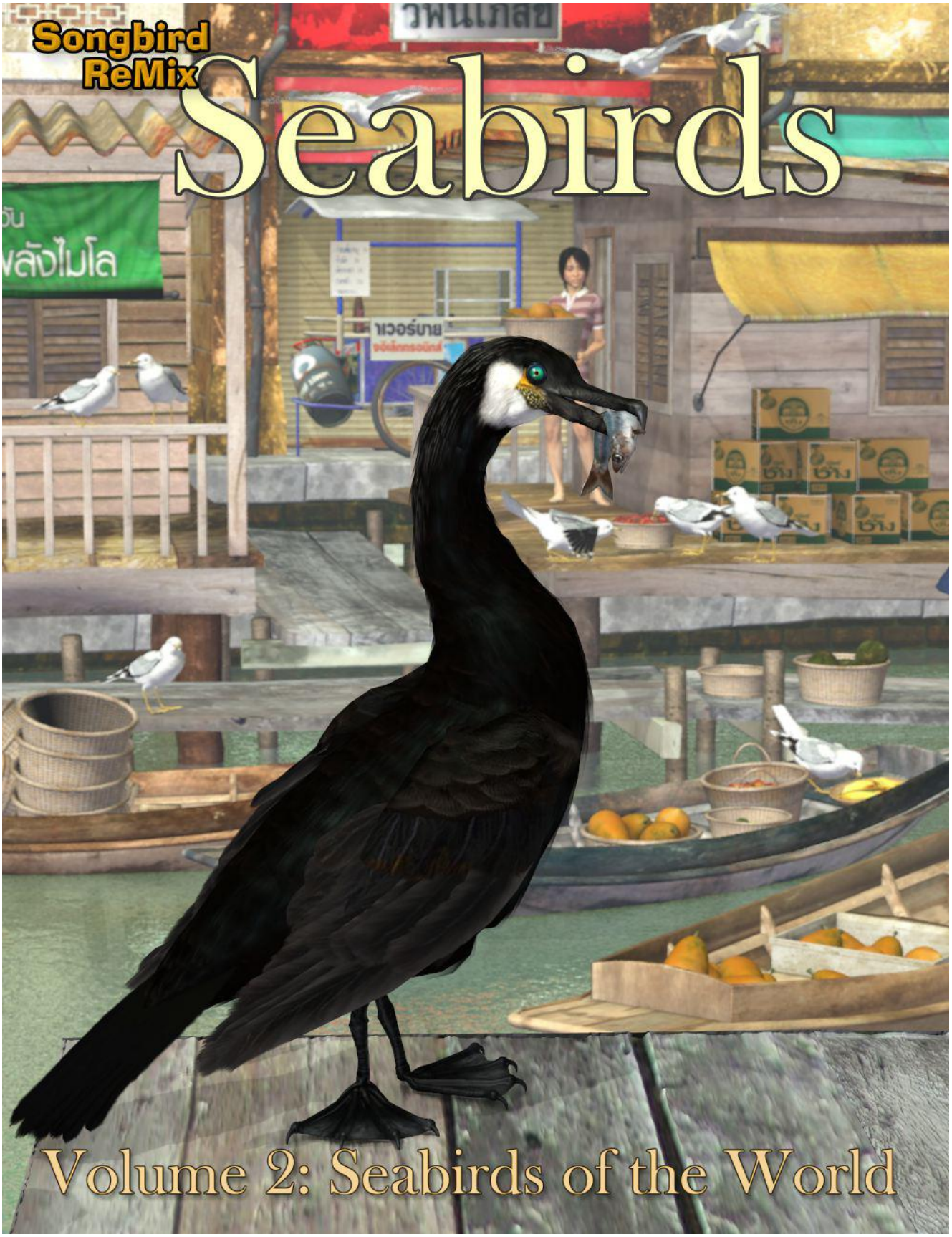


Avian Models for 3D Applications by Ken Gilliland

Songbird ReMix

Seabirds Volume 2

Manual

Field Guide

Songbird ReMix

Seabirds Volume 2

Introduction

“Seabirds Volume 2” expands the collection of Seabirds found in the first volume. This volume adds Albatrosses, Shearwaters, Petrels, Gannets, Boobies, Cormorants, Frigatebirds, Skuas, Gulls, Terns and Razorbills. This worldwide collection has both iconic and rare species included.

Of the more unique birds included, none is more spectacular than the male Magnificent Frigatebird which can expand an air sac in its throat to almost is complete size. Also included, in male and female form, is the very rare and endangered Abbott’s Booby from Christmas Island. The three gulls included; the Caspian Gull, the Mediterranean Gull (in 3 variations) and the Western Gull will fit the “bill” whether you are rendering the coastline or a garage dump. And the impressive pirate bird of the seas, the Great Skua, is ready to rob human and fowl alike of their edible possessions.

Whether you choose to create art with a message or you are simply looking for realistic and attractive birds for your imagery, this package will easily fulfill those needs.

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):
  - **Albatrosses and Petrels (Order Procellariiformes)**
  - **Boobies and Gannets (Order Suliformes)**
  - **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+. Usually 0.8-0.9 is about right.
- **Tongue poke-through** (especially when the beak is open). This can be easily solved by using the **Throat-Fuller1 & 2** morphs (*found in Creation Control/Head Shapes*).
- **Tail Spread2 and other morphs…** Because these are generic models, in some case, some morphs are provided that aren't normally used with a specific species of bird or have a limited use. They may find use in future expansions, so I've included them. **Tail Spread2**

is one of those morphs. Very few seabird species would ever spread their tails this way, but there may come an occasion when it does get used. This morph tends to create distortions when used with a combination of the 3 round tail morphs (Tail Round, Tail Round2 and Tail Rounder). Experimentation with those morphs will get you around the distortions.

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. This 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
Albatrosses and Petrels (Order Procellariiformes)	Laysan Albatross White-capped Albatross Newell's Shearwater Black-capped Petrel Common Diving Petrel
Boobies and Gannets (Order Suliformes)	Abbott's Booby Magnificent Frigatebird Common Shag Japanese Cormorant Northern Gannet
Gulls and Waders (Order Charadriiformes)	Great Skua Caspian Gull Mediterranean Gull Western Gull Caspian Tern Razorbill

Songbird ReMix

Seabirds Volume 2

Field Guide

Laysan Albatross
White-capped Albatross
Hawaiian or Newell's Shearwater
Black-capped Petrel
Common Diving Petrel
Northern Gannet
Abbott's Booby
Japanese Cormorant
Common Shag
Magnificent Frigatebird
Great Skua
Caspian Gull
Mediterranean Gull
Western Gull
Caspian Tern
Razorbill

Common Name: Laysan Albatross
Scientific Name: *Phoebastria immutabilis*

Size: 32 inches (81 cm); 195–203 cm wingspan

Habitat: Pacific Ocean; wide range across the North Pacific. Its main breeding colonies are in the Hawaiian Islands, particularly the islands of Midway and Laysan. It also nests in the Bonin Islands near Japan, the French Frigate Shoals, and has begun to colonize islands off Mexico, such as Guadalupe Island and others in the Revillagigedo Archipelago.

When away from the breeding areas they range widely from Japan to the Bering Sea and south to 15°N.

Status: Near Threatened. **Global Population:** 1,180,000 mature individuals. Historically, populations were greatly reduced by feather and egg collecting in the late 1800s and early 1900s, and by high seas drift nets used for squid and salmon that were active between 1978 and 1992. Prior to its closure, the high seas driftnet fishery killed over 17,500 Laysan Albatrosses in 1990 alone. Current key threats are being caught as bycatch in pelagic and demersal longline fisheries in the North Pacific as well as in illegal high seas driftnet operations.

Analyses in 2001 estimated that pelagic longliners in the North Pacific may kill 5,000-18,000 Laysan Albatross per year, with 8,000 thought the most likely figure, while demersal longline operations in the Bering Sea and Gulf of Alaska groundfish fisheries were estimated to kill 715 birds per year. However, more recent estimates indicate a drastic reduction in bycatch from previous years (with an estimated 83 birds taken in 2005). This is very likely attributable to the use of effective seabird avoidance measures. The bycatch rates in Japanese and Taiwanese pelagic longline fisheries in the North Pacific are still largely unknown.

Other threats include organochlorine contamination, invasive species, plastic ingestion, lead poisoning, human disturbance and conflicts with aircraft. Up to 10,000 chicks per year are potentially affected by lead poisoning from paint on buildings at Midway Atoll. Avian pox virus affects chicks on Midway and the Main Hawaiian Islands where introduced mosquitoes are present, but studies on O'ahu colonies show that fledging success was not reduced. Dogs kill adults and chicks on inhabited islands in Hawaii. Verbesina encelioides is an aggressive weed that degrades nesting habitat in the Northwestern Hawaiian Islands and introduced predators (notably the Polynesian Rat *Rattus exulans*) are an issue for colonies in Mexico and on the Main Hawaiian Islands.

