

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

Songbird ReMix Penguins

Manual & Field Guide

Contents

Manual

Introduction	3
Overview	3
Poser and DAZ Studio Use	3
Physical-based Renderers	4
Where to find your birds	4

Field Guide

List of Species	5
General Information on Penguins	6
<u>Africa</u>	
African Penguin	9
<u>Antarctica</u>	
Emperor Penguin	11
Adélie Penguin	13
Chinstrap Penguin	15
Gentoo Penguin	17
King Penguin	19
<u>Galápagos</u>	
Galápagos Penguin	21
<u>New Zealand</u>	
Little Blue Penguin	23
Fiordland Penguin	25
<u>Sub-Antarctica</u>	
Humboldt Penguin	27
Magellanic Penguin	28
Southern Rockhopper Penguin	29
Resources, Credits and Thanks	31

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Songbird ReMix Penguins

Introduction

Penguins consist of 9 Penguin species found around the globe. Included is a good sampling from the largest of species, the Emperor Penguin, and star of the academy award winning documentary “March of the Penguins”, to the smallest, the Little Blue Penguin. There also is the most endangered Penguin on the planet from the Galápagos Islands as well as the most populous, the Chinstrap Penguin of Antarctica.

Whether you want lighthearted images of frolicking Penguins or serious scientific pursuits, Songbird Remix Penguins is bound to please...

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):
- **Penguins (Order Sphenisciformes)**
- **Manuals:** Contains a link to the online manual for the set.
- **Props:** Contains any props that might be included in the set
- **Resources:** Items in this folder are for creating and customizing your birds
 - **Bird Base Models:** This folder has the blank, untextured model(s) used in this set. These models are primarily for users who wish to experiment with poses or customize their own species of bird. With using physical renderers such as Iray and Superfly, SubD should be turned to at least “3”.

Poser Use

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

DAZ Studio Use

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

Physical-based Rendering

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

Where to find your birds

Type Folder	Bird Species
Penguins (Order Sphenisciformes)	African Penguin Emperor Penguin King Penguin Adélie Penguin Chinstrap Penguin Gentoo Penguin Galápagos Penguin Little Blue Penguin Fiordland Penguin Humboldt Penguin Magellanic Penguin Southern Rockhopper Penguin

Where to find your poses

Type Folder	For what species?
Penguins (Order Sphenisciformes)	All Penguins

Songbird ReMix **Penguins**

Field Guide

Africa

African Penguin

Antarctica

Emperor Penguin

Adélie Penguin

Chinstrap Penguin

Gentoo Penguin

King Penguin

Galápagos

Galápagos Penguin

New Zealand

Little Blue Penguin

Fiordland Penguin

Sub-Antarctica

Humboldt Penguin

Magellanic Penguin

Southern Rockhopper Penguin

General Information about Penguins

From Wikipedia, the free encyclopedia (edited by Ken Gilliland)

Penguins are a group of aquatic, flightless birds living almost exclusively in the Southern Hemisphere. The number of penguin species is debated. Depending on which authority is followed, penguin biodiversity varies between 17 and 20 living species, all in the subfamily Spheniscinae.

Most penguins feed on krill, fish, squid, and other forms of sea life caught while swimming underwater. They spend half of their life on land and half in the oceans.

Penguins seem to have no special fear of humans and have approached groups of explorers without hesitation. This is probably on account of there being no land predators in Antarctica or the nearby offshore islands that prey on or attack penguins. Instead, penguins are at risk at sea from predators such as the leopard seal. Typically, penguins do not approach closer than about 3 meters (10 ft) at which point they become nervous. This is also the distance that Antarctic tourists are told to keep from Penguins.

Penguins are superbly adapted to an aquatic life. Their vestigial wings have become flippers, useless for flight in the air. In the water, however, penguins are astonishingly agile. Within the smooth plumage a layer of air is preserved, ensuring buoyancy. The air layer also helps insulate the birds in cold waters. On land, penguins use their tails and wings to maintain balance for their upright stance.

All penguins are countershaded for camouflage – that is, they have a white underside and a dark (mostly black) upperside. A predator looking up from below (such as an orca or a leopard seal) has difficulty distinguishing between a white penguin belly and the reflective water surface. The dark plumage on their backs camouflages them from above.

Diving penguins reach 6 to 12 km/h, though there are reports of velocities of 27 km/h (which are more realistic in the case of startled flight). The small penguins do not usually dive deep; they catch their prey near the surface in dives that normally last only one or two minutes. Larger penguins can dive deep in case of need. Dives of the large Emperor Penguin have been recorded which reach a depth of 565 m and last up to 22 minutes.

Penguins either waddle on their feet or slide on their bellies across the snow, a movement called "tobogganing", which conserves energy while moving quickly. They also jump with both feet together if they want to move more quickly or cross steep or rocky terrain.

