

ALASKA

TideLines

Vol. II, No. 6

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March, 1980

Presenting the "Impossible" PUFFIN



Would you believe a bird that

- digs its nest;
- molts its beak;
- spikes small fish on its "teeth"

(Now wait a minute—birds don't have teeth) and

- flies underwater?

Probably not.

Well, meet the Tufted Puffin.

"Sea parrot" it is sometimes called. And it would be a hard bird to lose in a crowd—even among the tens of millions of seabirds that are drawn to Alaska each summer to seek out safe nesting sites along our coasts (see pages 4-5) and feast on the abundant food supply in our northern waters.

The Tufted Puffin and its close cousins, the Horned Puffin and the Rhinoceros Auklet (which is really a misnamed puffin) are creatures of the North Pacific Ocean. Many of their major nesting sites are in Alaska. (Their other cousin, the Common Puffin, is an out-of-state resident that breeds along the coasts of the North Atlantic Ocean.)

The puffins belong to the seabird family called *Alcidae* (AL-see-dee), which also includes murrelets, murrelets, auklets, Dovekies, Razorbills, and guillemots (GILL-uh-mahts). These alcid (AL-sids) alone make up 65 percent of the 40-50 million seabirds that breed in Alaska.

Like the others, the alcid spend most of the year on the open ocean. But unlike some of the migrating seabirds that wing their way for thousands of miles to nest here, the alcid stay fairly close to home.

With their short stubby wings, the Tufted Puffins may fly like heavy-duty bombers. But underwater, they're something else. ➤

BIRDS THAT FLY UNDERWATER

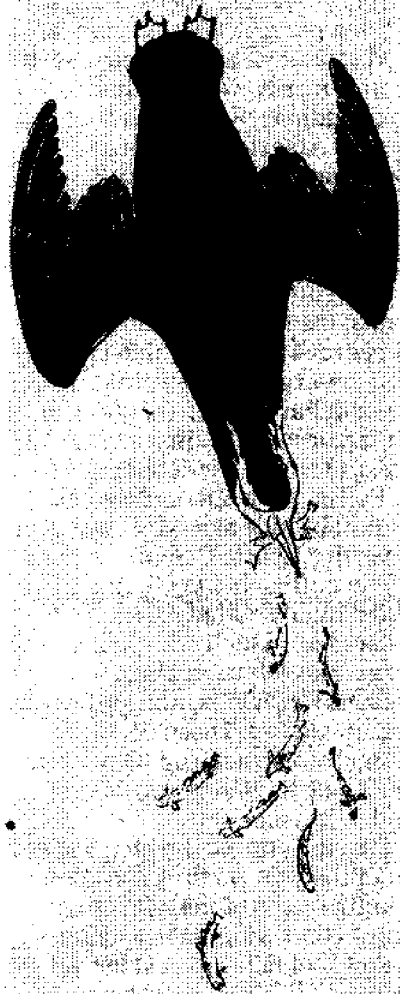
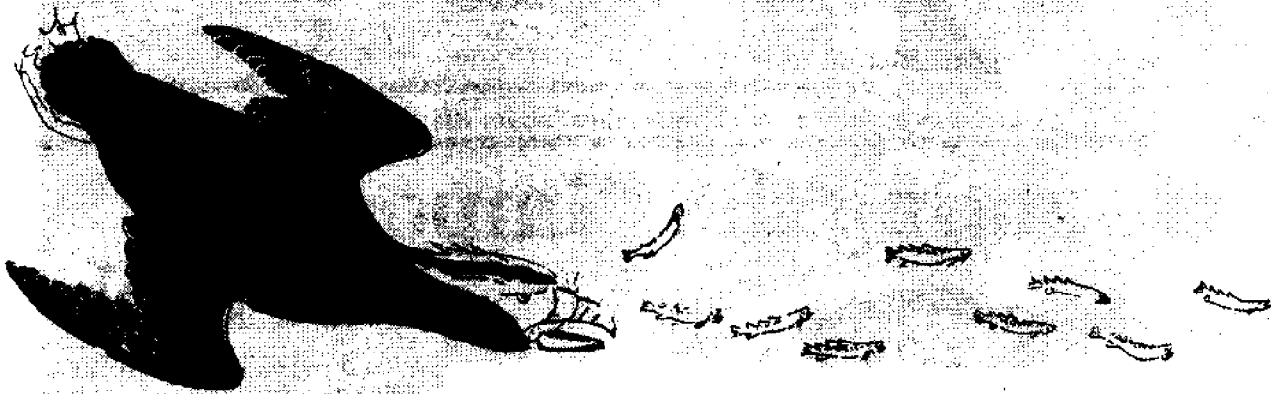


Illustration by Bernard Hunt

If you were to see a Tufted Puffin in the wintertime, you probably wouldn't think it was the same bird. They are brownish black with dark gray heads and bellies, and their bills are small and dull. All in all, they blend well with the dark waters of the stormy North Pacific.