Conservation measures underway… All of the major Hawaiian breeding localities are part of the US National Wildlife Refuge system or State of Hawaii Seabird Sanctuaries and, in 2006, the Papahânaumokuâkea Marine National Monument was established, encompassing all of the Northwestern Hawaiian Islands. Three breeding sites, supporting over 90% of the breeding population, are either counted directly or sampled at regular intervals. In 1991, a 50 Nautical Mile Protected Species Zone was established around the Northwestern Hawaiian Islands (primarily to protect monk seals). No longline fishing is allowed in this zone. Awareness programs and mitigation trials have been started in several major longline fleets operating within the foraging range of this species. The Hawaiian longline fishing fleet is required to use measures to reduce bycatch of seabirds. In 2006, the Western and Central Pacific Fisheries Commission adopted a measure to require large longline vessels to use at least two seabird bycatch mitigation measures when fishing north of 23 degrees North. Predator control programs are conducted at colonies in Mexico and the Main Hawaiian Islands.

Diet: Squid, but it also eats crustaceans, fish eggs and fish. It is a surface feeder. It scoops up its prey from just under the surface of the water. It does most of its feeding at night.

Breeding: Small two-tone, gull-like albatross. Upper wings, mantle, back, upper rump and tail blackish-gray. Head, lower rump and under parts white. Blackish smudge around eye. Bill pinkish with darker tip. Black-and-white under wing pattern varies between individuals having narrow black margins and variable amounts of black in the under wing coverts. Juveniles are very similar but have a grayer bill and wholly dark upper rump.

The Laysan Albatross is colonial, nesting on scattered small islands and atolls, often in huge numbers. It builds different styles of nests depending on the surroundings, these range from simple scoops in the sand to nests using vegetation. Laysan Albatrosses have a protracted breeding cycle, and breed annually, although some birds skip years. Juvenile birds return to the colony three years after fledging, but do not mate for the first time until seven or eight years old. During these four or five years they form pair bonds with a mate that they will keep for life. Courtship entails especially elaborate 'dances' that have up to 25 ritualized movements. Occasionally the birds form homosexual pairs consisting of two females. This has been

observed in the colony on the Hawaiian island Oahu, where the sex-ratio of male to female is 2 to 3. Unpaired females pair up among themselves and successfully breed. Eggs are often fathered by paired males, who "cheat" on their spouse.

The single egg is buff-white, and it may have spots. Both birds incubate the egg; the male does so first. Incubation takes about 65 days, and is followed by several weeks of brooding, after which both parents are out at sea to provide for the growing chick. The chick takes about 160 days to fledge. This time investment by the parents may explain the long courtship; both parents want to be sure the other is serious. The chicks are fed a stomach oil which is regurgitated by the parents.

Cool Facts: The Laysan Albatross is normally a silent bird, but on occasion they may be observed emitting long "moo"-ing sounds, descending whinnies, or rattles. Female Laysan albatrosses bond for life, so they can cooperatively raise their young.

A female Laysan Albatross known as "Wisdom" is the oldest known wild bird in the United States or the Northern Hemisphere. "Wisdom" was banded by a U.S. Geological Survey researcher in 1956 and in March 2011 was seen rearing a new chick on Midway Atoll. As of 2011 "Wisdom" is estimated to be at least 60 years old.

USGS photo of Wisdom with a new chick in 2011

Common Name: White-capped Albatross
Scientific Name: *Thalassarche cauta*

Size: 35-39 inches (90-100 cm); 210–260 cm wingspan

Habitat: Southern Hemisphere; endemic to Australia and it breeds on three island colonies; Albatross Island, Pedra Branca, and the Mewstone. During the breeding season, adults concentrate around southern Australia and Tasmania. Juvenile birds are known to fly as far as South Africa; otherwise, non-breeding birds can be found throughout the southern oceans, but specifics are difficult due to their similarity to the other species. It is sometimes found off the Pacific coast of the United States.

Status: Near Threatened. **Global Population:** 26,000 mature individuals. These Albatrosses comprised over 12% of seabirds caught by Japanese tuna longliners in Australian waters during 1989-1995 (up to 900 birds per year). The Japanese fishing effort ceased in 1997 and the current domestic effort is concentrated in northern waters where the likelihood of encountering albatrosses is much lower. Currently, there is limited overlap between the distribution of adult Shy Albatrosses and Australian longline fishing effort (although the impact of trawl fisheries is unknown). However, juvenile birds from the Mewstone population are known to traverse the Indian Ocean and forage in waters off South Africa, which brings them into contact with several

fisheries that pose a greater bycatch threat. At the small Pedra Branca colony, interaction with the Australasian Gannet *Morus serrator* (which is increasing across its range) is thought to be the primary cause of the observed rapid declines in the number of chicks produced each year at that colony, and extreme weather conditions may also reduce breeding success on the island. Avian pox virus has been recorded in chicks on Albatross Island (Tasmania) and has the potential to impact population trends through negative impacts to breeding success.

Diet: Fish, cephalapods, crustacea, and tunicates. It feeds by a combination of surface-seizing and some pursuit diving - it has been recorded diving as deep as 5 meters.

Breeding: It is a black, white and slate-grey bird with the characteristic black thumb mark at the base of the leading edge of the under wing. Adults have a white forehead and a crown, which is bordered on the bottom with a dark eyebrow and pale-grey face. Its mantle, tail, and upper wing are grey-black, and the rest is white. Its bill is gray-yellow with a prominent yellow culmen and yellow tip.

Shy Albatross breeds annually in colonies. Nests are a mound of soil, grass and roots, and are located on rock islands. Eggs are mostly laid in the second half of September. They hatch in December and chicks fledge mostly in April. Immature birds return to their breeding colony at least 3 years after fledging, mostly beginning breeding when at least 5 to 6 years old, nearly always in their natal colonies.

Cool Facts: This Albatross is also known as the Shy Mollymawk. It was once considered to be the same species as the Salvin's Albatross, (*Thalassarche salvini)* and the Chatham Albatross (*Thalassarche eremita*) but they were split around 2004. It was originally considered to be part of the Mollymawk (*Diomedeidae*) family which is similar to Shearwaters, Fulmars, Storm and Diving Petrels.

Common Name: Hawaiian or Newell's Shearwater
Scientific Name: *Puffinus newelli*

Size: 13 inches (33 cm); 76 cm wingspan

Habitat: Oceania; It breeds in at least 20 colonies on mountain slopes in the Hawaiian Islands. The main colonies are on Kauaʻi, on slopes around the Alakaʻi Plateau and probably in the Mokolea Mountains. Its distribution on the other islands is uncertain but it is known to breed on Molokaʻi and the island of Hawaiʻi and may breed on Oʻahu, Mau'i and Lānaʻi. From April to November it can be seen in the waters around the Hawaiian Islands, particularly around Kauaʻi. Outside the breeding season it disperses into the tropical Pacific Ocean. Its distribution at sea is little known but many move south and east into the waters of the Equatorial Counter Current. It has been recorded as far west as the Mariana Islands. In the south there are recorded sightings from Samoa in September 1977 and American Samoa in January 1993.

Status: **Critically Endangered.** **Global Population:** 10,000-19,999 mature individuals and rapidly decreasing. Since 2011, the population of this species has plummeted by over 60%.

The main threat to this species is thought to be predation by non-native species. Predation of adults and juveniles by feral cats and Barn Owls has been documented on almost every colony on Kaua'i, including the most remote sites. Polynesian Rats, Black Rats, Brown Rats and House Mice were inadvertently introduced to the Hawaiian islands as a result of human activity and shipwrecks and may depredate eggs and chicks. Brown Rats appear to be more associated with human settlement and do not appear to be as severe a threat as the other two introduced rat species. Another potential predator, the Small Indian Mongoose, has recently been discovered on Kaua'i, and could potentially be a greater threat than cats as its smaller size means it may be able to enter breeding burrows more easily. It is yet to establish a permanent presence on the island, although it has a history of incursions onto Kaua'i and one was trapped there in 2016. When the Two-spotted Leafhopper first established on the Hawaiian Islands, it led to habitat loss through feeding on the Uluhe Fern which provide cover for shearwater

burrows. The leafhopper was a cause for great concern not only for shearwaters, but also for agricultural crops and native flora; hence a biological control program was initiated and the insect is now hard to find on Hawai'i. Dogs have been shot at Ka'ena Point, while attacking nestling albatrosses and shearwaters, but the scale of their impact is unknown. Habitat loss due to conversion and introduction of herbivores like domesticated goats and pigs pose another threat on the Hawaiian Islands, and have been suggested as a contributing factor for the recent abandonment of some colonies.

On Kaua'i, hurricanes Iwa and Iniki devastated the forests in 1982 and 1992, dramatically reducing available nesting habitat and reducing breeding attempts for Newell's Shearwaters. Given that a large proportion of the population breeds on Kaua'i, catastrophic events, like hurricanes, represent a serious threat.

During the 1980s and 1990s an estimated 70 adults and 280 subadults each summer, and at least 340 fledglings each autumn, died as a result of collisions with power-lines and communications towers, or indirectly because of light attraction. In the surveyed areas on eastern and southern Kaua'i, 350 adults are reported dead each year from collisions with power lines. Fledglings on their first flight to the ocean are particularly susceptible to attraction to artificial light. The birds are attracted and disoriented by coastal street lights and once grounded, unable to fly and often killed by cars, cats or dogs, or die from starvation or dehydration. Between 1978 and 1981, more than 5,000 individuals were grounded on Kaua'i, and more than 30,000 have been found as victims of fallout since 1971. Intense rescue programm have been initiated to find grounded birds and return them to the sea. On Kaua'i, approximately 1,500 fledglings are recovered annually after becoming grounded, although with the suspected steep population decline on Kaua'i, the number of grounded birds is expected to have decreased proportionately. Collision with artificial structures (such as powerlines and wind turbines) is another key threat to the species, particularly in flight corridors for subadult and adult birds accessing inland colonies. Nine communications towers have recently been constructed on the Hawaiian Islands without proper consultation, and these are now the subject of an ongoing lawsuit. A field of wind generators was planned for Kaua'i and Lana'i, without accounting for the potential impacts on this species. Although wind farms have been shown to have only minor effects on other bird species elsewhere, night-flying Shearwaters may be particularly vulnerable and the cumulative effects of construction and maintenance, erosion, vegetation clearing and noise should be accounted for. It is not confirmed whether the wind farm projects will be realized.

