

Avian Models for 3D Applications
by Ken Gilliland

Songbird ReMix

Puffins

Contents

Manual

Introduction	3
Overview and Use	3
Creating a Songbird ReMix Bird	4
Physical-based Render Engines (Superfly/Iray)	4
Posing Considerations, Conforming Parts and IK	4
Where to find your Birds and Poses	5

Field Guide

List of Species	6
Atlantic Puffin	7
Horned Puffin	11
Tufted Puffin	13
Crested Auklet	16
Parakeet Auklet	18
Rhinoceros Auklet	20
Whiskered Auklet	22
Dovekie or Little Auk	24
Resources, Credits and Thanks	27

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Songbird ReMix

Puffins

Introduction

"Songbird ReMix Puffins" includes eight species of alcids found throughout the world. Within the Alcid family are Auks, Auklets and Puffins. Of course, the most well-known member of the family is Puffins. The sad expressions upon their clown-like faces and colorful bills make them an iconic bird of the northern oceans. Also included are four species of Auklets and the little Auk or Dovekie.

Overview and Use

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):
 - **Gulls and Waders (Order Charadriiformes)**
- **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. When 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.

Posing & Shaping Considerations

This volume has various species, so when using generic poses not every pose will work perfectly with every bird. You may find that some minor alteration on the stock poses may be warranted.

Here are some of the most common alterations you may need to make:

- Birds will not be flat on the zero plane due to leg size and overall scale.
- Because of the numerous beak shapes, closing the beak may range from 0.5 to 1.2. Usually 0.9-1.0 is about right.
- The models rounded head for puffins, it makes the bending of the puffins into a horizontal position for flight awkward, if not impossible. In "Correction Controls", there is a morph called "**Tuck Head for Flight**" that will mitigate some of this issue. While not 100% perfect, it does help quite a bit.

Conforming Parts

- There are **controls on all conforming parts**, however you must go to the conforming parts "**BODY**" section to use them. Species that have conforming parts are:

- **Tufted Puffin** (breeding plumage only)- The tufts are a complete addition model with 10 part strands per tuft. Each part has x-y-z controls (in each part) plus EZ-Pose controls in the BODY section.
- **Crested Auklet**- This a conforming prop with numerous morphs to control two parts Whiskers and Crest. The Crest Auklet only use the Crest parts (the Whiskers are hidden)
- **Rhinoceros Auklet** (breeding plumage only)- This a conforming prop with numerous morphs to control two strands, above and below the eye.
- **Whiskered Auklet**- This a conforming prop with numerous morphs to control two parts; Whiskers and Crest. The Whiskered Auklet uses both.

IK Concerns

Some poses may go askew when IK is turned on. By default, Poser's IK feature is turned off when loading a bird. To turn it on, select the "Figure" category from the main tool bar and "Use Inverse Kinematics" from the submenu.

By default, DAZ Studio's IK feature is turned on when loading a bird. I, personally find this annoying, and always turn off DAZ Studio's IK immediately when using my birds. Leaving IK on will cause the thigh and shin rotations change when the character is moved. The **CTRL K** keypress will turn IK on and off in DAZ Studio. IK doesn't work that well in Studio, so I suggest selecting the character in the **Scene tab** and simply deleting the two IK body parts to remove IK.

Where to find your Birds and Poses

Type Folder	Bird Species
Gulls and Waders (Order Charadriiformes)	Atlantic Puffin Horned Puffin Tufted Puffin Crested Auklet Parakeet Auklet Rhinoceros Auklet Dovekie or Little Auk Whiskered Auklet

Songbird ReMix

Puffins

Puffins

North Atlantic

Atlantic Puffin

North Pacific

Horned Puffin

Tufted Puffin

Other Auks

North Pacific

Crested Auklet

Parakeet Auklet

Rhinoceros Auklet

Whiskered Auklet

North Atlantic & Arctic

Dovekie or Little Auk

Common Name: Atlantic Puffin
Scientific Name: *Fratercula arctica*

Size: 12.6 inches (32 cm)

Habitat: North Atlantic. It inhabits the coasts of northern Europe southward to northern France, Ireland, the Faroe Islands, Iceland, Greenland and eastern North America south to Maine. It winters south to Morocco (Africa) and New York (North America).



It is found at sea and rocky cliffs and islands.

Status: Vulnerable. **Global Population:** 12,000,000 - 14,000,000 mature individuals with a decreasing population trend. The global breeding population was estimated in the 1990s at about 6,000,000 pairs (3,800,000–8,200,000), of which c. 60% in boreal zone (Southern Iceland to France and Norway), 40% in low Arctic waters (most of Eastern Canada and Western Greenland, Northern Iceland, Bear Island, Kola Peninsula, Southern Novaya Zemlya), and less than 1% in high Arctic marine zone (Northern Canada, Northwestern and Eastern

Greenland, Jan–Mayen, Spitsbergen, Northern Novaya Zemlya). The post-2000 estimates put the total European population at 4,770,000–5,780,000 pairs.

Puffins are hunted for eggs, feathers and meat. Atlantic Puffin populations drastically declined due to habitat destruction and exploitation during the 1800s and early 1900s. They continue to be hunted in Iceland and the Faroes even today. The Atlantic Puffin forms part of the national diet in Iceland, where the species does not have legal protection. Puffins are hunted by a technique called “sky fishing”, which involves catching low-flying birds with a big net. Their meat is commonly featured on hotel menus. The fresh heart of a Puffin is eaten raw as a traditional Icelandic delicacy.