But in April or May when they return to their breeding colonies on Alaska's offshore islands, they come dressed for the occasion.

Their bodies have turned glossy jet black; their faces snowy white. Behind each eye is a long yellow tuft of fine silky feathers. Their feet and legs are red, and their bills are enlarged with bright horny plates of orange and green. Even the corners of their mouths are decorated with little reddish rosettes—like a Spanish dancer carrying a flower in her teeth.

Decked out with these fine ornaments, the puffins go through a strange kind of courtship in the waters near their colonies. The male swims behind the female, rapidly jerking his head up and down in the same way you would nod "yes" in answer to a question. At the same time, he opens and closes his bill as if he were tossing a pea into the air and trying to catch it with the tip of his beak. He keeps this up until the female either flies away or accepts him as her mate.

Once the pair-bond is formed, the birds begin to prepare their nest. Most of the breeding colonies are on barren, isolated islands, free from foxes and other animals that might prey upon eggs

and chicks. But the puffins take even greater care than most birds do to protect their young. They build their nests in tunnel-like burrows in the ground.

Using their huge bills as pick-axes to loosen the dirt, they dig out a long hole with backward, scraping motions of their feet and legs. They manage to move rocks over twice their weight, and the burrows sometimes reach a length of over 30 feet.

One pair of birds may use the same burrow year after year. But each spring old burrows must be repaired and given a good housecleaning. Once all is ready, a new nest is built of pieces of grass and old feathers at the far end of the burrow. And a few days later the female lays her single white egg.

Both the male and female puffins have brood patches where the feathers have been shed to expose skin which carries body heat to the egg. They share the job of incubation, trading off duties at least once a day. When not on the nest, the other member of the pair usually goes fishing for food in the sea or loafs around the colony.

In Alaska the eggs usually hatch in July after about a month and a half of incubation. Puffin chicks are covered with a thick coat of black downy feathers. They are able to see as soon as they hatch, and within a few hours can walk around the dark nest chamber.

With hungry chicks to feed, the puffin colony is thrown into a flurry of activity. The young eat small fish—mainly sand lance

and capelin. For the next 40 to 50 days, the adult puffins will make countless trips back and forth from burrow to sea to feed their growing nestlings.

Seabirds get their food from the open ocean in a wide variety of ways. Some fold their wings and use their body weight to plunge deep into the water from high in the air. Others dive down under from the surface, with webbed feet providing the paddle power to pursue the fish. Some even skim the surface with their lower bills to scoop up food while still in flight.

But only a very few—the penguins and diving petrels of the Southern Hemisphere, the shearwaters, and the alcids—actually use their wings to “fly” underwater. And that includes, of course, the Tufted Puffin.

How do they do it? Well, it is quite a trick. Because to fly underwater, they have to overcome the very buoyancy that makes it possible for them to fly in the air.

Imagine the problem you would have trying to swim underwater with a life preserver on. One thing you could do would be to let the air out of your life preserver. And, in a way, that's what the puffins do, too. Before they dive, they expel the air from their lungs and squeeze out the air trapped between their feathers.

Once below the surface, puffins keep their wings partly closed and work them almost like underwater oars. In this way they are able to fly to depths of 100 feet or more and stay underwater for several minutes.

The fact that puffins are very successful fishermen says a lot for their speed and ability to maneuver. They seek out schools of small fish and capture them one-by-one in their huge bills. Most of the fish caught are around 2½ inches long—hardly enough to feed a growing young puffin. So on each fishing trip the puffins capture a number of fish—sometimes as many as 60!

How they manage to hold the fish they have already caught while capturing more is one of the wonders of puffin biology. (To appreciate this problem, try

holding a pencil crosswise in your mouth and see how many more you can pick up with your teeth. And remember, birds don't have any teeth.)

