

## OCEAN WAIFS AND WHAT THEY MEAN FOR DISTRIBUTION

By JOSEPH GRINNELL

When an ornithologist becomes interested in distributional studies, and gets very far with accumulating data, he begins to realize that records of occurrence cannot be rated on any uniform scale of significance. He encounters difficulties in the appraisal of records according to the circumstances of discovery or capture. Difficulties of almost any nature of course make the game fascinating, but also they demand more searching attention.

In my own long-time project of cataloging and examining the records of birds in California, I have come recently to give special consideration to that category which concerns birds reported from the ocean shore of the state, found cast up there, as a rule during or soon after winter storms.

Just now, I have been working with the alcids, a family of sea-fowl which is restricted to the northern hemisphere and which, in numbers at least of species, centers in the north Pacific. No less than eleven of these species are known from Californian waters, or at least have been recorded from these waters. These will be recalled as including the murre, guillemots, murrelets, auklets and puffins. It is the manner of occurrence of one of these species, the Horned Puffin, *Fratercula corniculata*, to which I wish now to call attention. Its known breeding stations extend south from Kotzebue Sound, on the Arctic coast of Alaska, through Bering Sea, and, on the American side of the Pacific, as far as Forrester Island, extreme southeastern Alaska. To the southward, in the waters of British Columbia, Washington, and Oregon, there is but one published record of occurrence known to me, until California is reached, for which state there are several.

Let us now, then, review, scrutinize, and try to find the meanings of, the records to date of the Horned Puffin for California. Considering these records, not chronologically, but from north to south, the occurrences are as follows:

In 1919, Franklin J. Smith (Condor, vol. 21, 1919, p. 128) found four Horned Puffins dead on the ocean beach at Samoa, across Humboldt Bay from Eureka. Two dates were represented, a week apart, February 16 and 23, and a circumstance noted was a recent "violent storm at sea." One of the birds found, and the original label of which corroborates these data, is now no. 30686, Mus. Vert. Zool. It was fresh enough to be sexed (as a male). The skin is clean-plumaged; there is a small "horn" above each eye; the bill shows some development toward the nuptial condition; but the cheeks are still gray. In a letter, Smith stated that some of the puffins found (Tufted Puffins in larger proportion were also represented among the bird remains on the beach) were more or less decomposed.

The next southward occurrence, and one not heretofore recorded, is of a bird found by Vincent Mowbray and Morgan Harris, dead on the outer beach one-half mile south of Fleishhacker Park, San Francisco, January 22, 1933. It was fresh enough to sex (a female) and to save as a skin (no. 62756, Mus. Vert. Zool.). The plumage is clean, free from tar, fairly fresh, unbleached. The bill is, seemingly, in first-winter condition.

Then we have a group of birds recorded by Harold C. Bryant (Condor, vol. 21, 1919, p. 239) from the ocean shore of San Mateo County, all in 1919. The first, a bird still alive but unable to fly, photographed, then released, was found near Mussel Rock on March 2. On Montara Beach, on May 24, Mrs. Amelia S. Allen, among other bird remains more or less oil-soaked in the drift, found those of two Horned Puffins. One

was brought to the Museum of Vertebrate Zoology, where it is saved as a skeleton (no. 30714). On May 17, at Coast Ways, near Pescadero, a bird was found by someone else and forwarded to the same museum; even though partly dried and decayed, it was saved as a skin (no. 30713). It was badly oil-soaked. Both these May-taken birds must have been dead a long time. The skin is in winter condition of plumage; the bill retains only that segment of the otherwise moltable bill-sheath that pertains to the end of the upper mandible. I judge this bird to have been of age two years or older.

On the ocean beach four miles north of Santa Cruz, Santa Cruz County, on August 25, 1929, Leslie Hawkins found the dried remains of a Horned Puffin. He saved the head for identification, and this has become specimen number 54004 in the Museum of Vertebrate Zoology, hitherto unreported. This bird exhibited winter plumage, with bill-sheaths of immature size developed on ends of both upper and lower mandibles.

