

## Animals of the Subantarctic Islands

### A Subantarctic Island

A Subantarctic Islands lies far enough south to be surrounded by cold seas (between 2 and 10°C) but far enough north that the sea around it never freezes. A few other islands are added to this subantarctic list as they have so much in common with them, for example New Zealand's Chatham Islands. As 'the Chathams' lie north of 60°S they are not within the realm of the Antarctic Treaty and therefore can be governed from Wellington. In total New Zealand manages six Subantarctic Island groups, more than any other country.

### Cool and wet with unique species

Surrounded by the large and hostile Southern Ocean the Subantarctic Islands:

- are protected from land dwellers
- are cool rather than cold
- see little difference between winter and summer
- suffer wet and windy westerlies throughout the entire year

Such harsh environmental conditions mean only a few species survive here, especially on the smaller islands which have a narrower range of habitats. The tough conditions combined with their isolation results in the Subantarctic Islands having many unique (endemic) species .

### Land animals

A warm body is a real advantage in the cold because you can stay active. However only mammals and birds can warm themselves with extra food, so there are no reptiles or amphibians found on any of the true Subantarctic Islands. Although most birds feed off the sea, a few islands support land based birds. Even though seals are regular visitors, there are no native land mammals on any Subantarctic Islands.

### Sea birds

Sea birds are the most obvious animals found on the Subantarctic Islands, where they make up the greatest range of species and the greatest numbers. Most famous are the penguins with half of the world's penguin species breeding on the islands in the southern ocean. Albatrosses and petrels are also present in large numbers, with most islands supporting several species of these wide-ranging foragers. For penguins and petrels, these far-flung islands, surrounded by the cold, food-rich seas, are perfect for feeding and nesting.

### Albatrosses

Some albatrosses routinely fly thousands of kilometres in a single feeding trip - made possible by their long, thin wings that are excellent for soaring above the ocean as they glide on the air pushed up by huge swells. The Royal and Wandering albatrosses have the longest wingspan of any bird, with large individuals reaching 3.5m from tip to tip. These birds can easily cover 900 km in a day, with some averaging 5991 km in a single trip. However once chicks need feeding these distances often drop to 500 km per day, still a great distance.



*The sea surrounding a Subantarctic Island does not freeze. Yellow eyed penguins, Auckland Islands.*

### Shearwaters and Petrels

Another record setting glider is the Sooty Shearwater (Titi) which has the longest measured annual migration of any animal, spending their winters in the north Pacific, near Alaska. Their figure-of-eight migration means they fly over 64,000 km each year.

Shearwaters and some small species of petrel nest on the Subantarctic Islands using underground burrows which provide shelter from the often bleak weather and predators such as skuas. On many islands, the ground is so honey-combed with the burrows of these sea birds that visitors must be careful where they walk.

### Penguins

Well adapted for life in cold, harsh environments, penguins are found on all Subantarctic Island groups. Four species are found only in the subantarctic: King, Erect-crested, Snares crested, and Royal penguins. Other species include the Magellanic, Gentoo, Rockhopper, Macaroni, and Yellow-eyed penguins. A small population of Chinstrap penguins nests at the south end of South Georgia.

Penguins are very much at home in the water and are the best divers among all birds. Each flipper is a highly modified wing that works very effectively as a paddle, allowing penguins to 'fly' through the water to catch fish, squid, krill and other prey that is beyond the reach of other birds. Penguins need land only for nesting and moulting, and most species spend much of the year at sea. During the summer breeding season most subantarctic penguins nest in large colonies. For several species, colonies of over 10,000 pairs are common.

### Seals and sea lions

Seals are the only mammals that naturally occur on subantarctic islands. The hunt for fur seals was the driving force for much of the early exploration of the Southern Ocean, with nearly all being removed from all Subantarctic Islands by the early 1800s. However after almost 200 years of protection the four seal species (Amsterdam, Antarctic, New Zealand, South American) are again thriving. Sea lions are bigger than seals and two species are found in the region, the South American sea lion on the Falkland Islands and the New Zealand (aka Hooker's) sea lion on the Auckland, Campbell, and Snares Islands.

The largest seal in the world, the Southern Elephant seal, breeds on many Subantarctic Islands. Males can reach lengths of over 5 m and weigh up to 3700 kg. Females are considerably smaller, topping out at 3m and 800kg. A small number of Weddell seals breed at the southern tip of the southernmost Subantarctic Island, South Georgia, but this is the only place outside of Antarctica where they do so.

### Introduced mammals

With the exception of the weather and climate, nothing has had a bigger impact on the Subantarctic Islands than the mammals that have been introduced by humans. Only five island groups are without introduced mammals, and the natural ecosystems on these islands are wonderfully intact.

Elsewhere, cattle, pigs, goats, sheep, reindeer, foxes, rabbits and even guanacos were deliberately brought ashore and established by people hoping to establish a reliable future food source or income. However the effects of these animals are clear and dramatic. Omnivorous pigs chew through succulent endemic plants, dig petrels out of their burrows, and snack on albatross chicks as they sit in their nests. Cattle cause soil erosion as a result of their over-grazing, and their heavy hooves destroy petrel burrows wherever they walk.

Rats (*Rattus norvegicus* and *R. rattus*) are the most widespread of the introduced pests, and these opportunistic feeders have been responsible for the extinctions of many island birds. Rats, along with mice were not deliberately introduced, but escaped to shore from many of the ships that visited the islands soon after discovery.

Cats, originally brought to some islands to combat the mice and rats, found that ground-nesting sea birds were easier prey and quickly made the problem worse.

Of the five mammal-free island groups, four (Snares, Prince Edward, Bounty, Heard) have remained unspoiled. On the fifth, New Zealand's Campbell Island, all introduced mammals have been deliberately eradicated by hunting and poisoning. In their absence, the native plants and animals have flourished, providing encouragement that, with proper management, the unique ecosystems of other Subantarctic Islands can be restored and preserved.

## Practical activity: Measuring biodiversity

### Introduction

Biodiversity is a measure of the 'health' of an