The collapse of fish stocks (especially of prey species such as herring) near breeding colonies mandate long distances to feeding areas with low density of prey, which causes poor growth and survival of chicks; such conditions existed at Røst Island, Norway, after overfishing of spring-spawning herring in 1960s at which colony size declined from 119,700 in 1979 to 43,160 in 1988, with no or few young reared. No major oil spills have affected Atlantic Puffins in North America, but clearly a major spill near a colony during breeding season would have disastrous effect.



Currently, this species is the focus of increased ecotourism from Newfoundland to Maine. Machias Seal Island (Gulf of Maine) is only North American puffin colony where ecotourists regularly permitted to land. Observation blinds and boardwalks permit approximately 2,000 visitors per year to observe puffins at

close range in this thriving colony. About 4,300 ecotourists visit East Egg Rock in Maine, each year and view puffins from the water. Puffins showed more restless behaviors when tour boats are present, although no measurable effects on reproductive success has been noted and the colony continues to increase. Tour-boat traffic near breeding islands resulted in Atlantic Puffins flying off the water and landing on breeding slopes.

Researchers should avoid disturbance of incubating birds as this can cause abandonment, which is the most frequent cause of breeding failure. Burrows with inspection hatches to allow egg-handling (with adult present) resulted in reduced egg survival but not reduced chick survival or laying. In plots where burrows were examined every 4 days after the egg hatched; fledging success was reduced in same and in subsequent year, compared to controls.

Diet: Predominantly small to mid-sized (5–15 cm length), schooling midwater fish. The eleven most common types are sand lance (or sandeel; *Ammodytes spp.*), sprat (*Sprattus sprattus*), capelin (*Mallotus villosus*), whiting (*Merlangius merlangus*), saithe (*Pollarchius virens*), red-fish (*Sebastes marinus*), haddock (*Melanogrammus aeglefinus*), herring (*Clupea harengus*), five-bearded rockling (*Ciliata mustela*), northern rockling (*Ciliata septentrionalis*), and three-bearded rockling (*Gaidropsarus vulgaris*).

Birds often gather offshore at the edges of banks where water-mass boundaries or fronts and flow gradients concentrate fish prey.

Several fish caught during dives, either swallowed (especially if small) or held in the bill, clamped against roof of mouth with tongue while additional prey caught. Feeding birds dive into fish schools, rather than circling them, and dive independently to feed, without synchronization between individuals.

Nesting: A medium-sized auk with its head, neck, and upper parts black. Sexes are alike in plumage, but the male is slightly larger than the female. Males also have significantly larger culmen length, bill depth, and head-bill length. It is mostly white to grayish-white on the face, with narrow black band from the forehead to its nape. It has a grayish chin and a pronounced dark post-ocular stripe. There are small gray protuberances above and below the triangular orange-red eye-ring, its iris is brown. The breast, belly and under tail coverts are white with the under wing-lining being dark. The most distinctive feature is large, triangular, laterally compressed bill. During breeding season, the bill turns red-orange, with slate-gray at the base with pale yellow cere and marked usually with more than one grooves that parallel the shape of the bill base. It has an orange-yellow rictal rosette at the gape with yellowish mouth and tongue. The bill size and number of grooves increase with age. After breeding season, the bill loses the covering of the colorful horny plates and becoming slightly smaller and less triangular in shape. It is less brightly colored as well. The grayish-white patch on

the sides of the head become a darker gray. The legs and feet are orange to yellow-orange or reddish, with sharply recurved black claws.

The juvenile resembles the adult, but is generally smaller (overlap between small adult females and large juveniles). Its bill and legs are duller and there are fewer than two transverse ridges on upper mandible.

Puffins breed in colonies on coasts and islands. The male Atlantic Puffin builds the nest and exhibits strong nest-site fidelity. The nesting substrate of the Atlantic Puffins is soft soil, into which tunnels are dug. The Atlantic Puffin burrow is usually lined with material such as grass, leaves and feathers but is occasionally unlined. The eggs of the Atlantic Puffin are creamy white but can be occasionally tinged lilac.

Atlantic Puffin, Lundy, UK Puffins form long-term pair bonds or relationships. The female lays a single egg, and both parents incubate the egg and feed the chick. The incubating parent holds the egg against its brood patch with its wings. The chicks fledge at night. After fledging, the chicks spend the first few years of their lives at sea, returning to breed about five years later. Puffins in captivity have been known to breed as early as three years of age.

After breeding, puffins winter at sea, usually far from coasts and often extending south of the breeding range.

Cool Facts: “Fratercula” in Latin means “little brother” and is probably a reference to puffins’ black and white plumage, which resembles monastic robes.

The puffins are distinct in their ability to hold several (sometimes over a dozen) small fish at a time, crosswise in their bill, rather than regurgitating swallowed fish. This allows them to take longer foraging trips, since they can come back with more food energy for their chick than a bird that can only carry one fish at a time.