Along the roof of a puffin's mouth are a number of spines that point backwards towards its throat. When a fish is caught, the puffin uses its tongue to push the fish onto these spines so that it is held in place when the bird opens its mouth to catch another fish.

Finally with a beakful of fish, the puffins fly back to the colony. But instead of landing right away, they usually circle around in a number of “fly-bys” to make sure no predators are around. Some birds like gulls and jaegers (YEA-gers) regularly wait for puffins carrying fish to return to the colony, and then attack them and steal their food.

When the coast is clear, the puffins zoom down to their burrows and run inside. They drop the fish on the burrow floor, and immediately run back outside again. The whole delivery takes only a few seconds—yet this is the only time the parents see their chicks during the long six to seven weeks they are in the burrow.

By early September, most of the young puffins are ready to leave the burrows. Under darkness of night, the chicks walk

to the edge of the cliffs and jump into the sea. By morning they are far from their island home. Unlike some birds, the adult puffins do not teach their young how to catch their own food. Once the young puffin leaves the burrow, it is on its own and must learn to take care of itself.

These young puffins will spend the first several years of their lives at sea without ever returning to land. When they are three or four years old, they will go back to the breeding colonies, probably the same one in which they were raised. That summer, and perhaps the following one as well, they will dig their own burrows to get ready for the time when they will raise chicks of their own.

By the first of October, the puffin colonies are nearly deserted. The adult puffins head back for their wintering areas in the North Pacific. There, like Cinderella after the ball, they will molt back to their dull plumage—even shedding the bright plates from their beaks. And they will ride the waves and “fly” under the seas until it's time to change back into their splendid spring wardrobes and return once again to the breeding colonies.

—Duff H.S. Wehle (See page 7)

What Is a Seabird?

What's the difference between seabirds, waterfowl, and shorebirds?

The word *seabird* usually refers to birds that take their food from the sea by swimming, diving or flying (skimming, dipping, etc.).

Birds like ducks and geese that normally nest in freshwater habitats are commonly classified as *waterfowl*, even though they may feed in coastal waters at other times of the year.

The term *shorebird* generally covers birds like herons and sandpipers that feed along the seacoast or in shallow waters all year round.

But it's all a little fuzzy. Take some species of gulls, for example, best known of

Alaska's seabirds. As if to make things tough for classifiers, they stray far into the Interior, feeding off riverbanks and garbage dumps from Anaktuvuk Pass to Mt. McKinley National Park. They've even been spotted nesting in spruce trees along the Kobuk River and muscling in on the great waterfowl nesting grounds of the Minto Flats.

And the gulls aren't alone. Black guillemots have been reported near Paxson 300 miles from saltwater, and a Crested Auklet has been seen near Nulato.

On the other hand, consider the eagle. For a land bird, he isn't a bad fisherman either.

ALASKA'S GREAT SEABIRD CITIES

Seabirds like company. When they return in late spring from the open ocean to nest and raise their young, they gather together by the millions in huge seabird cities on rocky islands or empty stretches of coastline all the way from the Arctic to the Southeast Panhandle.

No other place in the northern half of the world is as important to seabirds as Alaska. At least 35 species, numbering 40-50 million birds, breed here—more than in all other places in the Northern Hemisphere combined. And when they are joined by migrating visitors from as far away as Australia (see *Tidelines*, May, 1979), Alaska's summer seabird population swells to an unbelievable 140 million.

