

Observations on the Diving of the Surf Scoter (*Melanitta perspicillata*).— On November 4, 1953, near Lopez Island, San Juan County, Washington, I watched a male Surf Scoter diving. This bird, one of a flock of five, was feeding in salt water (depth probably two or three fathoms) 50 yards or so from the rocky shore of Lopez Island, near the ferry slip. The bird submerged with an initial movement of half-spread wings. On one occasion, when the bird was facing me, I could see that it began its dive by lunging forward and slightly upward so that the breast and belly cleared the water. At the same time the wings, strongly flexed at the wrists, were extended. The bird did not begin its dive by beating the water with the leading edges of its wings; instead, it began in a forward lunge propelled by the feet.

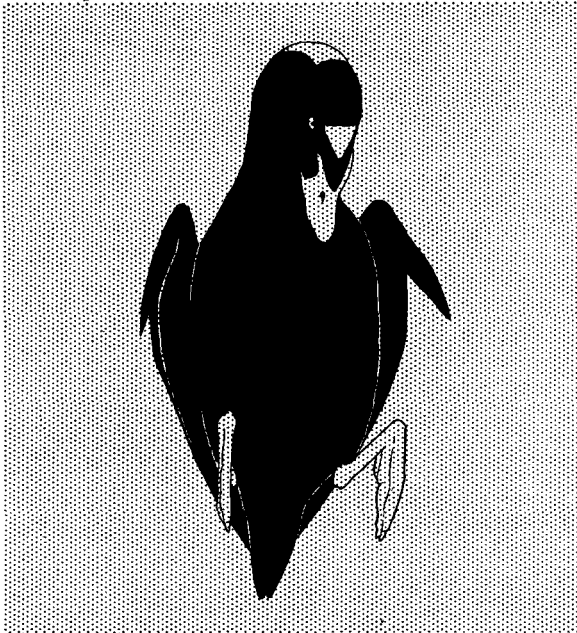


FIGURE 1. Surf Scoter rising to surface of water.

Observations by Stettenheim (field notes) and others indicate that Surf Scoters and White-winged Scoters (*Melanitta deglandi*) often submerge without extending the wings at all. It is not known whether in such cases the wings are used after the bird has submerged. When diving without use of the wings a Surf Scoter will sometimes clear the surface of the water in a high arc and disappear beneath the surface, propelled by the feet alone.

On December 30, 1953, at the Municipal Wharf, Monterey Bay, California, I observed the underwater activities of diving Surf Scoters. The water was deep (exact depth unknown) and the birds could be seen to a depth of about ten feet, where they passed out of sight. The diving Surf Scoters held the neck completely outstretched while descending towards the bottom; the wings were extended and sharply flexed at the wrists so that the wingtips were directed backwards. Although

the wingtips were near the rump, they had complete freedom of movement and were not pressed to the rump. The alula was plainly seen; it was extended laterally, away from the manus. Propulsion during descent was supplied by the feet and the wings, which moved synchronously, the downstroke of the wings and the propulsive stroke of the feet occurring together. The wings and feet moved together in steady, measured strokes with no pauses between them. The wings moved up and down (that is, dorsal to ventral, ventral to dorsal) steadily, instead of being pulled against the body to give a jet-like forcing of water backwards. The wing movements appeared to be underwater flying movements. The birds dove either straight down or at a slight angle from the vertical.

Brooks (Auk, 62: 520-521, 1945), describing the underwater activities of the White-winged Scoter (which, he says, dives in the same manner as the Surf Scoter), states that "the wings are flipped forward as the bird plunges, but under water the tips of the primaries can be seen crossed over the tail . . . the alula is extended to its utmost, giving the appearance of small, sharp-pointed wings held out rigidly on each side during the whole period of the dive. . . . No definite movement of the wings can be seen when the bird is submerged. As in all the diving ducks the feet appear as huge paddles with a decided lateral action. . . . To show how dangerous it is to be positive as to the invariability of any action, an adult female of this species always dived with her wings tightly closed and covered by the flank feathers; her mate just as invariably employed the above detailed action."

Forbush (Birds of Massachusetts and other New England states, vol. 1: 279, 1925) describes the underwater actions of a Surf Scoter as follows: "the wings were held about one-third spread and perfectly rigid. Used as planes or rudders they held the bird under water and on its course while the feet drove it onward. Both feet were used at once with powerful strokes."