At Pacific Grove, Monterey County, on February 17, 1914, a Horned Puffin was "collected" by Henry W. Marsden. This became no. 26172 in the L. B. Bishop collection (see Bishop, *Condor*, vol. 16, 1914, p. 204, and *idem*, vol. 17, 1915, p. 185). No details are known as to exactly how the bird was obtained. It was gotten nine days before Marsden's death, so was probably from a near-by beach. It was fresh enough to sex (as a female), and Dr. Bishop writes that it was "in winter plumage including the bill."

And finally, on the beach three miles north of La Jolla, San Diego County, on February 25, 1933, the well dried-out body of a Horned Puffin was found. Preserved as a "mummy," it became specimen number 16183 in the collection of the San Diego Society of Natural History (Huey, *Condor*, vol. 35, 1933, p. 233). This is the southernmost "record" to date.

To summarize, 12 individual Horned Puffins or their more or less disintegrated remains are on record from the coast of California. Of these, 10 were dead when found; some of them had been so a long time. One was alive but unable to fly; and one may have been alive, though its condition when discovered is not definitely known. The Horned Puffin is an open-sea forager. It may be assumed that all 12 birds had come to the sea-beach unwillingly; that is to say, each was unable to fly, or else it would have stayed out where conditions of food and safety for its kind were optimum.

While there is no doubt that oil on the water, of artificial, that is, human caused, origin, has in the most recent period of years directly brought high mortality to certain sea birds, we must grant as always normal a certain death rate, resulting in birds dead or in dying condition being swept continually shoreward. Back in the '60's, before any development of the oil industry, Cooper recorded unusual species on our coast, from their remains as found by him or friends of his on the beaches of this state. Avian jetsam is nothing new.

The prevailing winds with us are westerly; and the surface currents of the ocean, taking the entire coast into account, are southerly. In my early days, when I taught physical geography, it was the "Japan Current" that swept southward off the shores of western North America, the idea being that it originated somewhere over on the Asiatic side of the North Pacific, flowing north, then east, then south, circuitously. It seems, now, that any such source and course is unlikely, and our Pacific-side current has come to be called the California Current.

Dr. Harald U. Sverdrup, Director of the Scripps Institution of Oceanography, at La Jolla, tells me that, speaking in general terms, "the average southward drift of surface water off the coast of California is 10 to 30 miles in 24 hours." Let us say, then, that a floating object, nearly submerged, would be carried southward at the rate of 20

miles per day; in 40 days it could conceivably have gone the 800 miles, over the northwest-to-southeast course of the California Current from the Oregon line to a place off La Jolla.

But there are factors affecting a floating object beside this general movement of the water. There are reverse eddies in it, an especially noteworthy one south of Point Concepcion which would more or less delay the southward rate of an object that eventually might reach, say, the beach at La Jolla.

Then as to the winds, the prevailing direction of these along the entire California coast is from the west. But the strongest winds, those reaching gale velocity, are from the northwest and from the south. The latter would retard the object, the former accelerate its movement. Significantly, the northwest winds are dominant in the late-winter-to-spring period of the year, wherein, it will have been noted, all our Horned Puffin records fall. To review this matter, the dates for relatively "fresh" dead birds, and ones yet alive or possibly alive, ranged from January 22 to March 2. The specimens of May and August take were more or less dried up or decayed, and moreover the ones examined for this point were in winter plumage.

A water-logged bird body will undoubtedly be less affected by wind than a bird in good condition of plumage, riding high and dry, though it must be admitted that an alcid does not ride the waves as buoyantly as, say, a gull. Furthermore, its manner of feeding carries it beneath the surface, then more affected by the current of the water rather than of the air. A bird, alive but incapacitated for flying and therefore for recovering latitude, would be at the mercy of both elements and would drift to its fate as a result of the component of forces.

As to how long a puffin, even seriously debilitated from injury, disease, or old age, could survive, we can only guess—many weeks perhaps. The onset of a condition of complete helplessness might be very slow, involving months. The distance from the waters around Forrester Island, Alaska, to La Jolla, California, taking extreme points, is roughly 1800 miles. Let us add one-third, for local counter-currents, possible dominant influence, at times, of southerly gales, and other factors unknown, giving a total distance for drift, of 2400 miles. At 20 miles per day, 120 days would be used for the longest journey in the water. Subtract four months from the earliest date of recorded appearance in California, January 22, and we have September 22—about the time within the known regular habitat of the species when autumn storms come on and birds below par in vigor would be winnowed out of the resident population, literally to be cast adrift.

