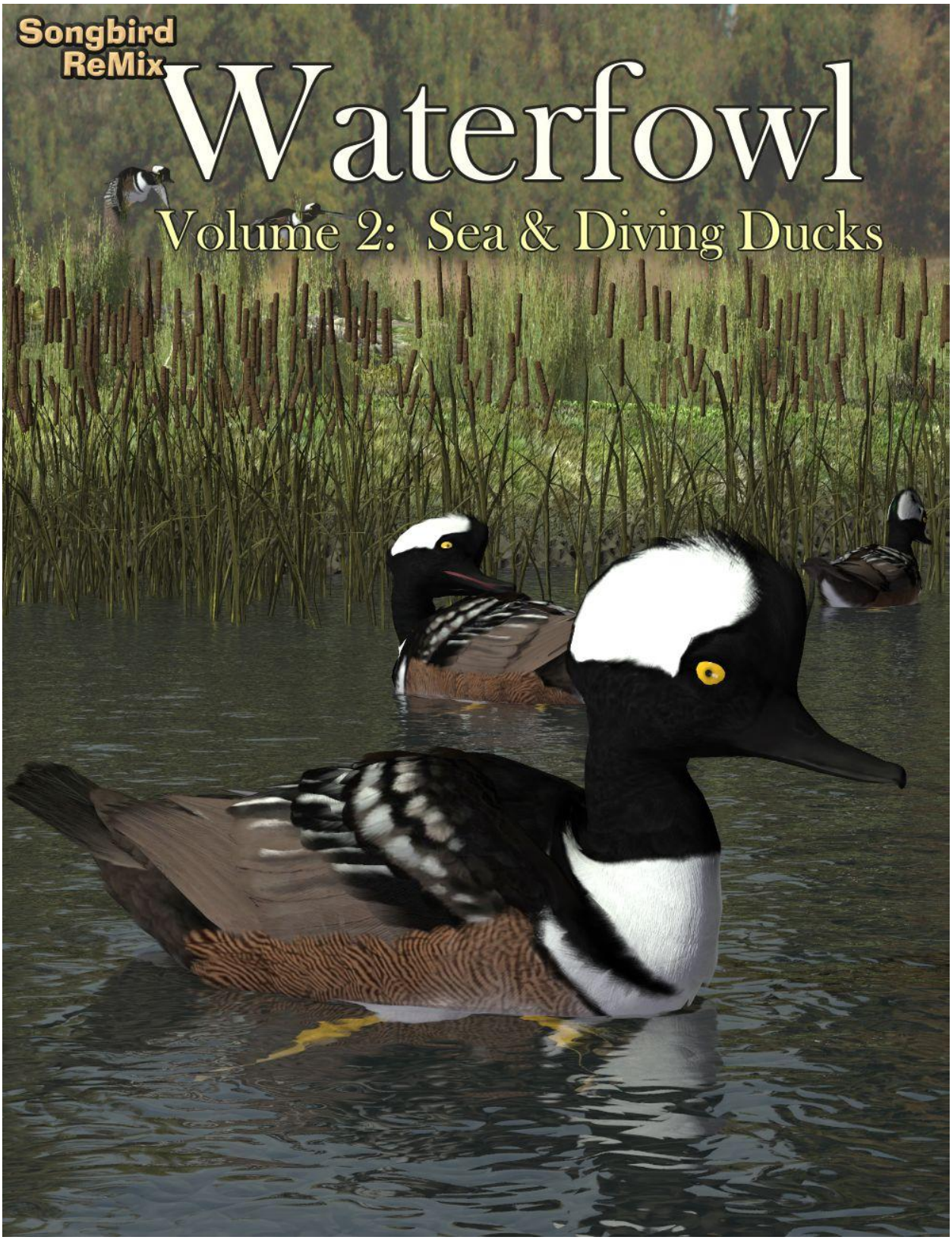


Avian Models for 3D Applications

Characters and Texture Mapping by Ken Gilliland

Songbird ReMix

Waterfowl: Sea & Diving Ducks

Contents

Songbird ReMix

Waterfowl: Sea & Diving Ducks

Introduction

There are two distinct groups of Ducks; Dabbling Ducks and Sea/Diving Ducks. They are divided into the two groups mostly by behavior.

Diving ducks and sea ducks forage deep underwater. To be able to submerge more easily, the diving ducks are heavier than dabbling ducks, and therefore have more difficulty taking off to fly. Diving ducks are commonly called pochards or scaups, while Sea ducks have a much larger family of species including eiders, scoters, mergansers, goldeneyes and other species. Most of these ducks occupy habitats in the northern latitudes.

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):
  - **Waterfowl (Order Anseriformes)**
- **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

Iray and **Superfly** requires more CPU and memory horsepower than the legacy renderers because of ray-trace bounces and higher resolution meshes needed for displacement. Poser's **Superfly** renderer will require that the "Min Transparent Bounces" be set to at least 16 and that the "Max Transparent Bounces" be set to at least 32 in render settings. Superfly renders may show artifacts in the head area. This is a known Poser issue and may be addressed in the future. Increasing the SubD may minimize this issue.

Where to find your birds

Type Folder	Bird Species
Waterfowl (Order Anseriformes)	Red-crested Pochard Pink-headed Duck (extinct) Redhead Tufted Duck Lesser Scaup Greater Scaup Hardhead Ferruginous Duck King Eider Harlequin Duck Black Scoter Smew Common Goldeneye Bufflehead Hooded Merganser Chinese Merganser Ruddy Duck

Where to find your poses

Type Folder	For what species?
Waterfowl (Order Anseriformes)	All Ducks

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 waterfowl 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**
    - BillOpenClose- Controls the opening and closing of the bill
    - EyesFwdBack - Controls the forward and backward movement of the eyes
    - EyesUpDwn - Controls the up and down movement of the eyes
    - EyeLidsCloseOpen - Controls the opening and closing of both eyelids
    - Neck Length- Allows retracting and extending of the neck. ERC controls also link the ThinnerNeck morph (Found in the BODY/Creation Morphs menu) to thicken the neck in retraction and thin the neck on extension.
    - BreastIn- Pulls the breast of the bird inwards and outwards. Besides species shapes, this morph could be used to simulate breathing and is used as a hidden ERC control to bring the breast in during flight.
    - Unspread Feet- Brings the webbed feet to a folded position (as they'd be, for instance in flight).
    - WingsFold- Puts both Wings into a folded position. The control allows the WingsDroop control to work and also activates the CoverWingFold fluff morph.
  - **Wing and Tail Controls**
    - These controls allow both wings or each individual wing to perform numerous wing actions and also the Tail feather actions like fanning, cupping and bending.
      - PintailBendUp- This morph is specifically used for Pintail Duck species (bending only the two middle tail feathers when extended in the pintail morph) and shouldn't be used with other species.
  - **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.
  - **Head Controls**
    - Exp-Smile- Creates a smile expression
    - Exp-Frown- Creates a frown expression

- **Bill Movement Section**- has individual controls for upper and lower mandibles. The BillOpenClose uses both of the morphs in this section and these morphs *will NOT work* unless BillOpenClose is set to 0.
- **Eyelid Movement Section**- has individual controls for upper and lower eyelid on both eyes, as well as EyeWink controls for both eyes. The EyeWink controls use the upper and lower eyelid morphs and the EyeLidsCloseOpen control uses BOTH EyeWink controls.
- **Tongue Movement Section**- various morphs control the movement of the tongue.

- **Fluff Morphs**
  - CrestLength- Controls the Length of the crest (top of duck's head)
  - CrestFrontUp- Pulls the forehead part of the crest forward/up
  - CrestTopUp- Pulls the middle part of the crest forward/up
  - CrestBackUp- Pulls the back part of the crest forward/up
  - JowlFluffOut- Pulls the feathers under the eye area (jowls) out.
  - ThroatFluff- Pulls the feathers on the throat area out.
  - Back Ruffle- Ruffles the transparency feathers on the back of the bird
  - BreastFluff- Controls the transparency feathers on the breast of the bird
  - ThighFluff- Controls the transparency feathers on both thighs of the bird
  - 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
  - RumpSidesFluff-Reduces the Fluff on the sides of the rump
  - **Fluff Over Folded Wings**
    - CoverWingFold- Moves Breast and Flank Fluffs to partially cover the lower edge of the folded wings. It is automatically turned on with the WingsFold control and turned off when the WingsDroop is used. You can also turn off this control by dialing it to -1.
    - FlankFluffOut- Pulls the feathers on the flanks (below each wing) out.
    - FlankFluffExpand- Enlarges the Flank Feathers to better hide the folded wing edges (see Tutorial)
    - FlankFluffDroop- Droops Flank Feathers
    - PullTopFlankFeathers & 2- Pulls tops of Flank Feathers in and out
  - **Fluff Under Folded Wings** (The Flank control will not work properly with the Mandarin Male Duck)
    - TuckAllFluff- Tucks all Fluff Controls found in this section under the wings
    - TuckBreastFluff- Tucks Breast Fluff sides in under the wings
    - TuckBackFluff- Tucks Back Fluff sides in under the wings
    - TuckFlankFluff- Tucks Flank Fluff sides in under the wings
    - TuckRumpFluff- Tucks Rump Fluff sides in under the wings

- **Specific Species Morphs**
  - King Eider Specific- These morphs control the King Eider Special Morphs.
  - Mandarin Duck Specific- These morphs control the Mandarin Duck Special Morphs.
  - Merganser Specific- These morphs control the Merganser Special Morphs.
  - Pintail Specific- These morphs control the Northern Pintail's extended Pin feathers.
  - Wood & Mandarin Duck Specific- These morphs control the Wood Duck Crest. The Mandarin Ducks also use these.
- **Correction Morphs**
  - Adj-BackHeadIn- removes lump from the back of head that might occur in some poses.
  - Adj-ThroatIn- removes lump from the throat that might occur in some poses.
  - Adj-BHLRemove- fills a dip in the back of the head that might occur in some poses.
  - Adj-RumpThinner- thins the Rump, hip and tail sections to prevent folded wing intersections that might occur in some poses.

- **Creation Morphs**
  - LegLength- Allows control of Leg Length (This control is not working properly in DAZ Studio and the dial has been hidden in Studio versions)
  - StubbyTalons- Decreases or increases the length of the talons on the webbed feet.
  - ThinnerNeck- Decreases or increases the thickness of the neck. This morph is also used as a hidden ERC control to add thickness to the neck when the NeckLength control (found in BODY/Action Morphs) is used.
  - BreastCrease- Creates a center crease on the breast.
  - RumpSleeker- Controls the size of the rump.
  - RumpTopWidth- Controls the transparency feathers on the topside rump/tail of the bird width.
  - RumpBtmExtend- Controls the transparency feathers on the underside rump/tail of the bird length.
  - **Species Shapes**- These morphs create very specific looks to resemble certain species of Waterfowl and include Bufflehead, King Eider Male, Mandarin Female and Male, Mergansers, Muscovy, Shoveler, Smew, Wigeon and Wood Duck.
  - **Head Shaping**
    - **Head Shapes**- These morphs control the shape of the head.
      - Hd-BrowsOut- Pulls the area above each eye outwards.
      - Hd-BackSq- Adds mass to the back of the Head.
      - Hd-BackDwn- Reduces mass to the back of the Head.
      - Hd-CrownUp- Raises the Crown of the Head.
      - Hd-ForeheadLow- Reduces the forehead extending to the bill.
      - Hd-ForeheadFwd- Adds to the forehead extending to the bill.

- Hd-ForehdCtrOut- Adds to the forehead center between the bill.
- Hd-JowlsExpand- Expands the cheeks of the duck.
- Hd-HideEar- Removes the ear holes.

▪ **Eye Shapes**- These morphs can change the appearance of the eyes.
- EyesDilate- Controls the pupil size of the eyes
- Ey-SocketOut- Pushes the eyelids and Sockets out further. This is useful if the eye size is larger than the default setting by moving the eyelids to fit the scaled eyeballs.
- Ey-BigEyes- This control creates larger eyes on the model. Through ERC controls, it scales the eyes to 120% and expands the eye sockets using a combination of its own morph plus the Ey-SocketOut morph.

▪ **Bill Shapes**- These morphs can change the appearance of the bill.
- Bill-Length- Controls the length of the entire bill.
- Bill-UprLength- Controls the length of the upper bill.
- Bill-LwrLength- Controls the length of the lower bill.
- Bill-Point- Brings the end of the bill to a point.
- Bill-Merganser- Creates the narrow bill of a Merganser.
- Bill-Scaup- Creates the bill of a Scaup.
- Bill-Scoter- Creates the bill of a Scoter.
- Bill-Shoveler- Creates the bill of a Shoveler.
- Bill-Slope- Adds or reduces the slope of the upper bill.
- Bill-TipFoward- Extends the center portion of the tip of the upper bill.
- Bill-TipBulb- Creates a bulbous tip on the upper bill.
- Bill-TipBulbTop- Makes the bulbous tip on the upper bill more pronounced.
- Bill-TipHook- Creates a stronger hook on the upper bill.
- Bill-NoseBridge- Lessens the slope of the bill to the forehead.

▪ **Nostril Shapes**
- Nostril-Fwd- Moves the nostrils on the bill forward.
- Nostril-Size- Controls the size of the nostrils on the bill.
- Nostril-Ridge- Adds a ridge to the nostrils on the bill.
- Nostril-Slit- Creates slit-shaped nostrils on the bill.
- Nostril-Tear- Creates tear-shaped nostrils on the bill.

▪ **Tongue Shapes**
- Tng-Length- Controls the length of the tongue.
- Tng-Width- Controls the width of the tongue.

o **Wing Shapes**- These morphs control the shape of the wings.
- WingSpan- Allows control of Wing Length
- WingPoint, lWingPoint and rWingPoint - Makes a pointed wing shape.

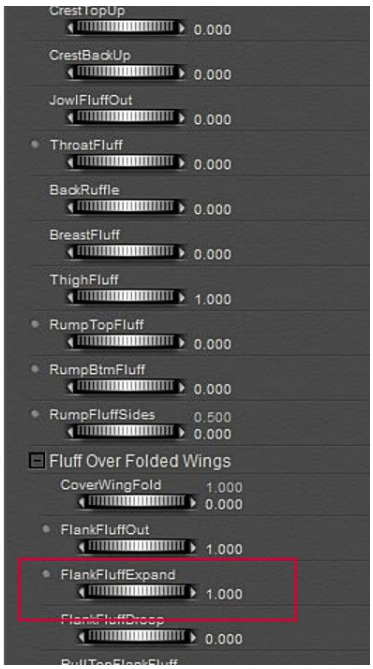
o **Tail Shapes**- These morphs control the shape of the tail feathers
- Pintail- Lengthens the middle two Tail feathers.

- Round- Rounds the Tail feathers.
- Length- Controls the length of the Tail feathers.
- Width- Controls the width of the Tail feathers.
- PointEnds- Makes Tail feathers have pointed ends.
- SquareEnds- Makes Tail feathers have square ends.

- **Scale**- Controls the size of the model

Working with Fluff Controls

In this example we see that the Flank Fluffs haven't adequately covered the folded wings. To correct this, go under the **"Feather Fluff Controls"** and select the **"FlankFluffExpand"** morph.