Penguins have an average sense of hearing for birds; this is used by parents and chicks to locate one another in crowded colonies. Their eyes are adapted for underwater vision, and are their primary means of locating prey and avoiding predators.

Penguins have a thick layer of insulating feathers which serve to keep them warm in water (heat loss in water is much greater than in air). The Emperor penguin (the largest penguin) has the largest body mass of all penguins, which further reduces relative surface area and heat loss. They also are able to control blood flow to their extremities, reducing the amount of blood which gets cold, but still keeping the extremities from freezing. In the extreme cold of the Antarctic winter, the females are at sea fishing for food leaving the males to brave the weather by themselves. They often huddle together to keep warm and rotate positions to make sure that each penguin gets a turn in the center of the heat pack.

They can drink salt water because their supraorbital gland filters excess salt from the bloodstream. The salt is excreted in a concentrated fluid from the nasal passages.

Penguins form monogamous pairs for a breeding season, though the rate the same pair recouples varies drastically. Most penguins lay two eggs in a clutch with the two largest species, the Emperor and the King Penguins, laying only one. With the exception of the Emperor Penguin in all penguins share the incubation duties. These incubation shifts can last days and even weeks as one member of the pair feeds at sea.

Penguin eggs are smaller than any other bird species when compared proportionally to the weight of the parent birds. When mothers lose a chick, they sometimes attempt to "steal" another mother's chick, usually unsuccessfully as other females in the vicinity assist the defending mother in keeping her chick. In some species, such as Emperor Penguins, young penguins assemble in large groups called crèches.

Threats to Penguins

Penguins have natural predators like leopard seals, sharks, orcas, sea lions, but sadly humans are the ones responsible for many deaths of these funny looking animals

Penguins' worst problem is oil spill since the oil gets on their feathers. Penguins can't fly and therefore must surface often to breathe and are really unable to avoid being coated by oil that is on surface of the water. Penguins are often killed by empty tankers too since they must fill their tanks with water and later the oily water gets discharged into ocean which many penguins pay with their lives.

Global warming is not fully affecting penguins, at least not yet since temperature isn't still worrying for them, but further temperature increases could be another harmful factor affecting penguin population.

12 penguin species are considered "at risk" or endangered, and mostly because of human activities. The most famous ones, such as the Emperor and Chinstrap Penguins live in Antarctica and are not endangered due to their isolation. If global warming continues, isolation won't mean lot to them.

Of all penguin species African penguins are mostly at risk since their population has continuous decline because of many different reasons such as egg collection, increase of commercial fishing and of course earlier mentioned oil spills .

Penguins in popular culture

Penguins are popular around the world, primarily for their unusually upright, waddling gait and (compared to other birds) lack of fear of humans. Their striking black-and-white plumage is often likened to a tuxedo suit. Mistakenly, some artists and writers have penguins based at the North Pole. This is incorrect, as there are almost no wild penguins in the northern hemisphere, except the small group on the northernmost of the Galápagos.

Penguins have been the subject of many books and films such as **Happy Feet** and **Surf's Up**, both CGI films; **March of the Penguins**, a documentary based on the migration process of Emperor Penguins; and a parody entitled **Farce of the Penguins**. Penguins have also found their way into a number of cartoons and television dramas; perhaps the most notable of these is Pingu, created by Silvio Mazzola in 1986 and covering more than 100 short episodes.

The tendency of penguins to form large groups feeds the stereotype that they all look exactly alike, a popular notion exploited by cartoonists such as Gary Larson.

Common Name: African Penguin
Scientific Name: *Spheniscus demersus*

Size: 26 $\frac{3}{4}$ - 27 $\frac{1}{2}$ inches (68-70 cm)

Habitat: Africa. Found around the coast of South Africa. Colonies are formed on the rocky shores when they are breeding.

Status: Endangered. **Global Population:** 52,000 mature individuals. Major reasons include depletion of their food from overfishing and pollution from incidences such as oil spills. Most nest on islands, where they should be safe from predators, but cats, mongoose and other introduced predators are now present on many of these islands.

Diet: Small fishes, such as herring, anchovies and sardines, but they also eat squid and crustaceans. When foraging they can travel distances up to 110 kms on a single trip.



Nesting: They tend to molt in November and December and during this time they remain on land. After they have gained their new plumage they head out to sea to feed, returning in January to mate and begin nesting.

African Penguins pair up for life and breeding occurs throughout the year, although the main breeding begins in February.

African penguins lay their eggs on rocky and sandy coastal islands and breed in huge, noisy colonies. They lay two eggs in burrows, bowl-shaped depressions dug in the sand, which protect the eggs from the sun.

Like all penguins, they form tight pair bonds, and both parents incubate the eggs and feed the chicks for 2-4 months. The chicks are old enough to breed in 2-4 years.

Cool Facts: African penguins are closely related to the Humboldt, Galapagos and Magellanic penguins. These penguins give out a loud, braying call that is similar to that of a donkey thus they're given the nickname, "jackass penguins".

