

A REVIEW OF THE SUBSPECIES OF THE LEACH PETREL,  
OCEANODROMA LEUCORHOA (VIEILLOT).

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Notwithstanding the considerable attention that has been paid to the petrels of the *Oceanodroma leucorhoa* group, the last word has evidently not yet been said on the subject. Nor do we consider that all points in this difficult case are settled by the present investigation, which we undertook in connection with the identification of the specimens of this species in the Biological Survey collection; but the following notes on the status of the different forms of *Oceanodroma leucorhoa* seem worthy of presentation in print while we are waiting for more material to clear up the remaining uncertainty concerning their geographic distribution.

The latest author to discuss the relationships of these birds<sup>1</sup> recognized two forms—*Oceanodroma leucorhoa leucorhoa* from the Atlantic Ocean, Bering Sea, and the Aleutian Islands, and *Oceanodroma leucorhoa kaedingi* from the Pacific coast of North America from southern Alaska southward. This conclusion, however, was arrived at apparently without examination of the type series of *Oceanodroma leucorhoa kaedingi*.

For the present comparisons we have had available the collections of the United States National Museum, including that of the Biological Survey of the Department of Agriculture, and also that of the Carnegie Museum, for which last the writer's thanks are due Mr. W. E. C. Todd. This material comprises altogether 158 specimens, representing nearly all parts of the North American range of the species, and includes the type series of *Oceanodroma kaedingi* Anthony, with, of course, the type, and also the types of *Oceanodroma beali* Emerson and *Oceanodroma beldingi* Emerson. All measurements have been taken in millimeters, and otherwise as in the writer's paper on *Butorides virescens*.<sup>2</sup>

We are able to recognize three forms of *Oceanodroma leucorhoa*, as set forth below:

OCEANODROMA LEUCORHOA LEUCORHOA (Vieillot).

*Procellaria leucorhoa* VIEILLOT, Nouv. Dict. d'Hist. Nat., vol. 25, 1817, p. 422 (maritime parts of Picardy, France).

*Procellaria leachii* TEMMINCK, Man. d'Ornith., ed. 2, vol. 2, 1820, p. 812 (St. Kilda Island, Scotland).

<sup>1</sup> Willett, Auk, vol. 32, July, 1915, p. 301.

<sup>2</sup> See Proc. U. S. Nat. Mus., vol. 42, Aug. 29, 1912, p. 533.

*Procellaria*. *Bullockii* FLEMING, Hist. Brit. Anim., 1828, p. 136 (St. Kilda Island, Scotland; based on the same specimen as *Procellaria leachii* Temminck).  
*Thalassidroma*. *scapulata* KITTLITZ, Denkwürd. Reise Russ. Amer. Micrones. und Kamts., vol. 2, 1858, p. 191 (Pacific Ocean off the coast of Japan, in latitude 37° N.; longitude 148° 30' E.).

*Subspecific characters*.—Size large; plumage sooty brown, lighter below; head slightly plumbeous; rump white; and tail much forked.

*Measurements*.—Male:<sup>1</sup> Wing, 145–157 (average, 152.9) mm.; tail, 77.5–88 (84.8); exposed culmen, 16–17 (16.4); height of bill at base, 5.8–6.8 (6.2); tarsus, 22–25 (23.8); middle toe without claw, 19.5–22 (20.6); fork of tail, 15.5–23 (19.3). Female:<sup>2</sup> Wing, 148–163 (average, 155.6) mm.; tail, 80–90 (85.8); exposed culmen, 15–17.1 (16.1); height of bill at base, 6–6.8 (6.3); tarsus, 23–25.8 (24.1); middle toe without claw, 18.8–22 (20.6); fork of tail, 15.5–26.5 (19.7).

*Type-locality*.—Maritime parts of Picardy, France.

*Geographic distribution*.—North Atlantic Ocean and North Pacific Ocean: breeds from southern Greenland and Iceland south to Maine and Ireland, and from the Aleutian and Commander Islands to the Kuril Islands. Migrates east to Sicily, south in the Atlantic Ocean to Virginia, the Bermuda Islands, the Equator, and casually even to South Africa; in the Pacific Ocean to Japan and Midway Island.

*Remarks*.—Petrels of this species from the Aleutian Islands and the middle and western portions of the North Pacific Ocean, including the Commander and Kuril Islands, appear to be slightly darker than birds from the North Atlantic Ocean, but this is probably due to the age of the specimens rather than to any subspecific difference; and since our series does not show them to be satisfactorily different, they must bear the name *Oceanodroma leucorhoa leucorhoa*. A specimen from the Ugashik River on the mainland of Alaska, west of the Alaska Peninsula, taken, December 3, 1881, is apparently also referable to this form.