Common Name: Horned Puffin
Scientific Name: *Fratercula corniculata*

Size: 15 inches (38 cm)

Habitat: North Pacific. It inhabits the coasts of Siberia, Alaska and British Columbia and winters south to California and Baja California. All large breeding colonies of Horned Puffins in North America are located within national wildlife refuges in Alaska.

It is found at sea and rocky cliffs and islands.

Status: Least Concern. **Global Population:** 80,000 mature individuals with a declining population trend. Drift-net fisheries on the high seas killed tens of thousands of Horned Puffins until the practice was largely eliminated by the early 1990s. Coastal fisheries still cause some Horned Puffin deaths. The population of these birds has been declining dramatically due to the introduction of rats onto some islands used for nesting.

Diet: Sandeel, herring and capelin; sometimes squid and crustaceans.

Nesting: A medium to large alcid with large, laterally compressed triangular bill. Male slightly larger than female, but sexes otherwise alike in appearance. The breeding plumage in adults is black with a large white patch on face and white under parts from the breast to the under tail coverts. It has an oversized bill that is bright yellow with the distal third turning red. There are a variable number (2–6) of vertical grooves on the distal third (depending on age), and bright-orange rictal rosette at base of gape. The legs and feet are a bright



♂



♀

females are
smaller with
smaller bills

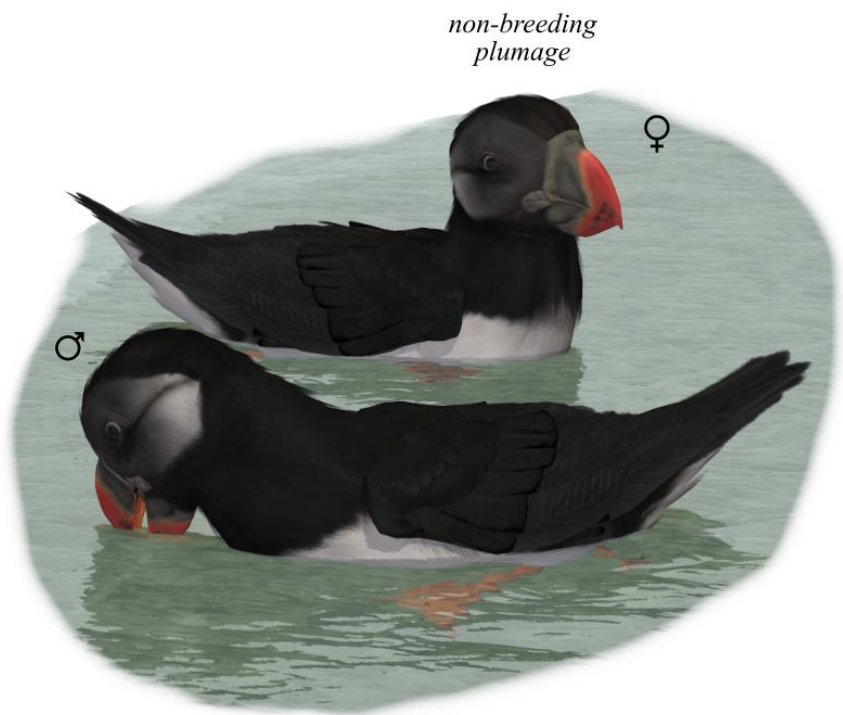
yellowish orange to reddish. In flight, contrast between the black chin and throat, white face, and white under parts creates appearance of a wide black necklace. At close range, a leathery dermal process, extending upward from eye (up to 12 mm) visible, creating dark horned appearance from which species' name derived. The non-breeding plumage on the adult is similar to breeding adult, but white portion of face replaced by smoky grayish brown anteriorly and silver gray posteriorly. Also the bill becomes smaller (rosettes and portion of outer bill covering at base of upper mandible absent) and duller (brown with distal portion reddish) but with grooves retained. The "Horn" also absent, and legs and feet become pale pinkish. The juvenile is similar to the non-breeding adult, but its bill is shorter, narrower, entirely brownish gray in color and lacking the grooves (which come with age). The face-patch is a smoky black. The immature also is similar to the non-breeding adult with the exception of no grooves on the bill, and its breeding plumage has less-developed nuptial bill ornaments.

Puffins breed in colonies on coasts and islands. Both sexes of the Horned Puffin help to construct their nest. Horned Puffin burrows are usually about 1 meter (3 feet) deep, ending in a chamber. The nesting sites of Horned Puffins are rock crevices on cliffs.

Feeding areas are usually located fairly far offshore from the nest. There is usually one chick and both parents feed the young.

After breeding, puffins winter at sea, usually far from coasts and often extending south of the breeding range

Cool Facts: Their neck is short and retracted into shoulders in flight, giving stocky appearance. At sea, flight is rapid and direct, usually a minimum of 10–30 m above sea surface. Swims and dives well, takes off from water after gathering momentum. Walks upright with ease over rocks, clinging to surface with claws. Reclines with its foot pressed flat, but walks on its toes.



Common Name: Tufted Puffin
Scientific Name: *Fratercula cirrhata*

Size: 15.8 inches (40 cm)

Habitat: North Pacific: British Columbia, throughout southeastern Alaska and the Aleutian Islands, Kamchatka, the Kuril Islands and throughout the Sea of Okhotsk. Winters south to Honshu and Northern California.



