

Songbird  
ReMix

# BIRDS of PREY

*Volume 6: Eagles of the World 2*



Avian Models for 3D Applications  
Characters and Texture Mapping by Ken Gilliland

## Songbird ReMix

# BIRDS of PREY

## Volume VI: Eagles of the World 2

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## Songbird ReMix

# BIRDS of PREY

## Volume VI: Eagles of the World 2

### Introduction

Eagles are large and powerfully built birds of prey. They have elongated heads, heavy beaks and long, broad wings. There are sixty species of eagles; most of which are found in Eurasia and Africa. Outside this area, just fourteen species can be found – two in the United States and Canada, nine in Central and South America, and three in Australia.

Eagles are informally divided into four groups; Fish Eagles, Booted Eagles, Snake Eagles, and Harpy Eagles. Sea eagles or fish eagles take fish as a large part of their diets, either fresh or as carrion. Booted eagles or "true eagles" have feathered lower legs. Snake or serpent eagles are adapted to hunting reptiles. Harpy eagles or "giant forest eagles" are large crested eagles that inhabit tropical forests.

Eagles throughout history have been icons of strength. From national symbols to the sports teams and rock group, eagles are well represented in many cultures in a variety of ways. The Eagle represents spiritual protection, carries prayers, and brings strength, courage, wisdom, illumination of spirit, healing, creation, and knowledge of magic. The eagle has an ability to see hidden spiritual truths, rising above the material to see the spiritual. The eagle has an ability to see the overall pattern, and the connection to spirit guides and teachers. The eagle represents great power and balance, dignity with grace, a connection with higher truths, intuition and a creative spirit grace achieved through knowledge and hard work.

### Overview

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

- **Bird Library:** This folder holds the actual species and poses for the "premade" birds. Birds are placed into a "type" folder (such as "Birds of Prey (Order Falconiformes)" which for example would hold falcons, hawks and eagles). The birds for this set can be found in the following folder(s):
  - ***Birds of Prey2 (Order Accipitriformes)***
- **Manuals:** Contains a link to the online manual for the set.
- **Props:** Contains any props that might be included in the set
- **Resources:** Items in this folder are for creating and customizing your birds
  - **Bird Base Models:** This folder has the blank, untextured model(s) used in this set. These models are primarily for users who wish to experiment with poses or customize their own species of bird. With using physical renderers such as Iray and Superfly, SubD should be turned to at least "3".

## Poser Use

Select **Figures** in the **Runtime** Folder and go to the **Animals : Songbird ReMix** folder. Select the bird from the renderer (*Firefly* or *Superfly*) folder you want and simply click it to load. Some birds in the Songbird ReMix series may load with attached parts (*Conformers*) such as tail or crest extensions. Some of these parts have specific morphs. You will need to click on the attached part to access those controls. Associated poses can be found in the same folder- **Bird Library : (Type) : Poses**.

## DAZ Studio Use

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

## Physical-based Rendering

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

## Where to find your birds and poses

Type Folder	Bird Species
<b>Birds of Prey2 (Order Accipitriformes)</b>	Black Hawk-eagle Black-and-white Hawk-eagle Booted Eagle Changeable Hawk-eagle Javan Hawk-eagle Little Eagle Mountain Serpent-eagle Nicobar Serpent-eagle Rufous-bellied Eagle Solitary Eagle Spanish Eagle Tawny Eagle Verreaux's Eagle White-tailed Eagle

# Morphs and their Use

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

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

## BODY section:

- **Action Morphs**
  - **Common Controls**
    - BeakOpenClose- Controls the opening and closing of the bill
    - EyesFwdBack - Controls the forward and backward movement of the eyes
    - EyesUpDown - Controls the up and down movement of the eyes
    - EyeLidsCloseOpen - Controls the opening and closing of both eyelids. Dialing to -1 will give a rounded eye shape. The individual EyeWink controls should not be used in conjunction with this morph.
    - WingsFold- Puts both Wings into a folded position. Dialing 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.
    - Breast Out - Moves the breast out.
  - **Wing and Tail Controls**
    - These controls allow both wings and each individual wing to perform numerous wing actions and also allows the Tail feather action of cupping.
  - **Neck Bending**
    - These controls allow global bending, twisting and moving side-to-side of the seven neck sections. Partial bending controls can also be found in each individual neck section. There is also a control to scrunch and stretch the neck.
  - **Head Controls**
    - Exp-Smile- Creates a smile expression.
    - Exp-Frown- Creates a frown expression.
    - **EyeLid Movement Section**- has individual controls for left and right EyeWink. These individual EyeWink controls will not work properly when the master EyeLidsCloseOpen morph is used.
    - **Tongue Movement Section**- various morphs control the movement of the tongue.

- **Crest Controls** (these controls are only used with crested eagles and will be non-operational if none of the crest morphs in “Creation Morphs” are active.)
  - CrestDown- Pulls the crest feathers down along the back of the head.
  - FeatherLength- Controls the length of the crest feathers.
  - FeatherWidth- Controls the width of the crest feathers.
  - CrestDisplay- Fans the crest feathers
  - MidFeatherLength- Lengthens the middle feathers of the crest.
  - MidFeatherFwd- Pulls the middle feathers of the crest forward.
  - TopFeatherAskew- Moves the middle feather of the crest askew.
- **Feather Fluff Controls**
  - **Head & Neck**
    - BlowBack- Pulls the fluff feathers from hip to head back.
    - FluffHead- Fluffs up all head feathers.
    - CrestFluffUp- Pulls the head feathers up/out.
    - CrestFluffLength- Controls the length of the head feathers.
    - CrestFluffHide- Hides the head feathers.
    - BackHdFluffUp- Pulls the back head feathers up/out.
    - BackHdFluffLength- Controls the length of the back head feathers.
    - BackHdFluffHide- Hides the back head feathers.
    - JowlFluffOut- Pulls the feathers under the eye area (jowls) out.
    - JowlFluffLength- Controls the length of the jowl feathers.
    - JowlFluffHide- Hides the jowl feathers.
    - ThroatFluffOut- Pulls the feathers on the throat area out.
    - ThroatFluffLength- Controls the length of the throat feathers.
    - ThroatFluffHide- Hides the throat feathers.
    - NeckFluffLength- Controls the length of the neck feathers.
    - NeckFluffOut- Pulls the neck feathers up/out.
    - NeckFluffDroop- Droops the front facing neck feathers.
  - **Main Body**
    - BreastFeathersOut- Pulls the breast feathers out.
    - BreastFluffSidesIn- Pulls the breast feathers sides in so they don't intersect with folded wings.
    - RaiseBackFeathers- Ruffles the feathers on the back of the bird.
    - FlankFluffLength- Controls the length of the flank feathers.
    - FlankFluffOut- Pulls the flank feathers out (not recommended when wings are folded).
    - RumpTopFluff- Controls the transparency feathers on the topside rump/tail of the bird.
    - RumpBtmFluff- Controls the transparency feathers on the underside rump/tail of the bird.
    - RumpFluffSides- Reduces the Fluff on the sides of the rump. Useful when wings are folded.
  - **Thighs**
    - ThighFluffBack- Pulls the thigh feathers back on the thighs.

