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Flight of the Sea Ducks

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Their migration routes have been charted. Their breeding biology is known. Their eggs meat and feathers have long been used by man. But eiders at sea remain an enigma.

Nesting in colonies that can number hundreds of birds, the eiders are among the most conspicuous of tundra-breeding birds. Although female eiders are a study in grays and browns that match the arctic tundra, the males are most boldly patterned in black and white, with striking green head colors. When the nesting season ends, the birds disperse over the vastnesses of the northern oceans, out of range of most human observers. Of the four species of eiders, the two most abundant and largest have circumpolar breeding distributions and extensive marine wintering ranges. These are the common eider, *Somateria mollissima*, and the king eider, *S. spectabilis*, whose flesh eggs and feathers have played a role in the survival of high-latitude human populations for thousands of years, and whose down has insulating

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qualities that are yet to be matched by artificially manufactured substitutes. The other two eider species are smaller and have much more restricted breeding distributions that center on the Bering Sea. These are the spectacled eider, *S. fischeri*, named for the gogglelike feathering pattern around its eyes, and the Steller's eider, *Polysticta stelleri*, named in honor of G. W. Steller, the naturalist on Bering's ill-fated expedition to Alaska.



Steller's eider. (All photos courtesy US Fish & Wildlife Service Digital Library)

Steller's eider breeds almost entirely in Siberia and winters primarily along the coastlines of the Aleutian Islands and in the vicinity of the Kamchatka Peninsula and the adjacent Kuril Islands. The spectacled eider, which nests commonly in some parts of eastern Siberia and in the Kuskokwim Delta of Alaska, seems to disappear into the open spaces of the Bering Sea every fall and is not seen again until the breakup of ice along the coasts of Siberia and Alaska the following spring.



Common eider.

It is the relatively sudden spring appearance of vast flocks of eiders, as the pack ice begins to break up near shore, that provides one of the intriguing aspects of these sea ducks. The flocks appear every spring at points and headlands along the western and northern Alaska coasts in numbers that are simply staggering. At places like Cape Romanzof and Cape Prince of Wales on the western coast of Alaska, flocks of eiders can be observed passing overhead in almost endless northbound streams between early May and early June.

On his trip to Alaska's Yukon-Kuskokwin Delta in 1924, naturalist Herbert Brandt watched the eider migration across Point Dall and Cape Romanzof. There the evidence of spring arrival was evidently associated with body size: the relatively large common eider arriving about the first week of May, followed in a few days by flocks of the king eider. The smaller spectacled eider and the Steller's eider followed in that order.

One flight, predominantly of king eiders, began late in the afternoon of May 14, apparently continued all night, and persisted all of the next day. Brandt considered the number of birds passing over Point Dall and Cape Romanzof on May 15 as "beyond all comprehension." Nonetheless, he provided an estimate of 75,000 for a two- to three-hour period on that day. Essentially, all of these were full-plumaged adult birds, indicating that as many or more first-year immatures must have remained at sea during the summer. The younger birds rarely come within sight of land until their second spring of life.



Spectacled eider.

At the time of Brandt's expedition, three of the four eider species nested in the vicinity of Hooper Bay, with the spectacled and Steller's eiders the most common. The Steller's eider has apparently ceased to breed in that vicinity, but the spectacled eider has remained common and this area is the center of

the species' breeding range in North America.