Status: Least Concern. **Global Population:** 3,500,000 mature individuals. Colonies fluctuate in size annually, based in part upon food supply and climatic events, such as El Niño. The Tufted Puffin is one of the most abundant and conspicuous seabirds nesting in the north Pacific. Many California populations, however, have disappeared or significantly declined. In recent years, potentially serious declines have occurred in Washington as well. Oil spills and gill-nets are threats to Tufted Puffins, as is human disturbance. In Washington, most breeding colonies are protected as wildlife refuges or are inaccessible to humans. Populations of large gulls, which prey on young puffins, have been increasing in Washington, which may account for some of the recent decline in numbers.

Diet: Small fish. They also eat crustaceans, mollusks, and cephalopods.

Its neck is short and retracted into shoulders in flight, giving stocky appearance. At sea, its flight is rapid and direct. It swims and dives well, and takes off from water after gathering momentum. It has difficulty maneuvering while landing, and uses runways for takeoffs and landings. It walks upright with ease over rocks, clinging to the surfaces with its claws. It reclines with tarsus pressed flat, but walks on its toes.

Nesting: It is a large alcid with large, laterally compressed, triangular bill. The male is slightly larger than female, but sexes otherwise they are alike in appearance. In breeding plumage, adults are brownish black with large, white face-mask and long, golden head plumes that drape down the neck. The crown, nape and throat are black. Its large, mostly orange bill has variable number of grooves on upper mandible (depending on age) and bright-orange rictal rosette at base of gape. The basal third of the maxilla with yellowish to greenish base and yellow ridge. The eye-ring is red and the iris is pale yellow. The legs and feet are bright yellowish-orange to reddish. The non-breeding plumage adult is similar to the breeding adult, but white portion of face becomes brownish-black, the plumes disappear, and it sheds bill plates and loses rictal rosette. The bill becomes smaller, loses its ridges, but remains orange. The juvenile is similar to the non-breeding adult, but its bill is shorter, narrower, and brownish gray in color.

Breeding takes place on isolated islands: over 25,000 pairs have been recorded in a single colony off the coast of British Columbia.

Tufted Puffins probably form long-term pair bonds. They nest in burrows at the edges of cliffs, on grassy slopes, or in natural crevices in rocks. The pair spends a great deal of time preparing the nest site, excavating the burrow with their bills and feet. The burrow is 2-7 feet long with a nest chamber at the end. This chamber may be lined with grass or feathers, or sometimes nothing at all. Digging the nest burrow is a time-consuming job, and the birds most likely do not breed in the season in which they dig the burrow, but wait until the following year. When the pair finally breeds, the female lays one egg, which both parents incubate for 6-1/2 to 7-1/2 weeks. Both parents care for the young for another 6-7 weeks, after which time the fledgling leaves its burrow at night and moves to sea. Most young birds are not yet capable of flight at this time, so they walk, or flutter to sea, without parental aid.

Cool Facts: As among other alcids, the wings are relatively short, adapted for diving, underwater swimming and capturing prey rather than gliding, of which they are incapable. As a consequence, they have thick, dark myoglobin-rich breast muscles adapted for a fast and aerobically strenuous wing-beat cadence, which they can nonetheless maintain for long periods of time.

The Tufted Puffin can capture and hold multiple small fish crosswise in its bill, routinely 5 to 20 fish at a time, for delivery to chicks at the nest. Adults eat their own food while still under water.

The Aleut and Ainu people of the North Pacific traditionally hunted Tufted Puffin for food and feathers. Skins were used to make tough parkas worn feather side in and the silky tufts were sewn into ornamental work. Currently, harvesting of Tufted Puffin is illegal or discouraged throughout its range.

Tufted Puffins are preyed upon by various avian raptors such as Snowy Owls, Bald Eagles and Peregrine Falcons, and mammals like the Arctic Foxes. Foxes seem to prefer the puffin over other birds, making the bird a main target. Choosing inaccessible cliffs and entirely mammal-free islands protects them from terrestrial predators while laying eggs in burrows is effective in protecting them from egg-scavengers like gulls and ravens.

Common Name: Crested Auklet
Scientific Name: *Aethia cristatella*

Size: 7-7.9 inches (18-20 cm)

Habitat: North Pacific; breeds in Aleutians and other islands and coasts around Bering Sea. It winters in nearby ocean waters.

Status: Least Concern. **Global Population:** 8,200,000 mature individuals. Threats by introduced predators, oil spills and food shortages caused by global warming may cause significant population declines.



Diet: Krill; occasionally copepods, pteropods (such as *Limacina*), amphipods and larval fishes.

It often forages in large flocks. Individuals in feeding concentrations dive beneath sea surface and pursue prey in rapid wing-propelled underwater "flight". It is estimated that maximum dive depth could be about 30 m.

Nesting: It is small, highly gregarious alcid with a colorful bill during breeding season, with ornamental facial plumes and crest and striking white irides that characterize *Aethia* species. Its wings are relatively longer, narrower, and more pointed than other auklets. It is similar to the much smaller Whiskered Auklet. Its forehead crest bushier, the white loreal plumes absent, and the bill color in breeding plumage is orange rather than red. Its crest ornament is present in both sexes and varies in size both within and between age groups. Crested Auklets have entirely dark sooty-gray plumage (and thus lack the whitish lower belly and vent of all other auklet species), and fly relatively fast and purposefully on longer pointed wings. Sexes similar, but males have larger and more strongly hooked bills, and in at least one population, longer crests than females. Non-breeding birds have browner bills, shorter crests, and the white plume behind the eye is faded or absent. Summer sub-adults (2-yr-old) have shorter crests and smaller bills than adults.