- ThighFluffOut- Pulls the thigh feathers out to be more fluffy.
  - ThighFluffLength- Controls the length of the thigh fluff.
  - ExpandAnkleBell- Expands the width of the ankle feathers. This control will only work when the “HideShinFeathers” morph in “Creation Morphs” is inactive.
- **Correction Morphs**
  - ThighsIn4Flight - Reduces the thigh lumps caused when legs are brought fully back for flight. This morph should only be used if BOTH thighs are pulled backward for flight.
  - lShinFluffFootUp & rShinFluffFootUp. Raises and lowers the ankle feathers to mitigate feather/foot intersections. These controls will only work when the “HideShinFeathers” morph in “Creation Morphs” is inactive.
- **Creation Morphs**
  - **Common Controls**
    - Sleeker- Thins the torso of the bird.
    - AddBulkTorso- Adds bulk to the torso of the bird.
    - AddBulkThighs- Adds bulk to the thighs of the bird.
    - BreastIn- Reduces/Adds to breast shapes.
    - BreastCrease- Creates a center crease on the breast.
    - BackFlatter- Reduces the curve on the back.
    - RumpAddBulk- Adds bulk to the lower portion of the rump.
    - RumpSleeker- Streamlines the Hip-to-Tail Sections.
    - RumpShorten- Reduces/adds to the length of the rump and tail sections.
    - RumpTaper- Reduces the width of the rump and tail sections.
    - RumpTopFluffWidth- Controls the width of the feathers on the topline rump/tail of the bird.
    - RumpTopFluffExtend- Controls the length of the feathers on the topline rump/tail of the bird.
    - RumpBtmFluffExtend- Controls the length of the feathers on the underside rump/tail of the bird.
    - LegLength- Allows lengthening of the legs.
    - LegThickness- Increases the girth of the shins.
    - FootSize- Controls the size of the feet.
    - MassiveTalons- Lengthens the talons.
    - HideShinFluff- This removes the fluff from the shins for non-“booted” eagles. This morph also makes “ExpandAnkleBell” and the “ShinFluffFootUp” morphs inactive.
  - **Species Crest Shapes**- These morphs create very specific looks to resemble certain species. Using any of these morphs will unlock the morphs found in “Crest Controls” in the “Actions Morphs” section.
    - AfrCrownedUnhide- Used with the African Crowned eagle.
    - AfrHarrierCrestUnhide- For use with the African Harrier-hawk.
    - CrestedEagleUnhide-- Used with Crested eagles.
    - HarpyCrestUnhide- Used with Harpy Crested-like eagles.
    - LowCrestUnhide- Used with low-crested eagles.

- PhilippineEagleUnhide- Used with the Philippine eagle. It creates a lion's mane-like crest.
  - **Head Shaping**
    - **Head Shapes-** These morphs control the shape of the head.
      - Hd-BigHead- Makes the head and neck parts around 30% larger
      - Hd-WedgeHead- Tapers the head from bill to back of head.
      - Hd-Rounder- Adds to the width of the head.
      - Hd-PuffOutBHead- Adds to the width of the back portions of the head.
      - Hd-ThickenUpperNeck- Adds bulk to the upper neck.
      - Hd-ThickenNeckSides- Adds bulk to the sides of the upper neck.
      - Hd-FillOutNeck- Adds bulk to the sides of the whole neck.
      - Hd-FlattenCrown- Flattens the crown of the head.
      - Hd-RaiseCrown- Raises the crown of the head.
      - Hd-ForeheadLow- Reduces the forehead extending to the beak.
      - Hd-NoForehead- Reduces the forehead portion and expands the beak.
      - Hd-ForeheadOut- Adds to the forehead extending to the beak.
      - Hd-NostrilLump- Adds or subtracts from the forehead/beak area.
      - Hd-BackHeadDown- Reduces/slopes the back of the head to neck.
      - Hd-BackHeadUp- Expands/angles the back of the head to neck.
      - Hd-BigBrows- Expands the eyebrow area out.
      - Hd-BrowDownFront- Angles the front of the eyebrow area down.
      - Hd-BigBrowFwd- Expands the entire brow area forward.
      - Hd-ExpandJowls- Thickens the jowl/cheek area.
      - Hd-ForeheadSplit- Adds a center crease to the forehead area.
      - HawkHead- Shapes the head for Hawks.
      - SuperOrbitalRidges- Makes Super-orbital Ridges (common in many Birds of Prey, especially eagles) more pronounced.
    - **Eye Shapes-** These morphs can change the appearance of the eyes.
      - Ey-Dilate- Controls the pupil size of the eyes.
      - Ey-BiggerEyes- Makes eyes about 20% larger.
    - **Beak Shapes-** These morphs can change the appearance of the bill.
      - Bk-Length- Controls the length of the beak.
      - Bk-Height- Controls the height of the beak.
      - Bk-Width- Controls the width of the beak.
      - Bk-SidesIn- Controls the width of the mid-portion of the beak.
      - Bk-UpperRounder- Rounds the top of the upper beak.
      - Bk-UpperFlatter- Flattens/angles the top of the upper beak.
      - Bk-UpperBeakCurve- Adds some curving to the mouth edge of the upper beak.
      - Bk-UpperBeakRaiseEnd—Raise the end of the upper beak giving an eagle-like shape.
      - Bk-TomialTooth- Adds the tomial tooth found in the falcon family.



- Bk-Notch- Adds a beak notch common in the hawk family.
- Bk-Hook- Extends the hook on the upper beak.
- Bk-CornersBack- Moves the corners of the beak forward or back.
- **Nostril Shapes**
  - Bk-MoveNostrils- Moves the nostrils on the bill forward and back.
  - Bk-ThinNostrils- thins the nostrils.
  - Bk-NostrilLength- makes the nostrils longer.
  - Bk-TearDropNostril- makes the nostrils more of a comma-type shape.
  - Bk-VerticalNostril- makes the nostrils shape a vertical slit rather than its default more horizontal shape.
- **Tongue Shapes**
  - Tng-Length- Controls the length of the tongue.
  - Tng-Width- Controls the width of the tongue.
- **Wing Shapes-** These morphs control the shape of the wings.
  - WingSpan- Allows control of Wing Length.
  - WingWidth- Expands the width of the wings.
  - WingsPoint- Brings the tips of the wings to a point.
  - HawkWingShape1- Controls the shape of the leading primary flight feathers
  - HawkWingShape2- Controls the shape of the secondary flight feathers
- **Tail Shapes-** These morphs control the shape of the tail feathers.
  - TailFanStyle- Creates the shape of the tail spread. 1=Fan, 0=Wedge,
  - 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.

## Female Species

For the most part, the female eagles have not been included in the set. The reasoning is that there is little different between the sexes other than size, which can easily be created on the fly. Female eagles are usually 10-15% larger than the males and up to 30% heavier. So, for example, a female could be created from the male of the species by adding up to 10% to its scale and adding 30% to the “Creation Morphs” such as “AddBulkTorso”, “AddBulkThighs” and/or negative amounts to “Sleeker” (if the dial is active).

**Songbird ReMix**

# **BIRDS of PREY**

Volume VI: Eagles of the World 2

## **Field Guide**

### **Sea or Fish Eagles**

White-tailed Sea-eagle

### **Booted Eagles**

Verreaux's Eagle

Changeable Hawk-eagle

Javan Hawk-eagle

Black Hawk-eagle

Booted Eagle

Little Eagle

Spanish Eagle

Rufous-bellied Eagle

Tawny Eagle

Black-and-white Hawk-eagle

### **Snake Eagles**

Nicobar Serpent-eagle

Mountain Serpent-eagle

### **Harpy or Giant Forest Eagles**

Solitary Eagle

**Common Name:** White-tailed Sea-eagle  
**Scientific Name:** *Haliaeetus albicilla*

**Size:** 29.1-36.2 inches (74-92 cm); **Wingspan:** 76-96.1 inches (193-244 cm)

**Habitat:** Worldwide; it can be found in southwestern Greenland, western Iceland, northern and central Eurasia south to Greece and Turkey, the southern Caspian Sea, Lake Balkhash and northeastern China. Its former range spread to lower the Yangtze River and very likely in to Egypt. It has bred on Attu Island (Western Aleutian Islands). It winters southward to the northern coast of the Mediterranean Sea, Israel, the Persian Gulf, Pakistan, northern India, northern Myanmar and southeastern China.



It lives in diverse aquatic habitats, both freshwater and marine including coasts, rocky islands, lakes, large rivers and large marshes. It can be found from desert to Arctic biomes. For nesting and roosting, it requires proximity to sea cliffs or to forests, the latter ideally with tall trees. It is rarely far from the coast or large stretches of water, and normally in the lowlands. It will frequent commercial fish farms and carp ponds in some areas.