The pink glands above each eye will become pinker when the penguin is hot. This is due to more blood flowing through them so that it can be cooled by the surrounding air.

African penguins have an average swimming speed of 7 km/hr but they can reach speeds of 20 km/hr when they are hunting. They dive to an average depth of 30 m but they can dive deeper and they can stay submerged for up to 2.5 minutes.

Predators of African Penguins include sharks, cape fur seals and killer whales. On land their eggs and chicks fall prey to mongoose, genet, cats, dogs and kelp gulls.

Common Name: Emperor Penguin
Scientific Name: *Aptenodytes forsteri*

Size: 42 inches (110 cm)

Habitat: Antarctica. Emperor Penguins are found circumpolar around Antarctica. They are social birds and they feed, travel and nest in groups. They are active during the day or night and from January to March they disperse into the ocean.

Status: Least Concern. **Global Population:** 270,000 - 350,000 mature individuals. Global warming is considered a threat.



Diet: Small fish, squid and crustaceans. They mainly dive to around 50 m (164 ft) to forage for food and one of their feeding strategies is to blow bubbles into cracks in the ice to flush out any fish that may be hiding.

Breeding: Emperor Penguins breed in winter and will travel approximately 90 km inland to their breeding site. In May or June the female will lay 1 egg that weighs approximately 450g then she leaves it with the male while she goes out to sea to feed and build up her nutritional reserves.

Male Emperor Penguins have an abdominal fold between their legs and lower abdomen that is known as their "brood pouch". This protects their egg and chick during the breeding season.

The male carries the egg on his feet and protects it with a pouch of feathery skin. He incubates it for approximately 65 days and during this time he will not feed, surviving on the fat reserves he has built up. To protect themselves against the cold, severe weather Emperor Penguins huddle together in what is known as the "turtle formation". The huddles can consist of 10 or hundreds of birds and each bird leans forward on a neighbor. Those on the outside shuffle slowly around the edge producing a churning action that gives each bird a turn in the middle. All the males huddle together to keep warm while they wait for their egg to hatch and the female to return.

In spring the female returns and the chick emerges from its egg. If the chick hatches before the female has returned with food, the male will produce a milky substance from a gland in his digestive system to feed the chick. After the female has returned the males then leave to go out to sea to feed, later returning to help rear the chick.

When the chicks are approximately 2 months old they will join other young penguins in a creche, but they are still fed by their parents. After approximately 5 months the young birds and their parents will return to the sea to feed for the rest of the summer.

Emperor Penguins become sexually mature at around 5 years of age. Those that are not of breeding age remain at the edge of the sea during the winter months, while the breeding adults make the trek inland.

Cool Facts: Emperor Penguins are the largest species of Penguin. Emperor Penguins are the 5th heaviest bird currently in existence. Emperor Penguins swim at speeds of 6 - 9 Km/hr (4 - 6 mph) but they can reach speeds of 19 km/hr (12 mph) in short bursts.

The call of each Emperor Penguin is distinct and males and females can be identified by their differing calls. On land they alternate between walking and "tobogganing" along on their stomachs, propelling themselves with their feet and wings.

The main predators of Emperor Penguins are leopard seals, killer whales, sharks, skua and Antarctic giant petrels.

Common Name: Adélie Penguin
Scientific Name: *Pygoscelis adeliae*

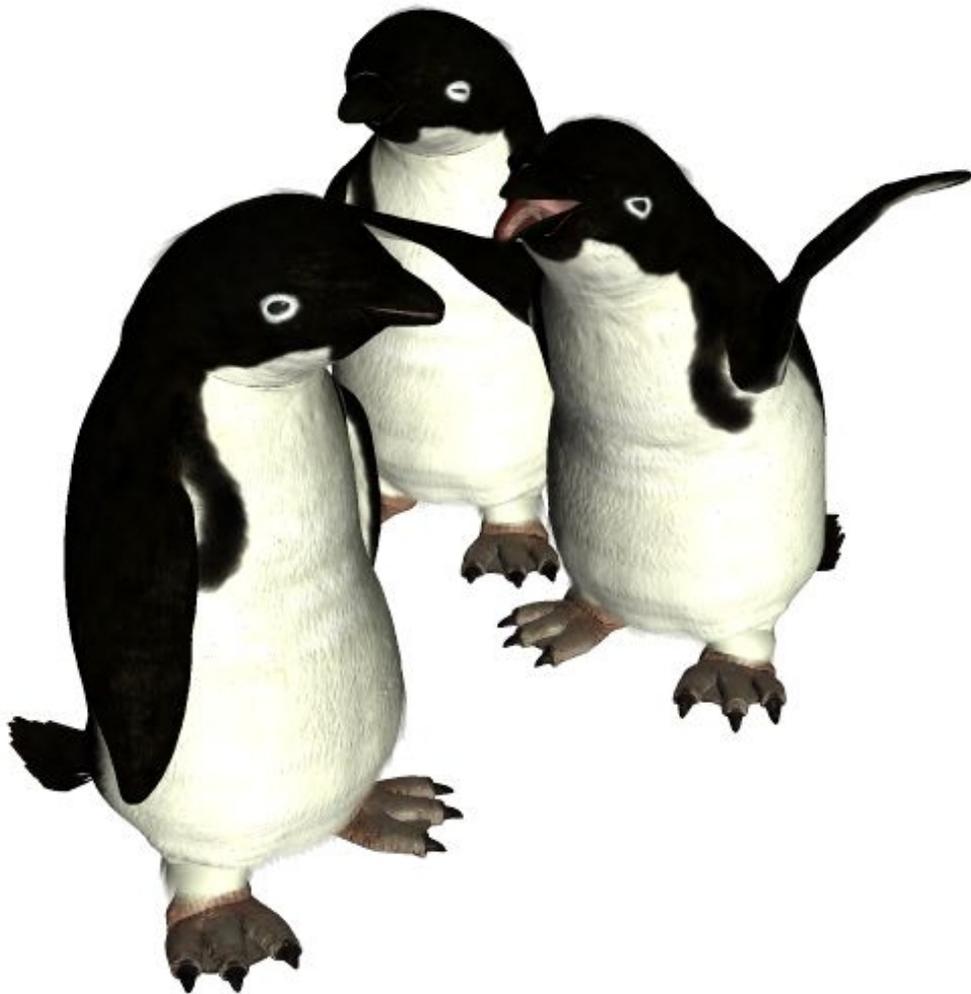
Size: 18-24 inches (46-61 cm)