They nest in huge colonies (10,000 to over 1 million individuals). Crested Auklets are socially monogamous; both sexes prefer mates with large crests, an example confirming Darwin's theory of mutual sexual selection. Males, and to a lesser extent females, compete aggressively for mates and nest sites, and crest size correlates with dominance. Pairs engage in elaborate courtship behavior with stereotyped postural displays that increase in intensity as courtship proceeds. These displays may attract other Crested Auklets in jostling melees.

Nests are located deep in crevices. They lay a single egg per clutch. Both male and female help to care for their semi-precocial young, which fledges at almost adult size after about 33 days in its nesting crevice.

Cool Facts: Perfume and insect repellent all in one? Crested auklets rub a citrus-like scent on each other during courtship which is secreted from the feathers on their backs. This behavior called "alloanointing". While this behavior is well known among some mammals, only Crested and Whiskered Auklets have been found to exhibit this behavior in the bird world. The secreted oil is also believed to protect the birds from parasites, such as ticks.

Their main predators are Herring Gulls and other gulls, Arctic Fox and ravens, but they have been reported in the stomachs of halibut caught on St. Lawrence Island.

Common Name: Parakeet Auklet
Scientific Name: *Aethia psittacula*

Size: 9-10.2 inches (23–26 cm)

Habitat: North Pacific: found in the boreal waters of Alaska and Kamchatka and Siberia.

It breeds on the cliffs, slopes and boulder fields of offshore islands, generally moving south during the winter.

Status: Least Concern. **Global Population:** 1,200,000 mature individuals. It is not thought to have declined recently, but may be threatened in the future by introduced predators, plastics at sea, oil spills and food shortages caused by global warming.

Diet: Euphausiids, copepods and amphipods. Recent research shows it also preys on jellyfish in some areas.



At sea studies have found Parakeet Auklets to occur at low densities. They are normally seen singly or in small groups of 2 or 3 individuals, never in large flocks. Rather than flocking (as other auklets do) they find over powerful upwellings that drive zooplankton to the surface and concentrate on it. Parakeet Auklets opportunistically forage on jellyfish which are a reliable but thinly distributed

source of food, although like other auklets they take a variety of available crustacean prey. It often feeds at a considerable distance from the colony, diving up to 30 m to reach its prey.

Nesting: It is a chunky alcid with blackish-gray upper parts and white under parts. The sexes alike in all plumages. The breeding and non-breeding plumage adults differ mainly in the extent of white on the under parts (white extending on to upper breast and throat off season). It is easily distinguished when ashore at colonies by the combination of white under parts, facial ornaments consisting of a single line of white auricular plumes extending backward and downward from each eye, round red bill, and its “*whinneying*” vocalizations. Juveniles have very short facial plumes and a stubby dark bill smaller but similarly shaped to adult's.

Breeding begins in April and May in colonies that are often shared with other auk species. Nests are constructed in crevices of cliffs, slopes and boulder fields facing seaward. In some cases, auklets may dig burrows in the soil to nest in.

They lay a single white egg that is incubated by both parents. The chick stays in the nest site until fully grown, where it waits for its parents to return from sea with food. When the chick has grown enough to fly, it leaves its crevice at night and flies out to sea. Its parents stop taking care of it once it leaves the nest and so it must quickly learn to swim and find food on its own.

Cool Facts: Parakeet Auklets spend most of their lives at sea, coming to land only to breed and raise young. They are usually seen singly at sea.

Calls: They are silent at sea. Adults in colony give rhythmic, hoarse calls similar to Cassin's Auklet. It may also give a quavering, descending squeal. They are highly vocal species at the nest.

Its wing beats are slower than other auklets and its unusual bill structure is probably an adaptation for handling slimy gelatinous prey.

Common Name: Rhinoceros Auklet
Scientific Name: *Cerorhinca monocerata*

Size: 15 inches (38 cm)

Habitat: North Pacific: Breeds from California (the Channel Islands) to the Aleutian Islands in Alaska in North America; and Hokkaidō and Honshū, Japan, as well as North Korea and Sakhalin Island in Asia.

It winters both in offshore and inshore waters, exhibiting some migration.

Status: Least Concern. **Global Population:** 1,300,000 mature individuals

Diet: Fish, with some krill and squid when at sea.



When breeding, it makes use of inshore waters and tide rips where prey is forced to the surface. They feed inshore during the breeding season in the mid-water. To catch their prey, they dive to as deep as 57 m (187 ft) for as long as 148 seconds. Prey mostly is taken in mid-water rather than at the bottom.