Plastic pollution poses yet another threat. On Kaua'i, 50% of Newell's Shearwater fledglings necropsied during 2007–2014 contained plastic items in their digestive tract and there is evidence that the mass and the number of items ingested per bird have also increased since the 1980s. It is thought that consumption of even small quantities of plastic, including fibers and small fragments, exposes birds at all stages of the breeding cycle to plastic-associated co-pollutants and associated impacts survival.

On Hawai'i, cinder mining has resulted in habitat loss at several colonies and together with other causes of habitat degradation (invasive vegetation, agriculture and urbanization) contributes to the exposure and increased predation of ground-nesting birds. The species is also likely to be impacted by the commercial fishery through bycatch and indirect ecosystem effects resulting from overfishing of tuna.

Diet: Squid and small fish. It feeds far from land, in areas of deep water (at least 2000 meters). It dives into the water to catch its prey, swimming down to a depth of up to 10 meters using its wings to move forward. It is attracted to schools of tuna and gathers in flocks with other seabird species to catch prey driven to the surface by the tuna.

Breeding: The upper parts are black with a brown tinge while the under parts are white. The dark coloration on the face extends below the eye and is sharply separated from the white throat. There is a white patch on the flanks, extending onto the sides of the rump. The under wings are mainly white with a dark border. The under tail-coverts have a black and white pattern and appear white in the field. The bill is dark gray or brown and the legs and feet are mainly pale pink.

The nest site is a burrow dug into a steep slope, usually sheltered by uluhe (*Dicranopteris linearis* ferns). A single white egg is laid during the first two weeks of June. Both parents incubate the egg and an incubation period of 62 days has been recorded. The young birds leave the nest in October, 88-100 days after hatching. They fly out to sea and are no longer dependent on their parents.

Cool Facts: It is named after Brother Matthias Newell, a missionary who worked in Hawaii from 1886 to 1924. By 1908, it was thought to be extinct but was rediscovered in 1947 and found breeding on Kaua‘i in 1967. It is known in Hawaiian as the ‘a‘o which describes its’ call.

The bird flies low over the water on stiff wings with a mixture of short glides and periods of rapid flapping.

Common Name: Black-capped Petrel
Scientific Name: *Pterodroma hasitata*

Size: 15.7 inches (40 cm); 96.5 cm wingspan

Habitat: North America; found in the Caribbean, it lives at sea (except for breeding). It breeds in Haiti and the Dominican Republic. There are an estimated 1,000 breeding pairs mostly in the Massifs de la Selle and de la Hotte, southern Haiti. Small numbers have recently been recorded on Dominica and in adjacent offshore waters, suggesting that it may still nest there. It now seems likely that small numbers breed in Cuba based on observation in the Sierra Maestra region (a congregation of 40+ individuals sighted in the vicinity of shoreline, vocalizations heard overhead by land-based observers and evidence of birds moving inland). It is believed extinct on Guadeloupe (to France) (where it was common in the 19th century). Black-capped petrel may have bred on Martinique (to France). Even during the breeding season it is highly pelagic, with sightings of breeding condition birds recorded off the North Carolina coast, USA. Birds disperse over the Caribbean and Atlantic from the north-east USA to north-east Brazil, with four records in European waters, but the at-sea range has contracted in the north and west.

Status:
Endangered.
Global Population:
5,000 mature individuals and decreasing. Habitat destruction and hunting for food have caused this species' decline, and remain key threats in Haiti. Birds are also predated by introduced mammals. Urbanization and concomitant increases in artificial lights may dazzle or disorientate birds into colliding with trees, wires and buildings. A telecommunications mast with stay wires erected in 1995 on Loma de Toro in Sierra de Bahoruco (the only known nesting locality in the Dominican Republic) poses a collision hazard. The proposed development of gas/oil fields off the coast of South Carolina, USA, could devastate this important feeding area. This bird has failed to make the US Federal Endangered Species list due to pressure from the energy industry and conservative elements within the US Government to keep it off the list.

Diet: Fish, invertebrate swarms, fauna associated with *Sargassum* seaweed reefs, and squid. Foraging seems concentrated at dawn, dusk, and night. Most food is captured in flight by seizing items with the bill. This petrel has also been observed touching the ocean surface with its feet (pattering). More rarely, it sits on the water with wings held high and sometimes dips its head below the surface. Nesting birds commute large distances from breeding to foraging sites.

Breeding: A medium-sized, long-winged gadfly petrel. It has a brownish-black cap extending to eye, nape and towards upper breast where it forms a partial collar. It has a white hindneck with a brownish-gray mantle and upper wing. The rump and upper tail coverts are white and the tail is a dark brown. It has entirely white under parts. The under wing is white with narrow black trailing edge, a black tip, and a broad black edge between primaries and carpal joint. The band extends weakly towards the center of the wing from the joint. It has a black bill and pink-orange legs. The feet are pink proximally and black distally.

In early November, Black-capped Petrels assemble off the shores of their nesting islands. The petrels approach their colony at night with bizarre calls, described as cries or screams. They excavate burrows in the soil or use natural fissures in rock outcroppings as nesting sites. In a burrow about 3 feet long, one male was observed sitting on an empty nest, constructed of sticks and pine needles. This burrow appeared to have been used in previous years. Young Black-capped Petrels probably fledge between late May and early June.

Cool Facts: Black-capped Petrels are also known as Diablotín, or "little devil" because of its night-time habits and odd-sounding mating calls, which reminded villagers of the sounds of evil spirits. The extinct Jamaica Petrel (*P. caribbaea*) was a related dark form, often considered a subspecies of this bird.

One possible reason why the Black-capped Petrel is nocturnal is so that it can avoid predation by gulls, hawks or crows at the breeding sites.

Petrels don't walk well—they tend to shuffle.

A group of petrels are collectively known as a "gallon" and a "tank" of petrels.

Common Name: Common Diving Petrel
Scientific Name: *Pelecanoides urinatrix*

Size: 7.9–9.8 inches (20-25 cm); 33-38 cm wingspan

Habitat: Southern Hemisphere; Common Diving-petrels have discrete ranges surrounding oceanic islands. These consist of South Georgia (Georgias del Sur), the Falkland Islands (Islas Malvinas), Tristan da Cunha and Gough Island (St Helena to UK) in the south Atlantic; in the south Indian Ocean, south and east of New Zealand (e.g. Antipodes Islands), and also on New Zealand's north island and Tasmania (Australia). Very little is known of their range when not breeding, but they are thought to be fairy sedentary, remaining in coastal waters adjacent to their colonies.

Status: Least Concern. **Global Population:** 16,000,000 mature individuals. The population is suspected to be in decline owing to predation by invasive species.

Diet: Mostly crustaceans; they catch prey by wing-propelled diving, and are capable of diving to 60 m (200 ft). They are known to forage at night on vertically migrating plankton. Feeding is mostly done in the ocean near the shore, but sometimes in the deeper pelagic zone during non-breeding season, which is only 2 months of the year.

Breeding: Sexes are alike, but the female has, on average, slightly longer wings and tail, and bill width and total head length. The upper parts including the upper wing and upper tail are a gray-black (blacker and glossier when fresh). The upper wing is browner, especially on the primaries, the central row of scapulars are partially paler gray with white tips forming pale line, but these soon wear off (many individuals appear to have evenly dark upper parts). The tail feathers narrowly tipped whitish in fresh plumage and the secondaries also have narrow whitish tips. The under wing is gray, with a darker gray on the axillaries and marginal coverts. The tips

of the greater primary and secondary-coverts are whitish-gray with most of the other coverts being a dull white, with or without dark grayish shaft-streaks. The under tail is gray. It has a blackish-gray mask through the eye and on the anterior (or over most) of the ear-coverts. It has dark to mid-gray on the anterior lores, superciliary (especially behind the eye) and the neck-sides (where it is often paler), becoming a dull white below the gape. The border is diffuse, with rest of the under parts being dull white except for a large gray to dark gray patch on the neck-sides (sometimes forming a complete collar) and some gray spotting on the sides and rear flanks (where they may join). The iris is dark brown and the bill is mostly blackish-gray with the lower mandible having a pale horn spot at its center and often a paler base. The legs and feet are a pale blue with grayer to blackish webs, soles and narrow line along rear tarsus. The juvenile has a weaker bill, but otherwise appears as an adult.

The mating habits are not well documented, although pairs form monogamous relationships. Breeding colonies are large and there is about one nest per 1 square meter (11 sq. ft.). The nest is a burrow around 50 cm long with a chamber at the bottom which may or may not be lined with dried grass. Females lay a single white egg, which measures 38 x 29 mm, and is incubated for 53–55 days. The young are brooded for 10–15 days and fledgling occurs at 45–59 days. Both parents take care of the young, which are grey-grown when hatched. The life expectancy is 6.5 years.

