



Pushed to brink, swans rebound with help from global warming



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Hunted to near extinction in the 19th century, the trumpeter swan is taking advantage of warmer, longer summers to expand its range and numbers - one of the few good news stories of global warming, at least for now

By Jane Kay

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ANCHORAGE, Alaska – Outside Alaska's largest city, where wildlife is more common than pigeons, locals bearing field glasses turn out every year to watch blazingly white trumpeter swans stop to feed on their way south for the winter.

The swans, famed for their French horn call and immortalized by author E.B. White, were nearly hunted to extinction in much of the United States and Canada by the late 1800s for their meat, feathers, down and quills.

Now, North America's largest wild fowl may be one of the few good-news stories of global warming – at least for the short term.

Trumpeters, which reach 38 pounds with an 8-foot wingspan, need a long summer to raise young to a size where they can keep up with the flock on the thousand-plus-mile journey to ice-free ponds in British Columbia, Washington and Oregon.

A warming climate is helping, expanding the swans' summer range northward into habitat never before used in their ancestral boreal forest, allowing populations to flourish, according to a new [study](#) by Alaska scientists.

Recovered population

As spring arrives earlier in Alaska and winter comes later, the season lengthens for breeding, hatching and cygnet rearing, all advantageous to the birds, which need at the minimum 145 ice-free days, according to the study, led by Joshua Schmidt of the National Park Service and published in the December issue of the journal *Wildlife Biology*. In comparison, the tundra swan, a smaller and more-abundant species distinguished by a yellow dot above its black bill, needs about 100 days.



Alaska is warming about twice as fast as the global average. From a swan's perspective, it means greater productivity.

- Terry Chapin, University of Alaska, Fairbanks



Trumpeter swans breed from central interior Alaska to the southeast coast and north to the Brooks Range in forested ponds and lakes. Since the mid-20th century, the population has recovered to roughly 25,000 swans. Prohibitions against hunting and attention to protection and food supply in winter feeding grounds have aided the surge. Small remnant populations of non-migratory trumpeters live year round in isolated spots of Montana, Wyoming, Idaho, Minnesota and Wisconsin, including Yellowstone National Park and Red Rock Lakes National Wildlife Refuge, the setting for White's affectionate portrayal of the resourceful, voiceless Louis in "Trumpet of the Swan."

Two years ago, a team of Alaska scientists **confirmed** that trumpeter pairs have been steadily increasing since at least the 1960s. The team found that swans have benefited from higher temperatures associated with warming atmosphere and oceans. There are fewer trumpeter swans in northern Alaska than in the southern half. But those in the northern population, between the Alaska and Brooks ranges and including the Yukon River basin, are increasing faster than in the southern portion, the researchers found.

New breeding habitat

New research by the National Park Service team has found the swans have expanded their range northward since 1968 into areas never before used as breeding habitat – even before hunting killed off much of the population. That shift, researchers concluded, is likely linked to the rising temperatures of the past hundred years.



The Arctic has a history of amplifying global temperature changes, warming or cooling faster than the rest of the planet. Recent **trends** are no exception: While the globe on average has warmed 0.6 degrees Celsius compared to historic norms, the Arctic has jumped 1.5 degrees Celsius, with some areas approaching 3 degrees Celsius warmer. Higher spring temperatures are causing the earlier snowmelt, and the timing of that melt influences the warming of the atmosphere. Reduction of the snow cover in most of Alaska and northern Canada, for instance, magnified the heating effect three times, researchers found.

"We found a direct link between temperature and the occupancy of breeding trumpeter swans in Alaska," said Schmidt, a wildlife biologist and data manager for the Park Service's Central Alaska Network. "In warmer periods, there are more pairs observed occupying the summer breeding habitat than in colder periods." With rising temperatures, the swans are gaining more habitat than they are losing, he added. They can now use thousands of acres for breeding that in colder eras were inaccessible.

Benefits vs. downsides

As the climate grows drier and warmer – melting glaciers, thawing permafrost and shrinking wetlands in the Northern Hemisphere – Schmidt and other scientists warn that there are many long-term factors that may be harmful to wildlife species, including the trumpeter swans. Changes in breeding cycles may bring a mismatch between food need and availability, for instance. But for now, they believe the





benefits outweigh the downsides of losing some wetlands at lower latitudes.

Negative effects abound for other Arctic and sub-Arctic creatures. The smaller tundra swan, with a breeding range that slightly overlaps the trumpeter's in the Koyukuk and Yukon river basins of northwest interior Alaska, may be feeling pinched by a more robust trumpeter population. Researchers also foresee serious consequences for the polar bear, the walrus, the ice seals and many other Arctic species that depend on sea ice to survive.

"Every species is immensely complicated because each species affects and is affected by so many other species, and because climate affects each species in different ways," said Nancy Fresco, network coordinator for a climate research group at the University of Alaska. Water, temperature, pests, diseases and invasive species are some of the factors, she said. Scientists are trying to more broadly assess the health of ecosystems rather than zero in on the health of individual species.

This fall, the first snow came to Potter Marsh on the Cook Inlet outside of Anchorage in September – typical for the region. As October rolled along, daylight shortened, temperatures lowered, leaves fell and flocks of migrating ducks and shorebirds called overhead, all age-old signals to swans that it was time to leave. The swans must be on their way by October's end, before the freshwater ponds they need freeze up. In 1992, an early cold spell in interior Alaska's Minto Flats, west of Fairbanks, trapped several young trumpeters that weren't yet ready to make the flight.

They froze in the ponds.

'Twice as fast'

This year Alaska is seeing a colder-than-average winter. But the trend is the opposite: The average length of the snow-free season was 154 days between 1910 and 1940 in most of Alaska and northern Canada, according to a 2007 [study](#) by University of Alaska, Fairbanks, scientists and published in the journal *Global Change Biology*. Between 1970 and 2000, the region saw an annual average of 157 days free of snow, the study said. The snow-free period increased by

1.6 days per decade between 1910 and 1940, and by 2.2 days per decade from 1970 to 2000.

"Alaska is warming about twice as fast as the global average. Snow melts earlier, the sea ice melts earlier. It changes the amount of heat that is absorbed by the land and ocean surface. A dark surface absorbs more energy, and therefore magnifies that rate at which temperatures rise," said Stuart "Terry" Chapin III, a professor emeritus in the Institute of Arctic Biology at the University of Alaska, Fairbanks, and an author of the 2007 study.

"From a swan's perspective," Chapin added, "it means a longer growing season, a somewhat warmer growing season. It means greater productivity, more food for the swans."

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Photo of researcher Kate Martin at a trumpeter swan nest on the Yukon Flats in Alaska by Mark Lindberg/University of Alaska, Fairbanks. Photos of trumpeter swans at Potter Marsh in Anchorage, Alaska, and Tern Lake in Kenai, Alaska © Jim Lawson and used with permission.

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