**Status:** Least Concern. **Global**

**Population:** 42,700,000 adult individuals with an increasing population trend. It was previously considered “Vulnerable” with a marked decline historically from 19th century, which included a drastic reduction and extinction from extensive areas (British Isles, Faeroes, western Europe and most of the Mediterranean. This trend reversed with recolonizations in different periods of 20th century, becoming generalized from 1980s.

Threats that affect this species include loss and degradation of wetlands, human disturbance and persecution, environmental pollution, collision with wind generators, and indiscriminate use of poisons. Modern forestry methods reduce the availability of suitable nesting habitat. Organochlorine pesticide and heavy metal pollution resulted in reductions in breeding success, particularly in the Baltic region. Although some losses may be taking place in Asian Russia owing to increased logging and oil industry development, these are outweighed by increases in Europe.

Accidental lead poisoning from spent ammunition remains a considerable source of mortality in Finland, with other anthropogenic causes of death including collisions with traffic and power lines or deliberate shooting. Overall, this study found that anthropogenic factors accounted for 60% of eagle deaths. Loss of large trees has left a deficit of suitable nesting sites, and increasing habituation to humans has meant that eagles nest closer to cities. This has increased the number of collisions between eagles and traffic, and may be linked to lower breeding success. Collisions with wind turbines is an additional source of mortality, though the risk can be mitigated with adaptive management. Birds are also occasionally threatened by outbreaks of the avian influenza virus.

**Diet:** A wide range of food types, including fish, small birds and, less often, mammals

Fish are probably main prey in many areas; some taken are dead or dying. They are normally caught without plunging; selecting species that swim near surface such as lump-sucker, cod and pike. Its avian prey is mainly seabirds and waterbirds; particularly species that dive, which are attacked on water, sometimes being chased to exhaustion by pair of eagles. It has been seen catches ducks in flight.

During breeding season, it often steals chicks and sometimes eggs from colonies, particularly of eiders and other *Anatidae*, auks, shags, gulls and coots. Mammals include rodents, rabbits and hares, and ungulates (sheep, goats and deer which are almost exclusively taken as carrion, although young individuals sometimes hunted). It will also steal from other birds such as ospreys, other eagles and cormorants. It has learned to take offal from fishing boats and exploits easy fishing in fish breeding ponds.

**Nesting:** Males and females are alike, however females are up to 25% larger than the males. It has a white tail, yellow bill and a yellow iris. Its head and neck are a pale buff. Its upper parts are fairly pale, with the wing coverts and upper back a yellowish-brown. Its tail is wedge-shaped. The juvenile is a blackish-brown, with its tail, head, bill and irides all dark. There are whitish markings on the axillaries. It gradually attains adult plumage over 5–6 years, but the tail is not white until 8th year. The bill turns yellow after 4–5 years.

Egg laying dates vary considerably with latitude; January in the south of its range and April through May in the Arctic regions. It nests mainly on ledges of sea cliffs or on high trees. In a tree, the nest placed in fork or touching trunk. Each pair normally has 2–3 nests, which are used alternately. It is an enormous structures of sticks and branches,

which in time can become several meters deep and wide. The nest cup lined with materials such as moss, grass, lichens, ferns, seaweed or wool. Incubation lasts 34 to 46 days per egg, starting with first egg. Adults share in the incubation and care of the young. The chick fledges after 70–90 days and the young eagle will continue to depend on the adults for at least 30 days more. Breeding failure can be very high.

**Cool Facts:** The White-tailed Sea-eagle can live for up to 27 years.

**Common Name:** Verreaux's Eagle

**Scientific Name:** *Aquila verreauxii*

**Size:** 31.5-35.4 inches (80-90 cm); **Wingspan:** 72.3-86.2 inches (181-219 cm)

**Habitat:** Africa; distributed throughout Eastern Africa from eastern Sudan, Eritrea, and Ethiopia to Somalia and thence south, with the main range from Kenya south to South Africa and then north through western Namibia and southwestern Angola. There are isolated populations in Egypt and Middle East (Sinai, Israel, Jordan, and especially Arabian Peninsula), and in eastern Chad and western Sudan. It has bred in Niger (Air Mts), and been recorded in Mauritania, Mali, Algeria, and Cameroon.

It prefers drier areas (with <75 cm of rainfall), and has shown some adaptability to forest clearance. It is generally seen in river gorges, rocky outcrops, kopjes, hills, and mountains, from sea level to over 5,000 m wherever hyrax (dassies) prey occurs

**Status:** Least Concern. **Global population:** 21,600,000 mature individuals with a stable population trend. Because the rugged terrain where they live is often the last to be modified, this species is largely unaffected by human activities. There have been some species declines where drought, overgrazing, and hunting combine to reduce hyrax prey. They are persecuted heavily in some areas of small stock farming, and have been eliminated from parts of southern Africa. However, in South Africa it



appears to thrive in some agriculturally transformed areas, with breeding increasing in the intensively farmed Sandveld region.

**Diet:** Hyraxes (*Procavia*, *Heterohyrax*) make at least 60-90% of its diet. This is supplemented with various other medium-sized mammals (including young antelopes, hares, rabbits, mongooses, meerkats, baboons), birds (such as francolins, guineafowl, pigeons, crows), and reptiles (including snakes, lizards, and tortoises). In rare instances it has attacked small livestock (lambs and goats; 1). South of equator, sometimes this eagle is more dependent on red rockhares (*Pronolagus*) than rock hyraxes.

It hunts mainly in flight, stooping from a height or swooping rapidly around a hillside to surprise prey. Most prey is terrestrial, but sometimes it will strike at treetop victims. Pairs often hunt in tandem, with one bird distracting potential prey while other strikes.

**Nesting:** It is a large-sized eagle with prominent head, a long slightly rounded tail (which is more wedge-shaped in female) and paddle-shaped wings (especially pronounced in female). It is a large, dark brownish-black eagle, with distinctive white patches on the back and at the base of the primaries. Its wings may be slightly raised when gliding and are held in shallow V when soaring. Other eagles in the range lack that distinctive shape. The white back and white patches in the primaries are notable against black plumage in flight, together with narrow base to wing. Juveniles are characterized by being relatively small-headed, long-necked, large-shouldered, long-legged, and 'tightly feathered,' with an uniform black ear-coverts, a black throat and breast, with pale, V-shaped tips to feathers, Its mantle is chestnut and the lower nape, and remiges are almost black, contrasting strongly with pale-tipped upper wing-coverts which form a white patch at the shoulder. It achieves adult plumage at either five or six years old.

Aerial displays witnessed virtually year-round. Both sexes (but mainly female) build massive nest of live and dead sticks, thickly lined with sprays of green leaves, on a cliff ledge or in cave. Pairs either alternate between two different nests, or the same structure may be used annually (though most pairs miss one year in three), sometimes for decades. Egg laying in November-January in southwestern Arabia, but apparently from October in Oman; August-December in northeast Africa; February-September in east Africa (with the peak in June-July); April-August in southern and central Africa (peak May-July). Usually two variably marked eggs are laid and incubated for 43-47 days. The eggs are incubated mostly or entirely by female. Once hatched, they are fed almost entirely by female, provisioned by male. The elder chick almost invariably kills younger sibling soon after hatching. Fledging takes 84-99 days and the young remain dependent on its parents for an additional 125 days.

This eagle has been reported to throw, drop, or kick rocks, earth, and other missiles to repel predators and intruder from its nest.

**Cool Facts:** Verreaux's Eagle is the most studied eagle in Africa. It is usually silent, and most vocalizations are rare and only heard near an active nest. The “Cluck” call (a turkey-like staccato *cluck, chuck*) is given by adults near the nest mainly when carrying prey, and is also uttered by begging young. Yelp calls and barks have been heard by a pair in display flight.



**Common Name:** Changeable Hawk-eagle  
**Scientific Name:** *Nisaetus cirrhatus*

**Size:** 20-32.2 inches (51-82 cm); **Wingspan:** 30.4-63 inches (100-160 cm)

**Habitat:** Asia; found through the Indian subcontinent and Indonesia.

It prefers deciduous and evergreen forest, as well as secondary forest, gallery forest, savanna, forested villages, tea and teak plantations. It is often seen in the lowlands and

foothills from sea-level to 2200 m (but mostly below 1500 m) at forest edges and in open woodland. It rarely ventures inside dense forests, where it is replaced by Wallace's Hawk-eagle (*N. nanus*) or Blyth's Hawk-eagle (*N. alboniger*).

