



Photo: CWS/SCF

# HINTERLAND WHO'S WHO

## ATLANTIC PUFFIN

### Introduction

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This bird

- looks so different in the breeding and nonbreeding seasons that people once thought it was two species
- has difficulty becoming airborne and often crashes when landing
- can catch and hold up to 61 fish in its bill
- can easily drown in fishing nets set for salmon and cod

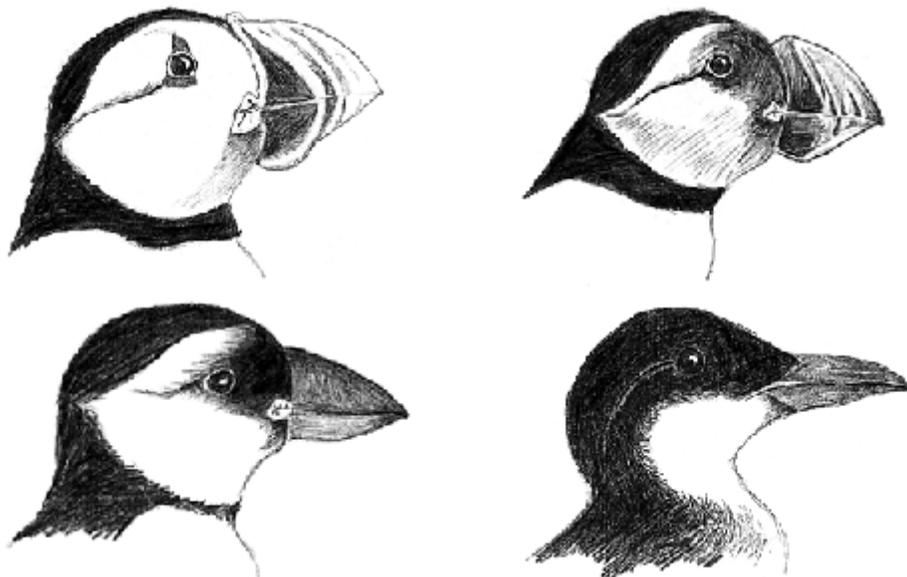


### Description

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The Atlantic Puffin *Fratercula arctica* is one of four species of puffins and is the only one that lives on the North Atlantic Ocean. One of the most popular and well-known seabirds in Canada, its colourful features often appear on calendars and posters. In 1992 it was made the official bird of the province of Newfoundland and Labrador. Most people know a puffin only when it is "dressed up" for the breeding season and would hardly recognize it in its plainer winter garb.

*Fratercula* means "little brother" or "friar," perhaps a reference to the puffin's black and white dress. Puffins belong to the family of birds called the auks, or *Alcidae*; other members of the family are the Dovekie, murre, guillemots, the Razorbill, auklets, murrelets, and the extinct Great Auk. Auks are diving seabirds of the northern hemisphere and use their wings to propel themselves underwater in pursuit of prey such as small fish.



Upper left: adult Atlantic Puffin in breeding plumage. Upper right: adult Atlantic Puffin in winter plumage. Lower left: juvenile Atlantic Puffin. Lower right: adult Common Murre.

The familiar breeding adult has a striking orange, yellow, and bluish bill and matching bright orange feet. The bill is wide in profile and narrow side-to-side. A puffin's greyish white face is decorated with fleshy yellow rosettes at the base of the bill and red rings and small bluish plates around the eyes. The upper parts, including the head, back, and wings, are black and contrast dramatically with the brilliant white underparts. The sexes look the same, although males tend to be slightly larger than females.

After the breeding season, the adult puffin sheds the colourful plates on its bill and around the eyes as well as the feathers on its head and neck. Its face becomes dark, especially around and in front of the eye. The Atlantic Puffin looks so different in the winter that people once thought it was a different species. In the late winter and spring it becomes flightless for a short period while it replaces its wing and tail feathers, which have become tattered after a year's use. New bill and face plates and new feathers around the head complete the dressing up for the next breeding season. Immature puffins look similar to winter adults but have smaller and more pointed bills. Adults in winter plumage and immature puffins are sometimes confused with murrelets.

Puffins are superbly adapted to swimming underwater, and much of their general shape can be attributed to the demands of this activity. They are compact, strong birds with a relatively long body. They have short wings and powerful wing muscles. At one end the bill and head cut through the water, which passes smoothly over the streamlined body, and at the other end, legs and feet act as rudders.

### **Signs and sounds**

Puffins make loud growling calls usually from underground, which sound like a muffled chainsaw. The chicks peep for food from parents.

## **Habitats and Habits**

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Puffins are true seabirds, spending most of their time swimming, diving, and feeding. For about four to five months every year they come to land to breed, but even then they spend a lot of time at sea. Puffins normally keep the same mate and the same burrow from year to year. The average bird lives about 20 years.