Songbird ReMix

Waterfowl: Sea & Diving Ducks

Field Guide

Diving Ducks

Red-crested Pochard
Pink-headed Duck (extinct)
Redhead
Tufted Duck
Lesser Scaup
Greater Scaup
Hardhead
Ferruginous Duck

Sea Ducks

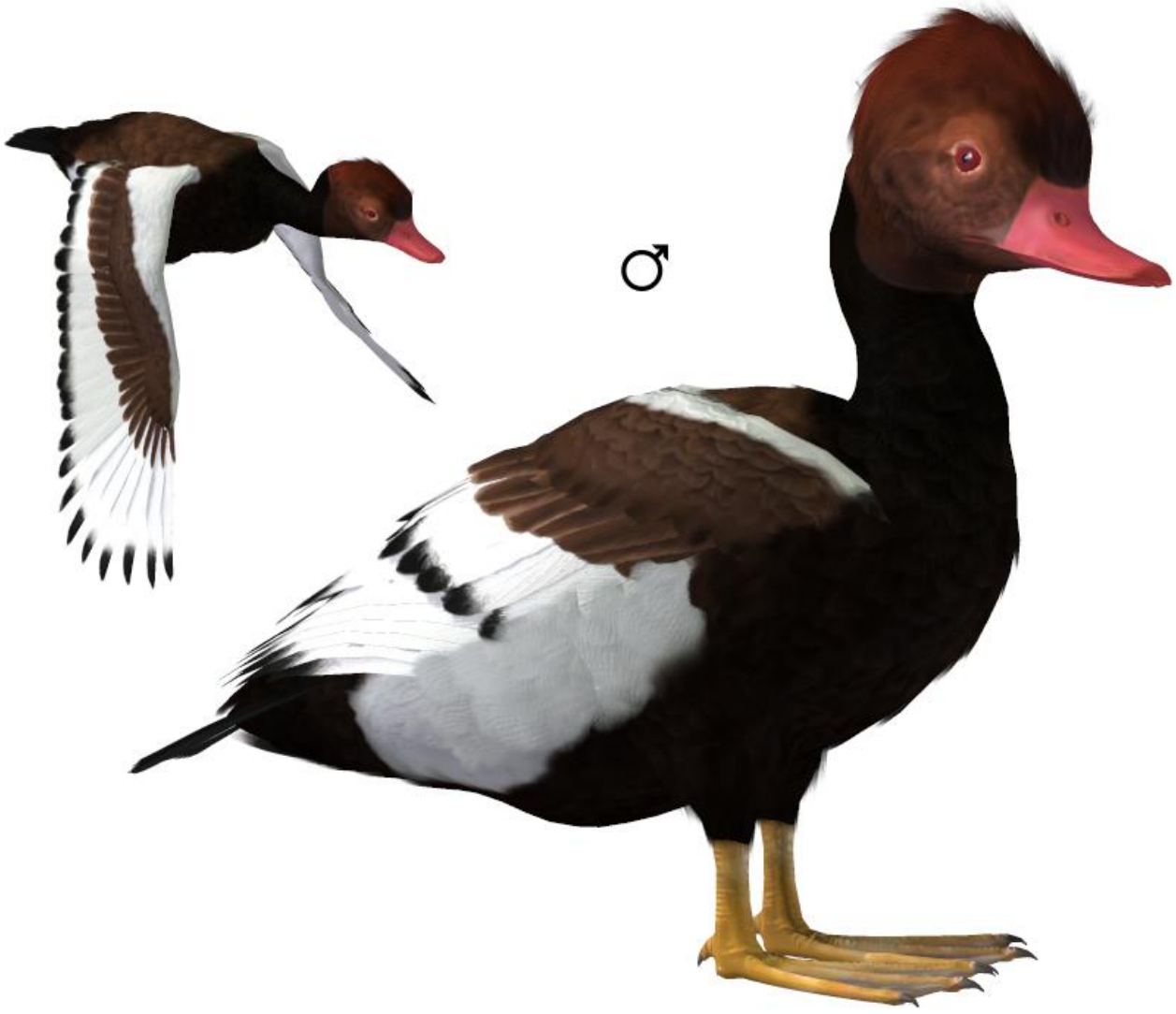
King Eider
Harlequin Duck
Black Scoter
Smew
Common Goldeneye
Bufflehead
Hooded Merganser
Chinese Merganser
Ruddy Duck

Common Name: Red-crested Pochard
Scientific Name: *Netta rufina*

Size: 20.8-22.4 inches (53-57 cm); Wingspan: 33.4-35.4 inches (85-90 cm)

Habitat: Europe, Asia, and North Africa. Found in Mediterranean Europe and Africa, as well as Central Asia and wintering in the Indian Subcontinent. It is somewhat migratory and northern birds will winter further south into North Africa.

The species inhabits inland, deep fresh or brackish, reed-fringed lakes, rivers, saline and alkaline lagoons in open country. They also occur less often on estuaries, river deltas and other sheltered, coastal habitats during migration.



Status: Least Concern. **Global population:** Unknown amount of adult individuals. The overall population trend is uncertain, as some populations are decreasing, while others are increasing, stable, or have unknown trends.

The two main threats to this species are habitat degradation through land-use changes, and Portugal and Spain not having any official hunting bag monitoring. The species also suffers poisoning from lead shot ingestion and is occasionally drowned in freshwater fishing nets in China. Deterioration in the water quality of wetlands can reduce the abundance of stonewort (*Nitellopsis obtuse*) which is an important part of the species' diet and it is susceptible to avian influenza so may be threatened by future outbreaks of the virus. Protected under the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA).

Diet: Roots, seeds and vegetative parts of aquatic plants ((*Hippurus spp*.), hornworts (*Ceratophyllum spp*.), pondweeds (*Potamogeton spp*.), milfoil (*Myriophyllum spp*.) and especially, stonewort (*Nitellopsis obtuse*). They feed mainly by diving or dabbling, and typically upend for food more than most diving ducks. It feeds diurnally, being most active during the early morning.

Nesting: The adult drake is unmistakable. It has a rounded orange head, red bill and black breast. The flanks are white, the back brown, and the tail black. The female is mainly a pale brown, with a darker back and crown and a whitish face. Eclipse males are like females but with red bills.

The species is fully migratory and breeds from mid-April to early-June in single pairs or loose groups. Males and non-breeders molt and become flightless for four weeks between June and August (females molting one month later) prior to which they may make extensive molt migrations which take them considerable distances from the breeding waters. Once this post-breeding molt is complete the species departs for its winter quarters, arriving there from October onwards.

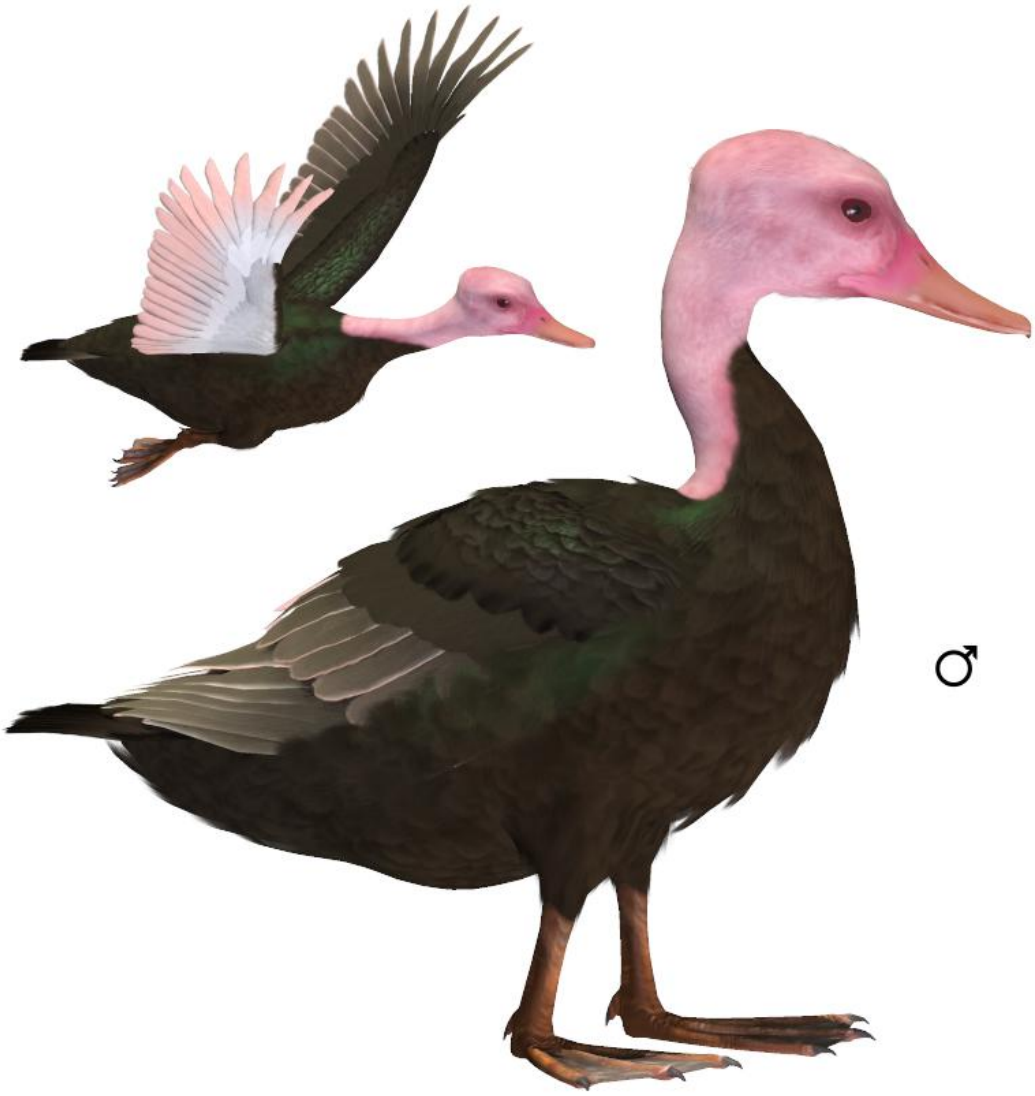
The nest is constructed of roots, twigs and leaves near water on the ground in dense vegetation or on floating mats of vegetation amidst reed beds. The female lays 8-12 pale green eggs.

Cool Facts: The species is highly gregarious for most of the year and although it is more commonly found in small groups, it often forms large concentrations of several hundred individuals in molting and wintering areas.

Common Name: Pink-headed Duck
Scientific Name: *Rhodonessa caryophyllacea*

Size: 16-17 inches (41-43 cm); Wingspan: 23.5 inches (60 cm)

Habitat: Asia; it was found in Asia; locally distributed in the wetlands of India, Bangladesh and Myanmar, and occurred rarely in Nepal, with most records from north-east India and adjacent Bangladesh.



It was shy and secretive, inhabiting secluded and overgrown still-water pools, marshes and swamps in lowland forests and tall grasslands, particularly areas subject to seasonal inundation and, in winter, it was also found in lagoons adjoining large rivers. Outside the breeding season, it was usually encountered in small groups and occasionally flocks of 30-40. Some, and possibly all, populations undertook local

seasonal movements, resulting in scattered historical records as far afield as Punjab, Maharashtra and Andhra Pradesh in India.

Status: Presumed Extinct. **Global population:** 0 adult individuals It was always considered uncommon or rare and was last definitely seen in the wild in 1949, surviving until around the same time in captivity. Its decline likely resulted from habitat loss, as clearance of forest and conversion of wetlands for agricultural use had destroyed much of its habitat. Furthermore, it suffered year-round persecution during a period (the late 19th and early 20th centuries) when hunting levels in India were high. A number of other waterfowl species have declined in South and South-East Asia as a consequence of human disturbance and/or hunting pressure and egg collection. However, these species, e.g. White-winged Duck (*Cairinia scutulata),* do persist in parts of South and South-East Asia, suggesting that hunting pressure alone is unlikely to have caused the species' extirpation. The invasive alien species water hyacinth (*Eichhornia crassipes*) may have contributed to its decline by altering wetland habitats to the detriment of this species.

Recent "sightings" and positive leads from a series of questionnaires about its possible continued existence in north-east India were the result of confusion with the Red-crested Pochard (Netta rufina). Five searches in Kachin State, Myanmar, between April 2003 and December 2006 gained a possible sighting (in 2004), with two credible reports from local fishermen and during the 2006 survey, focused at Nawng Kwin and the grasslands and oxbow lakes along the Indawgyi River, the team gathered the most convincing reports to date, from a local fisherman, that the species still occurs in the area. Further searches took place in January 2008 in northern Kachin State, focusing on the three sites from which there had been recent reports or claims, but the team failed to find convincing evidence of the species' continued existence there.

Diet: Water plants and mollusks. Their feeding behavior was more like other dabbling duck species; typically up-ending or dabbling on the water surface for food, rather than diving like a pochard.

Nesting: Males had a deep pink head and neck, blackish-brown center of throat, fore neck and most of remaining plumage. They had a rosy-pinkish bill. In flight, pale brownish-buff secondaries with a narrow, whitish leading edge to wing-coverts and pale pink underwing were visible.

Females had a duller, browner body, pale greyish-pink head and upper neck, with brownish wash on the crown, the hind neck and a duller bill.

Juveniles had a duller brown body than the female, with fine, whitish feather fringes.

Males uttered a weak whistle, females a low quack.

Its breeding habitat was lowland marshes and pools in tall-grass jungle. The nest was built amongst grass. The eggs, 6-7 in a clutch, were very spherical and creamy white. The eggs measured 1.71 to 1.82 inches long and 1.61 to 1.7 inches wide.

Cool Facts: Conjecture from researchers conducting surveys for the species has suggested that it may have been nocturnal, explaining the difficulty in locating it, and the reason behind its unique coloration. They were believed to have been non-migratory and found singly or in pairs and very rarely in small groups.

A study found that *Rhodonessa* was a close relative to the Red-crested Pochard (*Netta rufina*) suggesting that the two species be placed in the same genus. *Rhodonessa* was described prior to *Netta* which would then make *Rhodonessa rufina* the name of choice, however these changes have not been widely accepted.

Common Name: Redhead
Scientific Name: *Aythya americana*

Size: 16.5-21.3 inches (42-54 cm); Wingspan: 29.5-31.1 inches (75-79 cm)

Habitat: North America; southern and north-eastern United States, the Great Lakes region, northern Mexico and the Caribbean.

The breeding habitat is marshes and prairie potholes in western North America.

Status: Least Concern. **Global population:** 400,000 to 800,000 individuals. A population up to 1,000,000 was determined in 2007, however has since then declined. Loss of nesting habitat has led to sharply declining populations.

Diet: Seeds, rhizomes, tubers of pondweeds, wild celery, water lilies, grasses and wild rice. They also feed on mollusks, aquatic insects and small fish. These birds feed mainly by diving or dabbling.

Nesting: The adult drake has a reddish head and upper neck with a black lower neck, fore back and breast. The remaining back is a dark grayish color. The hind back and tail are brownish-black. A broad band of light gray extends across the dusky gray wing and out onto the primaries, which helps distinguish it from the Scaup. The legs and feet are gray, and the bill is light blue-gray with a whitish band behind a relatively wide black tip.

The adult hen has a reddish-brown head, neck and breast, with a buff white chin and throat and an indistinct eye ring and stripe behind the eye. The flanks are warm brown, contrasting little with the breast, but with buffer fringes. The upper parts are darker and duller brown, with the upper-wing-coverts browner than on the male; otherwise the wing is similar to that of the male. The bill is duller than the male's, but similar in pattern.

The drake's distinctive call, a mewing *weee-ooooo*, is given during courtship.

Redheads breed in the northern prairies of the United States and Canada and the intermountain marshes of the west. They prefer non-forested environments with water areas sufficiently deep to provide permanent and fairly dense emergent vegetation for nesting. Female redheads lay an average of 7-10 eggs.