**Status:** Least Concern. **Global population:** 15,400,000 individuals with a declining population trend. It is scarce on Java due to deforestation, and thought to be declining locally elsewhere owing to habitat destruction and human disturbance.

**Diet:** Small and large birds, snakes, frogs, lizards and small mammals (squirrels, rats, hares, and occasionally



monkeys and tree shrews).

It hunts similar to a goshawk, from concealed perch inside the forest edge. Prey are captured after short rapid stoop. It will scavenge on occasion.

**Nesting:** This hawk eagle occurring in two forms; crested and crestless. It is dark brown above, and heavily streaked dark on the whitish under parts. Its iris is yellow to orange-yellow as an adult, and grayish-brown to pale greenish-yellow as a juvenile. Its cere is gray to greenish-brown as an adult, and dull grayish with juveniles. Its feet are yellow. It differs from other Asiatic *Nisaetus* species in that the leg feathering does not extend down between the toes. The juvenile is similar, but has a pale head and less heavily marked under parts.

Breeding season varies on location and climate; usually December through May on Borneo, Sumatra, Sri Lanka and Malay Peninsula, November through May in India and April through August on Java. The breeding display consists of pair soaring over territory, constantly calling. A large stick nest is built by the pair 6–50 m up in the crown (or high fork) in a large tree. The clutch is one white egg, incubated exclusively by the female for about 50 days. Fledging occurs after about 68 days, and another 62 days before the juvenile becomes independent.

**Cool Facts:** What makes this Hawk-eagle changeable? The word 'changeable' refers to the changing dark morph to pale morph and vice-versa.

There are five recognized subspecies with are divided into two groups:

#### **The Crested Group**

- *N. c. cirrhatus*. The nominate subspecies is found in India south of Rajasthan and the Gangetic Plain.
- *N. c. ceylanensis*. This subspecies is endemic to Sri Lanka. This race is monomorphic, with a long crest, similar to the nominate race but smaller.

#### **The Changeable Group**

- *N. c. limnaeetus*. This subspecies is found in northern India and Nepal eastward through Bangladesh, Myanmar, Indochina and Malay Peninsula to the Greater Sundas and the western and southeastern Philippines (Palawan, Mindoro, Mindanao). This race lacks the crest and has a light morph that is more heavily streaked below than the nominate and a dark morph (that has not been recorded in northern India).
- *N. c. andamanensis*. This race is endemic to the Andaman Islands. It is monomorphic and crestless (or nearly so), but otherwise fairly similar to the nominate race. Race *andamanensis* is more or less intermediate between “Crested” group and the “Changeable” group, perhaps representing a transitional stage
- *N. c. vanheurni*. This race is endemic to Simeulue Island (off of western Sumatra). It is monomorphic and crestless (or nearly so), but otherwise fairly similar to the nominate race.

**Common Name:** Javan Hawk-eagle

**Scientific Name:** *Nisaetus bartelsi*

**Size:** 22-23.6 inches (56-60 cm); **Wingspan:** 43.3-51.2 inches (110-130 cm)

**Habitat:** Asia; it is endemic to Java.

Its preferred habitat is humid tropical forest. It will forage, to lesser extent, in secondary forest and other disturbed habitats such as tea plantations and agricultural lands. Juvenile and immature birds tend to occupy these areas more than do adults. It is typically found from 200–1200 m. Because of the extensive deforestation of lowland forests in Java, the range is now largely confined to steep slopes, ridges and mountains.



**Status:** **Endangered**. **Global population:** 300-500 mature individuals with a declining population trend. Most of the population occurs in small forest reserves, which urgently require rigorous protection measures. The chronic loss of forest has been a major factor

in decline of species which is a product of exponential growth of human population in Java. However, since little deforestation now occurs on Java, illegal trade has become the most serious contemporary threat to this species. It is regularly seen in Jakarta bird markets, with some 30–40 individuals, a figure conceivably equivalent to the species' annual productivity, reported in trade each year. Dispersing immatures are particularly vulnerable, as they tend to wander into areas with denser human population. Shooting also seems to have accounted for fair numbers of deaths. It has been designated a National Rare Animal in Indonesia in 1993 to help protect it, which conversely, stimulated illegal trade by increasing demand for the species (zoo holdings have increased, for example). Thus, putting a rare species in the spotlight to bring attention to conservation concerns should be done with close cooperation among conservation NGOs and government organizations, with appropriate legislation and management plans to prevent over-exploitation. A captive breeding program has been running since 1996, but had failed to produce any offspring by 2006.

**Diet:** A wide variety of vertebrate prey; including rats, squirrels, tree shrews, monkeys, Sunda stink badgers, lesser mouse deer, domestic chickens, partridges, button-quails, doves, frogmouths, woodpeckers, bulbuls, snakes and lizards.

As with most Hawk-eagles, it prefers to hunt from a perched location, capturing prey on ground or in trees, and occasionally from flight.

**Nesting:** A medium-sized hawk-eagle, with prominent black crest, dark upper parts, a white throat with dark vertical stripe, whitish under parts with streaking on upper breast and heavy barring on the belly, flanks and thighs. Its tail is fairly long and with 3–4 dark bands. The juvenile has a rufous-buff head and under parts (which are unmarked). The iris is yellow in the adult and blue-gray in the juvenile. Its cere is blackish-gray to gray and its feet are yellow.

Egg-laying has been reported from December to July. The nest is built by pair out of sticks and lined with green leaves, placed in tall tree 15–50 m above ground. Usually only one egg is laid and incubation is mostly by the female and lasting 47–48 days. The chick fledges after about 70 days, but may remain with parents for a year or more.

**Cool Facts:** It is the national bird of Indonesia, where it is commonly referred to as “Garuda”, from the bird-like creatures in Hindu and Buddhist mythology. The scientific name commemorates the Bartels family, who discovered it.

**Common Name:** Black Hawk-eagle  
**Scientific Name:** *Spizaetus tyrannus*

**Size:** 22.8-28 inches (58-71 cm); **Wingspan:** 55.1 inches (140 cm)

**Habitat:** North and South America; it occurs from Mexico south through the Amazon basin as well as in Atlantic coastal forest from eastern Brazil south to northern Argentina.

It is found in the lowlands and forests with its upper elevational limit is reported as 1000 m on the Atlantic slope in Mexico, but, locally, up to 1500 m on the Pacific slope.

**Status:** Least Concern. **Global population:** 17,500,000 adult individuals with a suspected declining population trend. The degradation of forests is the major cause of population declines in this species, following in importance by shooting and pesticide use. Farmers kill the Black Hawk-Eagle because it is said to be of danger to domestic birds (e.g., hens). Hunting and pet trade exploitation also reduces prey (such as toucans) which in turn affects Black Hawk-eagle populations.

**Diet:** Birds and mammals, up to the size of a large toucan or small junglefowl. Within mammals, it preys upon arboreal mammals (e.g., squirrels, small monkeys and bats) and nocturnal marsupials. It also preys on reptiles such as iguanas and snakes. The percentage of diet can change through different places, for example, in Mexico, 82% of prey were birds and the rest being small-medium mammals, while in Belize and Guatemala, 96% of prey were mammals (and 31% of that were bats).



Hunting relies on perches; moving from perch to perch, then flying from the perch with great speed in order to ambush its prey. It is usually alone, but occasionally seen in pairs,

**Nesting:** A large raptor with a a conspicuous crest on the crown, of black feathers with white bases. Overall, the plumage is mostly glossy black. The wings are very broad, and the tail is long and rounded. The under parts of the wings are barred with white, and the tail has broad gray bars. Females are like males, but larger. In juveniles, the plumage is much paler. The head is a mixture of white and yellowish beige, the breast is streaked black and brown, and belly is mottled black and white.