Cool Facts: There are six subspecies, which vary in body measurements, particularly bill size:

- *P. u. urinatrix.* First reported by J. F. Gmelin in 1789. The nominate subspecies is found in Australia and North Island in New Zealand.
- *P. u. chathamensis.* First reported by Murphy & Harper in 1916. This subspecies is found on Stewart Island, Snares Islands and Chatham Islands in New Zealand. It is similar to the nominate but smaller.
- *P. u. exsul.* First reported by Salvin in 1896. This subspecies is found on South Georgia, the subantarctic islands of the Indian Ocean, Auckland Islands, Antipodes Island, and Campbell Island. It has a relatively broad bill, the chest-sides tend to be darker, and it often has heavier gray mottling on the throat.
- *P. u. dacunhae.* First reported by Nicoll in 1906. This subspecies is found on Tristan da Cunha and Gough Islands. It is smaller than Race *berard*, with dusky streaking on the cheeks, lower head and neck-sides.
- *P. u. berard.* First reported by Gaimard in 1823. This subspecies is found on the Falkland Islands. It differs from the nominate in having a smaller bill, longer tail and middle toe. It also has rather more pronounced mottling on the lower head.
- *P. u. coppingeri.* First reported by Mathews in 1912. This subspecies is found in southern Chile. It is similar to Race *berard* but rather smaller.

Common Name: Northern Gannet
Scientific Name: *Morus bassanus*

Size: 31.9-43.3 inches (81-110 cm); 175-179 cm wingspan

Habitat: North Atlantic; Northern Gannet breeds in only six well established colonies: three in the Gulf of St. Lawrence, Quebec, and three in the North Atlantic off the coast of Newfoundland. In the eastern North Atlantic, it is distributed in 32 colonies from the coast of Brittany in France northward to Norway. Gannets winter and forage at sea.

Status: Least Concern. **Global Population:** 950,000 - 1,200,000 mature individuals. The population trend is increasing.

Relatively little affected by oiling. As their foraging methods largely preclude seeing fish under oil slicks, gannets seldom dive into or swim far enough on or under water to become coated with oil. Hatch-year young vulnerable to oiling during their first month at sea, while unable to fly.

Because of their trophic status, and preference for large fish, gannets especially prone to receive large quantities of certain toxic chemicals. Because large fish contain more organochlorine residues, both in absolute and relative terms, than small ones, and because gannets feed extensively on large fish, they tend to contain higher concentrations of organochlorines than other seabirds.

Diet: Surface-schooling fish (usually 2.5–30.5 cm in length). The main fish species taken include mackerel and herring, although in some localities depends heavily on other species, such as capelin (*Mallotus villosus*) off Norway, coalfish (*Pollachius virens*) off Iceland, and cod (*Gadus morhua*) in the North Sea. Squid are also taken.

While most seabirds' plunge-dives are relatively shallow, the Northern Gannet can dive as deep as 22 meters (72 feet). It thrusts its wings straight out over back, touching in the middle, just before breaking the water surface. It uses its wings and feet to swim deeper in pursuit of fish. If a fish is taken after diving, gannets swallow the fish underwater before surfacing.

Breeding: Sexes are similar. The adult plumage is largely white except for yellowish-buff tinge to crown and nape (most intense in breeding males during spring), fading to whitish on forehead, throat, and lower neck, and contrasting black primaries (which show as broad black wing-tips), black primary coverts, and alulae, and black-and-white lesser primary coverts. The bill is stout and chisel-like, pale blue (tending to gray-blue). There are black nasal grooves on each side of the upper mandible and the tip is downcurved and slightly overhanging the lower mandible. The bare skin of face and gular-stripe is a dark blue-gray with the orbital ring of the eye being an intense cobalt blue. The iris is clear, pale blue-green with a fine, dark outer ring. The legs and fully webbed feet are gray-black, with a conspicuous yellowish-green line in males, and bluish green in females, extending from the front of the tarsus down mid-ridge of toes

Young birds are dark brown in their first year, and gradually acquire more white in subsequent seasons until they reach maturity after five years.

They normally nest in large colonies, on cliffs overlooking the ocean or on small rocky islands. The largest colony of this bird, with over 60,000 couples, is found on Bonaventure Island, Quebec. Gannet pairs may remain together over several seasons. They perform elaborate greeting rituals at the nest, stretching their bills and necks skywards and gently tapping bills together. Predators of eggs and nestlings include Great Black-backed and Herring Gulls, Common Ravens, ermine, and red fox. The only known natural predator of adults is the Bald Eagle, though large sharks and seals may rarely snatch a gannet out at sea.

Cool Facts: Old names for the Northern Gannet include Solan, Solan Goose, and Solant Bird. Although they are strong and agile fliers, they are clumsy in takeoffs and landings.

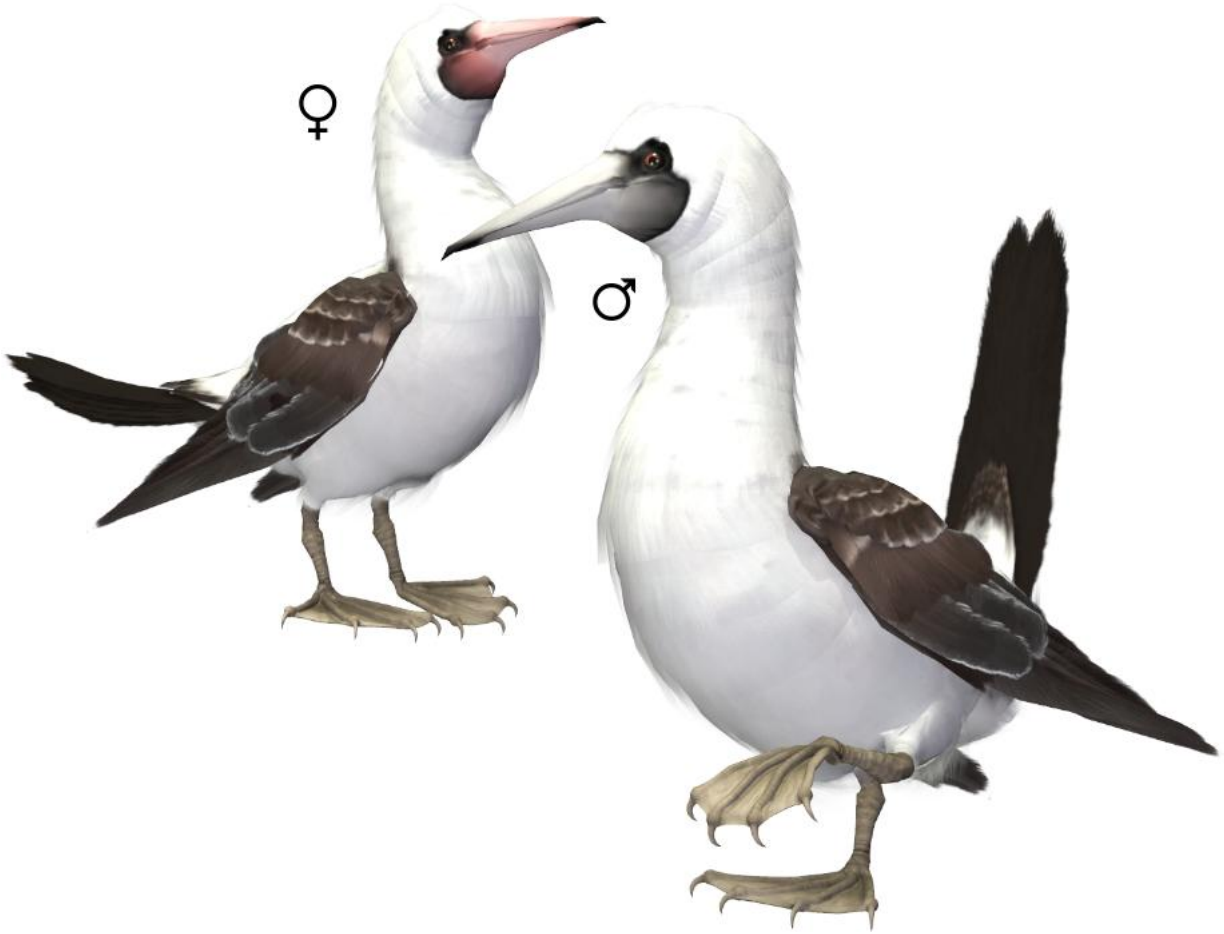
Common Name: Abbott's Booby
Scientific Name: *Papasula abbotti*

Size: 39 inches (79 cm); 190 cm wingspan

Habitat: Oceania; Christmas Island (an Australian territory in the eastern Indian Ocean). The Abbott's Booby now breeds only on Christmas Island, Indian Ocean, although formerly it bred on other Indian Ocean islands. At sea, it is mainly seen in the waters around Christmas Island.

Status: **Endangered.** **Global Population:** 6,000 mature individuals and decreasing.