Habitat: Antarctica. Found in the Antarctic and the surrounding islands. They come ashore to breed in large colonies but they spend the winter months at sea.

Status: Least Concern. **Global Population:** 4,000,000 - 5,220,000 mature individuals. Global warming is considered a threat.

Diet: Krill, but they will also eat fish. They mainly make shallow foraging dives of 20 m but they can dive to depths in the region of 175 m.

Nesting: Adélie Penguins come ashore during September and October to breed. They nest in colonies containing thousands of birds and there is fierce competition for nesting sites. A breeding pair will construct a nest by scraping the



ground and lining it with pebbles, often stealing pebbles from a neighbors' nest.

The female will lay two greenish/white eggs in early November and both parents will share incubation duties. After approximately 35 days the chicks hatch and even though the eggs hatch close together, one chick is usually stronger than the other. Both parents closely care for and feed the chicks for two to three weeks but if food is scarce the smaller chick will rarely survive.

The chicks grow rapidly and after 3 - 4 weeks they join crèches with other chicks to enable both parents to go to sea to feed and catch food for them. By March the chicks can swim and are ready to go to sea. Baby Adélie penguins grow the fastest of all penguins.

Cool Facts: Adélie Penguins were named after the wife of the French explorer Admiral Durmont d'Urville. They live 10-15 years.

Apart from the storm petrel, Adélie Penguins are the most southerly distributed of all sea birds. They are the smallest of the Antarctic penguins. They build nests of stones, and will fight over the best rocks.

They are strong swimmers and can jump straight out of the water onto the land. They love to sled down icy hills on their bellies. They are very playful. The main predators of Adélie Penguins are leopard seals. Eggs and chicks fall prey to skuas.

Common Name: Chinstrap Penguin
Scientific Name: *Pygoscelis antarctica*

Size: 15 ¾ inches (40 cm)

Habitat: Antarctica; Circumpolar around Antarctica. They live in large colonies all around Antarctica, but mainly on the South Sandwich Islands. One colony is believed to contain 10 million individuals. They leave their colonies and move north of the pack ice for the winter months.

Status: Least Concern. **Global Population:** 4,000,000 - 5,220,000 mature individuals. Global warming is considered a threat.



Diet: Krill and small shoaling fish. They feed by diving for prey close to their colonies, each dive being less than 1 minute long and no more than 61 m in depth. They are considered to be near shore feeders, although they can occasionally be seen in the open sea.

Nesting: Chinstrap Penguins build their nests from stones and when complete they are approximately 40 cms in diameter and 15 cms in height. They lay two eggs which are incubated by both parents; they alternate every 5 - 10 days.

After 5 - 6 weeks the eggs hatch but the chicks remain in the nest for a further 20 - 30 days before they join other young penguins in a crèche. The young penguins are colored grey on their back and white on their front.

After 7 - 9 weeks, and after molting and gaining their adult plumage, the young penguins venture out to sea.

Cool Facts: Chinstrap Penguins are one of the most easily identifiable penguins due to the thin black line that runs from ear to ear under their chin. It looks like a chinstrap, which is where their name originates.

