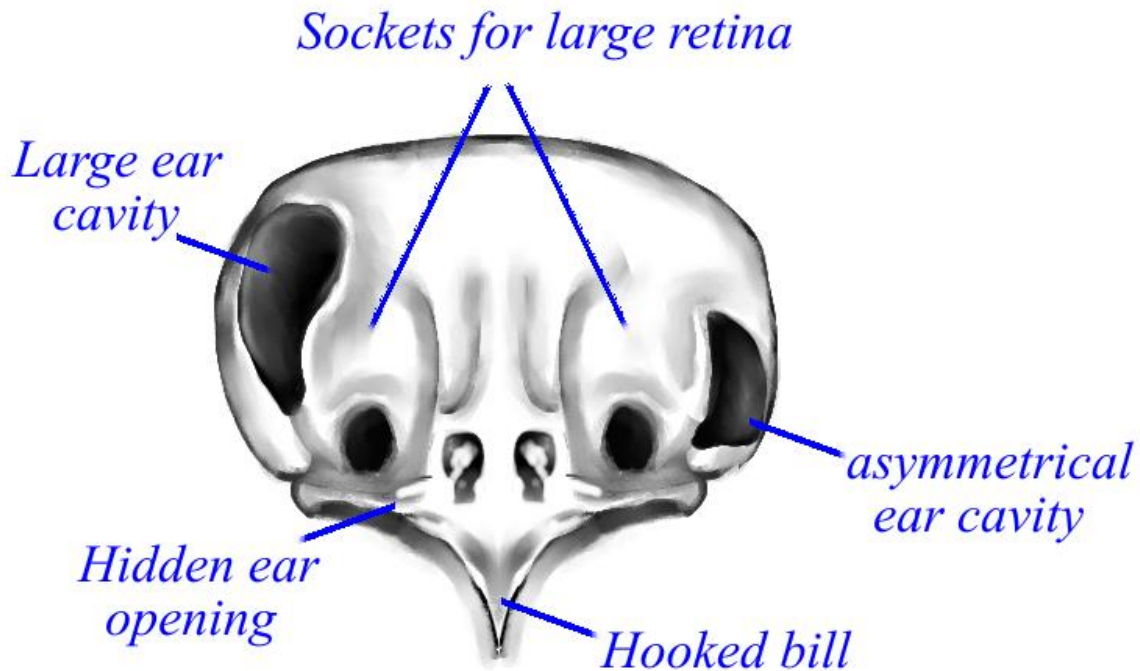
Arctic Circle

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 opening 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. 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 on 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 rangeland, 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. 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 and 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: 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. Territories are maintained by the same pair for as many as 8 consecutive years, however, these Owls are solitary in nature, only staying with their mate during the nesting season. 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 occurs 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. Hunts mainly from a perch in open woodlands, along the edges of open fields or wetlands, or makes 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. 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".

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 light cinnamon. There is rufous spotting on the breast with black anchor marks.

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, 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: 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 wingbeats and they will frequently make long glides, interspersed with rapid wingbeats. 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 multilayered 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 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 ½ inches (13-14 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 understory 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. 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 until 2007 when was seen in the wild for the first time. 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: Females are slightly larger. 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 densities in remaining forest may eventually be affected by a reduction in the availability of

suitable nest hollows and den sites 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 larger than females. 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: Females are significantly larger than Males. 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 the young. At 3 weeks the chicks start to feed themselves and begin to swallow smaller items whole. 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, they 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 ¾ - 8 ¼ inches (20-21 cm); Wingspan: 15 ¾ 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: Females are larger than males. 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: 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 Central** (<http://www.songbirdremix.com>)
- **Songbird ReMix “Bird Brains” User Group and Forum** (<http://artzone.daz3d.com/groups/songbirdremix>)

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