During 1965-1987, phosphate extraction resulted in the destruction of approximately one third of nesting habitat. Some trees in nesting areas have degenerated, but the extent of this is unquantified. In addition, exotic plants that have colonized and been introduced to old mine sites may invade existing forest and threaten habitat rehabilitation. Future habitat loss is possible through clearance for mining. In 2007, significant patches of mature secondary forest were cleared for mining. Also in 2007, a new application to mine a 250 ha area of rainforest was turned down, but has subsequently gone to appeal. Plans for a satellite launch pad on the island are not proceeding at present. The effect of satellite launches on this species is unknown. Breeding boobies are vulnerable to extreme weather events. In 1988, a cyclone destroyed a



third of monitored fledglings and nest-sites. In wind-affected areas, increased turbulence causes higher adult mortality and reduces fledging success. Artificial forest clearings, e.g. for roads and buildings, also cause wind turbulence. Possibly the most serious threat is the introduced yellow crazy ant (*Anoplolepis gracilipes*) which formed super-colonies during the 1990s and spread rapidly to cover 28% of the forest on the island. However, control efforts have been successful, and at the beginning of 2005 there were an estimated 300 ha with *A. gracilipes* present on Christmas Island, with densities considerably lower than prior to control. Despite the successes, in 2006 the ants were regarded as widespread and patchily common. Allowed to spread uncontrolled ant super-colonies may prey directly on nestlings or cause nest abandonment. However, there have been no observations of ants preying on the species, and comparison of ant distribution and densities with *P. abbotti* distribution showed no sign of nest abandonment in ant-infested areas. Super-colonies alter island ecology by killing the dominant life-form, the red crab (*Gecaroidea natalis*), and by farming scale insects which damage trees. *A. gracilipes* occurs from below ground-level to the canopy where *P. abbotti* nests. There are signs of forest die-back in a small area of breeding habitat, which may be indirectly caused or exacerbated by *A. gracilipes*, but its impact is unlikely to be severe. Less specific threats include over-fishing and marine pollution. In addition, climate change may threaten the species through changes to sea surface temperatures, rainfall patterns and El Niño Southern Oscillation, although it is unlikely to be affected by sea level rise as it nests above 100 m. At sea, birds may suffer from direct hunting and by-catch, but this has not been documented. If some birds feed close to Java this could bring them into contact with Taiwanese and Indonesian fisheries.

Diet: It feeds on fish, especially flying-fish (*Exocoetidae*), and squid.

It plunge-dives like other boobies. It will undertake long foraging trips to favourable feeding zones, and frequently away from its nest for several days.

Breeding: Dark eye and dark-tipped bill, pale gray in male, pink in female. White head, neck and most of under parts. Black upper wing with white flecking on coverts and narrow white leading edge. Black thigh patch and tail. Black patch on mantle and back continuous with wings, remainder white. Grey legs and feet. Juvenile similar to adult male.

Parent birds may only be able to breed from about eight years old, with successful breeding no more frequently than once every two years, and a potential lifespan of 40 years.

The species nests in emergent trees in rainforest, with pairs laying a single egg, mainly in June or July. Growth of the chick is slow, with most making their first flight in December or January, and remaining dependent on the parent birds for food for about the next 230 days.

Cool Facts: It is the sole living member of the monotypic genus, *Papasula*. This species is named for William Louis Abbott who discovered it on Assumption Island in 1892.

Common Name: Japanese Cormorant
Scientific Name: *Phalacrocorax capillatus*

Size: 23-26 inches (81-92 cm); 152 cm wingspan

Habitat: Asia; occurs on the Pacific coast of Asia, breeding on the extreme south-east coast of Russia down to North Korea and South Korea, including the central and northern coasts of Japan and the South Kuril Islands. During winter it can be found in small numbers off the eastern coast of China as far south as Taiwan.

This marine species occupies rocky coastlines and islands, and is rarely being found inland.

Status: Least Concern. **Global Population** 25,000 - 100,000 mature individuals. Locally it is common in Japan, especially on Hokkaido, which held about 1,900 pairs in 1980s. Three major Japanese colonies are among largest known, each with several hundred pairs. Increasing disturbances are caused by people fishing for sport, and as a result, no longer breeds on Kyushu. Censuses gave 1,199 in Japan in January 1991, and 825 in South Korea in January 1990. Total population of the Russian Far East fewer than 16,000 birds, including not more than 8,000 found in the Sea of Japan, and at least 7,000 on the Kuril Islands in 1963. The largest known colony on Furugelm Island (south of Vladivostok), with 1,520 birds in 1985. In the past, this species has been ravaged by introduced Arctic foxes (*Alopex lagopus*) and intense human exploitation and persecution (1940-60), involving shooting and egg-collecting. That led to loss of all accessible colonies of Sakhalin Island, nearby Moneron Island, and the South Kuril Islands. There were barely 100–120 birds on Sakhalin in 1980. All major Russian colonies are now included in protected areas.

Diet: Fish, which it catches by pursuit-diving

Diet composition and foraging behavior may change seasonally and between years in response to changes in prey availability according to a 3-year study. During the breeding

season, cormorants fed on an epipelagic diet of anchovy (*Engraulis japonicus*) and sandlance (*Ammodytes personatus*). Out of breeding season, they switch to a demersal diet, feeding on benthic rock fish (*Sebastes spp.*), flatfish (*Pleuronectidae*) and inshore-living naked sandlance (*Hypophychus dybowskii*), as well as epibenthic greenling (*Hexagrammidae*). They formed larger feeding groups, visited more feeding sites, and stayed at each feeding site for a shorter period in the year of epipelagic diet than in years of demersal diet. They also made long foraging trips and fed in mainland coastal habitat, distant from the colony, in years of demersal diet. Individual radio-tracked birds fed over the wide area between the islands and mainland, in the year of epipelagic diet, while most individuals specialized in mainland or island coastal habitats in years of demersal diet.

Breeding: Adults can be confused with the similar Great Cormorant. The upper wing-coverts and mantle have deep green sheen with black margins (bronze sheen on Great Cormorant), and flight-feathers also have dark green sheen. The facial skin and gular pouch are yellow, but less extensive than on the Great Cormorant. The yellow skin forms a vertical border just behind the eye then extends to a sharp point at the gape, and forms a small rounded patch on the chin and below the bill. Juveniles are duller than adults and commonly have white and/or mottled brown on the under parts and yellow lower mandibles.

Egg laying occurs between May and July in Japan in colonies. It will sometimes nest alongside the Great Cormorant (*P. carbo*) and herons. Nests are built on cliffs or rocks, often on flat tops. The clutch size is 4–5 eggs and they are incubated about 34 days. Nestlings fledge after about 40 days.

Cool Facts: It is one of the species of cormorant that has been domesticated by fishermen in a tradition known in Japan as “ukai” 鵜飼. It is called “umiu” ウミウ (sea cormorant) in Japanese. The Nagara River's well-known fishing masters work with this particular species to catch ayu.

It is also known as Temminck's Cormorant.

Common Name: European Shag
Scientific Name: *Gulosus aristotelis*

Size: 39 inches (68-78 cm); 95-110 cm wingspan

Habitat: Eurasia and Africa; It breeds around the rocky coasts of western and southern Europe, southwest Asia and north Africa, mainly wintering in its breeding range except for northernmost birds. The European Shag can readily be seen at the following breeding locations between late April to mid-July: Farne Islands, England; Fowlsheugh, Scotland; Runde, Norway; Iceland, Faroe Islands and Galicia. The largest colony of European Shags is in the Cies Islands, with 2,500 pairs (25% of the world's population).

It occupies marine habitats but does not usually occur far from land. It shows a strong preference for rocky coasts and islands with adjacent deep, clear water, and forages over sandy and rocky sea beds. It also prefers sheltered fishing grounds such as bays and channels, although it generally avoids estuaries, shallow or muddy inlets and fresh or brackish waters.

Status: Least Concern. **Global Population:** 230,000 - 240,000 mature individuals. The overall population trend is decreasing, although some populations may be stable.
This species is persecuted (e.g. shot, intentionally drowned or poisoned) at commercial fisheries and fish farms as it is perceived to be a threat to fish stocks. It also suffers predation at nesting colonies by introduced American mink, it is vulnerable to coastal oil pollution, locally suffers from accidental entanglement and subsequent drowning in gill-nets (fishing nets), and is susceptible to the Newcastle disease so may be threatened by future outbreaks of the virus.

Diet: A wide range of benthic, demersal and schooling, pelagic fish. Sandeels (*Ammodytidae*) are the dominant prey of birds in British and some Spanish populations. These are usually caught at, or near, the sea bed. Foraging rarely occurs inland.

Breeding: It has a longish tail and yellow throat-patch. Adults have a small crest in the breeding season. It is distinguished from the Great Cormorant by its smaller size, lighter build, thinner bill, and, in breeding adults, by the crest and metallic green-tinged sheen on the feathers. The shag also has a lighter, narrower beak; and the juvenile shag has darker under parts.. The European Shag's tail has 12 feathers, the Great Cormorant's 14 feathers.

It breeds on coasts, nesting on rocky ledges or in crevices or small caves. The nests are untidy heaps of rotting seaweed or twigs cemented together by the bird's own guano. The nesting season is long, beginning in late February but some nests not starting until May or even later. Three eggs are laid. Their chicks hatch without down and so they rely totally on their parents for warmth, often for a period of two months before they can fly. Fledging may occur at any time from early June to late August, exceptionally to mid-October.

Cool Facts: The green sheen on the feathers results in the alternative name "Green Cormorant". In Britain, this seabird is usually referred to as simply “the Shag”.

The European Shag is one of the deepest divers among the cormorant family. Using depth gauges, European Shags have been shown to dive to at least 45 m. In UK coastal waters, dive times are typically around 20–45 seconds, with a recovery time of around 15 seconds between dives; this is consistent with aerobic diving, i.e. the bird depends on the oxygen in its lungs and dissolved in its bloodstream during the dive. When they dive, they jump out of the water first to give extra impetus to the dive.