Cool Facts: Redhead hens regularly lay eggs in the nests of other Redheads or other ducks, especially Canvasbacks. They’ve been known to even lay eggs in the nests of the American Bittern and Northern Harrier. Most parasitically laid eggs fail to hatch.

Common Name: Tufted Duck
Scientific Name: *Aythya fuligula*

Size: 16-18 inches (40.6-45.7 cm); Wingspan: 33-35 inches (83.8-88.9 cm)

Habitat: Worldwide; breeds widely throughout temperate and northern Eurasia. It occasionally can be found as a winter visitor along both coasts of the United States and Canada. These ducks are migratory in most of their range, and winter in the milder south and west of Europe, southern Asia and all year in most of the United Kingdom.

During breeding Season, it is found in lowland regions with open water (showing a preference for eutrophic waters 3-5 m deep and avoiding lakes deeper than 15 m), that have islands for breeding and abundant marginal and emergent vegetation. It is common on large, freshwater lakes, ponds, reservoirs, gravel-pits and quiet stretches of wide slow-flowing rivers during breeding season. During the winter the species frequents large freshwater lakes, reservoirs and sheltered coastal locations such as

brackish lagoons, brackish inland seas (e.g. Caspian Sea), tidal bays and estuaries, although it avoids strong wave action and very exposed maritime conditions unless all inland freshwaters become frozen.

Status: Least Concern. **Global population:** 2,600,000-2,900,000 adult individuals. The overall population trend is stable, although some populations have unknown trends. The species is threatened by habitat degradation due to oil pollution, drainage, peat-extraction and changing land management practices (e.g. decreased grazing and mowing in meadows leading to scrub over-growth and agricultural intensification) in breeding areas. It also suffers decreased reproductive success as a result of disturbance from increased recreational use of inland water bodies, machinery noise from urban development, hunting and predation by American mink (*Neovison vison*) on islands. The species is susceptible to avian influenza so may be threatened by future outbreaks of the virus. The Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) applies to this species.

Diet: Omnivorous. A major part of its diet consisting of mollusks (especially *Mytillus* and *Cardium spp*.), gastropods and zebra mussels (*Dreissena polymorph*), crustaceans and aquatic insects, as well as grain and the seeds and vegetative parts of aquatic plants.

They dive to feed on the roots, seeds and buds of aquatic plants; clams; snails; aquatic insects and sometimes amphibians and small fish. They also skim flies and duckweed on the water's surface.

Nesting: The adult male is all black except for white flanks and a blue-grey bill. It has an obvious head tuft that gives the species its name. The female tufted duck is similar in appearance to female scaup, but is black-brown with a smaller patch of white at the base of the bill. At the back of the head, there is a small protuberance of feathers, which is much smaller than the male's.

The females' call is a harsh, growling "*karr*", mostly given in flight. The males are mostly silent but they make whistles during courtship based on a simple "*wit-oo*".

In central and north-west Europe this species is mainly sedentary although other populations are chiefly migratory. Migratory populations arrive on their breeding grounds from late-April where they breed in single pairs or loose groups with hundreds often nesting at the same site-- although not colonially. Once incubation has commenced, the males gather in flocks to molt between late-June and early-September when they become flightless for 3-4 weeks with females molting their flight feather 1-2 months later. The autumn migration begins in September, with a segregation of the sexes occurring in autumn and winter due to the difference in the timing of the molt. The return spring migration begins in late-February. During the winter the species is highly gregarious and may occur in flocks of several thousand individuals

The nest is constructed of vegetation and is placed in water on floating mats or islets, or on the ground on islands in rush or grass tussocks, under bushes or in the open amidst

marsh nesting gull or tern colonies (for protection against predators). Nests are usually placed within 20 m of water although on islands they may be placed up to 150 m away. Although the species is not colonial hundreds may nest on the same site with neighboring nests spaced 7-11 m apart (within gull or tern colonies nests are spaced 2-3 m apart). They lay an average of 9 eggs.

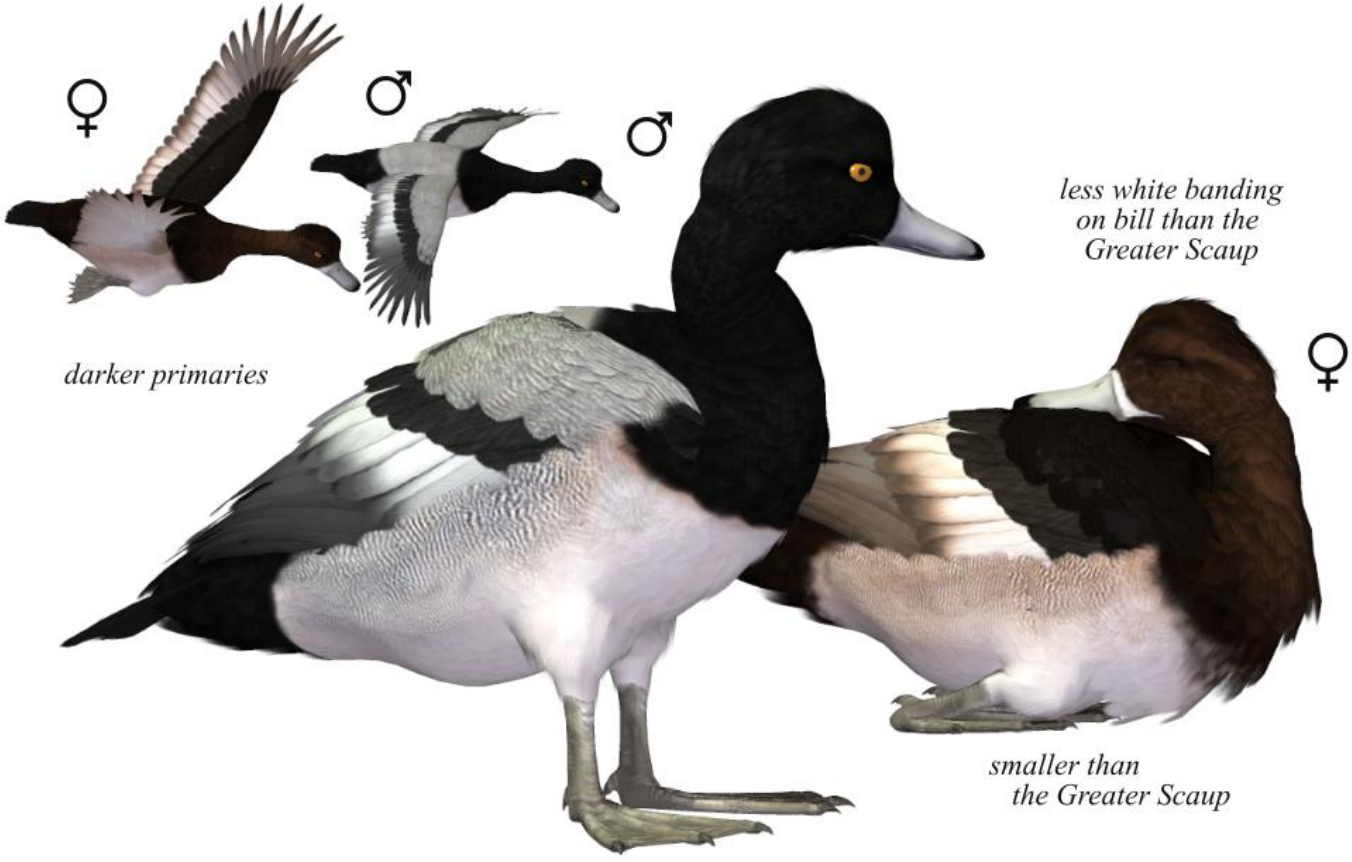
Cool Facts: The male tufted ducks closely resemble their counterparts, ring-necked ducks. The principle difference is the tuft of feathers that fall behind the head.

The Tufted duck is also known by a suite of other names, such as the tufted pochard, tufted diver, tufted scaup, the crested duck or crested diver, the black and white diver, white-sided diver or magpie diver, the black duck or black wigeon, or as the least wigeon. It also has a few names that are a bit more colorful, such as the black poker, pied duker, blue-billed curre, or the lapmark duck.

Common Name: Lesser Scaup
Scientific Name: *Aythya affinis*

Size: 15-19 inches (38-48 cm); Wingspan: 16.4-16.9 inches (41.7-43 cm)

Habitat: The Americas; their breeding habitat is inland lakes and marsh ponds in tundra from Alaska through western Canada to western Montana; few breed east of James Bay and the Great Lakes. Notable breeding concentrations, with more than half a million birds at the height of the season, can be found in Alaska, in the woodlands of the McKenzie River valley and on the Old Crow Flats. These birds migrate south (mostly via the Central and Mississippi Flyways) when the young are fledged and return in early spring, usually arriving on the breeding ground in May. Lesser Scaup typically travel in flocks of 25–50 birds and winter mainly on lakes, rivers and sheltered coastal lagoons and bays between the US–Canadian border and northern Colombia, including Central America, the West Indies and Bermuda.



Wintering Lesser Scaup are typically found in freshwater or slightly brackish habitat and unlike Greater Scaup rarely are seen offshore when unfrozen freshwater habitat is available. They may even spend the winter on lakes in parks, as long as they are not harassed, and will occur even on smallish Caribbean islands such as Grand Cayman. Thousands winter each year on the Topolobampo lagoons in Mexico, and even in the

southernmost major wintering location – Ciénaga Grande de Santa Marta in Colombia – where hundreds of birds can be seen. In Central America, flocks are present from July on, but only really numerous after September. They move north again in April and May. In the extreme southeast and southwest of the breeding range – the Rocky Mountains region of the northwestern USA and the southern Great Lakes – Lesser Scaup are present all-year; it is not clear whether the breeding birds are replaced by migrants from the far north in winter, or whether the local populations do not migrate, or whether both local and migrant birds are found there in winter.

Status: Least Concern. **Global population:** 3,000,000 adult individuals. Although the Lesser Scaup has the largest population of any species of diving duck in North America, their population has been steadily declining since the mid-1980s, and reached an all-time low in the early 20th century. During breeding bird surveys, Lesser and Greater Scaup are counted together due to the impossibility of identifying the species unequivocally when large numbers of birds are involved. Lesser Scaup are thought to comprise slightly less than nine-tenths of the scaup population of North America. In the 1970s, the Lesser Scaup population was estimated at 6.9 million birds on average; in the 1990s it had declined to about half that number, and by the late 2000s it is estimated at 3 million individuals or less. Due to the wide breeding range and the fact that the rate of decline, though remarkable, is still not threatening in respect to the enormous overall numbers, the Lesser Scaup is classified as a Species of Least Concern by the IUCN. An increase of the decline is liable to result in an uplisting to Near Threatened or even Vulnerable status.

The causes for this decline remain unknown. There are indications that the breeding success is decreasing. This may be caused by pollution and habitat destruction, especially in the wintering regions, as well as specific ecological conditions – such as abundance of key food items – which shifted winterwards due to global warming, without the ducks being able to adapt. The Great Scaup, which appears to be increasing in numbers, could be putting the Lesser Scaup under competition for food.

Diet: Small swimming invertebrates and some seeds. They forage by swimming along with bill lowered into the water, straining out small crustaceans and other invertebrates. They do not commonly tip their head and upper body forward into the water.

Nesting: The adult males (drakes) in alternate plumage have a black, effervescent head and a small tuft at the hindcrown, a black breast, a whitish-grey back and wings with darker vermiculations and black outer and greyish-brown inner primary remiges. The underparts are white with some olive vermiculations on the flanks, and the rectrices and tail coverts are black. Adult females (hens) have a white band at the base of the bill, often a lighter ear region, and are otherwise dark brown all over, shading to white on the mid-belly. Drakes in eclipse plumage look similar, but with a very dark head and breast, little or no white on the head and usually some greyish vermiculations on the wings. Immature birds resemble the adult females, but are duller and have hardly any white at the bill base. Both sexes have white secondary remiges, a blue-grey bill with a black "nail" at the tip and grey feet; the drakes have a bright yellow iris, while that of females

is orange or amber and that of immatures is brown. Downy hatchlings look much like those of related species, with dark brown upperparts and pale buff underparts, chin, supercilium and back spots.

These birds are not very vocal, at least compared to dabbling ducks. Hens give the namesake discordant scaup, scaup call; in courtship drakes produce weak whistles. Hens vocalize more often than those of the Greater Scaup – particularly during flight –, but their call is weaker, a guttural *brrtt, brrtt*

They nest in a sheltered location on the ground near water, usually among thick vegetation such as sedges and bulrushes, sometimes in small loose groups and not rarely next to colonies of gulls or terns; several females may deposit eggs in a single nest. The drakes court the hens in the winter quarters; pairs form shortly before and during the spring migration. When nesting starts, the males aggregate while they molt into eclipse plumage, leaving the task of incubation and raising the young to the females alone.

The nest is a shallow depression scraped in the ground and lined with plants and some down feathers. Breeding begins in May, but most birds nest only in June, later than usual for North American waterfowl. The clutch numbers about 9–11 eggs on average; up to 26 eggs have been found in a single nest, but such high numbers are from more than one female. Incubation is by the female only and lasts around 3 weeks. The young fledge some 45–50 days after hatching and soon thereafter the birds migrate to winter quarters. Lesser Scaup become sexually mature in their first or second summer.

About 57% of the Lesser Scaup nests fail each breeding season because the female was killed or the eggs were eaten or destroyed.

Lesser Scaup chicks are capable of diving under water on their hatching day, but they are too buoyant to stay under for more than just a moment. By the time they are 5 to 7 weeks old they are able to dive for 2-25 seconds and swim underwater for 15-18 meters (50-60 ft).

Cool Facts: It is also known as the Little Bluebill or Broadbill because of its distinctive bluish bill. The origin of the name scaup may stem from the bird's preference for feeding on scalp – the Scottish word for oysters, clams, and mussels.

Lesser Scaup are often hard to distinguish from the Greater Scaup when direct comparison is not possible, but in North America a large scaup flock will often have both species present. Females, juveniles and drakes in eclipse plumage are hard to identify; there is considerable overlap in length between the two species, but Greater Scaup are usually noticeably more bulky. Lesser Scaup females and immatures tend to have less white around the bill, but this too varies considerably between individual birds. The bill may give a hint; in the Lesser Scaup it has a stronger curve on the upper side than in the Greater, resulting in a distal part that looks somewhat flattened and wide in the Lesser Scaup – hence the vernacular name "broadbill". If the birds fly, the most tell-tale

sign is the white secondary remiges, whereas in the Greater Scaup the white extends on the primary remiges also, i.e. far towards the wingtip.

Habitat is also a key identifier; the Greater Scaup prefers salt water and is found in America and Eurasia, while the Lesser Scaup prefers freshwater and is found only in North America.