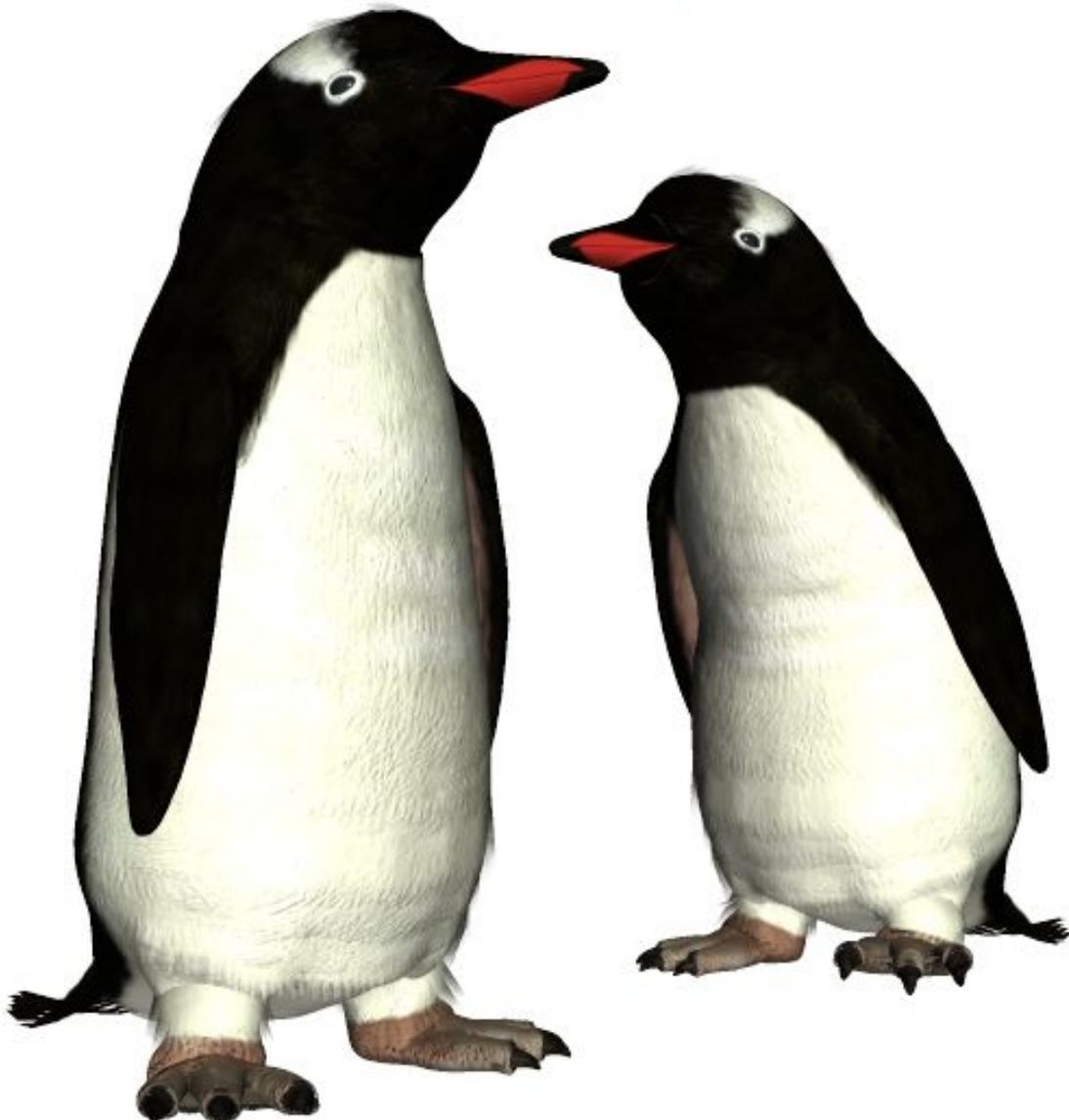
The main predators of Chin Strap Penguins are leopard seals. Eggs and chicks can fall prey to birds, such as sheathbills and the brown skua.

Common Name: Gentoo Penguin
Scientific Name: *Pygoscelis papua*

Size: 30-36 inches (75-90 cm)

Habitat: Antarctica; circumpolar distribution and are found on islands in the Antarctic region. The main colonies are found on the Falkland Islands, South Georgia and Kerguelen Islands and smaller colonies are found on Macquarie Island, Heard Islands, South Shetland Islands and the Antarctic Peninsula.

Status: Near Threatened. **Global Population:** 520,000 mature individuals. This species is suspected to be undergoing an overall moderately rapid population decline, owing to rapid declines in some populations. Threats include disturbance



by humans, local pollution, and potential interactions with fisheries and global warming.

Diet: Mainly feed upon krill; fish only make up approximately 15% of their diet.

Nesting: Nest in early June. Their nests consist of a pile of stones that are roughly 20 cms high and 25 cms in diameter. The female will lay 2 eggs and the incubation is shared by both parents, alternating daily.

After 34 - 36 days the eggs will hatch and the chicks will remain in the nest for 30 days before they form crèches. Chicks are colored grey on their back with white coloration on their front. After 80 - 100 days the chicks will molt into sub-adult plumage and venture out into the sea.