There are three subspecies and they differ slightly in bill size and the breast and leg color of young birds. Recent evidence suggests that birds on the Atlantic coast of southwest Europe are distinct from all three, and may be an as-yet undescribed subspecies.

- *G. a. aristotelis*. First reported by Linnaeus in 1761. The nominate subspecies (aka “Atlantic Shag”) is found in northwestern Europe (Iceland and northern Scandinavia south on coasts to Iberian Peninsula). Breeding adults generally have a conspicuous crest and the extent of yellow on the bill is restricted to its base. Most juveniles have brownish underparts. Birds from Northern Scotland and Norway tend to show larger bills than birds from southern England and Brittany. Shags from Galicia have similar wing-lengths but much larger bills than elsewhere. Juveniles are on average paler than North Atlantic shags but darker than Mediterranean ones. They may represent an undescribed subspecies.
- *G. a. desmarestii*. First reported by Payraudeau in 1826. The “Mediterranean Shag” is found in southern Europe and southwest Asia (Mediterranean Sea and Black Sea coasts). Differs from the nominate in having its breeding crest reduced or absent, its feet paler and bill more extensively yellow on average. Juveniles have generally whitish under parts, which is rare in the nominate subspecies. They also show more extensive whitish fringes to wing coverts, forming a pale wing panel. This subspecies is also smaller, with a longer and more slender bill, as well as shorter wings compared to the nominate.
- *G. a. riggenbachi*. First reported by Hartert & Jourdain in 1923. The “Moroccan Shag” is found on the northwest African coast. It is similar to Race *desmarestii* in coloration and size, but said to have a larger bill.

Common Name: Magnificent Frigatebird
Scientific Name: *Fregata magnificens*

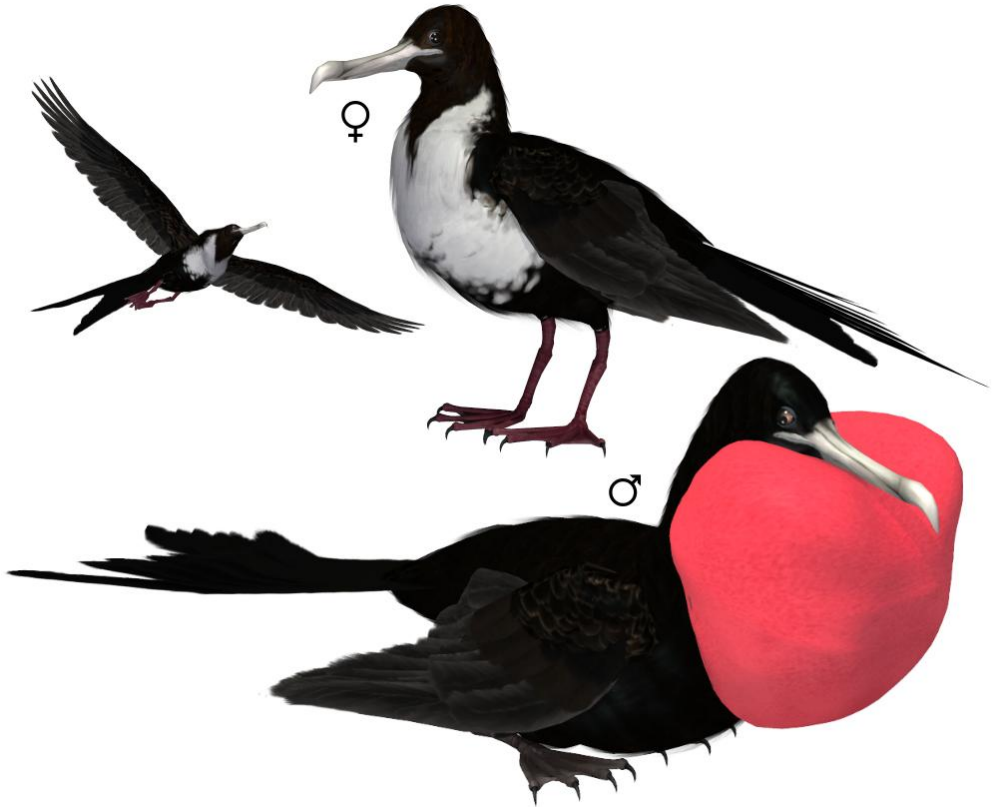
Size: 39 inches (100 cm); 215 cm wingspan

Habitat: Worldwide; widespread in the tropical Atlantic, breeding colonially in trees in Florida, the Caribbean and Cape Verde Islands. It also breeds along the Pacific coast of the Americas from Mexico to Ecuador including the Galapagos Islands.

Status: Least Concern. **Global Population:** 200,000 mature individuals. The population trend is increasing in North America.

A recent study found that the Magnificent Frigatebird on the Galapagos Islands is genetically and morphologically distinct. Based on this study, the Galapagos population has not been exchanging any genes with their mainland counterparts for several hundred thousand years. Given these findings, the Galapagos population of this tropical seabird may be its own genetically distinct species warranting a new conservation status. This small population of genetically unique Magnificent Frigatebirds is a vulnerable population. Any catastrophic event or threats by humans could wipe out the approximate 2,000 Magnificent Frigatebirds that nest on the Galapagos Islands.

Diet: Fish, squid, turtles, crabs, jellyfish, and offal.



Frigatebirds snatch food from the surface of water while flying past, and they chase other birds to force them to disgorge food, which is caught in flight before it hits the water.

Breeding: This species of frigatebird is similar to other frigatebirds with this exception; it lacks a white axillary spur. Males are all black with a scarlet throat pouch which is inflated like a balloon in the breeding season. Although the feathers are black, the scapular feathers produce a purple iridescence when they reflect sunlight. Females are black, but have a white breast and lower neck sides, a brown band

on the wings and a blue eye ring. Immature birds have a white head and under parts and juveniles show a distinctive diamond-shaped belly patch.

In a spectacular courtship display, male Magnificent Frigatebirds sit in varying size groups, throat sacs inflated, clattering their bills, waving their heads back and forth, quivering their wings, and calling to females flying overhead. The breeding period of the Magnificent Frigatebird is exceptionally long and young fledglings are often still being fed by the female at one year of age.

Frigatebirds nest in colonies. Nests are a flat or slightly hollowed platform of sticks and twigs, with some finer material such as grass or vines as lining. The nest is placed on flat tops of low bushes or trees.

Cool Facts: Frigatebirds are the only seabirds where the male and female look strikingly different. Frigatebirds are sometimes called “Man O' Wars”; which reflects its rakish lines, speed, and aerial piracy of other birds.

Christopher Columbus encountered magnificent frigatebirds when passing the Cape Verde Islands on his first voyage across the Atlantic in 1492. His journal for the voyage survives in a version made in the 1530s by Bartolomé de las Casas. The entry for 29 September reads in English:

> *“They saw a bird that is called a frigatebird, which makes the boobies throw up what they eat in order to eat it herself, and she does not sustain herself on anything else. It is a seabird, but does not alight on the sea nor depart from land 20 leagues [97 km; 60 mi]. There are many of these on the islands of Cape Verde.”*

Even though the Magnificent Frigatebird spends most of its life flying over the ocean, it will rarely (if ever) land on the water. It spends days and nights on the wing, with an average ground speed of 10 km/hour, covering over 200 km before landing. They alternately climb in thermals, to altitudes occasionally as high as 2500 m, and descend to near the sea surface. The only other bird known to spend days and nights on the wing is the Common Swift.

There are two subspecies:

- F. m. rothschildi. First reported by Jean-Baptiste du Tertre in 1667. This subspecies is found in the eastern Pacific (breeding from Mexico south to Ecuador), the western Atlantic (breeding Mexico and Florida south to Brazil), and in the eastern Atlantic (breeding on the Cape Verde Islands, where now very rare or extirpated)
- F. m. magnificens. First reported by Jean-Baptiste du Tertre in 1667. The nominate subspecies is endemic to the Galapagos Islands.

Common Name: Great Skua
Scientific Name: *Stercorarius skua*

Size: 20-23 inches (50-58 cm); 125-140 cm wingspan

Habitat: Northern Hemisphere; breeds in Iceland, Norway, the Faroe Islands and the Scottish islands, with a few on mainland Scotland. It is a migrant, wintering at sea in the Atlantic Ocean and regularly reaching North American waters and a vagrant to Mediterranean countries.

Status: Least Concern.
Global Population: 48,000 mature individuals. The population levels appear stable.

Recent reductions in sandeel stocks in Shetland have led to declines in breeding success and decreases in numbers at the largest colonies, but increases continue further south in Scotland. However, discards from fisheries provide more than half the summer diet in Shetland, so that changes in fishing practices there and elsewhere could drastically affect numbers. Some colonies have been limited in size by human persecution (often illegal).

As a top predator, pollutant burdens can be high but there is little evidence of toxic effects. Some birds are drowned in fishing nests or caught on hooks, especially in wintering areas. Harvesting for food has now almost ceased.

Diet: Fish, which it often obtains by robbing gulls, terns and even Northern Gannets of their catches. It will also directly attack and kill other seabirds, up to the size of Great Black-backed Gulls. A common technique is to fly up to a gannet in mid-air and grab it by the wing, so that it stalls and falls into the sea, where the Great Skua then physically attacks it until it surrenders its catch.

Breeding: Sexes are alike. The adult is streaked dark greyish brown, with a blackish cap, while the juvenile is a warmer brown and unstreaked below. Its tail is short and blunt.