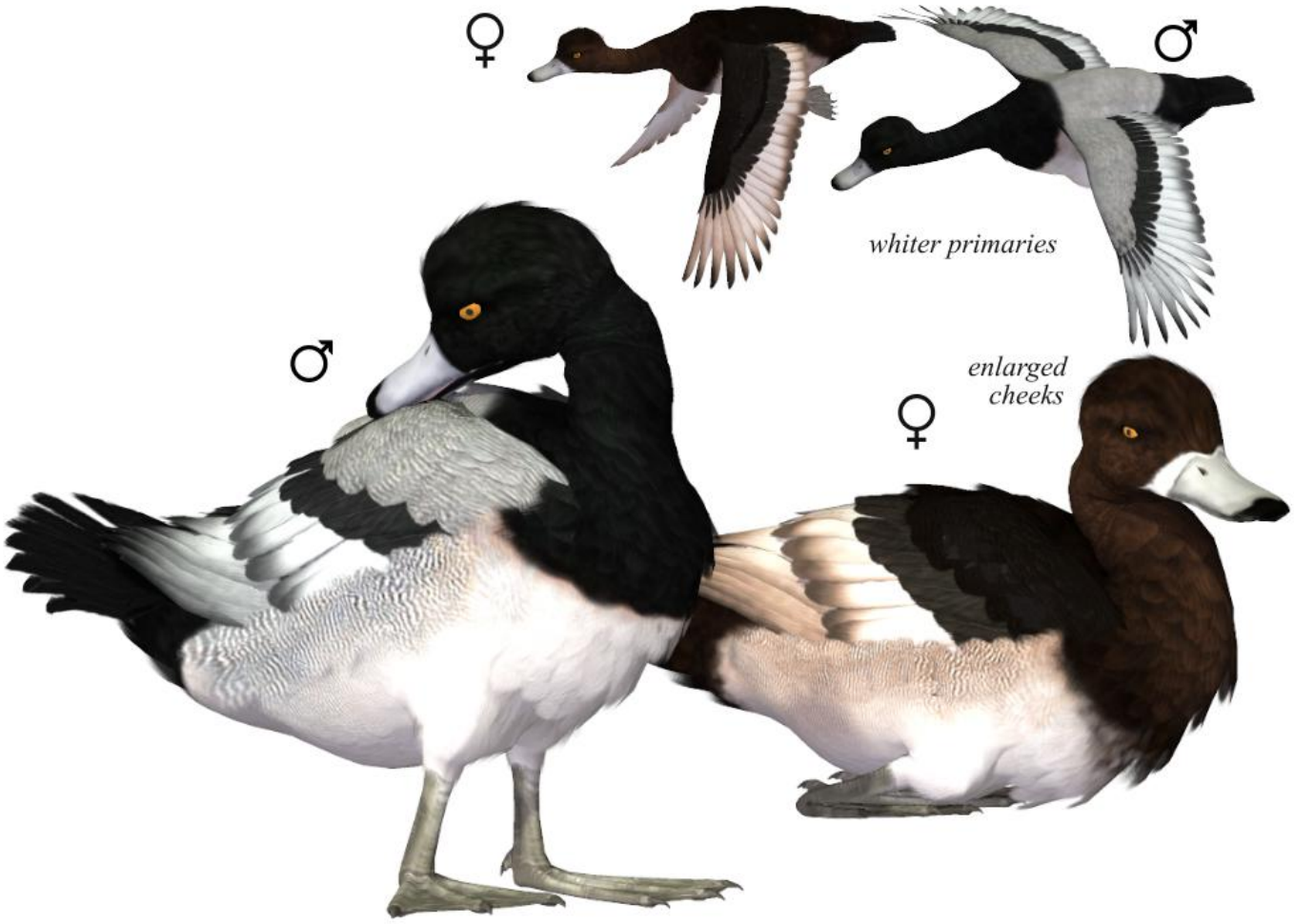
An adult Lesser Scaup may pretend to be dead (immobile with head extended, eyes open, and wings held close to body) when grasped by a red fox.

The oldest known individual reached an age of over 18 years.

Common Name: Greater Scaup
Scientific Name: *Aythya marila*

Size: 15-22 inches (39-56 cm); Wingspan: 28-33 inches (71-84 cm)

Habitat: Circumpolar; Summer breeding grounds of the Greater Scaup range across the northern limits of Europe (including Iceland) and Asia, through the Aleutian Islands (year-round breeding) to Alaska (USA), and across to the Atlantic coast of Canada. It is estimated that 75% of the North American population breed in Alaska. It winters further south, reaching California, the great lakes and northern Florida in North America, the Adriatic Sea and northern Black Sea in Europe, the western Caspian Sea, and on the Pacific coast of Asia as far as south-east China.



The summer habitat is marshy lowland tundra and islands in fresh water lakes. In the fall, they start their migration south for the winter. During the winter months, they are found in coastal bays, estuaries, and sometimes inland lakes.

Status: Least Concern. **Global population:** 1,200,000 to 1,400,000 individuals. Populations have declined significantly since 1980. Some of the primary factors contributing to this decline are habitat loss, contaminants, changes in breeding habitat, and a lower female survival rate. Common predators of the Greater Scaup are owls, skunks, raccoons, foxes, coyotes, and humans. In most countries where Greater Scaup are hunted, a duck stamp is required along with the normal hunting licenses that are required to pursue other game. In America and Canada, waterfowl must be hunted with non-toxic shot.

Diet: Aquatic mollusks, plants, and insects. These food sources are obtained by diving underwater and eaten on the water surface. Because of the Greater Scaup's body mass, it can dive up to 6 m (20 ft) and stay submerged for up to a minute, allowing it to reach food sources that are unobtainable to other diving ducks

Nesting: Great Scaups have blue bills and yellow eyes and is 20% heavier and 10% longer than the closely related Lesser Scaup. Distinguishing Greater from Lesser scaups can be extraordinarily difficult in the field, especially in terms of plumage, although (depending on posture) their general shape is slightly different.

The male has a dark head with a green sheen, a black neck, breast and tail, a light back and its belly and flanks are a bright white, sometimes with gray vermiculations on the lower flanks. The drake also has a white speculum on its wings. The drake or male Greater Scaup is larger and has a more rounded head than the female.

The Greater Scaup drake's eclipse plumage looks similar to its breeding plumage, except the pale parts of the plumage are a buffy gray.

The adult female has a white band and brown oval shaped patches at the base of the bill, which is a slightly duller shade of blue than the drake's bill. Females have grey on both their legs and feet. They have a brown body and head, with white bands on their wingtips.

Juvenile Greater Scaup look similar to adult females.

Drake Greater Scaup have a soft quick whistle to get the attention of hens during their courtship which takes place from late winter to early spring, on the way back to their northern breeding grounds. Female Greater Scaup have a single pitch, a raspy "*arrr-arrr-arrr-arrr-arrr*" sounding vocalization. The courtship procedure is complex and results in the formation of monogamous pairs. After the female lays the eggs, the drake abandons the female. Once the drakes leave the females, they go to a large, isolated lake, in order to molt.

They nest near water, typically on islands in northern lakes or on floating mats of vegetation. They begin breeding at age two, but start building nests in the first year. The nest consists of a shallow depression made by the female and lined with her own down feathers. Females lay a clutch of six to nine olive-buff colored eggs. The eggs hatch in

24 to 28 days. The down-covered ducklings are able to follow their mother in her search for food immediately after hatching.

Cool Facts: Occasionally an older female Greater Scaup will have male-like head color and male patterning on her back, but she still has the typical white face patch of a female.

The nest of a Greater Scaup is usually lined with a thick layer of down plucked by the mother from her own breast. Nests of poor-condition females may lack down and instead may contain small, grayish-white feathers plucked from beneath the outer body feathers.

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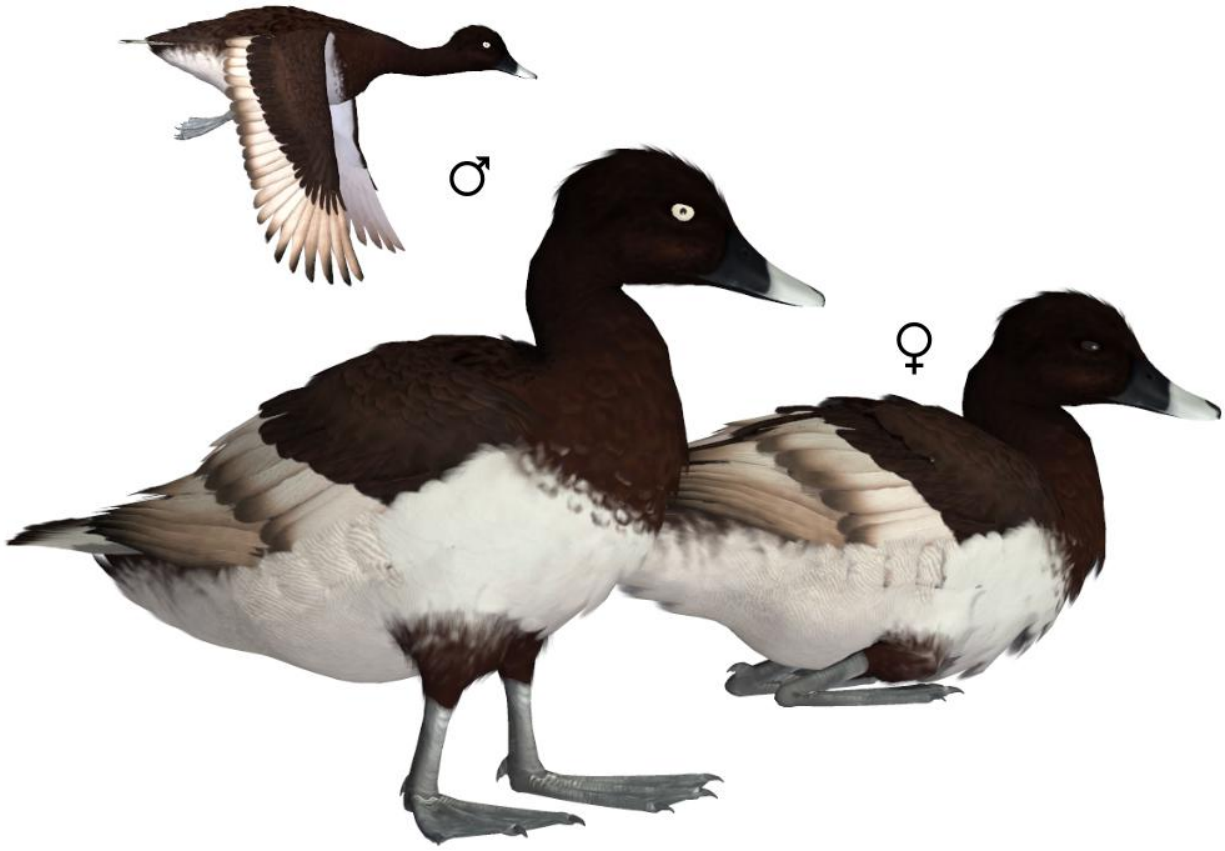
A large group of Scaups on the water (which can number up to 1,000 individuals) is called a “raft”.

Common Name: Hardhead
Scientific Name: *Aythya australis*

Size: 17.7-23.6 inches (45-60 cm); Wingspan: 29.5-33.4 inches (75-85cm)

Habitat: Australia; endemic and common in most of Australia, particularly in the Murray-Darling Basin, but also in the wetter country near the coasts. They are moderately nomadic in normal years, but disperse widely in times of drought. Significant numbers reach as far afield as New Guinea, New Zealand, and the islands of the Pacific, where they can remain for some time, even breeding for a season or two.

They are found in freshwater swamps and wetlands and occasionally in sheltered estuaries. They are rarely seen on land and tend to roost on low branches and stumps near the water. They prefer deep, fresh open water and densely vegetated wetlands for breeding.



Status: Least Concern. **Global population:** Unknown amount of Adult individuals. The overall population trend is fluctuating. Hardheads have declined in some areas after draining of freshwater wetlands or diversion of water for irrigation.

Diet: Small aquatic creatures, supplemented with water weeds. They dive deep into the water, often staying submerged for as long as a minute at a time, while they forage for food. They also sit low in the water.

Nesting: Both male and female are a fairly uniform chocolate-brown above, with rufous flanks and white undersides. The trailing edges and almost the entire underside of the wings are white. In the male, the eyes are a striking white, in the female, brown.

Hardheads breed in low, thick vegetation, in or near the water, along rivers and channels and around billabongs and dams. The nest is a trampled platform of reeds, sticks and vegetation, with some down lining. The nest is built by the female, and is often added to with what she can reach from the nest. The hen incubates the eggs alone.

Cool Facts: The “Hardhead” is also known as the “White-eyed duck”.

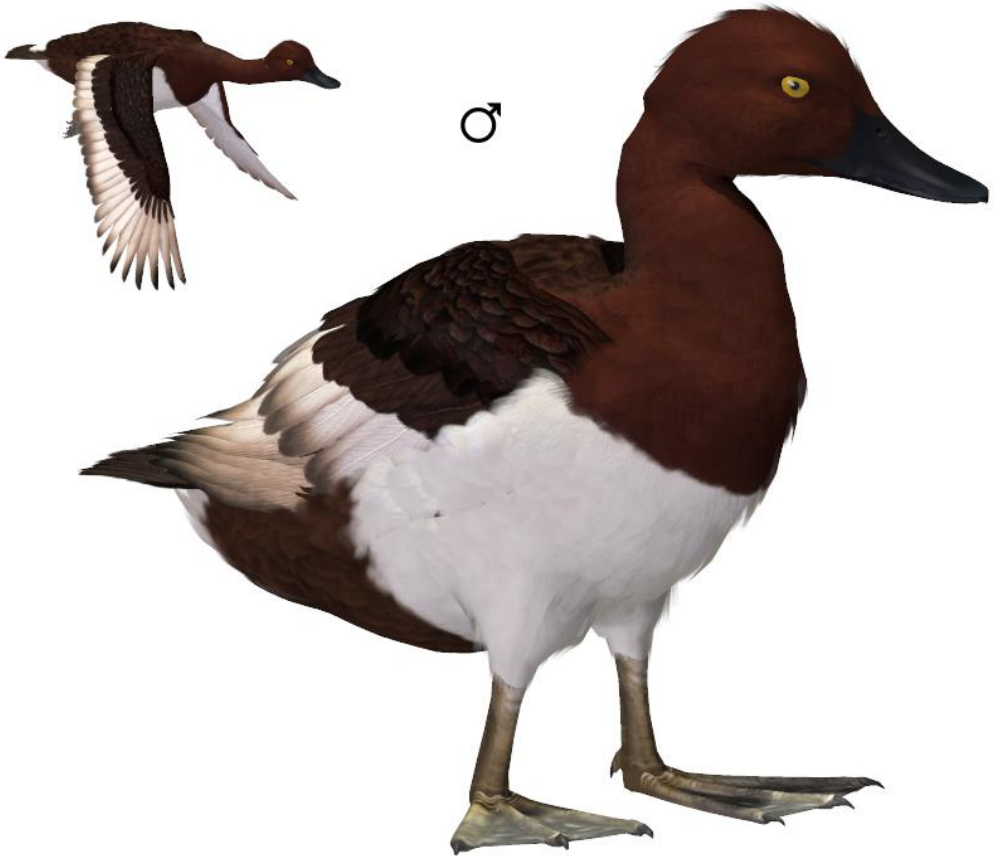
When flying, the wings make a distinctive whirring sound.

Common Name: Ferruginous Duck
Scientific Name: *Aythya nyroca*

Size: 15-16.5 inches (38-42 cm); Wingspan: 24-27.5 inches (62-70 cm)

Habitat: Eurasia and Africa; it breeds principally in south-western Asia (east to China and south to Pakistan and India), central and eastern Europe, and North Africa. The wintering range overlaps with the breeding range and extends to the Middle East, north-east and West Africa (mainly Mali and Nigeria) and South-East Asia.

It shows a strong preference for fresh standing water and is very rarely found on flowing streams or rivers. It requires shallow water close to littoral vegetation for feeding and generally avoids large open areas. It is also found on shallow mudflats, possibly as a result of more accessible and abundant invertebrate food sources in this habitat.