Very little is known about breeding. In Panama, chicks were recorded in February, young with feathers in July and fledglings in August. The young have a large dependency period; consequently, it seems that parents nest only every third year (in Panama and the Yucatan Peninsula).

**Cool Facts:** The Black Hawk-Eagle is considered a rare but conspicuous raptor, mostly due to its loud calls when soaring above the forest canopy. There are two subspecies; they differ in size and the pattern of barring.

- *S. t. serus*. This race is found in central Mexico (San Luis Potosí, Veracruz) southward through Central America to Colombia, east of the Andes eastward to Venezuela, Trinidad and the Guianas, and southward to eastern Peru, Bolivia (east to Santa Cruz) and northern and central Brazil. It is also found also west of the Andes in western Ecuador and extreme northwestern Peru (Tumbes). It averages smaller than the nominate and the under wing coverts are less heavily marked with black, but the flanks and tibiae more heavily marked with white crossbars.
- *S. t. tyrannus*. The nominate race is found in eastern and southern Brazil, eastern Paraguay and extreme northeastern Argentina (Misiones).

**Common Name:** Booted Eagle  
**Scientific Name:** *Hieraaetus pennatus*

**Size:** 16.5-20 inches (42-51 cm); **Wingspan:** 44.5-54.3 inches (113-138 cm)

**Habitat:** Eurasia and Africa; distributed through southwestern Europe and northwestern Africa to eastern Europe, Asia Minor and Caucasus to central Asia, northeasterly to Mongolia, the Baikal Lake area and Transbaikalia (perhaps eastward to northeastern China too), and southeast to northern and western Pakistan, northern India and Nepal. It is also in the southern part of South Africa (Western Cape and Eastern Cape) and northern Namibia. It winters mostly in Africa; south of Sahara, and in southern Asia, mostly in the Indian Subcontinent.



It prefers forests and woods mixed with open areas, often in open woodland. Type of woods varies, including closed forests of black pine (*Pinus nigra*) in Spain and broad leaved, coniferous, mixed woods and olive and palm groves in Morocco. It can also be found on the flat lands, low hills and mountain slopes; up to 3000 m in India, 2700 m in northern Africa, and 2000 m in Bulgaria. In Cape Province, South Africa, it occurs in mountainous terrain, with cliffs, low bushes and karoid scrub.

**Status:** Least Concern. **Global population:** 150,000-195,000 adult individuals with a stable population trend. Some negative

factors affecting this species are habitat degradation, decline in prey species, and human persecution. It is declining in Ukraine owing to deforestation.

**Diet:** Small and medium-sized birds (from small passerines to pigeons, gamebirds, domestic fowl and corvids), mammals (including mice, susliks, squirrels, pikas, and rabbits), reptiles (the Ocellated Lizard is important in some parts of Spain and the Caucasian Agama in parts of Pakistan), and some insects (locusts and termite alates in southern Africa).

It hunts in open or wooded areas and captures prey mainly on ground, stooping from air or after spotting prey from vantage perch. Sometimes, a pair may hunt together.

**Nesting:** This eagle has two distinct color morphs, with several intermediate plumages. Both morphs have a broad pale band across upper wings and pale upper tail coverts. The pale morph is more common and shows whitish under parts and under wing coverts, contrasting markedly with flight feathers, which are very dark. Apart from paler, the innermost primaries are slightly translucent. The dark morph replaces most of the whitish areas with a light brown. In the adult, the irises are dark yellow-brown to orange-brown or reddish-brown and the cere and feet are yellow. Juveniles are also polymorphic, and very similar to adult, especially in dark morph. The juvenile pale morph has more streaking and reddish-brown tint below. The iris is a gray-brown.

Egg laying begins in April and May in the North of its range and late September in Cape Province. They build their nests in trees in woods, or sometimes in solitary trees. In some regions (particularly Africa), nests are built on ledges, in clefts and on small trees on cliff faces. The nest is large (45–120 cm across, 40–60 cm deep), and built of sticks and twigs, then lined with fresh leaves. Normally 2 eggs laid at interval of 2–3 days and the incubation lasts 37–40 days, and is performed by female. The male brings all food during incubation and beginning of fledging period. Fledging 50–54 days and the juveniles may stay with adults for another 47 (or more) days.

**Cool Facts:** The size of this eagle varies from West to East with birds getting larger the more easterly they are found.



**Common Name:** Little Eagle

**Scientific Name:** *Hieraaetus morphnoides*

**Size:** 17–21.5 inches (45-55 cm); **Wingspan:** 43.3-53.5 inches (110-136 cm)

**Habitat:** Australia; it is endemic and occurs throughout most of continental Australia.

The Little Eagle frequents a variety of open and forested habitats, sparsely wooded foothills, scrub, timbered lands near water, and savanna, from sea level to 1,500 m. Typically, it occurs in undulating or rough, hilly country, but also on flat terrain; it generally shuns treeless areas, dense forests, and urban areas. Wooded habitats used by this species are typically dominated by Eucalyptus or Acacia trees, but it will hunt over rainforest canopy and use exotic conifer (*Pinus*) plantations. Open habitats include grassland, shrub-steppe, sparsely vegetated plains, vegetated floodplains, and agricultural or pastoral land. It nests in forest and woodland, in mature live trees, often in riparian habitats in the arid zone.

**Status:** Least Concern. **Global**

**population:** 10,000-100,000 adult individuals with a stable population trend. The little eagle was declared as 'Vulnerable' in the Australian Capital Territory (ACT) "under Section 38 of the Nature Conservation Act 1980". It was also listed as 'Vulnerable' in New South Wales (NSW) in Part 1 of Schedule 2 of "the NSW Threatened Species Conservation Act 1995" and Gazetted on 12 February 2012.

The main threats to the species are the destruction and degradation of its foraging and breeding habitat causing it to come into competition with the larger and more dominant Wedge-tailed Eagle (*Aquila audax*).



**Diet:** Mammals (terrestrial species), birds and lizards. In the temperate zone, it sometimes scavenges on road-killed vertebrates in the same size range as captured prey or somewhat larger (adult hares), and more rarely on larger dead mammals.

**Nesting:** A medium-sized, brown-and-white or brown raptor, though small for an eagle. It is polymorphic, with light and dark morphs. Plumage changes slightly with age. Adults of the light morph are brown dorsally and rufous to sandy on the head, merging with the white belly; the pale upper wing coverts produce a contrasting diagonal bar. The under wing pattern is distinctive, with a rufous inner wedge, white 'M' marking, and black-tipped primaries. The dark morph is similar dorsally but dusker ventrally, with dark-streaked sandy to smoky chestnut underparts, and a dark brown oblique band on the under wing contrasting with the pale inner primaries. The bill is blue gray tipped black, the cere is gray or cream, the irides are reddish brown to orangish brown, and the feet are pale gray or cream. The sexes are similar within their respective morph, although females tend to be more heavily streaked ventrally, and in the light morph may show more extensive rufous smudging on the under parts. Juveniles are similar to adults of the respective morph, but are more rufous and less streaked on the head and under

parts, with a darker and less contrasting upper wing bar, and some have rufous-tipped lesser upper wing coverts. They also have brown irides, and cream to pale yellow cere and feet. Plumages are the same throughout the year, although in juveniles the rufous under parts of the light morph and the pale upper wing bar quickly bleach and fade, approaching the adult



condition. Juveniles also have a thin pale line along the center of the spread upper wing (formed by pale tips to the greater coverts) and, in fresh plumage when backlit, a uniform thin translucent trailing edge to the wings and tail. These features are worn off or interrupted in adults with a mixture of old and new feathers. Immatures in their second year are rather intermediate, with increasing black streaks on the crown, face and under parts, and light brown irides.

**Cool Facts:** John Gould described the Little Eagle in 1841. The distinctive pygmy eagle has long been considered a subspecies, but a 2009 genetic study shows it to be distinctive genetically and warranted species status.