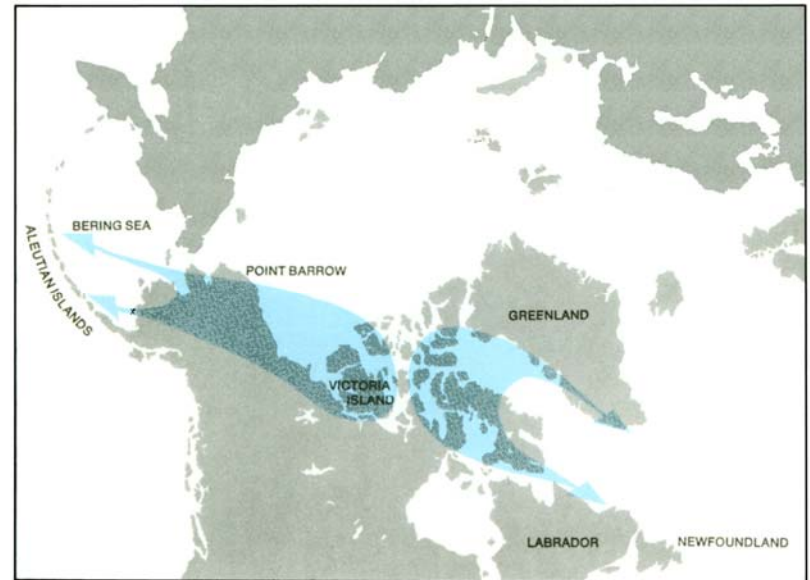
On a visit to the Hooper Bay area in 1963, I observed that the spectacled eiders were nesting semicolonially with nests often within fifty feet of their neighbors. Within a week or two after the females had begun their incubation, the males returned to the open sea. Based on observations by E. W. Nelson in the late 1800s, it is possible that the male North American spectacled eiders fly more than 200 miles north, to the vicinity of Norton Sound, in late June or early July to undergo a post-breeding molt.

All four species of eiders are known to undertake such "molt migrations," which can be of remarkable length. For example, a substantial number of male Steller's eiders from breeding populations in eastern Siberia have been banded at Izembek Bay, Alaska, where they undergo postbreeding molt. Some of these banded birds have been recovered from points as far



King eider.

North American Molting and Wintering Migrations—King Eider



Post-breeding populations from Victoria Island westward fly to an area south of Point Barrow, Alaska, to undergo molting. Those birds breeding east of Victoria Island migrate to the west-central coast of Greenland. After molting, the Alaskan birds migrate to their wintering ranges in the Pribilof and Aleutian Islands. The eastern populations move to the south of Greenland, and the coasts of Labrador and Newfoundland. (x= Point Dall/Cape Romanzof)

away as the Lena Delta in Siberia, nearly 2,000 miles to the west.

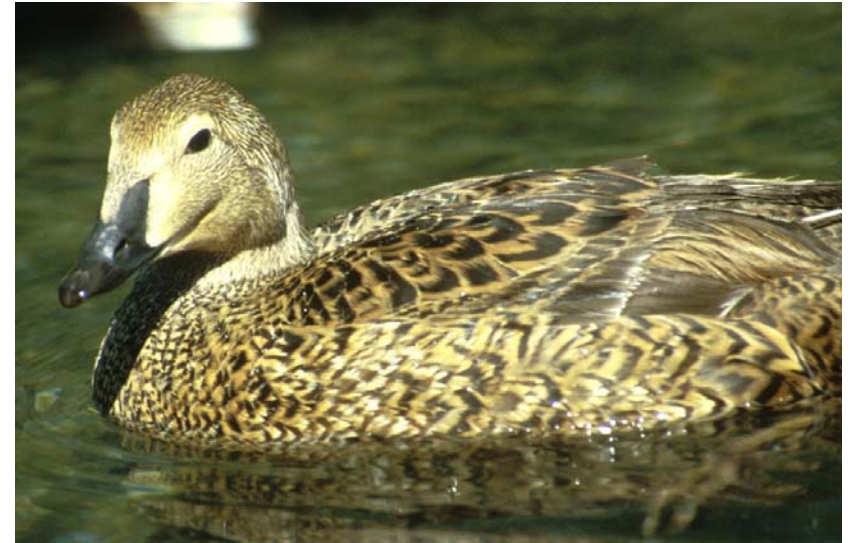
Why birds would migrate so far prior to undergoing the physiological stresses associated with molting can only be explained if the destination offers an unusual degree of safety and food. This is indeed the case. The shallow and plant-rich waters of Izembek and Bechevin bays on the Alaska Peninsula provide an abundance of aquatic life sufficient to sustain some

200,000 eiders at one time. The molting Steller's eiders, which include not only males but also some females that presumably were unsuccessful in their nesting efforts, remain in the vicinity of Izembek Bay from fall through April.