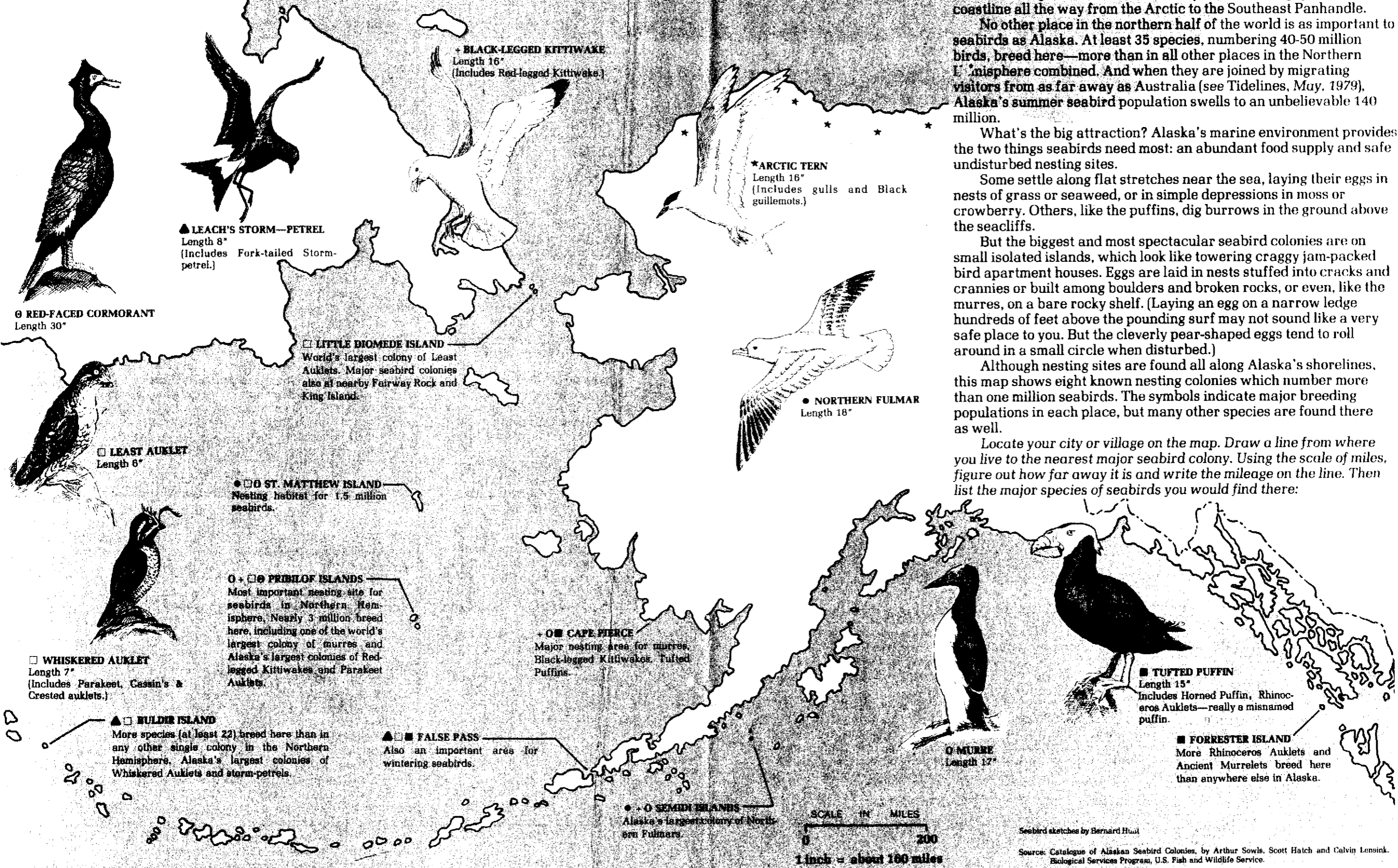
What's the big attraction? Alaska's marine environment provides the two things seabirds need most: an abundant food supply and safe undisturbed nesting sites.

Some settle along flat stretches near the sea, laying their eggs in nests of grass or seaweed, or in simple depressions in moss or crowberry. Others, like the puffins, dig burrows in the ground above the seacliffs.

But the biggest and most spectacular seabird colonies are on small isolated islands, which look like towering craggy jam-packed bird apartment houses. Eggs are laid in nests stuffed into cracks and crannies or built among boulders and broken rocks, or even, like the murre, on a bare rocky shelf. (Laying an egg on a narrow ledge hundreds of feet above the pounding surf may not sound like a very safe place to you. But the cleverly pear-shaped eggs tend to roll around in a small circle when disturbed.)

Although nesting sites are found all along Alaska's shorelines, this map shows eight known nesting colonies which number more than one million seabirds. The symbols indicate major breeding populations in each place, but many other species are found there as well.

Locate your city or village on the map. Draw a line from where you live to the nearest major seabird colony. Using the scale of miles, figure out how far away it is and write the mileage on the line. Then list the major species of seabirds you would find there:



“Other” Ways to Fly:

FLAPPING/ GLIDING/ SOARING

Have you ever stood on the deck of one of Alaska's ferryboats and watched gulls following along behind, motionless in the air like kites on a string? Have you ever seen birds soar suddenly upwards without seeming to move a feather—or put on an aerial circus of somersaults and loop-the-loops with only an occasional flap in between?

How do they do it?