It is unusual for both chicks to survive, the one that hatches first is usually stronger. However, if food is in abundance sometimes they will both survive. If Gentoo Penguins lose their first clutch of eggs they are able to lay a second clutch in the same season.

Cool Facts: Gentoo Penguins are the third largest species of penguin, after the emperor penguin and the king penguin.

Gentoo Penguins are the fastest underwater swimming bird and they can reach speeds up to 36 Km/hr (22.4 mph).

Predators of Gentoo Penguins include sea lions, leopard seals and killer whales. On land birds are known to prey upon chicks and steal eggs.

Common Name: King Penguin
Scientific Name: *Aptenodytes patagonicus*

Size: 36-38 inches (90 cm)

Habitat: Antarctica. They breed on the sub-Antarctic islands at the northern reaches of Antarctica, as well as Tierra del Fuego, South Georgia, and other temperate islands of the region.

Status: Not Threatened. **Global Population:** 2.23 million pairs and is increasing. This species is not threatened however global warming is considered a threat.

Diet: Small fish, squid and crustaceans.

Breeding: The King Penguin is able to breed at three years of age, although only a very small minority actually do then-- the average age of first breeding is around 6 years. King Penguins are serially monogamous. They have only one mate each year, and stay faithful to that mate. However, fidelity between years is only about 29%. The long breeding cycle may contribute to this low rate.

The King Penguin has an unusually prolonged breeding cycle, taking some 14-16 months from laying to offspring fledging. Although pairs will attempt to breed annually they are generally only successful one year in two, or two years in three in a triennial pattern on South Georgia. The reproductive cycle begins in September to November, as birds return to colonies for a prenuptial moult. Those that were unsuccessful in breeding the previous season will often arrive earlier. They then return to the sea for three weeks before coming ashore in November or December. The female penguin lays one pyriform (pear-shaped) white egg weighing 300 g ($\frac{2}{3}$ lb) It is initially soft, but hardens and darkens to a pale greenish colour. It measures around 10 x 7 cm (4 x 3 in). The egg is incubated for around 55 days with both birds sharing incubation in shifts of 6-18 days each. Hatching may take up to 2-3 days to complete, and chicks are born semi-altricial and nidicolous. In other words, they



have only a thin covering of down and are entirely dependent on their parents for food and warmth. The young chick is brooded in what is called the guard phase, spending its time balanced on its parents' feet and sheltered by its pouch. During this time, the parents alternate every 3-7 days, one incubating while the other forages. This period lasts for 30-40 days before the chicks form crèches, a group of many chicks together. A penguin can leave its chick at a crèche while it fishes as a few adult penguins stay behind to look after them. Other varieties of penguins also practice this method of communal care for offspring.

By April the chicks are almost fully grown, but lose weight by fasting over the winter months, gaining it again during spring in September. Fledging then takes place in late spring/early summer.

Cool Facts: The King Penguin (*Aptenodytes patagonicus*) is the second largest species of penguin weighing 11 to 16 kg (24 to 35 lb), second only to the Emperor Penguin. There are two subspecies - *A. p. patagonicus* and *A. p. halli*; *patagonicus* is found in the South Atlantic and *halli* elsewhere. The main predators are leopard seals, killer whales, sharks, skua and Antarctic giant petrels.

Common Name: Galápagos Penguin
Scientific Name: *Spheniscus mendiculus*

Size: 19.6 inches (50 cm)

Habitat: Galápagos Islands. Mainly found on Fernandina Island and on the west coast of Isabella Island, but small populations are also found scattered on other islands in the Galapagos archipelago.

Status: Endangered. **Global Population:** 1,800 mature individuals. One of the world's rarest penguins. In recent decades, this species has been influenced primarily by the effects of El Niño-Southern Oscillation (ENSO) on the availability of shoaling fish. This had been most evident in 1982-83 and 1997-98, when the penguin population underwent dramatic declines of 77 % and 65 %, respectively. After this, the population entered a slow recovery phase and annual penguin censuses indicate a relatively stable, and even slightly increasing, population trend over the last nine years, however the current population size is still 48 % below the pre-El

Niño population levels. Recovery from the 1982-1983 ENSO may have been slowed by the lower frequency of La Niña cold water events and above average surface water temperatures. Also, ENSO may have a disproportionate impact on females, which could result in a biased sex ratio, making population recovery slower.

Climate change may lead to an increase in the frequency of ENSO events in the future, which will also reduce the species'



resilience to other threats such as disease outbreaks, oil spills, or predation by introduced predators.

Local fishing boats operating in inshore waters in the western part of the archipelago are documented as incidentally drowning Galápagos Penguins due to floating nets and illegally-used bait fisheries in gill nets. Recent plans to establish longline fisheries in the Galápagos raises additional concern. Aside from the impact of by-catch caused by this technique, in the case of Galápagos Penguins, it is likely that an increasing demand for bait fish will dramatically increase inshore bait fisheries with all its associated problems.