Status: Near Threatened.
Global population: 200,000-300,000 adult individuals. This species' range has fluctuated considerably over the last 150 years as it has modified its distribution. However, most figures suggest widespread declines. Owing to significant local declines it is classified as "Vulnerable" in Europe. Evidence of declines in the larger Asian populations is sparse, and sometimes contradictory. The overall population is estimated to be declining at a moderate rate. The species is threatened by the degradation and destruction of well-vegetated shallow pools and other wetland habitats.

The population is estimated to number 2,400-2,600 in North Africa; 36,000-54,000 in eastern Europe; 25,000-100,000 in south-west Asia and north-east Africa (based on

counts in the 1990s of 9,000 in Azerbaijan, 21,000 in Turkmenistan and 7,000 in Uzbekistan); and over 100,000 in the rest of Asia (based on tens of thousands breeding in Inner Mongolia, common occurrence on the Tibetan Plateau, and upwards of 90,000 being present in north-east Bangladesh in January 2002).

The species is fully protected in Belarus, Bulgaria, Czech Republic, France, Germany, Hungary, Italy, Moldova, Netherlands, Russia, Slovakia, Slovenia, Spain and Switzerland, and is protected from hunting in Austria, Belgium, Greece, Poland, Turkey and Ukraine.

Diet: Animal matter taken includes worms, mollusks, snails, crustaceans, adult and larval insects (such as beetles, dragonflies, waterbugs, caddisflies), amphibians (frogs, tadpoles and spawn) and small fish (up to 3 cm).

Nesting: Sexes are similar; it is a dark chestnut colored duck. Both sexes uniform chestnut, slightly darker on back with white belly and under tail; male with distinctive pale iris. Juveniles are similar but the belly and under tail are grey-buff. In flight a broad white wingbar extends onto outer primaries.

In the spring females give a noisy *err, err...* call while in flight and males make a short chuk call.
The major breeding habitats are shallow eutrophic freshwater pools and marshes with dense abundant submergent, floating, emergent and shoreline vegetation. Shallow banks with flooded vegetation and mudflats are particularly used for foraging during this season. The species shows a particular preference for breeding, molting and staging on large river deltas and extensively managed fish ponds in Eastern Europe.

The nest is a low platform of reeds and other vegetation placed on the ground or on an islet or hummock in thick vegetation close to water. Alternatively nests may be placed over water on floating mats of vegetation or in dense reedbeds along the shoreline.

Cool Facts: It breeds from April or May until late June in single pairs or loose groups. Adults undertake a wing molting period on the breeding grounds between July and August when large flocks of molting individuals may gather. Departure from the breeding grounds begins in mid- to late-August and peaks in October, with the species arriving in wintering areas from late October. The return migration to the breeding grounds begins in early March. Large gatherings of up to 100 individuals may occur prior to migration at the end of the post-breeding molt (July to August), and on migration the species often remains in small groups of 20-50 individuals. Outside of the breeding season the species may be observed solitarily, in pairs or small loose of 2-5 individuals, and larger gatherings of 1,000-2,000 individuals are also recorded from wintering grounds in Niger and Chad.

Common Name: King Eider
Scientific Name: *Somateria spectabilis*

Size: 22 inches (55.9 cm); Wingspan: 35 inches (88.9 cm)

Habitat: Worldwide; breeds along Northern Hemisphere Arctic coasts of northeast Europe, North America and Asia. The birds spend most of the year in coastal marine ecosystems at high latitudes, and migrate to Arctic tundra to breed in June and July. It winters in arctic and subarctic marine areas, most notably in the Bering Sea, the west coast of Greenland, eastern Canada and northern Norway. It also occurs annually off the northeastern United States, Scotland and Kamchatka. Breeding areas include the Arctic coastal tundra of the north coast of Alaska.

Status: Least Concern. **Global population:** 790,000-930,000 adult individuals. The overall population trend is decreasing, although some populations may be stable, and others have unknown trends. The species is threatened by chronic coastal oil pollution and future oil spills, especially when these occur where it forms large aggregations on the sea during the molt period, on migration or in the winter. The species is also threatened by the degradation of food resources as a result of oil exploration, by human

disturbance when it is molting and on migration, and by disturbance from uncontrolled shipping (e.g. oil transportation) on its wintering grounds. In addition, the population wintering in Greenland is under serious threats from over-exploitation (10-20 % of the winter population is killed annually by hunting).

The King Eider is protected under the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA).

Diet: Invertebrates; such as crustaceans, polychaete worms, and mollusks, with mussels being the favorite food. During the breeding season, Eiders feed by tipping up, probing, or diving, depending on water depth. In winter, it most commonly dives to the sea floor to take prey. Wintering birds can form large flocks on suitable coastal waters, with some flocks exceeding 100,000 birds.

Nesting: Drakes have a white neck and chest with a yellowish-buff wash over the upper breast. The body is mostly black with white sides on the rump. There are large white patches on the forewings. The forehead, crown, and nape are pearl blue and the cheeks iridescent pale green. The bill bright red with a white tip, There is a large yellow or orangish swollen knob at base of upper bill. Two feathers stick up as two small triangular black sails on back (similar to the Mandarin Duck). The legs are bright yellow, with dusky webs and black nails.

Nonbreeding males resemble the female in being brownish, but they have blackish wings and white forewing patches. The bill is duller than in breeding and the lobe smaller and with dark brownish spots.

Females are mostly deep reddish brown, barred with black. The feathers on the sides and flanks have black crescent or U-shaped black bars and dark centers. The bill is gray, and not enlarged like the male's, with a rounded edge of feathering at the bill base. The feet are greenish gray to yellowish, with dark webs.

Immatures are like adult female. First-year male similar to the female, but has pale chest, a light eye line, and an unswollen, orange or yellowish bill.

The nest is a slight hollow on dry ground and is usually positioned near water in the open or under the cover of driftwood, grass hummocks or rocks. They nest in various tundra habitats, generally in low marshy areas. The female King Eider alone attends the nest. When an intruder is present, the female sits low on the nest with her head flattened on the ground. She sits tightly on the eggs and sometimes can be touched or picked up off of the nest. She will not feed very often during the 22-24 day incubation period. She lays four to seven eggs in a scrape on the ground lined with grass and down.

Cool Facts: The female of this species is often referred to as the “Queen” Eider.

King Eiders can forage on sea beds up to 25 m (82 ft) deep.

Common Name: Harlequin Duck
Scientific Name: *Histrionicus histrionicus*

Size: 13-21.3 inches (33-54 cm); Wingspan: 22-26 inches (56-66 cm)

Habitat: North America and Asia; found in north-western and north-eastern North America, eastern Russia, the Aleutian Islands, southern Greenland and Iceland. It can winter further south, being found off Korea, northern California and North Carolina (United States). They are short distance migrants and most winter near rocky shorelines on the Atlantic and Pacific coasts. They are very rare migrants to Western Europe.

This species is found breeding on cold, swift torrents and rapid streams of rugged uplands, normally wintering on rocky coastlines.

Status: Least Concern to Endangered. **Global population:** 190,000-380,000 adult individuals. The overall population trend is increasing, although some populations may

be stable or declining. The eastern North American population is declining and is considered endangered. Possible causes include loss of habitat due to hydroelectric projects and loss of life due to oil spills near coastal areas. It is listed as "Endangered" in Canada and "Threatened" in Maine (United States). A *"Species of special concern"* in the western United States.

Diet: Mostly insects and their larvae in summer; catching mollusks and crustaceans in winter. They find food mostly by diving, but also dabbling and head-dipping in shallow water.

Nesting: Male are larger than females. Adult male's body plumage is slate-blue with white bands and collars, bordered with black lines, on chest and neck. There is a large white crescent in front of eye, a small white circular patch near ear and a white vertical stripe alongside the neck. On top of the head is a black streak, bordered by white and amber lines. It has iridescent blue secondaries and a rich dark slate-blue belly with chestnut-brown flanks.

Adult females are less colorful, with a brown body and white belly with brown checks or spots. There is a round white spot behind ear and faded variable white patches in front of eye. Occasionally, there are white streaks on back of the head.

Immatures are similar to adult female, but with darker bellies.

Breeding begins in May or June, and nesting on the ground concealed in vegetation. Three to nine pale creamy eggs are laid.

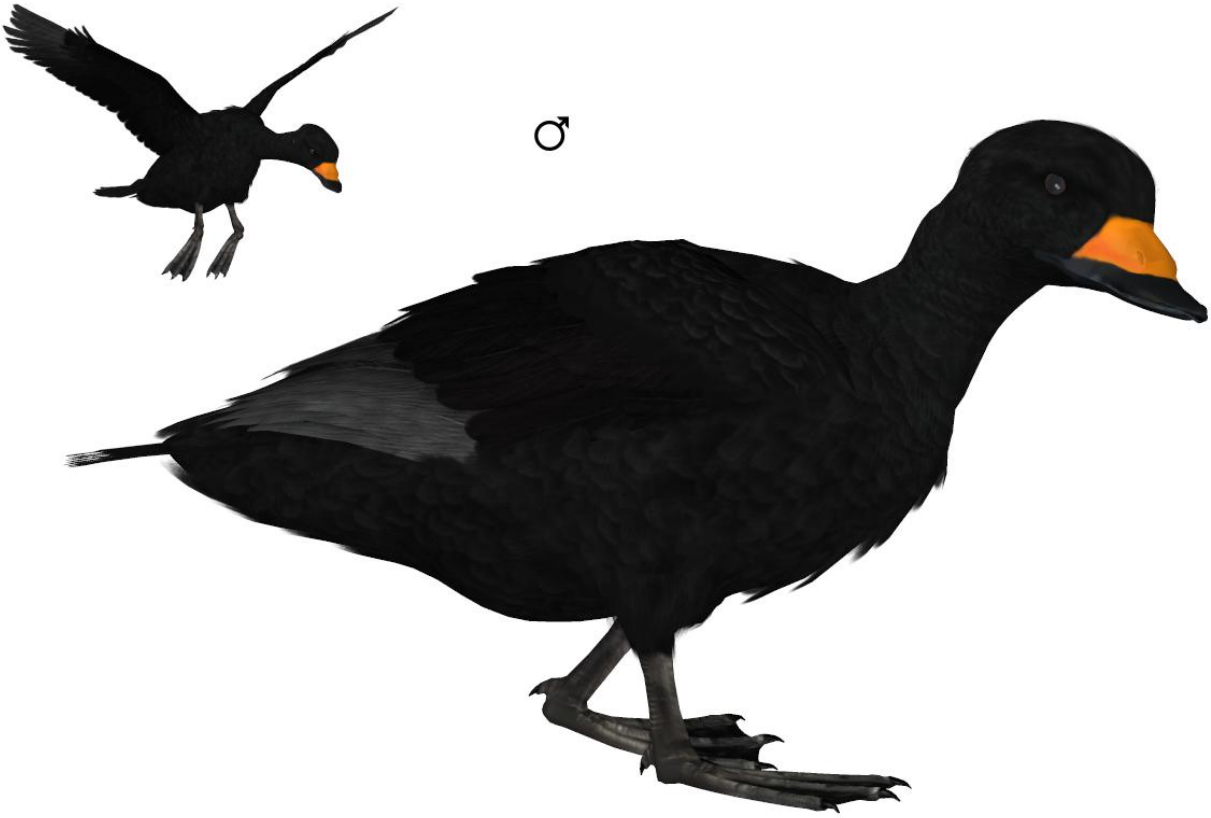
Cool Facts: It takes its name from Arlecchino, Arlequin in French, a colorfully dressed character in "Commedia dell'arte". The species name comes from the Latin word "histrio", "actor". In North America it is also known as "Lords and ladies".

Harlequins have smooth, densely packed feathers that trap a lot of air within them. This is vital for insulating such small bodies against the chilly waters they forage. It also makes them exceptionally buoyant, making them bounce like corks after dives.

Common Name: Black Scoter
Scientific Name: *Melanitta americana*

Size: 17-19 inches (43-49 cm); Wingspan: 30.3-32.7 inches (77-83 cm)

Habitat: North America and Asia; breeds in the far north of North America in Labrador and Newfoundland to the southeast Hudson Bay, in Alaska. It also occurs on the Siberian side of the Bering Straits east of the Yana River. It winters further south in temperate zones, on the coasts of the northern USA and Canada, on the Pacific coast south to the San Francisco Bay region and on the Atlantic and Gulf of Mexico coasts, and in Asia as far south as China. Some birds may over-winter on the Great Lakes. This species is a very rare vagrant to Western Europe.



This species is strongly migratory and often travels considerable distances over land making brief stop-overs on inland waters. It arrives on its breeding grounds between late-April and May and breeds from late-May onwards in highly dispersed solitary pairs. After mating (from June onwards) males migrate long distances prior to their flightless molt, most travelling in small groups to inshore or offshore coastal waters. Females and juveniles leave the breeding grounds in September. The species is highly gregarious when not breeding with males forming large congregations during the flightless molting period and large flocks of several hundred to a thousand or occasionally over 100,000

individuals occurring during winter. Non-breeders often over-summer on the wintering grounds.

Their breeding habitat is on Arctic dwarf heath or boggy tundra on pools, small lakes, streams and slow-flowing rivers. It shows a preference for freshwater habitats with low banks, small islets with a high abundance of aquatic invertebrate and plant life, positioned in swampy valleys or among mossy bogs, especially where there are suitable shrubs (e.g. willow or birch) and herbaceous vegetation. It generally avoids areas with steep slopes or wetlands enclosed by forest. Non-breeding habitat: Although the species may use freshwater lakes on migration the majority molt and overwinter at sea on shallow inshore waters less than 20 m deep (optimally 5-15 m) with abundant benthic fauna, generally between 500 m and c.2 km from the shore.

Status: Near Threatened. **Global population:** 530,000-830,000 individuals. This species is thought to be declining in western Alaska and to be stable on the Arctic coastal plain. Numbers also appear to be declining in the Atlantic flyway. Trends are apparently uncertain in far north-east Asia, where the species occurs east of Lena and numbers an estimated 300,000-500,000 birds or 12-24% of the estimated global population.

The large concentrations of this species that occur during the molting period and in winter are highly vulnerable to oil spills, chronic oil pollution, human disturbance and the degradation of food resources as a result of oil exploration. The species also suffers disturbance from high-speed ferries. The effects of commercial exploitation of benthic shellfish also poses a threat (through competition for food resources), and the species' breeding habitats are threatened by eutrophication (such as algae blooms) in some areas. The species is susceptible to avian influenza so may be threatened by future outbreaks of the virus.

Diet: Predominantly mollusks and other crustaceans during migration or wintering on the sea-coasts. During the nesting period, it feeds on insects and their larvae (especially caddisflies and fish eggs) and vegetation such as duck weed on freshwater. Food is obtained mostly through diving.

Nesting: Males are larger than females. Scoters have a bulky shape and large bill. The male is all black with a very bulbous yellow bill. The female is a brown bird with pale cheeks, very similar to female Common Scoter.

The lined nest (scrape type) is built on the ground close to the sea, lakes or rivers, in woodland or tundra. 5–7 eggs are laid. The incubation period may range from 27 to 31 days. Females brood their young extensively for about 3 weeks, after which the still flightless young must fend for themselves.