Nesting: A medium-sized auk with plump body and short wings. Sexes are alike. The breeding has a large bill that is prominent. It is orange with a dark brown tip and a pale yellow horn, rising 1–3 cm in length, projecting vertically from base of upper mandible above the nostril. Its back, upper wing, and upper tail coverts are

dark sooty brown. Its throat, breast, and flanks are gray-brown, becoming paler on the upper belly and off-white on lower belly and under tail. Its under wing is brown except for pale wing lining. It has narrow white plumes, 3–7 cm long, consisting of very narrow feathers that sweep back from just above eye and from base of bill. Those above the eyes are usually longer. The eggs and feet vary from a yellow to a gray, and often greenish-gray. The iris is usually yellow-brown, sometimes off-white. Non-breeding adults and immatures are similar to breeding adults but the bill duller and more brown, without the horn (or with only a vestigial horn), the white plumes much reduced or absent, and the belly is a gray-brown. First-winter birds show a distinct barring on the belly and have shallower, brown bills.

Nests are burrows dug into the soil or in natural caves and cavities between 1 to 5 m deep. It prefers nesting sites on slight inclines to aid take-off (as it is a poor flier). A single egg is incubated by both parents for 45 days, the semiprecocial chick is then fed each night with a bill full of fish (in the manner of puffins) for 50 days. The nocturnal behavior is believed to be a response to predation by gulls.

Cool Facts: Its name is derived from a horn-like extension of the beak. This horn is only present in breeding adults, and like the elaborate sheath on the bill of puffins is shed every year. The Rhinoceros Auklet is also known as the Rhino Auklet, Horn-billed Puffin, or Unicorn Puffin. It is the only living species of the genus *Cerorhinca*.

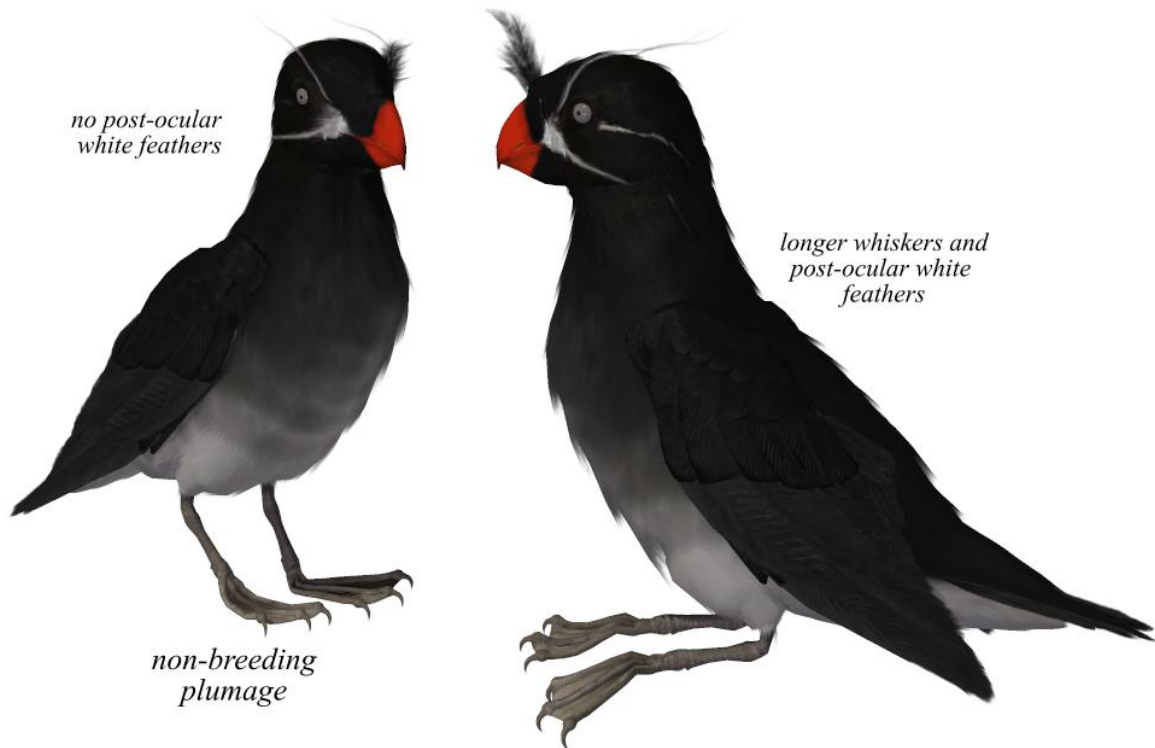
The Rhinoceros Auklet gives a series of 7 to 12 mellow "moo" notes sound much like a cow when near the colony. This is done to aid in location of its mate at night.

Common Name: Whiskered Auklet
Scientific Name: *Aethia pygmaea*

Size: 6.7-7.5 inches (17-19 cm)

Habitat: North Pacific: Breeds on Alaska's Aleutian Islands, where it is thought to nest on no more than 10 islands and Asia's Commander Island and south to Kurile Island. It is also observed in the Sea of Okhotsk. Aleutian birds spend the winter in waters near nesting islands. Some Asian birds move further south to spend winters near Japan.

Status: Least Concern/Vulnerable. **Global Population:** 100,000 mature individuals. Predation of eggs and chicks by introduced arctic foxes and Norway rats on breeding islands is the largest threat. Nocturnal fishing activities near breeding colonies that use lights pose an unknown but potentially serious threat as birds come and go from breeding colonies at night and they can be attracted to lights and collide with ships or become entangled in nets. Oil spills also pose potentially serious threats as they can affect large areas in a short period of time.