The molt migrations of king eiders are also impressive. The North American population breeds along the northern coastlines of Alaska and Canada and falls into two groups: those that fly directly west across the north coastline of Alaska to a destination that is probably in the vicinity of Point Lay, about 200 miles southwest of Point Barrow; and those that fly almost directly east to the coast of Greenland. Virtually entire migratory flocks are composed of males, including both adults and immatures. The concentration off Greenland numbers several hundred thousand birds and includes all of the birds from Canada's eastern arctic, thus requiring a flight, in some instances, of more than 1,500 miles.



Common eider, female on nest.



King eider, female.

The king eider populations of Victoria Island and of Canada's western arctic may number at least a million birds. Nearly all of these pass by Point Barrow between mid-July and the end of August. This is evidently a migratory tradition of long-standing for among the most common weapons excavated at Point Barrow are 900- to 1,400-year-old Eskimo bone and ivory bola weights used in hunting eiders.

The first of the massive flocks to pass over Point Barrow in July is composed entirely of adult males; but by mid-August there is a preponderance of unsuccessful female nesters. The later molting period of the females allows them more time to complete a nesting cycle. At least some of the adult females that succeed in hatching young do not participate in any of the major flights to the molting grounds; instead they remain until their young fledge in late August, then undergo their molt on the breeding grounds. By forming creches, relatively few fe-

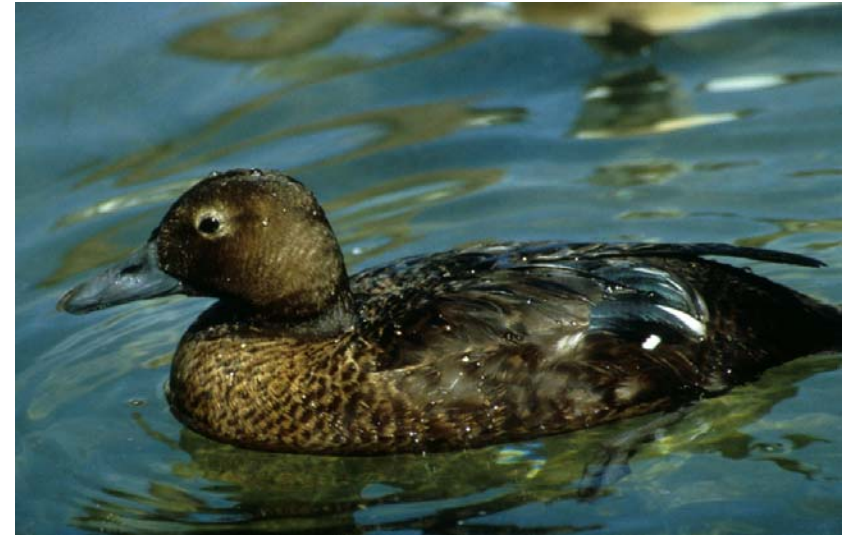
males are required to remain on the breeding grounds with the flightless young, thus freeing the rest for their molting migration.

After the adult eiders have finished molting, they again migrate. The eastern king eider population moves from western to southern Greenland and the coasts of Labrador and Newfoundland. The Alaskan birds move south to the Pribilof Islands, Saint Lawrence Island, and the Aleutian Islands where as many as a quarter-million birds may winter.

Little is known of common eider migrations in North America. In Scotland the movement from the breeding grounds to the molting area is only about 60 miles. In Norway there is enough topographic protection and available food in the breeding range to allow the completion of the flightless period there and no special molt migration pattern has developed.



Spectacled eider, female.



Steller's eider, female.

While the eiders in Alaska are still on their nesting grounds, they suffer some depredations from humans. At Hooper Bay I often observed young Eskimo men collecting waterfowl eggs and hunting adult eiders with single-shot rifles. Herbert Brandt, talking of the same area, said that the skins of eiders and other ducks, and also those of geese, provided the favored linings for parkas, with the feathered side worn against the face. On Cape Dorset, Eskimo form organized egg-collecting forays to the colonies of common eiders, while women and children set up snares to capture nesting females.