**Common Name:** Spanish Eagle  
**Scientific Name:** *Aquila adalberti*

**Size:** 29-33.5 inches (74–85 cm); **Wingspan:** 69.7-86.6 inches (177–220 cm)

**Habitat:** Europe; endemic to Spain.

**Status:** Vulnerable.  
**Global population:** 1,060-1,080 adult individuals with a stable to increasing population trend. It has a very small population, which is dependent on continuing intensive management measures to mitigate the impact of threats such as poisoning, electrocution, shooting, collision with wind turbines and insufficient food availability. Having increased steadily during the end of the 20th and beginning of the 21st century, the population now appears to have reached a plateau.

**Diet:** Mammals (mostly European rabbit) make up 66% of its diet. Additional prey consists of birds (32.9%) and reptiles (0.5%). This diet may vary regionally; for example, in Doñana, where most eagles reproduce around marsh habitats, birds accounted for 51.4% of prey items, mammals 46.6%, reptiles 1.5%, and fish/other prey 0.5%.

This eagle employs four different hunting strategies: hunting in flight, still-hunting from a perch, kleptoparasitism, and scavenging.



**Nesting:** A very large dark eagle. Females are 10% larger than males and up to 40% heavier. Adults have a blackish-brown body with long and broad wings with conspicuous white feathered leading edges, and white feathers on the back/wing connection. They also have yellowish-brown feathers on the nape with a blackish triangle-shaped patch on the forecrown. The primaries and secondaries are blackish brown. The rectrices are mottled gray (may appear lightly barred) with a wide black subterminal band and a thin, pale terminal band (when freshly molted). According to the pattern of white feathers of the shoulders, adults exhibit eight plumage types which allows them to be individually recognized. The iris is brown, but varies slightly in coloration. The tarsi are feathered.

Juveniles have uniform reddish brown-gray (with orange tone) to body, head, and wing and tail coverts. Immatures and sub-adults (ages 3–5 years) differ from juveniles, depending on their stage of molt, in having contour feathers blackish brown, interspersed with yellowish brown-gray feathers. Older sub-adults begin to show their characteristic white patches on the wings and back. Adulthood is reached at 5–6 years.

It reproduces annually and is generally monogamous, with pair bonds maintained over many years. Nests are built in trees and frequently reused from year to year. The nest cup is lined with green twigs, fur and grass. Each pair will have 2–6 nests, but the reuse of the same nest in consecutive seasons is fairly common. The time from egg-laying until fledging can last 114 days and the period of dependency extends between 2 to 3 months more.

**Cool Facts:** It originally populated northern Africa and the Iberian Peninsula, and was reduced to near extinction in the 1970s, with barely 50 breeding pairs recorded in 1974. These remaining pairs retreated to the most remote mountains and reserves in Spain: Monte del Pardo (Madrid), Sierras de San Pedro and Monfragüe (Cáceres), Montes de Toledo (Toledo), and Sierra Morena and Doñana National Park (Andalusia). In Portugal and Morocco, it was extirpated (or very nearly so) by the late 1900s.

In the late 1960s, Jesús Garzón Heydt initiated a recovery effort that involved locating breeding territories and documenting a large percentage of chicks lost via siblicide. He pioneered strategies to counter this behavior, rescuing rejected chicks and collecting eggs for artificial incubation. Heydt then reintroduced young into wild nests using fostering techniques. The adoptive parents often accepted the juveniles, and many adoptees joined the breeding population years later.

Heydt's work raised awareness of the Spanish Eagle throughout Spain, creating interest in its study and conservation. As a result, social and legislative measures implemented in the 1980s began to improve the species' status. Spain enacted strict legislation protecting the eagle, and in 1989, it banned the use of poisoned bait as a wildlife control method, minimizing the availability of carcasses that would poison the eagles that consumed them. Electrocution was also a leading cause of death. In a coordinated response funded by Spanish institutions and the European Union, thousands of

electricity pylons (transmission towers) were retrofitted in the most important breeding and dispersal areas.

The decline of the Spanish Eagle in the 1900s was compounded by the shortage of its main prey, the European rabbit (*Oryctolagus cuniculus*). Viral diseases like myxomatosis and rabbit hemorrhagic disease decimated the rabbit population throughout the Iberian Peninsula, leading to decreased fertility and breeding failure for the eagle. Supplemental feeding programs included in conservation plans helped to stabilize the population, resulting in the successful fledging of chicks and an increase in juvenile survival. European rabbit populations eventually began to recover, especially in agricultural areas, and the eagle has colonized new breeding areas with high-density rabbit populations.

As of 2019, the breeding population consisted of 647 occupied territories in central and southern Iberia (630 pairs in Spain, 17 pairs in Portugal), and the population continues to expand. Based on studies of habitat selection conducted during the nadir of the eagle's existence, it seems to prefer mountain regions dominated by mature forest, far from human activity. Thankfully, protection provided during that time by several large private estates ensured the survival of a core population. More recently, recovery of the European rabbit population has led to expansion of the Spanish Eagle outside the mountains, though it still tends to avoid human activity, often selecting large trees in which to locate its nest.

The increasing popularity of wildlife photography poses danger to the Spanish Eagle (e.g., ecotourists including birdwatchers, hikers, and photographers caused many of the disturbances observed during the nest surveillance program. Photographers use food to attract eagles, and these artificial feeding stations usually are established at inappropriate locations that create conflict between species and among the eagles themselves. Interactions between eagles and foxes have increased, and these conflicts often are encouraged by photographers seeking to capture a dramatic image. This forced behavior is abnormal and occurs rarely in nature or at the supplementary feeding stations designed using scientific data. For example, during field studies at supplementary feeding stations by González et al., there were few recorded interactions between eagles and other predators, and no interactions between eagles and other breeding pairs. In Extremadura, commercial photographers set up a blind at a feeding station in an area where two breeding territories overlapped, setting the stage for antagonistic interactions between eagles from each territory. Because of the continuous fighting that ensued, both nests lost eggs. The indiscriminate placement of these feeding sites has potential to injure or kill an eagle by interspecific or intraspecific agonistic interactions. The negative effects can be reduced by regulations that designate appropriate sites for wildlife photography and that limit their use to the non-breeding period.

**Common Name:** Rufous-bellied Eagle  
**Scientific Name:** *Lophotriorchis kienerii*

**Size:** 18.1-24 inches (46-61 cm); **Wingspan:** 41.3-55.1 inches (105-140 cm)

**Habitat:** Asia; it found is northern India, Nepal, Sri Lanka, Bhutan, Assam, Myanmar, Hainan, Indochina and Malay Peninsula to Greater Sundas (including Bali), the Philippines, Sulawesi and the Sula Islands, and the Western Lesser Sundas.

**Status:** Near-threatened. **Global population:** 1,000–10,000 mature individuals with a declining population trend. It is rare on Java and in Myanmar, scarce in Nepal and just three documented records in Bangladesh. It is uncommon in the Philippines, but moderately common on Sulawesi. It is common in forested areas of northeastern India and southwestern India (West Ghats). It has undoubtedly suffered as result of extensive deforestation that still continues throughout most of range.

**Diet:** Birds and mammals; including squirrels, Kalij Pheasants, junglefowl, spurfowl and pigeons.

It is mostly an aerial hunter; capturing prey on or near ground or treetops after spectacular dives--reminiscent of Peregrine Falcon (*Falco peregrinus*).

Also, it will hunt from a perched location.

**Nesting:** A smaller eagle with short bushy crest, with longish wings and tail and feathered tarsi. It has bright rufous under parts and under wing-coverts with dark streaking. Its throat and upper breast are white. Its upper parts are jet black. The iris is



a dark brown to reddish-brown. The cere and feet are yellow. The wing shape and under wing pattern in flight is similar to those found in buzzards. The juvenile is strikingly different, with completely white under parts and under wing.

Breeding displays involve repeated dives with wings closed, and also the shivering of wings. It nests from December through March in Sri Lanka and southern India; February in the Philippines and somewhat later in northern India. It creates a large nest (up to 1.2 m across, 60 cm deep), which is built by the pair in crown of large tree in dense forest, and lined with green leaves. The clutch is one egg and are incubated by both sexes. The pair will vigorously defend of the nest against all intruders, including humans.