Comments on the Common (or American) Scoter (*Melanitta nigra*) by Brooks (*op cit.*, 522), Marples (Brit. Birds, 23: 45, 1929), and Townsend (Auk, 26: 241, 1909) indicate that its diving habits are probably as variable as those of the Surf and White-winged scoters. Although more observations are needed, it seems clear that scoters can dive in any of the following ways: 1) using the feet only, 2) using the feet for propulsion and half-extended motionless wings for "planes or rudders," 3) using both feet and half-extended wings for propulsion. Whether these different methods of diving are merely individual differences as Brooks' observations suggest, or whether they are triggered by different environmental conditions, remains to be determined.

Surf Scoters returning to the surface of the water after dives were lifted by their own buoyancy. I made many observations of this behavior at the Municipal Wharf, Monterey Bay, California. During the ascent of a Surf Scoter to the surface of the water, the wings and feet were motionless and the head was held with the tip of the bill close to the breast. The wings were slightly extended and sharply flexed at the wrist; the alula was extended more or less laterally. The toes were together and flexed against the tarsus. The tarsus was directed antero-ventrally and laterally, flexed against the tibiotarsus (see Figure 1). The back of the bird's head was the first part to reach the surface of the water. As the scoter broke the surface of the water, it fell forward, the head was elevated from its position on the breast, and the bird resumed its natural position resting on the surface of the water. The position of the wings and feet prepared the bird for another dive immediately on reaching the surface of the water.

The path of a Surf Scoter returning to the surface of the water was often vertical

or at a slight angle from the vertical. Sometimes, however, I have seen them return to the surface on a spiral course, the bird's body rotating around its long axis. At no time, however, did I see any movement of the appendages during the ascent. I am grateful to Richard L. Zusi for drawing the accompanying figure from my field sketch.—PHILIP S. HUMPHREV, *Peabody Museum of Natural History, Yale University, New Haven, Connecticut.*

Food of the Black Skimmer (*Rynchops nigra*).—A. H. Howell, whose finds are based on Biological Survey examinations of stomachs, states that "skimmers apparently feed wholly on fish" (*Florida Bird Life*, Fla. Dept. Game and Fresh Water Fish, 1932, p. 275). E. H. Forbush (*Birds of Massachusetts*, Mass. Dept. Agr., Vol. I, 1929, p. 134.) states that they feed on fish and shrimp. I. T. Tomkins (*Auk*, 68: 236-239, 1951), in an excellent note on method of feeding, agrees with the latter, as do others who have observed the birds in their nesting colonies. The following observation indicates that shrimp are an important item in the diet of adult birds at other times than during the nesting season.

In the course of other investigations, ten Black Skimmers (*Rynchops nigra nigra*) were sacrificed. These birds were killed on the nights of February 3, 4, and 5, 1954, at Merritts Island, Brevard County, Florida. They had been observed skimming over the water in a shallow brackish lagoon in the late afternoon, the lower mandible cutting the surface of the water as is their habit. Examination of these ten digestive tracts revealed that six contained both fish and shrimp, while four contained only fish. Digestion was in most cases so far advanced that specific identification of the fish was not possible; however, one large needlefish (*Tylosurus* sp.), several *Lutjanus* sp., and several *Fundulus* type minnows were present. All shrimp that were identifiable were *Palaemonetes* sp. The largest number of whole fish in any one stomach was ten; they varied from 21 mm. to 55 mm. in length. Several of the large minnows had apparently been severed into two pieces. Sand was present in only one gizzard, but all contained fish scales in two instances a clean mass, all other organic material having been digested. A filamentous green alga was present in significant amounts in two birds; however, this may have been unavoidably ingested with animal food.

I am indebted to W. L. Jennings of the Fla. Game and Freshwater Fish Commission for aid in making these specimens available.—B. B. LEAVITT, *Department of Biology, University of Florida, Gainesville, Florida.*

The Gray Lag-Goose in Massachusetts: Correction.—The Gray Lag-Goose (*Anser anser*) was recorded from Massachusetts by S. Morris Pell (*Auk*, 50: 208-209, 1933), with details of its capture December 2, 1932, on the ice of the Housatonic River.

Later Mr. Pell became convinced that the bird had escaped from captivity, since it could not fly and was too heavy for a wild bird. This was also the opinion of Bartlett Hendricks, who saw the bird, examined the skin, and obtained this information.

This correction is being published at the suggestion of Dr. Alexander Wetmore.—DOROTHY E. SNYDER, *Peabody Museum, Salem, Massachusetts.*