In this connection, the Fourth Edition of the A.O.U. Check-list says of the Horned Puffin, "Winters from the Aleutian and Commander islands south to . . . California (Pacific Grove)." I can find no record of any able-bodied bird for British Columbia (save for Masset which is only some 50 miles south of the breeding colony on Forrester Island), Washington, or Oregon. It would appear that the one California record cited was the only bit of evidence to warrant the implication that the Horned Puffin is migratory south of its southernmost breeding ground; and this implication the evidence now assembled makes seem unwarranted. At the far north, in Bering Sea and in the Arctic Ocean immediately north of Bering Sea, there may well be, as stated by Nelson, a southward drift of the population there, as forced by the winter ice pack. But this movement may be interpreted as not exactly a seasonal migration, but rather a local shift of population comparable, say, to the movement, down here, of California Gulls from lakes of the Great Basin westward to the seacoast for the winter.

Now, if the southward drift of coastal waters is responsible for the occurrence on our coast, as now seems likely, of such non-migratory sea-fowl as the Horned Puffin, what

status shall we accord our records of them? My own present inclination is to appraise them as adventitious—accidental in the true sense of that word, to be classed along with occurrences due to man's own transportation of birds from place to place. Such occurrences should, it seems to me, weigh not at all in defining the normal geographic ranges of the species, winter ones or summer ones. Inferences as to the factors of distributional limitation for such species will be drawn after such adventitious records have been carefully appraised as such, and excluded from consideration.

*Museum of Vertebrate Zoology, University of California, March 17, 1938.*

NOTE.—After the above article was written I solicited, and received, information concerning manner of southward occurrence of Horned Puffins, which is much worth giving space for recording, in this supplementary note. Major Allan Brooks, under date April 3, 1938, writes me:

"As far as I know, the Masset record of the Horned Puffin is the only one for British Columbia; but this proves little, as the shore line is so little worked. The species does not come 'inside,' that is, into the waters between Vancouver Island and the mainland, as far as I know. During two seasons' work on the north end of the Queen Charlotte Islands I saw nothing of the species, although Forrester Island was in sight. But it has been picked up on the beach in Washington a good number of times and also, I believe, in Oregon. I have one specimen picked up by E. A. Kitchin at Westport, Grays Harbor, Washington, January 29, 1933."

Mr. Stanley G. Jewett, under date March 29, 1938, furnishes facts as follows:

"On March 7, 1936, I found two Horned Puffins dead on the beach at Netarts Bay, Oregon. These were badly decomposed but I saved the head of one which now is no. 3903 in my collection. During the early winter of 1932, and at least until February, 1933, a large number of these birds drifted in on the Oregon beaches. During five days spent on the beach, namely, January 13, 14, 15, and February 4, 1933, I saw at least one hundred on the beaches of Tillamook and Lincoln counties. A number of the specimens were preserved and ten of them are now in my collection, nos. 7582-91. During a conversation with Frank A. DuFresne of Juneau, Alaska, he told me that while he was crossing the Gulf of Alaska during October, 1934, thousands of Horned Puffins and other sea birds were seen dead on the surface of the Gulf."

Dr. Hildegard Howard writes me of yet another, previously unrecorded specimen of *Fratercula corniculata* from California. This is number Bi661 in the bird skeleton collection of the Los Angeles Museum, obtained by Leigh Marian Larson and Edna Fisher on the beach at Del Monte, Monterey County, February 22, 1929.

It will be observed that the supplementary information just given in no essential degree changes the trend of significance as apparent in the main article. However, when this paper of mine was read at the annual meeting of the Cooper Ornithological Club, in Fresno, April 16, 1938, ensuing discussion from the floor produced some considerations of import. Mr. George Willett stated that from his field experience in southeastern Alaska, he knew of no midwinter record for the Horned Puffin in those waters; the birds summering there either went south or went far out to sea. He, Dr. Loye Miller, and other speakers, thought there was still a good chance of off-shore southward migration to some oceanic area, even as far as the latitude of southern California, which has not yet been searched out by any ornithologist, and from which our "waifs" may be swept shoreward by the westerly winds. Grantedly, the evidence as it stands now in the light of this theory is somewhat equivocal.—*J. Grinnell, April 24, 1938.*