Predation by introduced cats (*Felis catus*) on the Galápagos Penguin population at its main breeding site resulted in adult mortality of 49 % year⁻¹. Also, mosquitoes (*Culex quinquefasciatus*) arrived on the Galápagos in the 1980s as a result of human actions. Since they are vectors for avian malaria, and penguins in the genus *Spheniscus* are highly susceptible to this disease these insects represent a potential new threat for the penguins. Many of the above threats are exacerbated by an expanding human population and pressure from tourists visiting the islands.

Diet: Small fish including mullet and sardines.

Nesting: Galapagos Penguins pair up for life and they will breed 2 - 3 times per year if food is plentiful. They lay 1 - 2 eggs in a cave or rock crevice to protect them from the sunlight. The eggs are incubated by both parents for 38 - 40 days but if both eggs hatch, only one chick is ever raised.

One parent always remains with the eggs or chick while the other one leaves to feed. For 30 days after hatching both parents tend to the chick and by the end of the 30 days the chick is able to be left while both adults go to sea.

When the chick is 60 - 65 days old they have molted and are ready to fledge. Females reach sexual maturity at 3 - 4 years of age and males at 4 - 6 years of age.

Cool Facts: Galapagos Penguins are the only penguin to live on the equator. They live 15-20 years

Predators of Galapagos Penguins and their young include crabs, snakes, birds of prey, cats, dogs, rats, sharks, seals and sea lions.

Common Name: Little Blue Penguin

Scientific Name: *Eudyptula minor*

Size: 16 inches (41 cm)

Habitat: Oceania; found in large colonies on the southern coast of Australia, Tasmania and New Zealand. They spend their days out at sea hunting for food but at night they return to their burrow or rock crevice.

Status: Least Concern. **Global Population:** Unknown. Global warming is considered a threat.

Diet: Fish, squid and crustaceans. They mainly make shallow dives up to 30 ft in depth to catch prey but sometimes they will dive down to the ocean floor.



Nesting: Little Penguins usually mate for life and their breeding season is variable although it usually begins in August or September. They construct nests in a sheltered rock crevice or they dig a burrow in which to lay their eggs.

Females lay 2 eggs, but depending on the availability of food supplies they may lay up to 3 clutches of eggs in one breeding season. Both parents incubate the eggs and after approximately 5 weeks the chicks hatch.

Up until the chicks are 3 weeks old they are closely cared for by both parents, but for the following 5 weeks both adults go to sea to hunt, only returning to the chicks to feed them. When the youngsters reach 8 weeks old they are ready to leave the nest and fend for themselves.

Cool Facts: The Little Blue is the smallest species of penguin.

The main predators of Little Penguins include southern fur seals, leopard seals, sea lions, killer whales, foxes, dogs, cats, sea eagles and large gulls. Eggs and chicks fall prey to rats, weasels, stoats, snakes and lizards.

Common Name: Fiordland Penguin
Scientific Name: *Eudyptes pachyrynchus*

Size: 23 ½ inches (60 cm)

Habitat: New Zealand; breed along the Fiordland coast, its outlying islands and Stewart Island.

Status: Vulnerable. **Global Population:** 5,000 - 6,000 mature individuals. Threats include disturbance by humans, local pollution, and potential interactions with fisheries and global warming.

Diet: Fish, krill, and squid. They make shallow dives to go and forage and feed.



Nesting: Male Fiordland Penguins return to the breeding site in June, closely followed by the females. They usually return to the nesting site they used the

previous year and they construct nests in dense temperate forests, usually under bushes or in rock crevices. They nest in small colonies close to but out of sight of other breeding pairs.

In July females will lay 2 eggs and these are incubated by both parents for 30 - 36 days. They each take 5 - 12 day shifts incubating the eggs while the other one goes out to feed at sea. When the chicks hatch usually one is stronger and in most cases the weak one will not survive.

The chick is looked after by the male and fed by the female for the first few weeks, then the parents take it in turns to hunt. Sometimes the chicks join a crèche with other youngsters, but they always return to their nest to be fed. By the time the chicks reach 10 weeks old they have their adult plumage and they are ready to go to sea.

Fiordland Penguins begin to breed when they reach 5 years of age and they return to their home colony to raise their young.

Cool Facts: On their cheeks they have white streaks of feathers that they puff out when defending their nest.

They communicate by emitting barking calls when out at sea and by visual and vocal displays while on land.

Fiordland Penguins are very timid, usually active on land during the night, and are hardly ever seen during the day.

Common Name: Humboldt Penguin
Scientific Name: *Spheniscus humboldti*

Size: 26-28 inches (65-70cm)

Habitat: Sub-Antarctica; Coastal Peru and Chile

Status: Vulnerable. **Global Population:** 12,000. Their principal threat is the activity of man. They are vulnerable to disturbances in their food chain caused by strong El Nino currents. There are approximately 6000 breeding pairs.