Most habitats preferred by Whiskered Auklets are protected within the Alaska Maritime National Wildlife Refuge (Aleutian Islands). Many aspects of the breeding biology and population dynamics of this species are unknown and research on this bird is difficult because of its nocturnal behavior, hard-to-locate and widely dispersed nests, and isolated breeding and winter ranges. Without

population estimates, however, managing viable populations will be difficult. Until then, habitat protection must remain a priority for this species both within and outside the U.S. The removal of introduced predators from the nesting islands of Whiskered Auklets should also be a priority.

U.S. National Wildlife Refuges like the Alaska Maritime NWR in Alaska provide essential habitat for Whiskered Auklets, and a great number of other species throughout the U.S. and its territories. Unfortunately, the refuge system is often under-funded during the U.S. government's budgeting process.

Diet: Copepods during the summer months, mostly on the species *Neocalanus plumchrus*; and switching to euphausiid krill in the fall and winter.

They often stick to nearshore areas where currents converge and concentrate zooplankton

Nesting: One of the smallest alcid; only Least Auklet is smaller. The plumages of both sexes are similar. The Whiskered and Cassin's are the only auklets with dark gray dorsum and breast, and white belly (aside from Rhinoceros Auklet which is about twice as large). Cassin's lacks facial plumes while Whiskered has the most elaborate plumes of any auklet: three sets of white plumes which give the "whiskered" appearance. Whiskered has a much smaller bill than any auklet except Least; the two bills differ in color, that of the Whiskered being scarlet with a white tip while the Least's is black-dull red with a whitish tip. Non-breeding birds are very close to breeding ones, but head plumes shorter and less obvious.

Neither the male nor the female builds a nest. Instead, the female lays one egg on bare rock or in a small crevice on a cliff face. A colonial breeder, Whiskered Auklet colonies often number far less than those of Least and Crested Auklets. Both parents feed young regurgitated food (marine zooplankton) at night.

Cool Facts: One of the smallest and rarest of the alcids in the U.S. (only the Kittlitz's, Craveri's, and Xantus Murrelets have smaller populations), the Whiskered Auklet breeds and winters largely in the remote Aleutian Islands of Alaska.

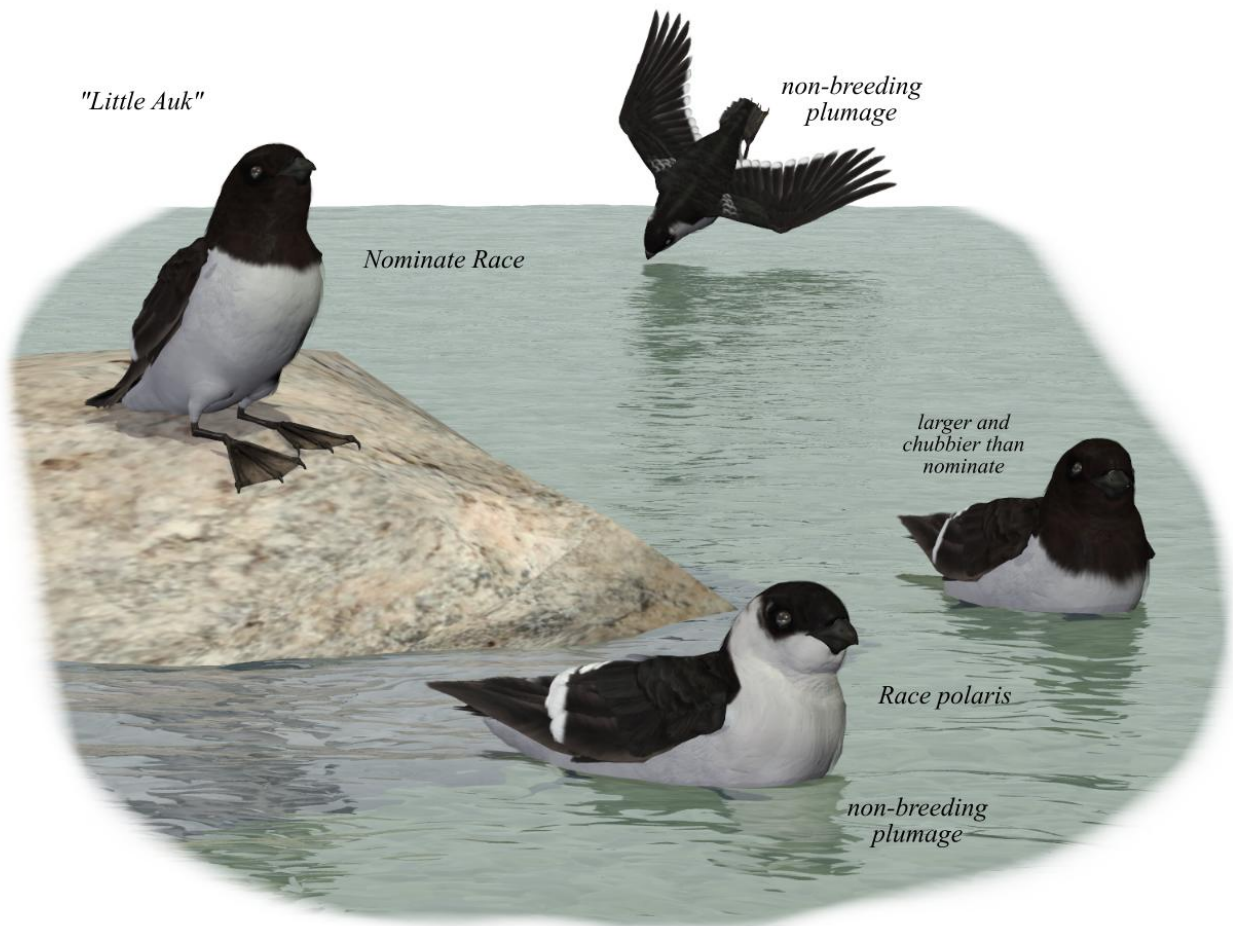
Its name is derived from the long white feathers on its face that are part of its breeding plumage. The whiskers have been shown to help them sense their way to and out of their nests at night.