The two commonest kinds of flight—flapping and gliding—aren't so hard to figure out. By flapping, the bird beats its wings to lift itself upward and push itself forward through the air. In gliding, it simply spreads its wings to offset the pull of gravity and “coasts” down from a higher point to a lower point.

But with soaring flight, birds must be wise to the ways of the winds and unseen air currents to keep them aloft. Here are some of their secrets:

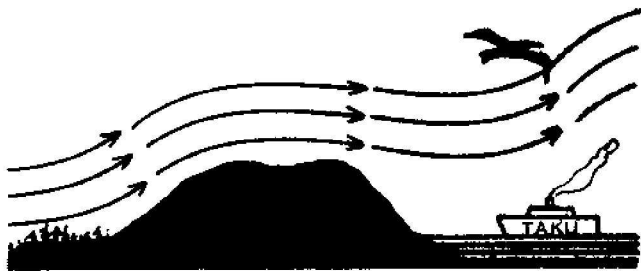


Figure 1.

When the wind hits a barrier, such as ships at sea, mountains, islands, or seacliffs, it is forced up and over. This forms a rising air current, or “updraft,” not just in front of the barrier but behind it as well. These air currents, called *obstruction currents*, carry the birds upwards too. And from the higher altitude, the bird can glide quite a distance before coming down—or catching another updraft.

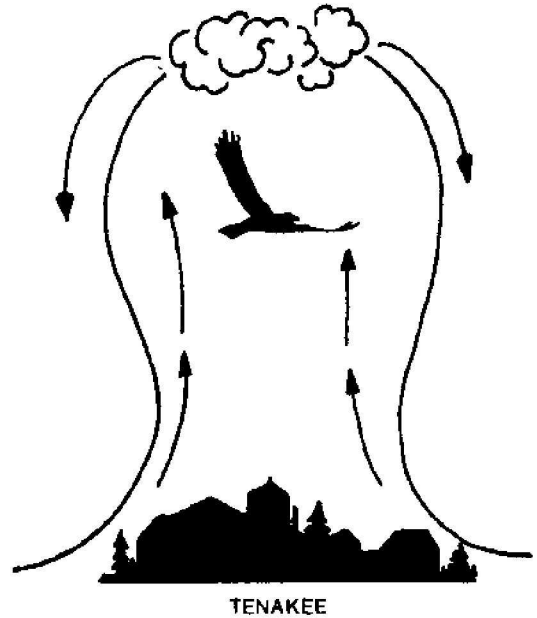


Figure 2.

Warm air is lighter than cold air. And certain surfaces of the earth—*islands, sands, mud flats, bare rock, buildings*—warm up under the sun's rays faster than other sections do. As the air over these surfaces becomes warmer, it expands and rises above the cool air next to it. These updrafts, called *thermals*, can be very strong. They can provide a fast elevator ride for all kinds of birds.

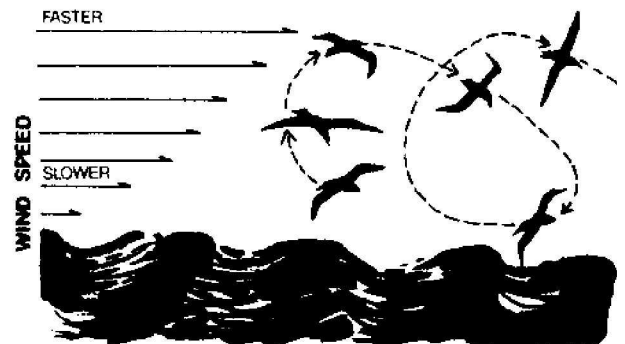


Figure 3.

Out on the open sea, there is only the wind. As it blows across the water, it makes waves. These waves, in turn, create a friction which causes the wind near the surface of the water to move slower than the wind higher up.

Soaring birds know how to work these wind patterns and speeds. They glide down from the fast winds aloft, pick up speed, then turn into the slower winds near the surface and let their momentum carry them back up again. With a series of such loop-the-loops, they can travel many miles.



CAREER (Coming Up) CORNER:

MEET DUFF

From Buldir Island in the far western Aleutians to the misty Isle of May off the east coast of Scotland, University of Alaska graduate student Duff Wehle has spent most of the past six years in scientific pursuit of the puffin.

He has studied the haunts and habits of puffins on land, sea, and in the air. He has reached down countless puffin burrows checking out eggs, and the food and growth-rate of chicks. Now he is completing work on his thesis (written study) on the world's four species of puffins as one of the final steps on the long road to his Doctors' degree.