**Cool Facts:** It is generally silent, except during the breeding season when gives a repeated piercing “keeee” during display flight and contact between pair-members, sometimes extended into a piping “kee-kee-kee-kipkip-trree” call.

There are two subspecies:

- *L. k. kienerii*. The nominate race is found in northern India (from eastern Uttarakhand) eastward through Nepal and Bhutan to Assam. Also it is found in southwestern India (Western Ghats) and Sri Lanka.
- *L. k. formosus*. This race is found in Myanmar and Hainan through the west, south and eastern-central Indochina and Malay Peninsula to Greater Sundas (including Bali), Philippines, Sulawesi and the Sula Islands, and the Western Lesser Sundas (Sumbawa, Flores). This race has more uniformly black upper parts and is smaller (about 10%) than the nominate race.

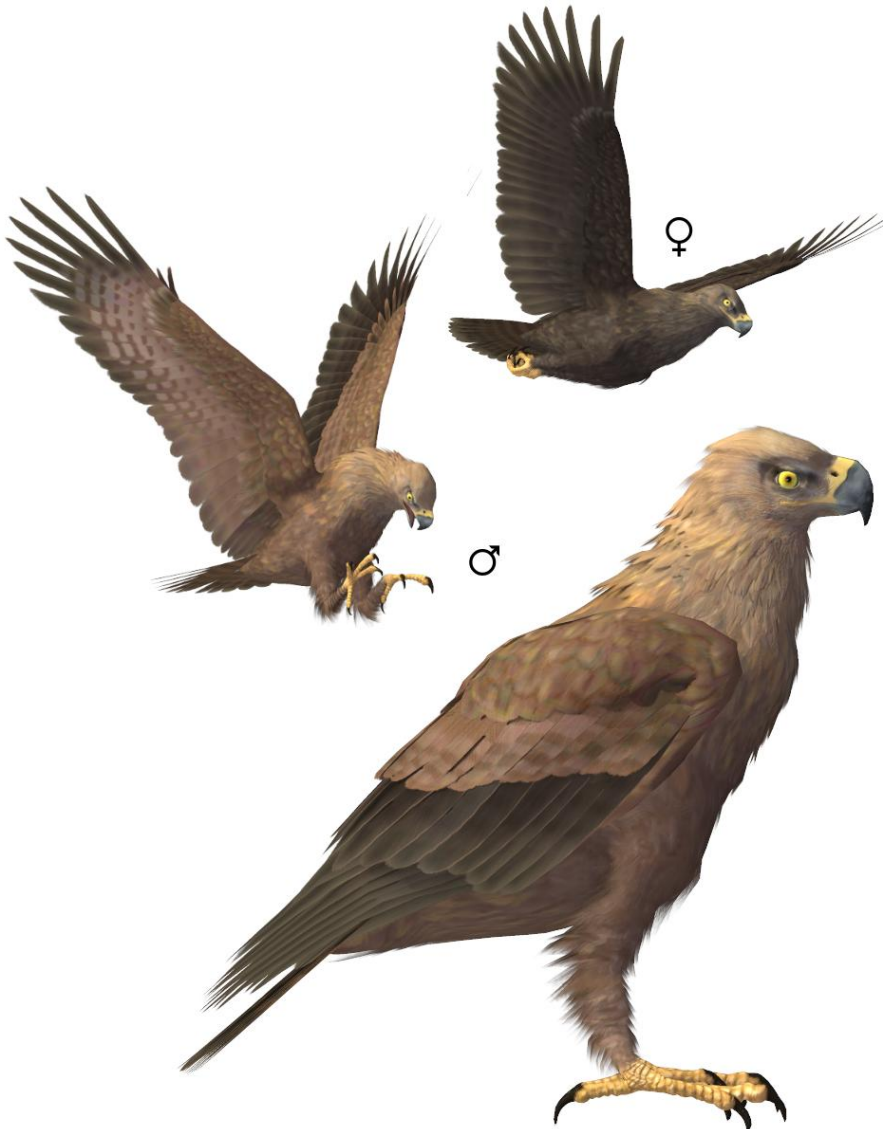
**Common Name:** Tawny Eagle  
**Scientific Name:** *Aquila rapax*

**Size:** 23.6-29.5 inches (60-75 cm); **Wingspan:** 62.6-72 inches (159-183 cm)

**Habitat:** Africa and Asia. It is found in the non-desert and non-jungle portions of Africa and the Indian subcontinent.

It is usually found in open woodland, wooded savannah, semi-desert and arid steppe. It

is only absent from the forest and true desert. Often, it is found near villages and cultivation in India, where it visits rubbish dumps and slaughterhouses. In Nepal, virtually restricted to terai. Recorded from sea level to 3000 m, but principally found in lowlands.



**Status:** Vulnerable.  
**Global population:** 100,000–499,000 mature individuals with a declining population trend. Overall declines are tentatively suspected to be rapid, and as such the species is listed as Vulnerable. Its scavenging habits make it susceptible to poisoning and has declined in many farming areas of southern and eastern Africa. Also declining in western and

northeastern Africa, and may now be largely absent from large areas of western Africa outside conservation units.



**Diet:** Primarily mammals (hares and dikdiks), birds (large gamebirds and hornbills) and lizards. It may also take carrion (to size of elephants) with vultures and other raptors. The remains of domestic chickens have been found in nests.

It dives on prey (as large as flamingos) from a perch or stoops while soaring high overhead, but may also walk about collecting food on the ground (from rubbish dumps and slaughterhouses). It regularly and boldly steals from other birds such as storks, other raptors and ground hornbills.

**Nesting:** A mid-sized to large eagle, with long neck, but relatively short wings and slightly rounded to almost square-ended tail. It is polymorphic and individually variable in intensity of color and extent of markings. The iris is a yellow amber. Females are up to 15% larger than males and usually darker and more heavily marked. Juveniles are more plainly colored, especially ventrally, and the plumage fades to a blond tone.

**Cool Facts:** It has in the past been considered con-specific with the Steppe Eagle (*A. nipalensis*), but the two differ in morphology, behaviour and ecology, and treatment as separate species supported by molecular analysis.

Races differ on size, on markings and the extent of rufous coloration. There is considerable individual variation and extensive overlap in the subspecies.

- *A. r. belisarius*. This race is found in Morocco and Algeria; southwestern Arabia and tropical Africa southward through east Africa to Congo, northeastern Democratic Republic of the Congo and northern Kenya. It shares most plumage types with nominate race (notably the very pale immature), but tends not to appear so scruffy.
- *A. r. rapax*. The nominate subspecies is found in the southeastern Democratic Republic of the Congo and southern Kenya southward to South Africa and west to Angola and Namibia.
- *A. r. vindhiana*. This race is endemic to southeastern Iran, Pakistan, much of India, and southern Nepal. It has been seen as a vagrant in Myanmar. It is smaller, generally tends to be darker, lacks the tawny color, and usually has a brown iris.

**Common Name:** Black-and-White Hawk-eagle  
**Scientific Name:** *Spizaetus melanoleucus*

**Size:** 20-24 inches (51-61 cm); **Wingspan:** 43.3-53.5 inches (110-135 cm)

**Habitat:** North and South America; from Mexico southward through the Amazon basin and in the Atlantic coastal forest of Brazil south to northern Argentina.

It is present in a variety of habitats, generally in areas with a mix of forest and some open areas.

**Status:** Least Concern. **Global population:** 20,000–49,900 mature individuals with a declining population trend. Formerly the IUCN classified this Hawk-Eagle as “Near Threatened”, presumably to the its apparent low population density and the lack of data on the global population size. In 2000, however, the species was reassessed as of “Least Concern” in view of its wide geographic range, and despite a population trend that appears to be decreasing.



**Diet:** Primarily mammals, birds, reptiles, and amphibians. It has also been observed attacking small monkeys.

It is a soaring predator, and often soars to high-altitudes. When it spots potential prey, it folds its wings for a quick pursuing dive.