Breeding begins in May, and it is loosely colonial but highly territorial. It breeds on coastal moorland and rocky islands that have flat ground with some vegetation cover. They usually avoid human contact. Two spotted olive-brown eggs are laid in grass-lined nests. Most birds breed within 1 km of their birth place.

Cool Facts: Genetic studies have found surprising similarities between the Great Skua and the Pomarine Skua, despite their dissimilar appearance. Many ornithologists now believe either that the Great Skua originated as a hybrid between the Pomarine Skua and one of the southern-hemisphere species presumably as a result of vagrancy or migration across the equator by the southern species, or that the Pomarine Skua evolved from hybridization of the Great Skua and one of the small Arctic species.

Like other skuas, it will fly at the head of a human or other intruder approaching its nest. Although it cannot inflict serious damage, such an experience with a bird of this size is frightening.

In Britain, it is sometimes known by the name Bonxie, a Shetland name of unknown origin. A group of skuas are collectively known as a "shishkab" of skuas.

Common Name: Caspian Gull
Scientific Name: *Larus cachinnans*

Size: 23-26 inches (59-67 cm); 120-155 cm wingspan

Habitat: Eurasia; breeds around the Black and Caspian Seas, extending eastwards across Central Asia to north-west China. In Europe it has been spreading north and west and now breeds in Poland and eastern Germany. Some birds migrate south as far as the Red Sea and Persian Gulf while others disperse into Western Europe, in countries such as Sweden, Norway and Denmark. Small numbers are now seen regularly in Britain, especially in South-east England, East Anglia and the Midlands.

Status: Least Concern. **Global Population:** unknown number of mature individuals.

Diet: Small fish and animals by hunting or scavenging.

Breeding: Male and female look alike. The legs, wings and neck are longer than those of the Herring Gull and Yellow-legged Gull. The eye is small and often dark; the legs vary from pale pink to a pale yellowish color. The back and wings are a slightly darker shade of gray than the Herring Gull but slightly paler than the Yellow-legged Gull.

First-winter birds have a pale head with dark streaking on the back of the neck. The under parts are pale and the back is greyish. The greater and median wing-coverts have whitish tips forming two pale lines across the wing.

It typically nests on flat, low-lying ground by water unlike the Yellow-legged Gull which mainly nests on cliffs in areas where the two overlap. The breeding season starts from early April. Two or three eggs are laid and incubated for 27 to 31 days.

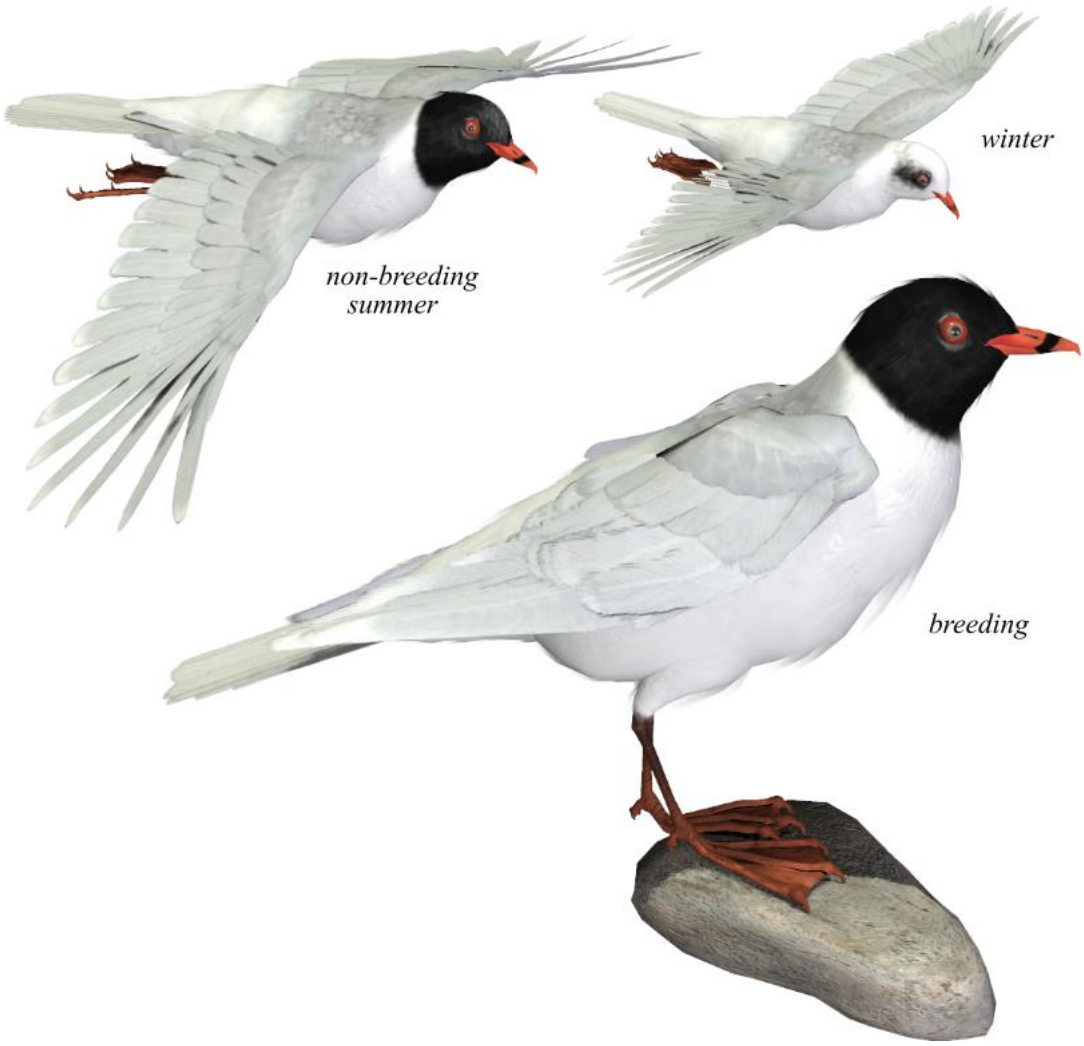
Cool Facts: This gull has a troubled taxonomic history. Currently, it is treated as a full species by some authorities and as a subspecies of the Herring Gull by the British Ornithologists' Union Records Committee (saying DNA samples don't offer conclusive evidence). Some authorities include the Yellow-legged Gull (*Larus michahellis*) within Larus cachinnans but it is now commonly considered to be a separate species.

The Mongolian Gull (*Larus vegae/cachinnans mongolicus*) may be classed as a subspecies of the Caspian Gull, a subspecies of the East Siberian Gull or as a species in its own right. It breeds in Mongolia and surrounding areas and migrates south-east in winter.

Common Name: Mediterranean Gull
Scientific Name: Ichthyaetus *melanocephalus*

Size: 14-15 inches (36-38 cm); 98-105 cm wingspan

Habitat: Europe; breeds almost entirely in Europe, mainly on the Black Sea coast of Ukraine, with a recent spread to the northern Caucasian Plains and Azerbaijan. It also breeds at scattered localities throughout Europe, including the Netherlands, southern France, Italy, Greece, Turkey, southern England, Belgium, Germany and Spain. It winters in the Mediterranean, the Black Sea, north-west Europe and north-west Africa.



This gull breeds in colonies in large reed beds or marshes, or on islands in lakes; where its population is small, it nests in Black-headed Gull colonies. It is highly gregarious in winter, both when feeding or in evening roosts. It is not a pelagic species, and is rarely seen at sea far from coasts.

Status: Least Concern. **Global Population:** 360,000 - 960,000 mature individuals. Populations appear stable but this species has sustained heavy losses as a result of tourist disturbance at breeding colonies. The species may also be threatened by habitat loss resulting from tourism development, and by marine pollution (e.g. oil spills and chemical discharges).

Diet: Fish, worms, food scraps, insects, offal and carrion.

Breeding: Sexes are alike. First-winter birds resemble young Common Gulls but the black forewings and black lines through the secondaries are even more pronounced. This bird takes two years to reach maturity. At rest, non-breeding Mediterranean Gulls of all ages have a distinct dark smudge behind the eye, often with some black extending over the crown. Compared with Black-headed Gulls, they are chunkier-bodied, with a heavier, more angular head and a thicker bill.

The species breeds in colonies, usually of less than 1,000 pairs and occasionally in single pairs amidst colonies of other species. The nest is a shallow depression, situated on the ground in sparsely vegetated sites, thickets or reed beds near water. Nests are about 60 cm apart from neighboring pairs.

Cool Facts: Birders often abbreviate its name to "Med Gull". It closely resembles the Black-headed Gull but is slightly larger and does not have the black-band on the edge of the primary feathers or tail feathers.

Common Name: Western Gull
Scientific Name: *Larus occidentalis*

Size: 23.6 inches (60 cm); 147 cm wingspan

Habitat: North America; The Western Gull ranges from British Columbia, Canada to Baja California, and Mexico. It is rarely encountered inland or away from the ocean and is almost an exclusively marine gull.

Status: Vulnerable. **Global Population:** 120,000 mature individuals. Despite being a well-known bird species on the West Coast of the US, it is of some slight conservation concern given its restricted range for a gull. Western Gulls are very aggressive when defending their territories and consequently were persecuted by some as a menace. The automating of the lighthouses, and the closing of Alcatraz Prison, allowed the species to reclaim parts of its range. They are currently vulnerable to climatic events like El Niño events and oil spills.