Diet: Small fish; anchovies, herring, smelt and crustaceans

Nesting: Burrows among piles of droppings in caves and along cliffs. Females lay one, two, or three eggs with both parents taking turns incubating them for a period of about 40 days. Chicks are born with greyish brown, downy feathers.



Chick care begins with parents alternating jobs of sitting with the chick and hunting for food. After about two months, the chick is left alone during the day while both parents search for food. Humboldt penguin chicks molt at about 70-90 days with the young fledglings losing their down feathers and replacing them with all grey adult feathers which become darker over time.

Cool Facts: They are able to communicate via telepathy. In South America the Humboldt Penguin is found only along Pacific coast, and the range of the Humboldt Penguin overlaps that of the Magellanic Penguin on the central Chilean coast. They do not migrate, preferring to reside in temperate waters year round.

The main predators are gulls and skuas.

Common Name: Magellanic Penguin
Scientific Name: *Spheniscus magellanicus*

Size: 24-30 inches (61-67 cm)

Habitat: Sub-Antarctica; breeding in coastal Argentina, Chile and the Falkland Islands, with some migrating to Brazil.

Status: Vulnerable. **Global Population:** Unknown. Although millions of these penguins still live on the coasts of Chile and Argentina, this species is classified as "Near Threatened," primarily due to the vulnerability of large breeding colonies to oil spills, which kill 20,000 adults and 22,000 juveniles every year off the coast of Argentina. The decline of fish populations is also responsible, as well as predators such as sea lions and giant petrels.

Diet: Small fish; anchovies, herring, smelt and crustaceans

Nesting: Nests are built under bushes or in burrows. Two eggs are laid.

Incubation lasts 39-42 days, a task which the parents share in 10-15 day shifts. The chicks are cared for by both parents for 29 days and are fed every 2-3 days. Normally both are raised through adulthood, though occasionally only one chick is raised.

Magellanic Penguins mate with the same partner year after year. The male reclaims his burrow from the previous year and wait to reconnect with his female partner. The females are able to recognize their mates through their call alone.

Cool Facts: Magellanic Penguins travel in large flocks when hunting for food. The main predators are gulls and skuas.



Common Name: Southern Rockhopper Penguin
Scientific Name: *Eudyptes chrysocome*

Size: 21 inches (55 cm)

Habitat: Sub-Antarctica; range from islands near New Zealand to islands near South Africa and around South America (Falklands). Found in large colonies on sub-Antarctic islands during the breeding season and they spend their winters at sea.

Status: Vulnerable. **Global Population:** 500,000-999,999 mature individuals. Increasing disturbance and pollution results from ecotourism and fishing. Food supplies may be affected by squid fisheries, climate change and shifts in marine



food webs. In Patagonian coastal waters (an important wintering ground for the Falklands population) hydrocarbon exploitation is a threat. Rock-lobster fisheries have previously used birds for bait. On Auckland, Macquarie and Kerguelen, introduced predators may affect breeding success.

Diet: Fish, krill, and squid.

Nesting: Rockhopper Penguins breed during the spring and summer and the female will lay 2 eggs in a rocky burrow. Usually the first laid, smaller egg is lost during incubation, or if it is retained it usually does not hatch.

The egg is incubated by both parents and after approximately 5 weeks it hatches. The chick is cared for by both parents and it joins a crèche with other chicks when it is approximately 3 weeks old.

When the chick reaches 10 weeks old it will have gained its full adult plumage and is ready to go to sea.

Cool Facts: They earned the name “rock hopper” because they breed on rocky surfaces and need to jump from rock to rock to get wherever they’re going.

Rockhoppers have the largest range and temperature range tolerance for a penguin. They are loud, aggressive birds and they use a call known as "ecstatic vocalization" to attract mates. As well as vocalizing they also communicate by head shaking, bowing, preening, and head and flipper waving.

Predators include blue sharks, fur seals and leopard seals. Eggs and chicks fall prey to skuas, petrels, kelp gulls and other sea birds.

Special Thanks to...

....my beta testers (Bea, Gary, Jan, Kelvin, Nancy, Rhonda and Sandra)

Species Accuracy and Reference Materials

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

The author-artist has tried to make these species as accurate to their real life counterparts as possible. With the use of one generic model to create dozens of unique bird



species, some give and take is bound to occur. The texture maps were created in Painter with as much accuracy as possible. Photographic references from photographs from various Internet searches and several field guides were used.

Field Guide Sources:

Wikipedia (<http://www.wikipedia.com>)

BirdGuides.com (<http://www.birdguides.com>)

The Animal files (<http://www.theanimalfiles.com>)

International Union for the Conservation of Nature (<http://www.iucn.org/>)

Other Resources:

- Songbird ReMix.com
- Songbird ReMix on Facebook

Songbird ReMix

Merchandise



www.empken.com/store