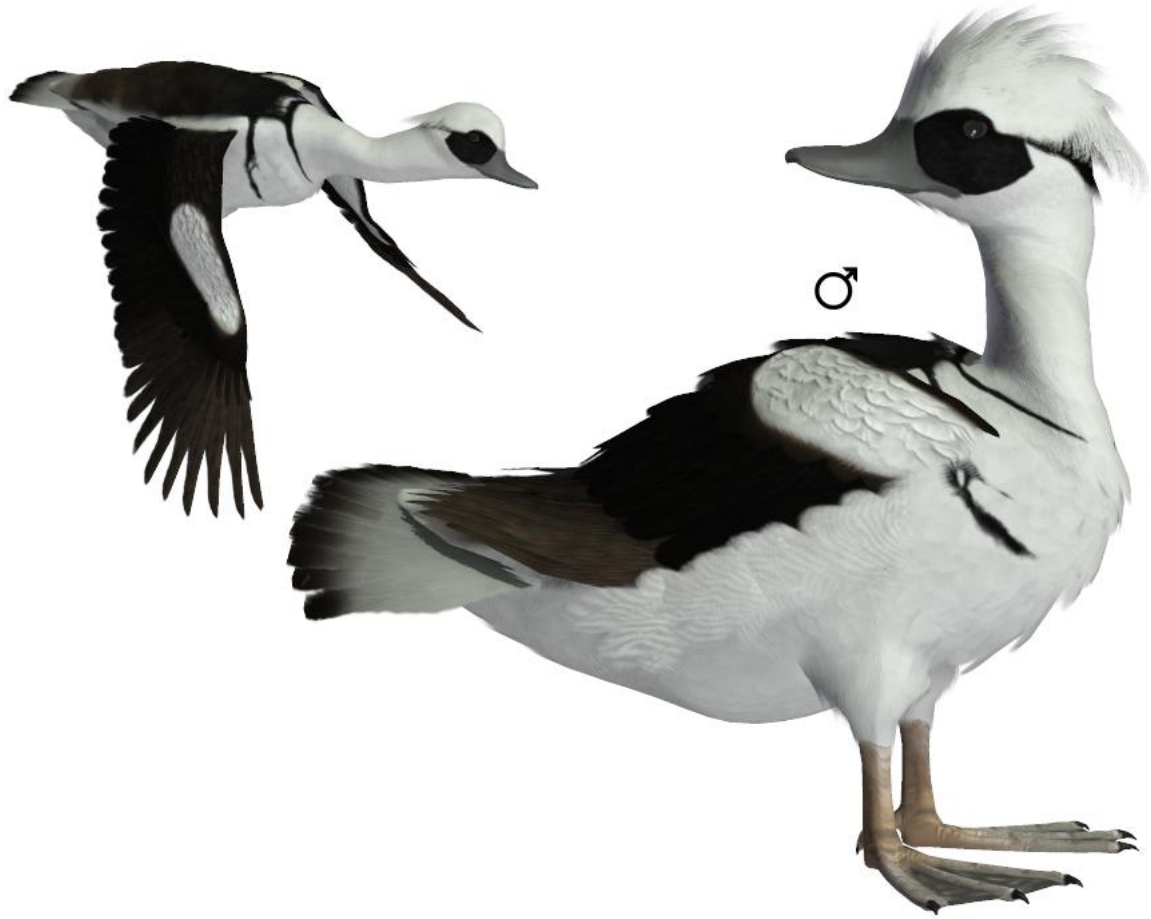
Cool Facts: This is America's only black duck, although the female may have some yellow around the nostrils.

Common Name: Smew
Scientific Name: *Mergellus albellus*

Size: 15-17 inches (38-44 cm); Wingspan: 30 inches (77 cm)

Habitat: Eurasia; breeds in the northern taiga of Europe and Asia. As a migrant, it leaves its breeding areas and winters on sheltered coasts or inland lakes of the Baltic Sea, the Black Sea, northern Germany and the Low Countries, with a small number reaching Great Britain. Vagrants have been recorded in North America.

This species is highly migratory, often resting and feeding on inland water bodies when on passage. It arrives on the breeding grounds from April or early-May and breeds from



mid-May onwards in single pairs or loose groups. Males gather in large flocks close to the breeding grounds after mating to undergo a flightless molting period. The species then leaves the breeding grounds in early-September and October. Outside of the breeding season the species is highly gregarious and occurs in small or large flocks usually not exceeding 100 individuals, although larger gatherings may form at major

passage waters during migration and flocks of over 10,000 have been recorded during the winter.

Preferred breeding habitats are on freshwater, oligotrophic lakes, pools, oxbow lakes, backwaters of large slow-flowing rivers, bogs and flooded riverside woods in coniferous and mixed deciduous or evergreen forest. They show a preference for shallow water and require mature broadleaved trees with holes in which to nest. The species overwinters on large freshwater lakes and reservoirs, ice-free, brackish coastal lagoons, estuaries and sheltered coastal bays (although rarely on the open sea), often resting and feeding on small bodies of water or small streams when on migration.

Status: Least Concern. **Global population:** 130,000 adult individuals. The population is decreasing and is suspected to be much affected by availability of nest sites in suitable habitat. Populations are also subject to hunting pressure during migration and have been affected by pollution from oil spills. Populations declined in Europe throughout the 19th and 20th centuries due to habitat degradation and loss (e.g. the loss of mature trees in river valleys as a result of logging, conversion to agriculture and building of river canals). The species has also suffered local declines as a result of predation by American mink (*Neovison vison)* and is susceptible to avian influenza so may be threatened by future outbreaks of the virus.

The Smew is one of the species to which the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) applies.

Diet: Aquatic invertebrates (such as adult and larval insects), crustaceans, mollusks and polycheate worms, amphibians, fish and plant matter (such as seeds, leaves and roots) during breeding season. During the winter and in early spring, however, the species mainly feeds on fish. The species feeds diurnally by diving to depths of 1-4 m and forms gregarious nocturnal roosts.

Nesting: The drake Smew, with its panda-like appearance, is unmistakable, and looks very black-and-white in flight. The females and immature males are grey birds with chestnut foreheads and crowns, and can be confused at a distance with the Ruddy Duck.

It has oval white wing-patches in flight. The Smew's bill has a hooked tip.

The species nests in tree hollows up to 10 m or more above the ground and may use those excavated by Black Woodpeckers (*Dryocopus martius*) (Madge and Burn 1988) in mature broadleaved trees (e.g. oak, willow or aspen). It may also nest in artificial nest boxes, especially those erected to attract Common Goldeneye (*Bucephala clangula*). It lays 6–9 cream-colored eggs.

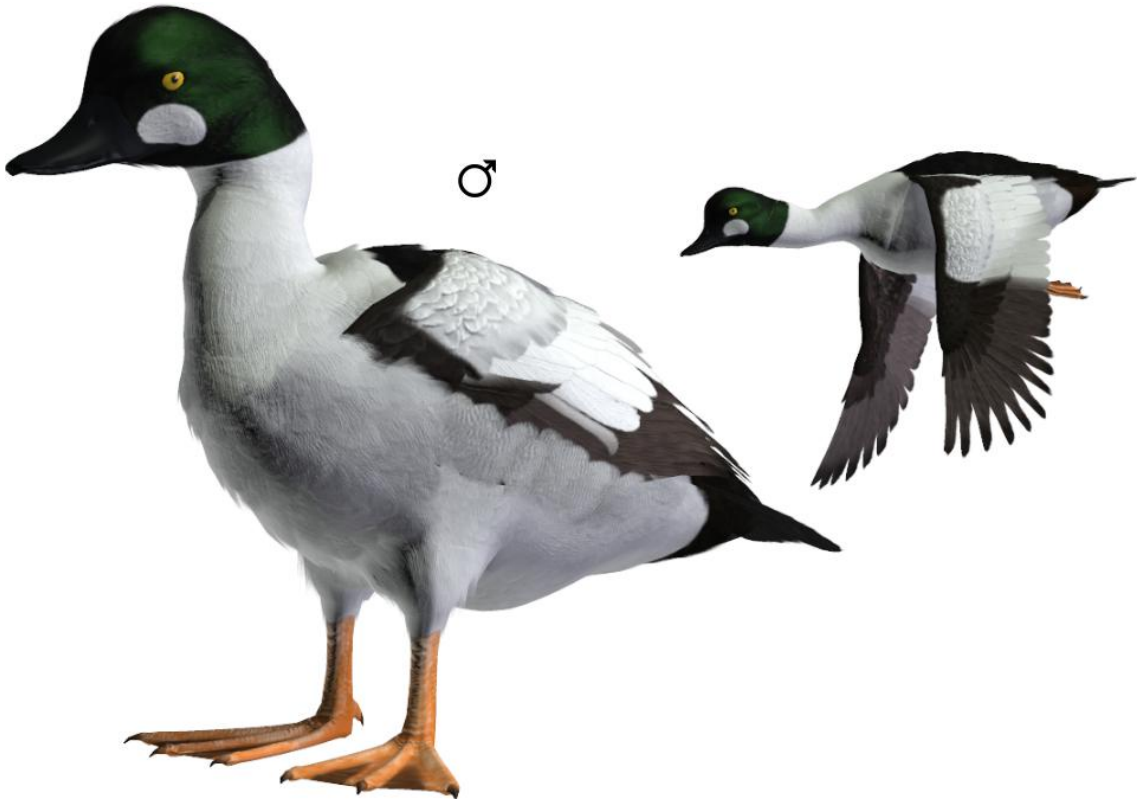
Cool Facts: It is the only member of the genus *Mergellus* and a seaduck fossil from the Middle Miocene shows that birds similar to Smew existed up to 13 million years ago (the extant species dates back to the Pleistocene).

Common Name: Common Goldeneye
Scientific Name: *Bucephala clangula*

Size: 15.7-20.1 inches (40-51 cm); Wingspan: 30.3-32.7 inches (77-83 cm)

Habitat: Worldwide; breeds in taiga. They are found in the boreal forests of Scandinavia, Eastern Europe, Russia, Mongolia, northern China, Canada, Alaska and northern USA. Its wintering range is equally broad, encompassing the coast of northern Europe including inland United Kingdom, scattered coastal and inland water bodies in south-eastern Europe (e.g. Turkey) and central Asia, the coasts of eastern China, Korea, Japan and the Kamchatkha Peninsula (Russia), the Pacific coast of Canada and the Alaskan coast and inland USA. They have been recorded as a vagrant in various parts of the Indian Subcontinent.

They breed along lakes and rivers bordered by forest. They winter primarily in marine waters, bays and harbors, as well as in large inland lakes and rivers.



Status: Least Concern. **Global population:** 2,500,000-4,600,000 individuals. Populations appear stable or increasing in some areas. The species is threatened by wetland degradation and loss in North America and is susceptible to atmospheric acid deposition (e.g. acid rain) throughout a large part of its breeding range. The main threat to the species in its wintering range is pollution (e.g. from coastal oil spills or other pollutants from sewage outfalls).

The Common Goldeneye is one of the species to which the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) applies.

Diet: Crustaceans, aquatic insects and mollusks. Insects are the predominant prey while nesting and crustaceans are the predominant prey during migration and winter. Locally, fish eggs and aquatic plants can be important foods.

These diving birds forage underwater.

Nesting: The species gets its name for its distinctive eye color. Adult males have a dark head with a greenish gloss and a circular white patch below the eye, a dark back and a white neck and belly.

Adult females have a brown head and a mostly grey body. Their legs and feet are orange-yellow. Immatures are similar to females and first winter males similar to the adult male, but they have a browner head, gray sides and chest, and smaller and less distinct white oval on face.

Goldeneyes are tree nesters, using natural tree cavities made from broken limbs or reusing nests created by Pileated Woodpeckers or Black Woodpeckers (the only woodpeckers that make a cavity large enough to normally accommodate a goldeneye). The female lays 5-16 eggs. She does all the incubating and is abandoned by the male about 1 to 2 weeks into incubation. The incubation period ranges from 28 to 32 days. The young remain in the nest for about 24–36 hours.

Brood parasitism is quite common both with other Common Goldeneyes, as well as other duck species, and even Tree Swallow and European Starling eggs have been found mixed with goldeneye eggs.

The broods commonly start to mix with other females' broods as they become more independent. Goldeneye young have been known to be competitively killed by other goldeneye mothers, Common Loons and Red-necked Grebes. The young are capable of flight at 55–65 days of age.

Cool Facts: The eyes of a Common Goldeneye are gray-brown at hatching. They turn purple-blue, then blue, then green-blue as they age. By five months of age they have become clear pale green-yellow. The eyes will be bright yellow in adult males and pale yellow to white in females.

After the ducklings leave the nest they can feed themselves and require only protection. Some females abandon their broods soon after hatching, and the young will join another female's brood. Such mixed broods, known as "creches," may also occur when a female loses some ducklings after a territorial fight with another female. Young scatter and mix when females fight, and not all of them get back to their mother when the fight ends. Some or all of the ducklings may be transferred to one brood, usually that of the territory owner.

Common Name: Bufflehead
Scientific Name: *Bucephala albeola*

Size: 12.6-15.7 inches (32-40 cm); Wingspan: 21.7 inches (55 cm)

Habitat: North America; wintering throughout North America and summering in artic North America. Vagrants have been sighted in Kamchatka, Japan, Greenland, Iceland, the British Isles, Belgium, France, Finland, and Czechoslovakia.

Buffleheads breed near ponds and lakes in boreal forest and aspen parkland of Canada and Alaska, with isolated populations in the western United States. The Bufflehead's breeding range is limited by the distribution of Northern Flickers, which are their main source of nesting cavities. In winter, they occur mainly near the coast (although they can be found in smaller numbers inland). They use shallow, sheltered coves, harbors, estuaries, or beaches, avoiding open coastlines. Inland, they use ponds, lakes, impoundments, or bays along slow-moving rivers. During spring migration they spend time on major rivers or valley lakes, often in the first spots to become free of ice.

Status: Least Concern. **Global population:** 1,400,000 +/- individuals. In the early twentieth century, Buffleheads had become scarce from overshooting, but they

recovered under the protection of the Migratory Birds Convention between the United States and Canada. Christmas Bird Counts show a steady increase in Bufflehead numbers between 1927 and 1992, with an overall population estimate of some 1.4 million Buffleheads in 1992. The Bufflehead's tendency to winter near to shore along coastlines tends to put it within range of hunters. Duck hunting is carefully managed to maintain populations; nevertheless between 200,000 and 250,000 are shot per year in the U.S. and Canada combined. Bufflehead are also losing nest sites as loggers clear-cut boreal forest, and as agricultural fields replace aspen parklands in western North America. Putting up nest boxes with small (2.5-inch diameter) openings in appropriate habitat can help.

Diet: Aquatic invertebrates, crustaceans, and mollusks. Food is caught by diving and is typically swallowed while still underwater. Dives last on average about 12 seconds and rarely more than 25 seconds, typically staying on the surface another 12 seconds or so before diving again.

Buffleheads swim buoyantly, dive easily, and take flight by running a short distance on the surface. They fly low over the water and higher over the land. To dive, Bufflehead compress their plumage to squeeze out air, then give a slight forward leap and plunge powerfully downward. They hold their wings tightly against their bodies underwater and use only their feet to propel themselves. At the end of a dive, they may bob to the surface like a cork.

Nesting: Adult males have a white body, black back, and a dark head with a large white patch that wraps around the back of the head.
Females and first-year males are gray-brown overall with an oval, white cheek patch. In flight adult males have a large white patch on the upper wing; females and first-year males have a smaller white wing patch.