In contrast to the harvesting techniques used in Canada and Alaska, the people of Iceland, Scandinavia, and Siberia have developed a tradition of eider "farming." In eider farming, down is collected intermittently during each nesting season, without destroying the nests or killing the females. When the female is approximately halfway through the incubation period there is a

maximum amount of high-quality down present in the nest, and most of this can be removed without endangering the eggs. After the eggs have hatched, the remaining mixture of down and breast feathers can be gathered, although this collection is of second-quality and far lower commercial value. Roughly three-quarters of an ounce of high-quality down can be collected per nest, plus an equivalent amount of poorer quality down.

In Norway and Iceland the birds have been protected so long that they are almost domesticated. They are protected from predators and provided with specially prepared nesting sites. Colonies of more than 5,000 pairs have been developed under such conditions. On some eider farms the eggs are also taken from the first clutch, forcing the female to renest and produce a new clutch that she is allowed to hatch. In the USSR, eider-down collection has been a part of the northern economy for centuries; seventeenth-century documents mention "bird down" among the goods sold to Dutch merchants. In 1930 about 1,000 pounds of down were obtained from Novaya Zemlya; on some protected areas of this archipelago, the density of nesting birds has been increased to as much as 13,000 nests per hectare (2.47 acres).

Once the birds have left their breeding grounds and moved to molting or wintering areas, their foraging activities and ecologic relationships become progressively obscure. The three larger eiders (genus *Somaterid*) have virtually identical bill structures, which can be characterized as being relatively massive, with a broad and flattened naillike structure at the tip, much like that of their near relatives the scoter ducks. The larger eiders and scoters are known to feed predominantly on mollusks, particularly such bivalves as blue mussels, probably the single most important food of common eiders. King eiders

also feed to a great extent on mussels, but are believed to forage in somewhat deeper waters and to utilize a greater proportion of echinoderms such as sand dollars and sea urchins in their diet. In spite of its lack of obvious streamlining or other diving adaptations, the king eider is able to dive to great depths to forage, reportedly as deep as 180 feet. This allows the species to forage farther from shore than the other eiders or scoters and reduces foraging competition between them.

Far less is known of the foraging ecology of spectacled eiders in their wintering or migratory areas. Indications are that the spectacled eider also feeds on bivalve mollusks. Since it is scarcely seen near any coastlines in winter, the implication is that the spectacled eider must be able to dive to considerable depths in order to obtain its food.

The Steller's eider is known to forage in relatively shallow waters, often feeding while wading at the water's edge, dabbling like surface-feeding ducks. They evidently prefer soft-bodied crustaceans, such as amphipods and isopods, over mollusks, and in correlation with this, their bills have soft, membranous edges and an inconspicuous bill nail that is ill-suited to scraping bivalve mollusks off rocks. Consequently, the Steller's eider competes little for forage with other eiders.

The breeding biology and molting and wintering migrations of the eiders have brought them into contact with man. To the people of the northern latitudes, eiders have been a valuable resource because of those characteristics of their life cycle that bring the birds in to shore. But more than any other group, eiders are sea ducks; and although not well known, the behavioral and morphological foraging adaptations of the four species illustrate the importance of the marine environment in their evolution.



A prolific writer on ornithological subjects, Paul A. Johnsgard is currently studying the taxonomy of grouse, quails, and ducks. He has done extensive investigations of waterfowl and his field work has taken him to virtually all areas of the Western Hemisphere. He is now compiling and editing a catalog of classic American bird decoys. *The Bird Decoy: An American Art Form*, which will be published by the University of Ne-

braska Press this fall. A professor of zoology at the University of Nebraska, Johnsgard has published many articles in *Natural History*, the most recent being "Quail Music" (March 1974).

Permission has not been obtained to reproduce three photographs originally published with this article. Captions and credits are given below.

pp. 68-69 *Common Eider (male)*. Fred Bruemmer.

pp. 70-71 *Colonies of common eiders nest among tussocks on coastal flats. The males leave the breeding area on their molt migration before the females finish incubating*. Olin Pettingill. Photo Researchers.

pp. 72-73 *Salt-excreting glands in the forehead of eiders (male king eider, right) are an adaptation for a marine existence*. K. W. Fink; Bruce Coleman, Inc.