Why spend so much time on puffins? Or, for that matter, on the Doctors' degree?

"Well, the puffin is a fascinating bird—and it's never really been studied before in Alaska," Duff explains. "Now offshore oil development is coming up near major nesting grounds of the three species that breed here. So it's important for us to know what impact possible oil spills might have on the food and habitat of the puffins."

And the Doctors' degree? Well, it is one of the highest academic degrees given by colleges and universities. "Degrees" are simply ranks which a student earns after completing a certain course of study. The Bachelors' degree comes first, usually after four years of undergraduate study. Next, if you want to learn more, comes the Masters' degree, which requires an additional one to two years in graduate school. And finally, if you decide to shoot for the top, comes the Doctors' degree, which involves a demanding course of study in the field you choose, and requires a number of years to complete. But in effect, it classifies you as an "expert," and it opens doors to top positions in many careers—in this case, research, education, or wildlife management.

Duff got interested in seabirds after he signed up for a summer course at Cornell University's marine laboratory on the Isles of Shoals off the coast of Maine and New Hampshire. He had graduated from Cornell the year before with a Bachelor of Science degree in Environmental Education, and had been teaching natural history at a community college in New York State.

But on the island he met an elderly professor whose enthusiasm for seabirds rubbed off on Duff. "After awhile," says Duff, "I'd be the one who would get him up early in the morning, and we'd go out in a small boat and spend hours and hours watching the birds."

That led to a job with the Massachusetts Audubon Society doing research on terns off Cape Cod—which led, in turn, to a desire for more knowledge about seabirds—which led, naturally, to Alaska.

In the fall of 1974, Duff was accepted as a graduate student at the University of Alaska and started on a program of puffin research. The following summer was spent on Buldir Island in the Aleutian Island National Wildlife Refuge, doing field work for the U.S. Fish and Wildlife Service. It was pretty remote, but at least he had a portable cabin and the company of a four-man team.

But over the next two years, he would spend a total of almost nine months camped out in a tent on Ugaiushak Island, a tiny two-mile-long speck on the map off the Alaskan Peninsula about 40 miles due north of the Semidi Islands.

"All supplies had to be taken in at the start of the season. One other person was there most of the time, but except for radio contact in case of emergency we were completely on our own."

How was it? "I loved it. I like being out alone in the wilds—even though the weather was terrible at times.



Photo by Robert G. Day

In 1978 he traveled to the Isle of May to study the Common Puffin, the only member of the puffin family that is not found in the North Pacific. Since then he has been dividing his time between Alaska and his house overlooking the Gulf of Maine on the east coast, and completing work on the various requirements for his Ph.D. degree.

Ph.D. stands (in reverse) for "Doctor of Philosophy"—which doesn't sound like it has a whole lot to do with puffins, until you take the words apart. You usually think of a "doctor" as someone who takes care of the sick. But actually the word comes from the Latin *docere*, meaning "to teach." The word "philosophy" comes from the Greek *philos*, meaning "loving," plus *sophos*, meaning "wise." So it all adds up roughly to "a teacher loving (or searching for) wisdom or knowledge."

Since Duff is interested primarily in teaching and writing about seabirds, that fits just fine. Part of his doctoral program requirements included designing the seabird display at the University of Alaska's new museum, writing a Teaching Guide on Alaska Seabirds*, and last, but not least, providing the material and writing much of this issue of *Alaska Tidelines*. (Thanks Duff!)

*Alaska Seabirds: Teaching Guide, by Duff H.S. Wehle. Copies (free) may be obtained through the Communications Office, Alaska Sea Grant Program, University of Alaska, Fairbanks, AK 99701.



reproductions of paintings by wildlife artist Bob Hines, plus an eight-page guide. You can get yours FREE, while the supply lasts, by writing:

Alaska Area Office
U.S. Fish & Wildlife Service
1011 East Tudor Road
Anchorage, AK 99503



April issue:
Spring Comes to the Sea

Beautiful Bargain

"A Host of Seabirds—Alaska," Wildlife Portrait Series No. 4, was published recently by the U.S. Fish and Wildlife Services, Department of the Interior. It consists of five beautiful 16' x 26' full-color

Whaaaaat?
Seabirds nest in some pretty wierd places, but really...!
Write a title or "gag line" for this cartoon. Or do some "cartoon balloons." (What is the moose saying? What is the seabird saying?) Send them to SPOUT, and we'll try to print the funniest (?) as space allows.