Unlike most ducks, the Bufflehead is mostly monogamous, often remaining with the same mate for several years. Bufflehead nest only in cavities, using holes dug by Northern Flickers and sometimes Pileated Woodpeckers (as well as artificial nest boxes). Just before egg laying, females make more secretive flights to prospective holes, either alone or with their mates. They usually choose cavities in poplar or aspen trees, except in California where they often use pine trees. 4-17 Cream-colored eggs are layed.

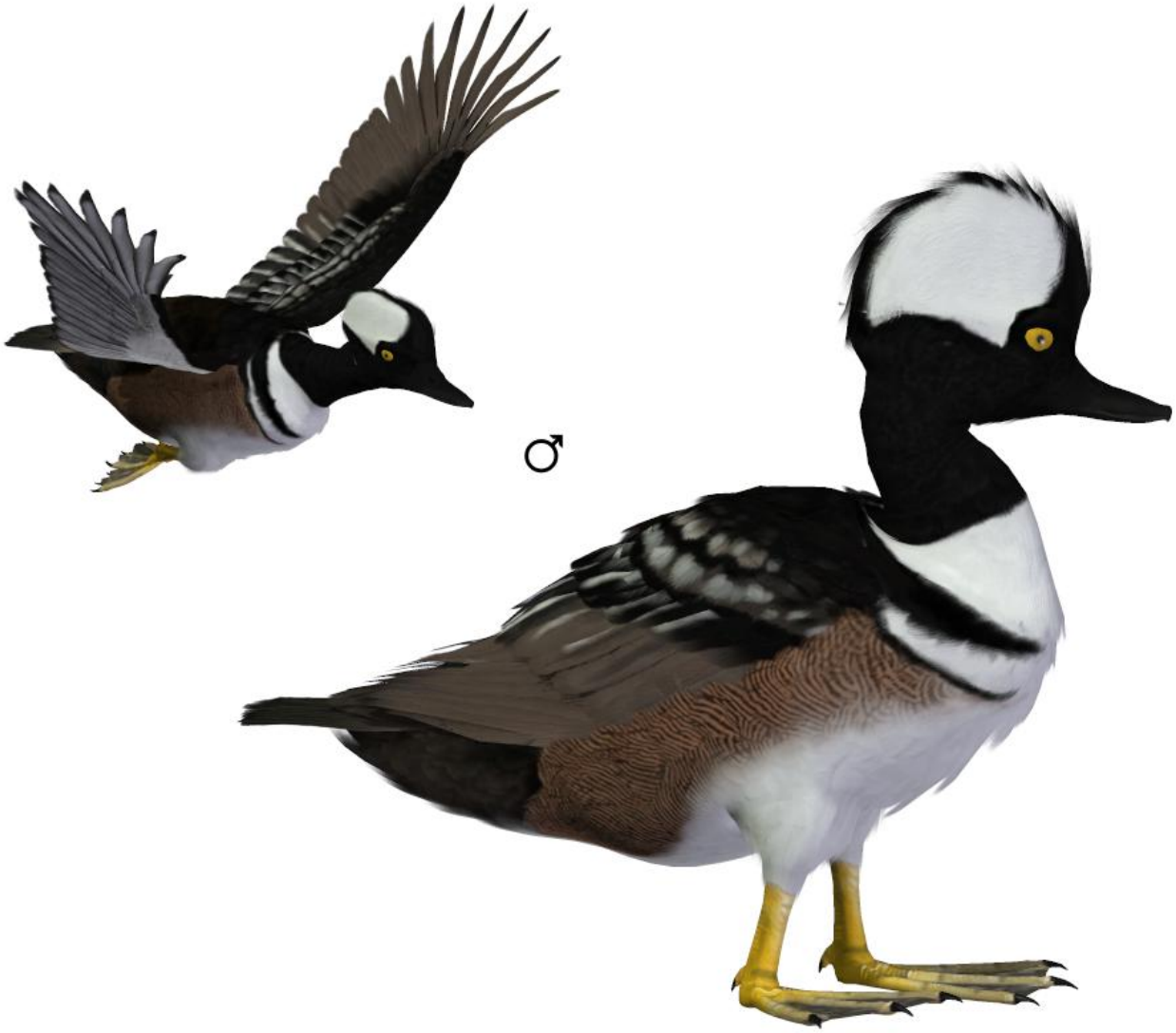
Cool Facts: It rivals the Green-winged Teal as the smallest American duck. Buffleheads have evolved their small size in order to fit the nesting cavity of their "metabiotic" host, a woodpecker, the Northern Flicker.

Bufflehead fossils from the late Pleistocene (about 500,000 years ago) have been found in Alaska, California, Florida, Illinois, Kansas, Texas, and Washington. One California fossil that resembles a modern Bufflehead dates to the late Pliocene, two million years ago.

Common Name: Hooded Merganser
Scientific Name: *Lophodytes cucullatus*

Size: 17.7-19.3 inches (40-49 cm); Wingspan: 23.6-26 inches (60-66 cm)

Habitat: North America; breed in forested wetlands throughout the eastern half of North America and the Pacific Northwest, and may also nest in treeless wetlands where people have put up nest boxes. They are most common in forests around the Great Lakes. Their habitat ranges from spruce-fir forest in the Northwest to pine-hardwood forest and cottonwood-elder riparian forest in the Midwest, to oak-cypress-tupelo forest



in the Southeast. Families of newly hatched ducklings forage in shallow water such as marshes, small lakes, ponds, beaver wetlands, swamps, and forested rivers—and rest on exposed rocks, logs, or sandbars. They winter in these habitats as well as on shallow freshwater and brackish bays, estuaries, and tidal creeks, where they often concentrate along the edge of ice. During migration they stop in a wider range of

habitats, including open waters of rivers and lakes, brackish coastal bays, tidal creeks, and seasonally flooded forest.

Status: Least Concern. **Global population:** Unknown amount of adult individuals. The population trend appears to be increasing. Threats include the loss of nest sites as logger's clear-cut forests, and as agricultural fields replace parklands in North America. Putting up nest boxes in appropriate habitat can help.

Diet: Small fish, aquatic insects, crustaceans (especially crayfish), amphibians, vegetation, and mollusks. They dive in clear, shallow forest ponds, rivers, and streams and locate prey by sight. They propel themselves with their feet and use their slender bills to grasp their prey. Ducklings can dive for food right after leaving the nest, at one day old, though their dives are short and shallow during their first week. They also feed by swimming with just their heads underwater.

Nesting: Adult males are black above, with a white breast and rich chestnut flanks. The black head has a large white patch that varies in size when the crest is raised or lowered, but is always prominent.

Females and immatures are gray and brown, with warm tawny-cinnamon tones on the head.

Mergansers are tree nesters, using natural tree cavities made from broken limbs or reusing nests created by Woodpeckers. The female makes a shallow bowl nest with materials already present in the cavity, gradually adding down from her belly after she starts laying eggs.

Mergansers often lay their eggs in other females' nests. This is called "brood parasitism" and is similar to the practice of Brown-headed Cowbirds, except that the ducks only lay eggs in nests of their own species. Female Hooded Mergansers can lay up to about 13 eggs in a clutch, but nests have been found with up to 44 eggs in them.

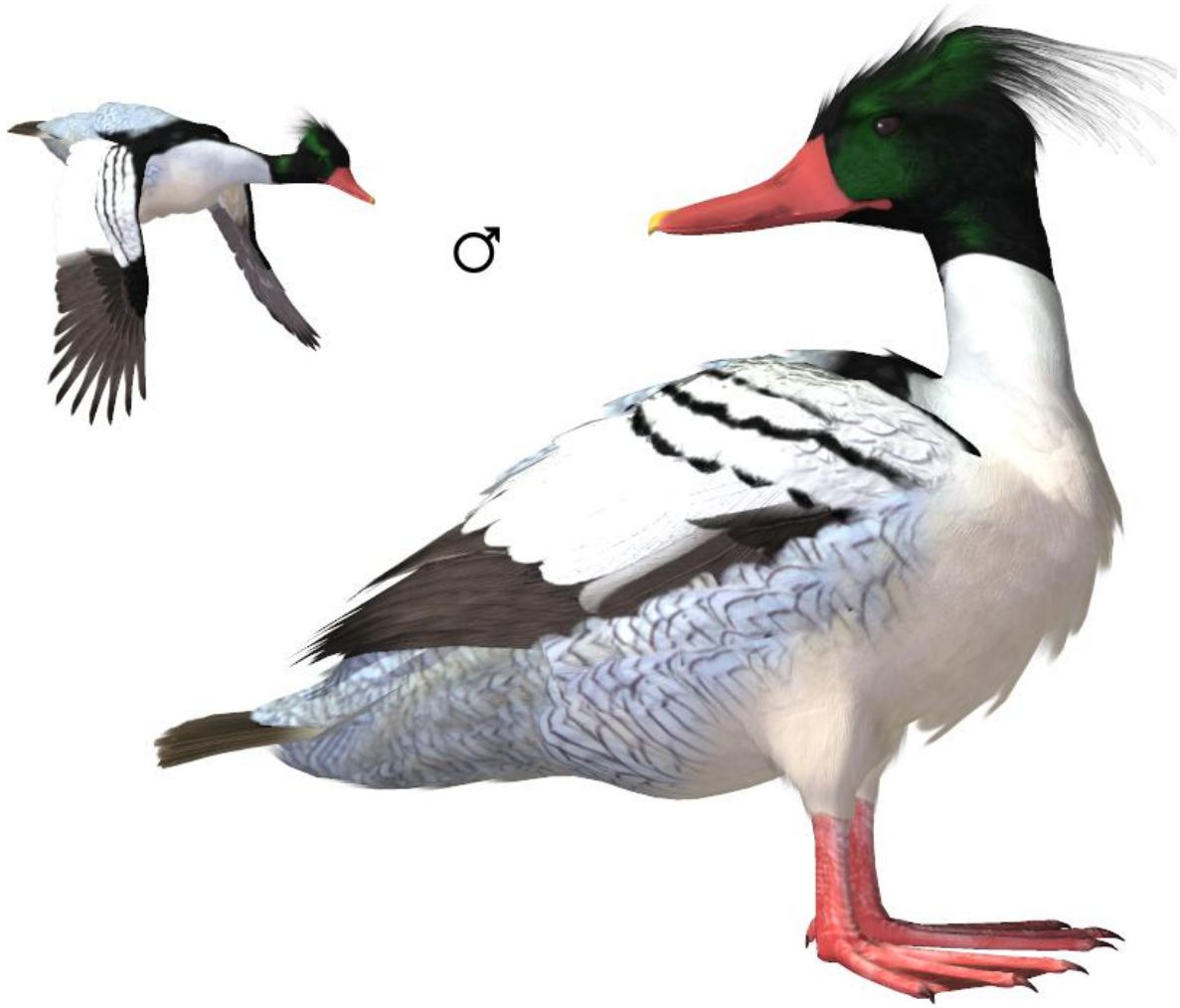
Hooded Merganser ducklings leave their nest cavity within 24 hours of hatching. First, their mother checks the area around the nest and calls to the nestlings from ground level. From inside the nest, the ducklings scramble up to the entrance hole and then flutter to the ground, which may be 50 feet or more below them. In some cases they have to walk half a mile or more with their mother to the nearest body of water.

Cool Facts: Hooded Mergansers find their prey underwater by sight. They can actually change the refractive properties of their eyes to improve their underwater vision. In addition, they have an extra eyelid, called a "nictitating membrane," which is transparent and helps protect the eye during swimming, like a pair of goggles.

Common Name: Chinese or Scaly-sided Merganser
Scientific Name: *Mergus squamatus*

Size: 20.4-22.8 inches (52-58 cm); Wingspan: 26-29 inches (83-85 cm)

Habitat: Asia; south-east Russia, North Korea and Heilongjiang, Jilin and Inner Mongolia in north-east China. Some birds winter in south-east Russia and North Korea, but most winter in central and southern China (the majority of wintering flocks found on rivers and other water bodies in the Yangtze River catchment, with small numbers in Japan, South Korea, Taiwan (China), Myanmar and Thailand.



It breeds below c.900 m in mountainous areas, along rivers with tall riverine forest, mainly within the temperate conifer-broadleaf forest zone. It is largely confined to primary forests, with an abundance of potential nest-holes. During a study on the Russian breeding grounds, river size, mountain slope, human population, estimated forest cover and water clarity all failed to explain the observed distribution, but the species showed a marked preference for the middle reaches of rivers.

It prefers freshwater habitats in winter, only c.10% are known to winter on coastal waters. On passage and in winter, it feeds along large rivers. Flocks of up to 20 individuals have been noted on passage or in winter. In Russia, they molt on a range of water bodies within the breeding range and north and east of breeding range, including rivers, estuaries and the sea.

Status: Endangered. **Global population:** >2,500 individuals. This species has a very small population which is suspected to be undergoing a continuing and rapid decline as a result of habitat loss, illegal hunting and disturbance.

In the 1960s and 1970s, its decline in Russia coincided with economic development of the taiga. Primary forests in the valleys of all large rivers were greatly altered, but large-scale deforestation in river valleys is now prohibited; however, the new Russian Forest Codex (2007) requires a water protection zone (no deforestation) of only 100 m for large rivers (50 m on each side), and 50 m (25 m each side) for rivers shorter that 100 km, which is likely to significantly reduce suitable breeding habitat for this species, which nests up to 150 m from rivers. Logging of river sources and adjacent slopes has led to reduced spring water levels and changes in fish abundance; since logging began on the Avvakumovka River in 2004, spring water levels and merganser populations have undergone continuous declines. Other major threats within the breeding range include illegal hunting, drowning in fishing nets (a major cause of mortality at Russian breeding sites in 2003-2007, disturbance from motor boats during the breeding season, river pollution and natural predators. Increased hunting of waterfowl for sport together with poor regulation of the spring hunting season (which is intended to coincide with passage migration and avoid targeting locally breeding birds) is a significant and increasing threat; large numbers were reportedly shot in the Kievka River basin, southern Primorye, in spring 2008.
Threats in its breeding range in China include dam construction, deforestation, illegal hunting, human disturbance and the use of poisons and/or explosives for fishing. Fine-meshed nets were a significant threat to the post-breeding congregations at Song Jiang He in Jilin Province, China, but illegal fishing at the site has been reduced and only large-meshed nets are used in legal fish-farming. The site remains threatened by industrial pollution.

The proposed Korean Grand Canal project, which aimed to canalize 3,134 km of the Korean peninsula's rivers and radically alter the Han and Nakdong rivers (which currently support an estimated 30-50 birds in winter), was suspended in June 2008 and an alternative scheme, the Four Rivers Project, was proposed in December of that year, with an environmental impact assessment and launch of construction in 2009. In South Korea, the species is impacted by increased river turbidity due to construction and dredging, bridge-building activities, river-bank strengthening and road-widening schemes. Some of these activities are associated with the Four Rivers Project on several stretches of river used regularly or irregularly by the species. Other significant aspects of habitat modification will include the deepening of rivers and the removal of

boulders and islands, which are used for roosting. Many stretches of river are expected to be rendered unusable for the species owing to habitat degradation and disturbance.

The species has low genetic diversity. High levels of heavy metals, especially As and Hg, were reported in females and their eggs after wintering in the Yangtze catchment. Poor egg hatchability recorded within Sikhote-Alin population could be a result of pollution on the wintering grounds.