Diet: At sea they take fish and invertebrates like krill, squid and jellyfish. They cannot dive, and feed exclusively on the surface. On land they feed on seal and sea lion carcasses, as well as cockles, limpets and snails in the intertidal zone. It also drops shellfish on to rocks to break them. They also feed on human food refuse, in human-altered habitats, including waste landfills, and taking food from people at marinas and beaches.

Breeding: Male and female look alike. A large white-headed bull with a heavy bill and pinkisk legs. Breeding adults have a dark gray back, an orange ring around the eye and a red spot on the lower bill. Non-breeding birds have a small amount of streaking on the head and neck.

Western gulls take approximately four years to reach their full plumage. In the colonies, long term pairs aggressively defend territories whose borders may shift slightly from year to year, but are maintained for the life of the male.

It nests from late April or early May, and later in the north, nesting on barren substrates in colonies on rocky islets with some herbaceous cover and gravelly beaches.

Cool Facts: It was previously considered conspecific, the same species, with the Yellow-footed Gull (*Larus livens*) of the Gulf of California. In Washington state, the Western Gull hybridizes frequently with the Glaucous-winged Gull, and may closely resemble a Thayer's Gull. The hybrids have a flatter and larger head and a thicker bill with a pronounced angle on the lower part of the bill, which distinguishes it from the smaller Thayer's Gull.

The Western Gull typically lives about 15 years, but can live to at least 25 years.

There are two subspecies:

- *L. o. occidentalis.* The nominate subspecies is found in northwestern Washington (Destruction Island) to central California (the Farallon Islands). The gulls tends to be larger and to have slightly paler upper parts and darker eyes than Race *wymani*. The head often develops fine gray streaks in Basic plumage while in Race *wymani*, the head usually remains white all year.
- *L. o. wymani.* The “Southern” subspecies is found from central California (Monterey Bay) to central Baja California (Guadalupe Island).

Common Name: Caspian Tern
Scientific Name: *Hydroprogne caspia*

Size: 23.6 inches (48-56 cm); 127-140 cm wingspan

Habitat: Worldwide; breeding habitat is large lakes and ocean coasts in North America (including the Great Lakes), and locally in Europe (mainly around the Baltic Sea and Black Sea), Asia, Africa, and Australasia (Australia and New Zealand). North American birds migrate to southern coasts, the West Indies and northernmost South America. European and Asian birds spend the non-breeding season in the Old World tropics. African and Australasian birds are resident or disperse over short distances.

Status: Least Concern. **Global Population:** 240,000 - 420,000 mature individuals. The overall

population trend is increasing, although some populations are decreasing, stable, or have unknown trends. The largest breeding colony in North America is off the coast of Oregon. Increasing numbers of terns at this site have caused problems with young salmon releases, some of them endangered species. Efforts are being made to move the colony to other areas, away from the fish stocking programs. Caspian Terns are protected under the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) and the Migratory Bird of 1918 in the United States.

Diet: Fish; occasionally eat large insects, the young and eggs of other birds and rodents. They may fly up to 60 km from the breeding colony to catch fish at freshwater lakes or at sea by hovering high over the water and then falling into plunging dives.

Breeding: Male and female look alike. Adult birds have black legs, and a long thick red-orange bill with a small black tip. They have a white head with a black cap and white neck, belly and tail. The upper wings and back are pale grey while the under wings are pale with dark primary feathers. In flight, the tail is less forked than other terns and wing tips black on the underside. In winter, the black cap is still present (unlike many other terns), but with some white streaking on the forehead.

Breeding is in spring and summer, with one to three pale blue green eggs, with heavy brown spotting, being laid. They nest either together in colonies, or singly in mixed colonies of other tern and gull species. The nest is on the ground among gravel and sand, or sometimes on vegetation; incubation lasts for 26–28 days. The chicks are variable in plumage pattern, from pale creamy to darker grey-brown; this variation assists adults in recognizing their own chicks when returning to the colony from feeding trips. Fledging occurs after 35–45 days. Young Caspian Terns appear to have a difficult time learning to catch fish efficiently. They stay with their parents for long periods of time, and are fed by them even on the wintering grounds. Many young terns do not return to the nesting grounds for several years, remaining instead on the wintering areas.

Cool Facts: It is the world's largest tern and was recently reclassified from the *Sterna* family to *Hydroprogne* family. This tern is sometimes confused with the Common Tern. The Caspian Tern is much larger, has blackish feet and a less defined black tip stripe as well as a less forked tail.

Terns aggressively defend their breeding colonies. They will pursue, attack, and chase potential predatory birds, and can cause bloody wounds on the heads of people who invade the colony. The entire colony will take flight, however, when a Bald Eagle flies overhead, exposing the chicks to predation from gulls.

The oldest known wild Caspian Tern lived to be more than 26 years old. Average life span of Great Lakes Caspian Terns is estimated to be 12 years.

In New Zealand, it is also known by the Maori name *Taranui*.

Common Name: Razorbill
Scientific Name: *Alca torda*

Size: 16.9 inches (43 cm); 63–68 cm wingspan

Habitat: Northern Hemisphere; distributed across sub-arctic and boreal waters of the Atlantic. Their breeding habitat is islands, rocky shores and cliffs on northern Atlantic coasts, in eastern North America as far south as Maine, and in Western Europe from northwestern Russia to northern France. North American birds migrate offshore and south, ranging from the Grand Banks of Newfoundland to New England. Eurasian birds also winter at sea, with some moving south as far as the western Mediterranean. Approximately 60 to 70 percent of the entire razorbill population breeds in Iceland.

Status: Least concern. **Global Population:** 500,000-700,000 mature individuals. In 1917, Razorbills were put under the protection of the “Migratory Bird Treaty Act”. Since then populations are thought to be stable or increasing throughout major parts of its global range. The current threat for the razorbill population is the destruction of breeding sites and the conservative elements of the US Government wanting to dismantle the “Migratory Bird Treaty Act”, claiming it is “bad for business”.

Diet: Fish; especially sandeels, sprats and herrings.

Razorbills dive underwater to capture their prey, using their wings to swim.

Breeding: It is a large, stocky, crow-sized alcid. Male and female look alike, though females are slightly smaller. The upper parts are black and the under parts are white. It is thick-necked,

with large, roundish head that supports a deep, rectangular, laterally compressed bill. Adults in the summer (Breeding plumage) shows 2-3 white lines against otherwise all-black head, neck, and bill, these being both prominent and diagnostic: one (loral-line) extends horizontally from feathers at base of bill backward to front of eye, the other(s) crosses upper and lower mandibles in a broken, vertical arc. Bill also has 1–3 shallow, vertical grooves distal to white line. The wings narrow and pointed. The secondaries are tipped with white, forming a narrow white border on trailing edge of wing, this and white loral-line being only contrasts to black upper parts. The white on the under parts extends well up onto black of neck in a point. In flight, clean white on under surface of forewing and white tips to secondaries contrast sharply with otherwise dark underwing. Tail long and pointed compared to other Alcidae. The inside of the mouth is orange-yellow, the iris is brown, and the legs and feet are black.

In winter, the adult is similar, except that the black on sides of head and neck replaced by white, and the pale, speckled streak extends back from eye across side of head. In addition, the white loral-line is either faded or absent in winter. First-winter plumage is similar to the winter adult, but is smaller overall, and has shorter, shallower bill with no white line or grooves.

Throughout the pre-laying period razorbills will socialize in large numbers. There are two types of socializing that occur. Large groups will dive and swim together in circles repeatedly and all rise up to the surface, heads first and bills open. Secondly, large groups will swim in a line weaving across each other in the same direction.

Razorbills will choose only one partner for life and females will lay one egg per year. The pair will mate up to 80 times in a 30 day period to ensure fertilization.

Razorbills will nest along coastal cliffs in enclosed or slightly exposed crevices and will only come to land in order to breed. Both parents will spend equal amount of time incubating. Once the chick has hatched, the parents will take turns foraging for their young and will sometimes fly long distances before finding prey.

Cool Facts: It is the largest living member of the Auk family. Razorbill's average lifespan is roughly 13 years, although a bird ringed in the UK in 1967 has survived for at least 41 years—a record for the species.

There are two subspecies of Razorbill recognized by the American Ornithologists' Union. *Alca torda torda*, named by Linnaeus in 1758, occurs in eastern North America, Greenland, Bear Island (Norway) and the Baltic and White Seas. *Alca torda islandica* was named by C. L. Brehm in 1831 and occurs throughout the British Isles and Northwestern France. The two subspecies differ slightly in bill measurements. A third suspecies, *Alca torda pica*, is no longer recognized because the distinguishing characteristic, an additional furrow in the upper mandible, is now known to be age-related.

There are two subspecies:

- *A. t. torda.* First reported by Linnaeus in 1758. The nominate subspecies is found in eastern North America (Digges Sound and southeastern Baffin Island south to the Gulf of Maine), Greenland and east to Bear Island, Norway, Denmark, Baltic Sea region, Murmansk and White Sea.
- *A. t. islandica.* First reported by C. L. Brehm in 1831. It is found in Iceland, Faeroes, Britain, Ireland eastward to Heligoland, and south to the Channel Islands and northwestern France (Brittany). It is smaller than the nominate.

Special Thanks to my beta testers…

- 2012 Original Release: FlintHawk, Linda, Jan, Rhonda and Sandra
- 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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