TUFTS & PUFFS

Starred (*) words are based on information in this issue.

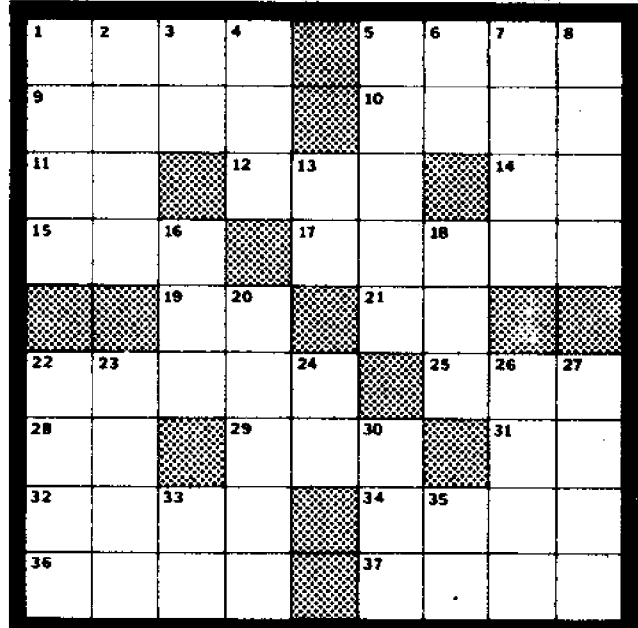
ACROSS

- * 1. One of the first things you notice about the puffin is its big bright orange _____.
- * 5. With its (1 across) it is able to catch and carry many small _____.
- * 9. A good place to study the Common Puffin is on the _____ of May off the coast of Scotland.
- * 10. Since ducks and geese normally nest in a freshwater habitat, such as a _____, river or marshland, they are not classified as seabirds.
- 11. Letters in the alphabet between Q and T.
- 12. North American Indians' (init.).
- 14. By the time you get this, the 1980 running of the 1,049-mile sled dog classic, the _____ (init.), will be history.
- * 15. Both male and female puffins share the job of tending the nest, trading off duties at least once a _____.
- * 17. Arctic _____ are gull-like birds that nest on the North Slope.
- 19. Latin word for "and," as in _____ cetera.
- 21. Spanish word for "yes."
- * 22. Puffins are able to stay under _____ for several minutes.
- * 25. There is concern over how _____-shore oil development will affect major seabird colonies.

- 28. Alaska Railroad (abbr.).
- * 29. The Tufted Puffin gets its name from a long yellow tuft of feathers behind each _____.
- 31. Oh-oh (abbr.).
- * 32. During the winter months, seabirds feed and _____ on the open ocean without ever coming to shore.
- * 34. It takes 40-50 days for puffin chicks to _____ big enough to leave their burrows.
- 36. TV show starring Alan Alda as an Army doctor in the Korean War, * * * * *
- * 37. A common seabird, which also spends a lot of its time in the Interior, is the _____.

DOWN

- * 1. Alaska's summer sea _____ population may number as many as 140 million.
- 2. Environmental Science Services Administration (init.).
- * 3. Puffins belong to the large seaoidr family called "_____idae" (first 2 letters).
- 4. Kenneth's friends call him _____.
- * 5. The puffin is one of the few birds that _____ underwater as well as in the air.
- 6. Aleutian Islands (abbr.) (backwards).
- * 7. Puffins molt feathers from "brood patches" so that the eggs can be warmed against the bird's _____.
- 8. Not his, but _____.
- 13. Alaska Transport (abbr.).



February X-Word Answers

- 16. "Not now," or "not _____"
- 18. Spanish word for "river," as in _____ Grande.
- * 20. Birds don't have any _____. But the puffin uses sharp spines on the roof of its mouth to hold small fish.
- * 22. Cold air is heavier than _____ air.
- 23. A certain space or region. For example, in long-distance telephoning, Alaska's _____ code is 907.
- 24. Yukon River (init.) (backwards).
- 26. Don't be an April _____ on April 1!
- * 27. Ducks, geese and swans are commonly classified as water _____.

- * 30. Female puffins lay a single _____.
 - 33. Social Security (abbr.).
 - 35. Rutgers University (init.).
- Answers in April issue.

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