Common Name: Dovekie or Little Auk
Scientific Name: *Alle alle*

Size: 7.5-8.3 inches (19-21 cm)

Habitat: North Atlantic and Arctic: It breeds along high arctic coasts (Iceland and Greenland) and only makes its way southward in winter as far as New England. Also a rare visitor on the coasts of the British Islands and it has been reported as common as far to the northward as Spitzbergen.

It is found mainly in the high Arctic, with breeding in large colonies on the sea



coasts, usually in crevices in rock scree of maritime slopes. It is mostly pelagic during the winter, and found mainly in low Arctic waters, often associated with edge of pack ice, and in boreal zone. The winter distribution corresponds with regions of greatest abundance of oceanic zooplankton.

Status: Least Concern. **Global Population:** 8,990,000 - 20,500,000 mature individuals with a declining population trend. Large numbers of Little Auks have been killed in several oil-spill incidents, but climate changes (such as global warming happen) in Southern Greenland and Iceland seems to be the reason for the decreasing populations there. The global population has been halved since the initial release of "Puffins" in 2009.

Diet: The winter diet consists primarily of copepods (small crustaceans), while summer diet in the High Arctic consists mainly of amphipods (detritivores) and copepods.

Cold waters in moderate to heavy offshore pack ice, over banks at sea, and at upwellings and oceanographic fronts that transport and concentrate planktonic prey near the surface, which attract dovekies. Dovekies often sits low in water. They can appear almost neckless at most times, and fly with a rapid, insect-like, whirring wing beat at sea.

They collect in large groups before heading out to sea for food. They also gather into large groups as they return. Dovekies dive underwater to capture their prey, using their wings to swim. Dovekies may play the part of scavenger, cleaning up remains of the kill that a polar bear made.

Nesting: They are a small alcid with compact and stout body shape and very short bill. Sexes are alike in appearance. The non-breeding adults and juveniles have a white throat and upper breast with a whitish crescent on the sides of their necks. Breeding adults are black with a white breast.

Dovekies nest in large colonies. The Dovekie builds a simple nest, a bed of pebbles in a crevice amongst boulder field or in the crevices of rocky cliffs, bordering the sea coast. It lays one or two bluish white eggs which are about the size of the pigeons.

Cool Facts: The Dovekie has been given many colorful names by different cultures. Norwegians refer to it as Alkekonge or King Auk. Newfoundlanders call it Bull Bird (owing to its chunky, neckless appearance). One small Newfoundland community just south of St. Johns, called Bay Bulls, is apparently named after this small, hearty auk.

The Dovekie breeding population at Thule in northwestern Greenland is amongst largest and densest breeding aggregations of all auks. This population traditionally has been estimated as 30 million birds.

The Dovekie is generally silent at sea; but makes a high trilling call at the nesting colony. Their flight is direct, with fast whirring wing beats due to the short wings. The glaucous gull and the arctic fox are the main predators on Little Auks, and, in some cases, polar bears have also been reported to feed on their eggs.

Dovekies sometimes show up out of range along the east coast of North America in massive “wrecks” of stranded, starving birds. Sustained, strong easterly winds may make feeding conditions unsuitable and push the weakened, emaciated birds landward. The largest recorded “wreck” in North America was in the winter of 1932 -1933, and saw Dovekies raining down on the streets of New York City and large numbers washing up along the entire eastern seaboard, from Nova Scotia to Florida.

There are two subspecies:

- *A. a. alle*. First reported by Linnaeus in 1758. The nominate subspecies is found on East Baffin Island through Greenland and Iceland to Jan Mayen, Spitsbergen, Bear Island and Novaya Zemlya.
- *A. a. polaris*. First reported by Stenhouse in 1930. This subspecies is restricted to Franz Josef Land (and perhaps Severnaya Zemlya). It averages larger and heavier than the nominate.

Special Thanks to my beta testers...

- 2009 Original Release: Bea, Jan, Kelvin, Nancy, Sandra & Walter
- 2022 Re-release: Alisa and FlintHawk

Species Accuracy and Reference Materials

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

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

Sources for this Volume and Field Guide

Books, Magazines and Papers

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- **"The Sibley Guide to Birds"** by David Allen Sibley. Allred A. Knopf, New York 2001.

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- **Cornell Labs Birds of the World** (<https://birdsoftheworld.org>)
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