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Environmental stress on the Whistling Swan

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In North America, Whistling Swans *Cygnus c. columbianus* number about 100,000 birds. They breed across the Arctic from Alaska to Baffin Island; on the winter range, they are separated into two fairly-evenly divided populations residing a continent apart, on the Pacific and Atlantic coasts.

My comments in this paper refer to the Atlantic population because it has been studied in more detail, but there is reason to believe that similar circumstances exist for the Pacific population.

On the Atlantic seaboard, the eastern population of about 50,000 Whistling Swans winters largely in Chesapeake Bay but, of late, they have been appearing in increasing numbers as far south as Back Bay, Virginia, and the coastal marshes of North and South Carolina.

Beginning in March, their spring migration takes them northwestward across the continent some 3,000–4,000 miles (5,000–6,500 km) to the breeding range. As one follows them on this long trek, accomplished in 3 months, it becomes more and more evident that they are faced with increasing stress from actual or potential ecological damage of a serious nature at both ends of their range and at every major stopping point in between.

Chesapeake Bay

The heavy traffic of tankers and other shipping in the narrow confines of Chesapeake Bay make oil pollution of the Bay a continuous threat. Neighbouring Delaware Bay, occasionally visited by swans, recently suffered a serious oil pollution incident. Oil slicks of a minor nature are probably a chronic condition on Chesapeake Bay but, in addition, massive industrial and municipal pollution pours into the Bay from the Susquehanna and Potomac Rivers and from the giant Bethlehem Steel plant on the Bay.

Whistling Swans frequent the small inlets and marshy reaches to obtain their basic diet of aquatic and sub-aquatic vegetation. How well this vegetation is standing up to severe water pollution and shoreline development is a problem that is being actively studied.

Lake Erie and Lake St Clair

When the spring migration from Chesapeake Bay begins in March, the first major stop-over is 400–500 miles (650–800 km) to the north-west, in the marshes of Lake Erie and Lake St Clair. Some birds carry on to Shiawassee National Refuge and Saginaw Bay in Michigan.

The extensive pollution of Lake Erie is now a matter of international concern. More and more heavy industry continues to take up space along its shoreline on both sides of the border. Many of its marshes have been destroyed or seriously depleted. As a haven for migrating swans, it can now support only a few thousand at a time.

Lake St Clair still has extensive marshes, particularly along the eastern shore, in Canada. The much publicized discharge of mercury from a chemical plant into the St. Clair River is probably of less concern to swans than the effluent from oil refineries, polymer plants, and municipal sources. To what extent the quality and quantity of swan food has been affected in recent years is not known.

Within the past 5 years, swans have developed the habit of flying from the St Clair marshes daily to glean corn from agricultural land. Between 5 March and 5 April at least half of the eastern population of Whistling Swans visits a 4-mile by 5-mile (6·5 by 8·0 km) area of corn fields east of Lake St Clair. Whether this development is to exploit a newly found food source or whether it has been made necessary by deterioration of the marsh vegetation in Lake St Clair is an important matter we should hasten to investigate.

The sloughs of North Dakota

By late March or early April, the swans are heading for their next major stop-over, on the plains of North Dakota, fully 850 miles (1,370 km) to the west-northwest. There, the countryside used to be dotted with sloughs and potholes. In recent years, the trend towards increasing mechanization and large holdings in wheat-farming operations has brought about accelerated draining of these waters. Even large lakes, such

as Rush Lake, a major swan assembly area, are being drained by diverting the water into the Pembina River, in Canada.

The breeding habitat for ducks has been permanently reduced but, except for Rush Lake, swans are less seriously hit because their spring stop-over lasts only about a month—early April to early May—and at that time of the year the accumulation of snow melt usually lasts until after the swans leave. Most of the marshland is gone, however, and swans are frequenting standing water in the fields, again gleaning for grains, mostly wheat.

The Athabaska Delta

In late April and early May, the Whistling Swans make their next long jump, 900 miles (1,450 km) northwest across the Canadian province of Saskatchewan. The only major stop-over area we have located is in the confluence of waters about the delta of the Athabaska River where it flows into Lake Athabaska. Nearby, the Slave River forms the outlet from the Lake, and the Peace River, descending from British Columbia, flows into the Slave. This was an unusually rich area of wetlands, exceptionally well suited to swans as a staging area. Unfortunately, a few years ago a large power dam was completed far upstream on the Peace River, in British Columbia. With water now held behind the dam, the spring run-off no longer floods the wetlands, and the rich shallow feeding grounds of Lake Claire and other smaller lakes now virtually dry up in years of low run-off. Much concern has been shown in Alberta about the effect of the drastic change in water flow on Indians, muskrats and ducks, but no one has yet considered the plight of the Whistling Swans, which now must largely frequent the open waters of Lake Athabaska, where plant food is relatively scarce.

The Mackenzie Delta

From the Athabaska Delta, the main migration route of the swans continues northwest another 950 miles (1,530 km) to the Mackenzie Delta, which lies within the breeding range. This constitutes the last staging area before dispersal to the breeding territories as soon as weather permits—usually about the end of May and early June.

As yet, the swans are relatively undisturbed, but the Delta is now a centre of exploration for fossil fuels underlying the Delta itself. It is criss-crossed with seismic lines and dotted with drilling rigs—particularly on the outer reaches of the delta which constitute a favoured nesting area. Oil and gas have been discovered there in fairly sizeable quantities, and the start of production appears close at hand. A major oil spill will be a continuous threat for years to come, and what is perhaps more important, human and mechanical disturbance on an unprecedented scale is virtually a certainty.

The Arctic coast

As the snow melts in late May and early June, the swans spread out east and west across the tundra, each pair taking up a sizeable territory, usually centred about a small lake or tarn, and many nesting within sight of the coast. There is safety in this isolation but for one new development—the skidoo or snowmobile. The sale of skidoos is being pushed hard and Eskimos have taken enthusiastically to them. They make extended travel possible through the spring, and I suspect that, as a result, the hunting pressure on wild animals has increased by a factor almost as great as when the rifle was first introduced. The principles of conservation do not come easily to the Eskimo nor, for that matter, to his fellow whites in the Arctic. For the Eskimo, the bird in the hand continues to be better than two on the tundra, and swans are no exception to the rule. The snowmobile makes it possible to cover long distances along the coast, and swans make a large and tempting target.

The melting of the snow and ice at least brings isolation to nesting swans—except for disturbance from low-flying planes and helicopters hurrying back and forth on errands of exploration and research. The swans are left to contend with the more traditional problems of a wilderness existence, but these must not be minimized. The schedule for the breeding season is very tight indeed, and a delayed spring or early winter storm may keep successful reproduction to a low figure. Summer is only too short, and, even in an 'average' year, many young cygnets are overtaken by winter before they have the strength to fly out.

The long return route southeast to Chesapeake Bay closely retraces the spring migration route—a band about 100 miles (160 km) wide drawn diagonally across the continent. Much the same problems have to

be faced, with the added complication of a hunting season now introduced in a few states and under consideration by others.

If we wish to maintain their numbers in the vicinity of present levels, it is essential to begin now to establish the information needed for intelligent management of this resource. The place to start, in my opinion, is with a study of food habits, and a determination of the productivity of relevant plant and animal food sources in the wintering and staging areas.

I think it is true to say that anyone who takes the trouble to become closely acquainted with these birds soon acquires a great respect and admiration for them. They are truly one of the noblest of our birds. They have great adaptability, but they will need all of it in the years to come.

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