In eastern Canada, most puffins return to their colonies in April. Early in the season many birds are "house-hunting," and owners have to defend their sites. Puffing up their feathers, opening their bills, and making other threat displays is usually enough to scare off newcomers. If not, fights break out, and it is not uncommon to see two puffins tumbling down a slope with their bills locked together in combat.

Observers at puffin colonies are often impressed by large groups flying in wide circles over the sea in front of their nesting grounds. These puffin "wheels" are common behaviour at most colonies, but are more frequent at colonies where there is much gull predation. They probably serve as an anti-predator tactic by confusing or swamping the predator and reducing the chance that an individual puffin will be killed (or their prey stolen). Puffins returning to or leaving the colony can join the wheel and then drop out near their burrow or on the sea. Wheels also may be important to immature puffins, allowing them to learn about the colony without a high risk of being killed.

### Unique characteristics

Puffins are poor fliers. They have difficulty becoming airborne and flap their wings at an amazing 300 to 400 beats per minute to maintain flight. They also have trouble landing and often crash onto the sea or tumble onto the grass, bowling over other puffins that get in their way. On land puffins stand upright and walk or hop about with apparent great care over the uneven terrain of the colony.

Puffins are very curious and will rush over to watch a pair billing or fighting, so that these events are often surrounded by a crowd of spectators.

## Range

Atlantic Puffins are one of the most common seabirds in the northern hemisphere. The latest estimate of the world population is about 12 million breeding birds, or about 24 million puffins in total including younger birds that haven't yet reached breeding age.

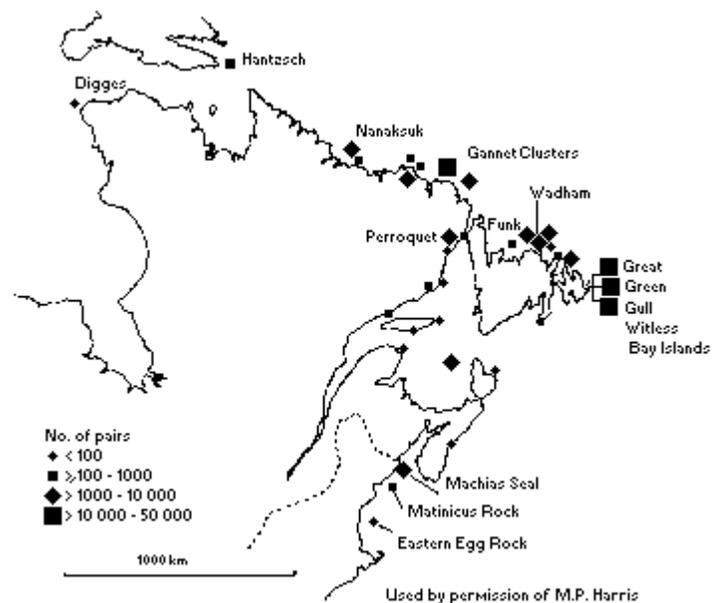
Most puffins nest in colonies on small, rugged islands that are free of mammal predators such as mink and foxes. A few nest along mainland shores where they gain protection from predators by choosing safe locations on cliffs. Thousands and sometimes hundreds of thousands nest together at large colonies. The largest concentrations nest mostly on islands around Iceland, Norway, the Faeroe Islands, British Isles, and eastern Canada. About 500 000 pairs breed in North America from northern Maine in

the United States to the Canadian Arctic. At present, about 60 percent of the North American population breeds on four islands in Witless Bay off the east coast of the island of Newfoundland.

Puffins spend their winters scattered across the open North Atlantic far from land. They can be sighted, mostly in ones and twos, anywhere from along the edge of the Arctic pack ice in the north, to as far south as New York in the west and the Canary Islands off northern Africa in the east.

## Feeding

Puffins eat small marine animals, mainly fish such as capelin and sandlance. Other fishes, as well as crustaceans, squid, and marine worms, are taken when those are less available. When feeding, a puffin swims at the surface of the sea much as a duck would, then dives head-first underwater. The bird probably swims down through the water until it reaches a depth at which its prey can be caught, pursues suitable fish or other food items, and grabs one after another with its bill beautifully fashioned for this task before returning to the surface.



Atlantic Puffin Colonies

Adults hold fish crossways in their bills while carrying food back to their chicks. Chicks are normally fed about 10 g of food four to ten times per day, mostly in the morning. Adults usually carry only one or two 12 to 15 cm capelin or sandlance at a time, but more if the fish are smaller. The record observed number of fish held at one time by a puffin in Canada is 61. These were larval sandlance 2.3 to 3.3 cm long that together weighed only 2.3 g, about the same as a half teaspoon of water, but that unfortunately were low in energy value.

How can a puffin catch and hold 61 fish in its bill? In the puffin's mouth, a series of backward-pointing spines project from the tongue and top of mouth and hold the food in place while more is being caught.