**Nesting:** Sexes are alike, however the female is 10% larger. It is largely white, with a black back and upper wings, black eye patches, a small black coronal patch, and black-

and-gray barred tail. The tarsi are feathered, as in other species of hawk-eagle (*Spizaetus*), but the Black-and-white Hawk-Eagle has a shorter crest than other *Spizaetus* species, and the wings are less oval. The juvenile has pale lores, a yellowish cere, and extensive black barring on the flanks and tibial feathers.

The only documented nest of the Black-and-white Hawk-Eagle was made of sticks and placed high in a tall tree on a ridge.

**Cool Facts:** The Black-and-white Hawk-Eagle is a poorly known. While its affinities have been debated, recent molecular evidence supports its placement within the genus *Spizaetus*.

Originally, its name, *Spizaetus melanoleucus*, was given to the Black-chested Buzzard-Eagle in 1819. The same person (Vieillot) who had named the Black-and-white Hawk-Eagle as *Buteo melanoleucus* three years prior. Later, in 1844, the buzzard-eagle was moved to a separate monotypic genus (*Geranoaetus*) and the Black-and-white Hawk-Eagle was eventually moved to *Spizastur* in 1994 (Bierregaard et al.)

Interestingly, a later conflict occurred between the names of the same two species as the Black-chested Buzzard-Eagle's placement in the genus *Geranoaetus* was disputed, and some authors suggested that *melanoleucus* belonged in the genus *Buteo*. If that classification were adopted, then the buzzard-eagle would take the name *Buteo melanoleucus*, which was the original name of the Black-and-White Hawk-Eagle.

**Common Name:** Nicobar Serpent-eagle  
**Scientific Name:** *Spilornis klossi*

**Size:** inches (38–42 cm); **Wingspan:** inches (85–95 cm)

**Habitat:** Asia. Endemic to Great Nicobar, in southern Nicobar Islands. It has been recorded also on Little Nicobar and Menchal.

It is found in mixed evergreen forest, most frequently in the canopy. It does also occur also in grasslands and regenerating habitats. It is found from sea-level to 100m.

**Status:** Near Threatened. **Global population:** 1,700 mature individuals with a declining population trend.

BirdLife reports some apparent confusion over the species' status, which in 1993 said to have been "rarely seen" on Great Nicobar, but this not the impression of other fieldworkers; described as being common at end of 20th century, and from surveys in 2009–2011, it was thought to be uncommon. At least formerly was common on Great Nicobar. It occurs on Great Nicobar (including Pulo Kunji), Little Nicobar, Menchal, Pilo Milo and Treis, in South Nicobar Group. Although it appears not to be so scarce as was earlier feared, its population could suffer

from the increased human settlement in the islands, which has led to ever greater pressure on natural resources, and further development projects could have serious adverse impacts on the species' habitat within its very small range.



Surveys are needed in order to gain accurate assessment of population size, and regular monitoring at selected sites across range seems advisable. The species' abundance in forest at different levels of perturbation should be ascertained. Significant areas of intact forest in the islands should be fully protected, and the possible impact of development programs must be properly investigated and action taken to mitigate against the likely impacts.

**Diet:** Primarily lizards, rats, the Emerald Dove (*Chalcophaps indica*) and small birds.

It hunts from a hidden perched position.

**Nesting:** A small, secretive, but confident serpent eagle, with relatively flat crown, large head and short-looking wings and tail. It has pale, uniformly colored under parts and tail with fewer bands than most eagles. Female is larger than male by up to 12%. The bare parts (facial skin and legs) are a dull orange-yellow (the legs are a dirty yellow in the juvenile). The juvenile has a broad buff-white edging on feathers of crown, back and upper wing and tail-coverts, and has more bars. The sub-adult has brownish-gray iris and greenish-yellow facial skin.

Breeding habits are poorly studied. It is believed March and April are the breeding months and there does not appear to be any flight display.

**Cool Facts:** It is also known as the Great Nicobar serpent eagle and the South Nicobar serpent eagle.

**Common Name:** Mountain Serpent-Eagle  
**Scientific Name:** *Spilornis kinabaluensis*

**Size:** 20-22.8 inches (51–58 cm); **Wingspan:** 46.5-50.8 inches (118–129 cm)

**Habitat:** Asia; endemic to the mountains of northern and central Borneo, from Mt. Kinabalu (western Sabah) southward, at least to, Mt. Mulu (northeastern Sarawak) and Mt. Murud (northeastern Kalimantan).

It is found in montane and submontane evergreen forests with a tendency to prefer

ridge-top forests. It prefers higher altitudes (mostly between 1500 m and 2500 m) than other snake-eagles, which inhabits adjacent lowlands.

**Status:** Vulnerable.  
**Global population:** 2,500-9,999 mature individuals with a declining population trend. It has a very small range, and probably small population likely decreasing because of continuing habitat loss and degradation. Principal threats facing this species are



destruction, degradation and fragmentation of habitat, especially towards its lower elevational limits, where agricultural expansion and intensification have led to fairly rapid reduction in extent of forest cover; even at higher altitudes forest is under threat, here

by, for example, smallholder agriculture. Rates of logging and land clearance, spreading from lower altitudes up into montane habitat occupied by this raptor, suggest that its numbers are likely to be decreasing, although rate of population decline has not been estimated.

**Diet:** Primarily snakes and lizards.

**Nesting:** A large-headed, broad-winged dark serpent-eagle. It is dark brown from above with white speckles along the crown and shoulders. The crest is short and the head and throat are black. The breast is reddish-brown and there is white spotting along the belly, flanks, and thighs. The flight feathers are black-tipped with white bases, and the tail is black with a broad white band. The beak, cere, and feet are bright yellow. Legs are unfeathered.

Breeding habits are poorly known, but adults with two fledged young observed in early November.

**Cool Facts:** They do occur within the Kinabalu National Park and the Gunung Mulu National Park.

**Common Name:** Solitary Eagle  
**Scientific Name:** *Buteogallus solitarius*

**Size:** 25.6-29.5 inches (65-75 cm); **Wingspan:** 61.8-70.8 inches (157-180 cm)

**Habitat:** North and South America; it primarily occurs in humid montane forest in Central and South America from Mexico south to Bolivia, but also is found in drier pine-oak forest in northern Mexico.



It prefers humid forested mountain slopes, including tropical and subtropical premontane and humid montane forest. It is also found in cloud forests, and pine-oak forests in Central America. In Mexico and northwestern Peru, it is also found in tropical deciduous forests.



**Status:** Near Threatened. **Global population:** 1,000-2,499 mature individuals with a declining population trend. This species has a moderately small population size which is likely to be declining owing to habitat loss and poaching.

**Diet:** Primarily reptiles (lizards and snakes).

**Nesting:** The wings long and broad. It is all dark slate-gray. Its short crest tends to be inconspicuous. It has a very short tail has bold white median band and white tip. Its cere, legs and feet are bright yellow (greenish in the juvenile). The female is larger than male, and has brownish wash and feather edgings.

Breeding habits are poorly known. It builds a stick nest with dead and green leaves. It appears to nest in late November through January with young in the nest from April through June.

**Cool Facts:** When soaring, this eagle holds its wings flat or in slight dihedral. There are two subspecies:

- *B. s. sheffleri*. This race is found in western Mexico (from Sonora) southward locally in highlands to Costa Rica and possibly Panama.
- *B. s. solitarius*. The nominate race is found locally from northern Colombia (Santa Marta Mountains) and northern and southern Venezuela, west-central Guyana and French Guiana, and south through the humid Andes from Colombia to extreme northwestern Argentina (Jujuy and Salta).

## *Special Thanks to...*

....my betatesters, Alisa and FlintHawk

## *Species Accuracy and Reference Materials*

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

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

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

### *Field Guide Sources:*

- **"Illustrated Checklist of the Birds of the World. Volume 1: Non-passerines"** by HBW and BirdLife International
- **"Raptors of the World"** by James Ferguson-Lees and David A. Christie

### *Internet Sources:*

- **Cornell Labs Birds of the World** (<https://birdsoftheworld.org>)
- **Wikipedia** (<http://www.wikipedia.com>)
- **Birdlife International** (<http://www.birdlife.org>)

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