Diet: Aquatic arthropods and small or young fish. Stonefly (*Plecoptera*) and giant caddisfly larvae (*Phryganeidae*) may constitute the bulk of its diet when available. Beetles and crustaceans are eaten less regularly, though the latter may be more important in autumn. As aquatic insect larvae hatch in the course of the summer, fish become more prominent in the diet. Favorite fish species include the Dojo Loach (*Misgurnus anguillicaudatus*) and the lenok (*Brachymystax lenok*). More rarely eaten are such species as the lamprey (*Eudontomyzon morii*), the sculpin (Mesocottus haitej, or the Arctic Grayling (*Thymallus arcticus*). Food is caught by diving and is typically swallowed while still underwater.

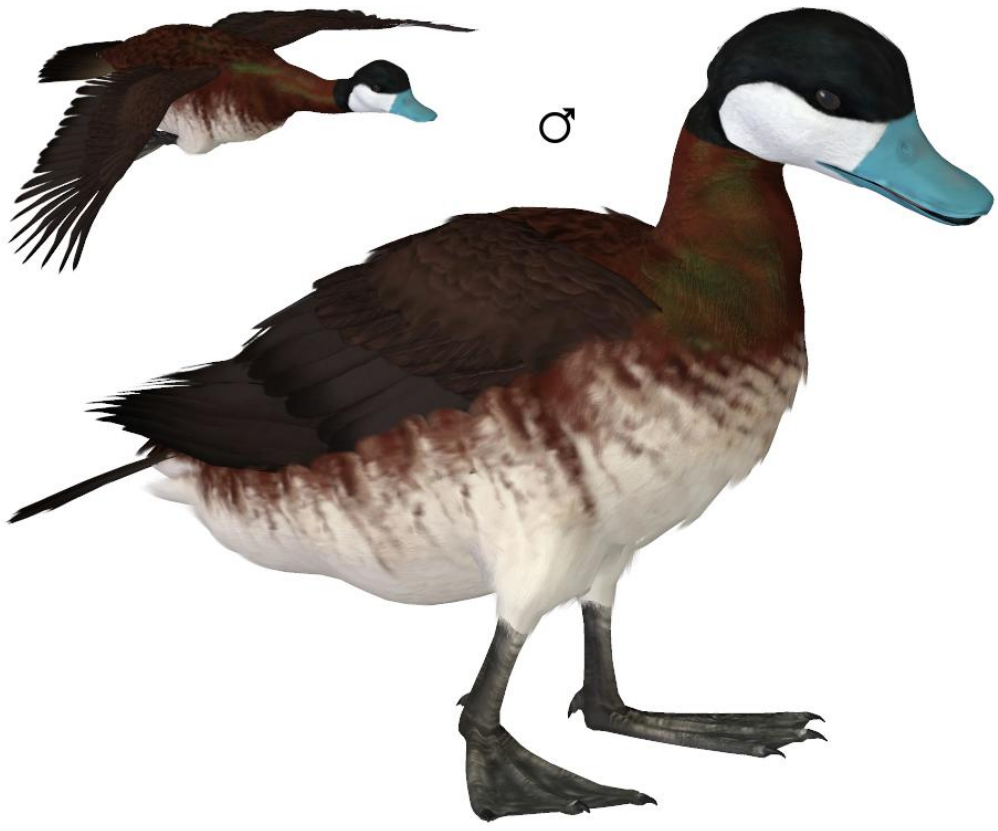
Nesting: It has a thin red bill and a scaled dark pattern on the flanks and rump. Both sexes have a crest of wispy elongated feathers, reaching almost to the shoulders in adult males and being fairly short in females and immatures. The legs are orange-red. The adult male has a black head and neck, white breast and under parts, and blackish mantle and wings, except for the white inner wings. The scaling is also black, while the tail is medium grey. The female has a buffish head and greyish neck.

Cool Facts: They are shy birds and startle easily. They spend most of the daylight time foraging, except around noon when they take some time to rest, preen and socialize at the river banks, where they also sleep.
Primary forests are protected at some breeding localities in China and at the most important breeding site in North Korea. Small proportions of its breeding and non-breeding populations occur inside protected areas, notably Sikhote-Alin' State Biosphere Reserve, Lazovskiy State Reserve and Botchinskiy State Reserve (Russia), and Changbai Shan Nature Reserve (China). An artificial nest program in Russia, involving the provision of at least 180 nest boxes, has shown positive results, increasing habitat capacity along rivers with logged flood-plains. The program involves the continued maintenance of artificial nests, liaison with hunters and fishers and collaboration with local communities, including information and education activities and the construction of a research and visitor center. This has already resulted in a change in fishing practices by local people. It has also facilitated the capture of females for tagging with geolocators, allowing the identification of staging and wintering sites.

Common Name: Ruddy Duck
Scientific Name: *Oxyura jamaicensis*

Size: 13.8-16.9 inches (35-43 cm); Wingspan: 22-24.4 inches (56-62 cm

Habitat: The Americas; breed in wetlands and reservoirs from southwestern Canada through the western United States and Mexico, as well as in scattered sites in the eastern United States and on the Caribbean islands. About 86 percent of the breeding population is concentrated in the prairie pothole region of south-central Canada and north-central United States. Their breeding habitat includes large marshes, stock ponds, reservoirs, and deep natural basins. Migrating Ruddy Ducks stop in a variety of habitats, most often on large, permanent wetlands, lakes, and reservoirs, frequently mixing with other diving ducks such as Bufflehead and Goldeneyes.



They spend the winter throughout the southern half of the breeding range, also moving into wintering habitat that spans most of the United States and extends through Mexico to Central America. Their wintering habitat includes freshwater wetlands, lakes, and reservoirs as well as brackish bays, coastal marshes, and tidal estuaries.

Status: Least Concern. **Global population:** 520,000-600,000 mature individuals. Ruddy Duck populations are decreasing. Though they were hunted during the 1890s (and numbers declined during that time), they are not popular with hunters today. The U.S. Fish and Wildlife Service records about 50,000 Ruddy Ducks shot by hunters each year. Like all waterfowl, Ruddy Ducks are susceptible to poor water quality, pollution, and oil spills. The population in Chesapeake Bay dropped significantly between 1955 and 1979, probably because of habitat degradation from exotic species invasion and pollution. Ruddy Ducks depend heavily on wetlands in the prairie pothole region of North America, where grazing, burning, and wetland drainage have degraded portions of their habitat. Their future success will depend in large part on the protection and restoration of that region.

Diet: Aquatic invertebrates, especially midge larvae. They forage mostly by diving to the bottom of shallow ponds, straining mouthfuls of mud through thin plates on their bills and swallowing the prey items that are left behind. They feed most actively at night. During the day, they sleep.

Nesting: Male Ruddy Ducks have blackish caps that contrast with bright white cheeks. In summer, they have rich chestnut bodies with bright blue bills. In winter, they are dull gray-brown above and paler below with dull gray bills.

Females and first-year males are brownish, somewhat like winter males but with a blurry stripe across the pale cheek patch. In flight, Ruddy Ducks show solidly dark tops of the wings.

They nest in marshes adjacent to lakes and ponds, primarily in the Prairie Potholes region. The nest is usually made of dead, dry plant materials, though some are built entirely with green vegetation. It starts as a platform and becomes more bowl-like throughout the construction process, with an inner cup measuring 4–12 inches across and 0.5–5 inches deep. Ruddy Ducks usually weave a canopy of vegetation over their nests. The nest is usually placed 2–10 inches over the water in cattails, bulrushes, or grasses, the nest is supported and well-concealed by vegetation. The female chooses the site.

Ruddy Ducks lay big, white, pebbly-textured eggs—the largest of all duck eggs relative to body size. Energetically expensive to produce, the eggs hatch into well-developed ducklings that require only a short period of care.

Cool Facts: Pleistocene fossils of Ruddy Ducks, at least 11,000 years old, have been unearthed in Oregon, California, Virginia, Florida, and Illinois.

Ruddy Ducks are very aggressive toward each other and toward other species, especially during the breeding season. They are even known to chase rabbits feeding on the shore. They get harassed by Horned Grebes, Pied-billed Grebes, and American Coots during the breeding season. The grebes sometimes attack Ruddy Ducks from below the water, a behavior known as “submarining.”

Special Thanks to…

….my betatesters (FlintHawk, Rhonda, and Barbara)

…and Nerd3D (for his invaluable help in special Poser coding)

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:

- **"The Sibley Guide to Birds"** by David Allen Sibley.
- **"The LeMaster Method to Waterfowl Identification"** by Richard LeMaster
- **"Birds of Europe"** by Killian Mullarney, Lars Svensson, Dan Zetterstorm and Peter J. Grant.
- **"Birds of Southeast Asia"** by Craig Robson.
- **"Birds of East Asia"** by Mark Brazil.
- **"Field Guide to the Birds of East Africa"** by Terry Stevenson and John Fanshawe

Internet Sources:

- **Cornell Lab of Ornithology (**http://www.birds.cornell.edu)
- **Wikipedia** (http://www.wikipedia.com)
- **Birdlife International** (http://www.birdlife.org)
- **Ducks Unlimited** (http://www.ducks.org)
- **Birds in the Backyard** (http://www.birdsinbackyards.net/)

Appendix

Why are there so many Transparency Maps?

All the Transparency Maps are made to overlay the “Main” Texture Maps to retain the correct texture locations. However the Transparency Maps also overlap each other, requiring separate mapping to retain the proper overlays.

Material Zones							
Main	Tail	Wings	Transparencies for Main Map				
			Trans1	Trans2	Trans3	Trans4	Trans5
Bill Cornea Ear Eyes Feet InnerBeak Iris Nostril Plumage Pupil Tongue	TailFeathers	Wings WingFeathers1 WingFeathers2	BackFeathers1 BackFeathers3 BackHead3 BackHead5 BreastFluff1 BreastFluff5 CrestFeathers1 CrestFeathers6 CrestFeathers9 JowlFeathers1 RumpFeathers1 RumpTopFeathrs1 ThighFluff1 ThroatFluff1 FlankFluff2 FlankFluff6	BackFeathers2 BackFeathers4 BackHead2 BreastFluff3 BreastFluff6 CrestFeathers2 CrestFeathers5 CrestFeathers8 JowlFeathers2 RumpFeathers2 RumpTopFeathrs2 ThighFluff2 ThighFluff6 ThroatFluff2 FlankFluff4	BackFeathers5 BackHead1 BreastFluff2 CrestFeathers3 CrestFeathers7 JowlFeathers3 RumpFeathers3 RumpTopFeathrs3 ThighFluff3 ThroatFluff3	BackHead4 BreastFluff4 CrestFeathers4 JowlFeathers4 RumpFeathers4 ThighFluff4 ThroatFluff4	JowlFeathers5 RumpFeathers5 ThighFluff5 ThroatFluff5 WoodDuck1 WoodDuck2 WoodDuck3 FlankFluff1 FlankFluff3 FlankFluff5 FlankFluff7

Other Maps Used on the Ducks in this Set

Duck Species	Main Map Diffuse	Main Map Specular	Main Map Bump	Wing Map Diffuse	Wing Map Specular	Tail Map	Additional Maps
Black Scoter-M	BScoterM1.JPG	BScoterM1_s.JPG	RedheadM1_b.JPG	BScoterM2.JPG	BScoterM2_s.JPG	BWDuck3.JPG	
Bufflehead-M	BufflhdM1.JPG	BufflhdM1_s.JPG	RedheadM1_b.JPG	BufflhdM2.JPG	ComGoldM2_s.JPG	PHDuckM3.JPG	
Chinese Merganser-M	ChinaMergM1.JPG	ChinaMergM1_s.JPG	ChinaMergM1_b.JPG	ChinaMergM2.JPG	HMergM2_s.JPG	ChinaMergM3.jpg	ChinaMergM1_t.JPG (replaces sbrm_d1_t5 jpg)
Common Goldeneye-M	ComGoldM1.JPG	ComGoldM1_s.JPG	RedheadM1_b.JPG	ComGoldM2.JPG	ComGoldM2_s.JPG	BWDuck3.jpg	
Ferruginous Duck-M	FerrDuckM1.JPG	FerrDuckM1_s.JPG	NSMDuck1_b.JPG	FerrDuckM2.JPG	FerrDuckM2_s.JPG	CinTealM3.JPG	
Greater Scaup-F	GScaupF1.JPG	GScaupF1_s.JPG	RedheadM1_b.JPG	GScaupF2.JPG	GScaupM2_s.JPG	CinTealM3.JPG	

Greater Scaup-M	GScaupM1.JPG	GScaupM1_s.JPG	RedheadM1_b.JPG	GScaupM2.JPG	GScaupM2_s.JPG	CinTealM3.JPG	
Hardhead-F	HardheadF1.JPG	BWTealM1_s.JPG	NSMDuck1_b.JPG	HardheadM2.JPG	BWDuck2_s.JPG	HardheadM3.JPG	
Hardhead-M	HardheadM1.JPG	BWTealM1_s.JPG	NSMDuck1_b.JPG	HardheadM2.JPG	BWDuck2_s.JPG	HardheadM3.JPG	
Harlequin Duck-M	HarqM1.JPG	HarqM1_s.JPG	RedheadM1_b.JPG	HarqM2.JPG	NSFDuck2_s.JPG	BWDuck3.JPG	
Hooded Merganser-M	HMergM1.JPG	HMergM1_s.JPG	HMergM1_b.JPG	HMergM2.JPG	HMergM2_s.JPG	EurWigM3.JPG	
King Eider-M	KingEiderM1.jpg	KingEiderM1_s.jpg	KingEiderM1_b.jpg	KingEiderM2.jpg	BWDuck2_s.JPG	BWDuck3.jpg	KingEiderM1_t1.JPG (replaces sbrm_d1_t1.jpg)
Lesser Scaup-F	LScaupF1.JPG	GScaupF1_s.JPG	RedheadM1_b.JPG	LScaupF2.JPG	GScaupM2_s.JPG	CinTealM3.JPG	
Lesser Scaup-M	GScaupM1.JPG	GScaupM1_s.JPG	RedheadM1_b.JPG	LScaupM2.JPG	GScaupM2_s.JPG	CinTealM3.JPG	
Pink-headed Duck-M	PHDuckM1.JPG	PHDuckM1_s.JPG	NSMDuck1_b.JPG	PHDuckM2.JPG	PHDuckM2_s.JPG	PHDuckM3.JPG	
Red-headed Pochard	rhpouchardM1.JPG	BWDuck1_s.JPG	BWDuck1_bJPG	rhpouchardM2.JPG	HMergM2_s.JPG	BWDuck3.JPG	
Redhead-M	RedheadM1.JPG	RedheadM1_s.JPG	RedheadM1_b.JPG	RedheadM2.JPG	HMergM2_s.JPG	RedheadM3.JPG	
Ruddy Duck-M	ruddyduckM1.JPG	ruddyduckM1_s.JPG	RedheadM1_b.JPG	ruddyduckM2.JPG	HMergM2_s.JPG	WFDuck3.JPG	
Smew-M	SmewM1.JPG	HarqM1_s.JPG	RedheadM1_b.JPG	SmewM2.JPG	NSFDuck2_s.JPG	SmewM3.JPG	SmewM1c.JPG, SmewM1_t5.JPG (replaces sbrm_d1_t5 jpg)

Poser Rendering with Ambient Occlusion Lighting

Because of the high use of specular maps and quirks in Poser rendering in the Waterfowl series, ambient occlusion lighting may produce unexpected results such as a seams, grid patterns and odd shadowing. Seams appear to show up on neck lines when rendered at a distance, but not when close-up. Grids sometimes appear on close-up renders but not at distances.

The Ambient Occlusion lighting does not appear to add to the realism in rendering of the waterfowl so it is suggested that it not be used, if these issues appear.

Songbird ReMix Merchandise

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