## Breeding

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It takes four to five years before a puffin is mature enough to breed. Most puffins choose to nest on grassy slopes in burrows 50 to 200 cm long, which they dig with their bills and the sharp claws on their feet. Some birds nest in cracks under boulders or in crevices on cliff faces, especially in arctic colonies where there is little soil or where the soil remains frozen for much of the summer. After cleaning out their burrows, many puffins line their nest chamber with grass, twigs, and feathers. The slightly enlarged nest chamber where the egg is laid is usually placed at the end of the burrow.

Courtship occurs mostly on the water, where males flick their heads back, puff up their chests, and flutter their wings to attract females. Billing is one of the most obvious and endearing behaviours to be seen on a puffin colony. A billing pair face each other and repeatedly tap their bills together by rapidly swinging their heads side to side. This is usually a pair-bonding behaviour between mates, but birds will sometimes bill with neighbours as well.

After a period of courtship and mating, the female puffin lays a single egg that is about 14 percent of her weight. The egg is whitish at first with faint blotches, but quickly becomes stained brown with dirt and mud. Both mates take turns incubating the egg, which takes about six weeks to hatch.

A newly hatched chick is covered with soft down, grey-black on the back and head and white on the belly, and weighs about 40 g. It has to be brooded, or kept warm, by a parent for the first week until it can maintain its own body temperature. Then it is left alone most of the time in the safety of the burrow while both parents come and go, bringing it food.

The chick grows rapidly if food is abundant. In four or five weeks it reaches a peak weight of 250 to 350 g and has replaced its downy coat with body and flight feathers. Chicks normally fledge, or complete the process of growing flight feathers and leave the nest, when they are about 40 days old, but the process can take as long as 80 days if food is scarce. Most chicks fledge under the cover of night and are at sea, far from the colony, by morning. Many chicks die if food is very scarce. Breeding success varies greatly between years and even between colonies, but is usually about 60 to 90 percent.

## Conservation

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The main predators of puffins are other birds and humans, since other mammals cannot normally gain access to the isolated breeding colonies. The Great Black-backed Gull is an important predator of adult puffins. Herring Gulls, which are smaller, kill puffin chicks but are not a threat to adults.

Although hundreds of thousands of Atlantic Puffins currently breed in eastern Canada, this is only a fraction of the number that used to live there. Major declines probably started in the 1600s when fishermen from Europe visited the shores of Atlantic Canada and harvested puffins for food. This, together with shooting, egg collecting, and habitat destruction in the 1800s, severely depleted or destroyed many eastern North American colonies. Protection since the early part of the 1900s halted most declines in North America and has allowed some populations to recover partially. Still, several threats remain.

Many thousands of puffins have drowned in fishing nets set in Canadian waters. For example, in 1980 an estimated 8 000 puffins, or about two percent of the local breeding population, were killed, mainly in gill nets, in Witless Bay, Newfoundland. The mesh in gill nets designed to catch fish, such as salmon and cod, are just the right size to entangle a swimming puffin. Fortunately, since the widespread closure of the cod fishery in 1992, seabird bycatch has been greatly reduced in eastern Canada.

Oil pollution is always a threat for puffins as they spend a large proportion of their time on the surface of the ocean. Fortunately, the illegal activity of dumping oily bilge water into Canadian waters by ocean-going vessels is declining, resulting in fewer seabirds getting oiled at sea. However, an oil spill near a colony in summer could have disastrous consequences. Fortunately, this has not yet happened in Canada.

Puffins can suffer from food shortages caused by overfishing and by natural changes in the distribution and abundance of important prey species. Severe breeding failures, in which almost all chicks starved to death, followed the collapse of herring stocks in Norway. In the future, a goal of fisheries management should be to maintain adequate stocks for both people and other predators like puffins. Sometimes changes in the availability of fish for puffins are due to climatic and oceanographic changes beyond our control.

Most of the large puffin colonies in Canada are protected as provincial reserves or federal migratory bird sanctuaries. This helps protect puffins at their nest sites but does little to protect them from the dangers of fishing nets, oil pollution, and overfishing. Reducing the numbers of puffins killed requires changes in the types of nets used and the timing of net fishing, tighter regulations to control the purposeful dumping and accidental spilling of oil, and good management of fish populations on which puffins rely.

Educating people about the dangers facing puffins is one way to achieve these changes. Many people travel to Newfoundland expressly to see puffins. Tour boats in Witless Bay take people around some of the large colonies where there are spectacular views of puffins sitting on the water, flying, and standing on the colonies. The sight of a thousand puffins wheeling through the sky is a remarkable experience. Future generations will enjoy that experience if we take care of the puffin's environment today.

## Resources

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### Online resources

[Environment Canada, Seabirds: Sentinel Species for the Gulf](#)

[All About Birds, Atlantic Puffin](#)

[Audubon's Project Puffin](#)

**Print resources**

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