Average measurements of specimens from the different parts of the range of this subspecies are as follows:

Locality.	Wing.	Tail.	Exposed culmen.	Height of bill at base.	Tarsus.	Middle toe without claw.	Fork of tail.
	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>
Ten males from northeastern North America..	152.9	84.8	16.4	6.2	23.8	20.6	19.3
Five males from the North Pacific Ocean.....	153.4	84.8	16.0	6.1	24.8	19.5	21.0
Eight females from northeastern North America.....	155.6	85.8	16.1	6.3	24.1	20.6	19.7
Two females from the North Pacific Ocean....	153.8	84.8	15.7	5.9	25.0	20.3	17.5

Birds of this species evidently become much more brownish and sometimes paler after lying in the cabinet for a long term of years,

<sup>1</sup> Ten specimens, from northeastern North America.

<sup>2</sup> Eight specimens, from northeastern North America.

since fresh birds are usually darker. The more or less plumbeous cast of the plumage is entirely an individual variation, and the complete lack of it is often due to the age of the skin, like the brownish cast above mentioned. The whitish edgings on the secondaries and tertiaries, used sometimes by authors as a subspecific or specific distinction, are an indication of fresh plumage, for these apparently soon either partially or completely wear away by abrasion of the feathers. The measurements given above bring out the fact that the female of this subspecies, as in all the other forms of the species, averages slightly larger than the male.

The writer has examined 34 specimens of *Oceanodroma leucorhoa leucorhoa*, including, in addition to those from the localities mentioned in the subjoined table of measurements, birds from the Potomac River and from the State of New York, both without date of capture.

*Measurements of specimens of Oceanodroma leucorhoa leucorhoa.*

U.S.N.M. No.	Sex.	Locality.	Date.	Collector.	Wing.	Tail.	Exposed culmen.	Height of bill at base.	Tarsus.	Middle toe without claw.	Fork of tail.
62387 <sup>1</sup>	Male	Grand Menan Island, N. B.		H. Herrick	mm. 148.5	mm. 84	mm. 16	mm. 6.8	mm. 24.1	mm. 20.8	mm. 15.5
62386 <sup>1</sup>	do	do		do	157	84.5	16.5	6.2	22	20	20
93003 <sup>1</sup>	do	Off Nantucket Shoals, Mass.	July 28, 1883	J. E. Benedict.	152	88	16	6	24.5	19.5	21
93007 <sup>1</sup>	do	do	July 27, 1883	do	155	87	17	6	24	22	18
75238 <sup>1</sup>	do	Bank Quereau, North Atlantic Ocean.	Sept. 13, 1878	R. L. Newcomb.	156	87	17	6.5	23	20	23
75242 <sup>1</sup>	do	Sable Island Bank, Nova Scotia.	Sept. 3, 1878	U. S. Fish Commission.	154.5	87	16.2	6	25	21	22.5
75243 <sup>1</sup>	do	do	do	do	145	77.5	16.5	6.1	24	20.2	16
25278 <sup>1</sup>	do	Washington, D. C.	Aug. —, 1842	do	151	85	16.5	6.5	23.3	21	18
1194 <sup>1</sup>	do	do	do	do	155	84.5	16	6	24.8	21	21
94554 <sup>1</sup>	do	Fort Chimo, Ungava, Quebec.	July 12, 1882	L. M. Turner	155	83	16	5.8	23.5	20.5	17.5
65428	do	Attu Island, Alaska.	June 20, 1873	W. H. Dall	151	84	16.5	5.9	25.5	19.2	19.5
192387	Male?	Kiska Island, Alaska.	Sept. 17, 1904	J. H. Egbert	153	87	15.1	5.3	24	19	25.1
211226	Male	Near Midway Island, Pacific Ocean, Lat. 27° N.; Long. 179° E.	Nov. 9, 1907	P. Bartsch	155.5	83	16.5	6.2	25.5	20.1	16.5
211225	do	Near Midway Island, Pacific Ocean, Lat. 27° 20' N.; Long. 172° 45' W.	Nov. 5, 19	do	158.5	86	16.2	6.1	24.5	21	22
201457	do	Simushir Island, Kuril Islands, Japan.	June 23, 1904	A. H. Clark	149	84	15.5	6.8	24.5	18	22
93004 <sup>1</sup>	Female	Off Nantucket Shoals, Mass.	July 28, 1883	J. E. Benedict.	148	87	17.1	6	25.8	20.5	16
111719 <sup>1</sup>	do	Bird Rocks, Gulf of St. Lawrence, Quebec.	July 9, 1887	W. Palmer	152	80	15	6.7	23.5	19.2	15.5
111718 <sup>1</sup>	do	do	do	do	156	84	16.5	6	23.5	20	17.5
75239 <sup>1</sup>	do	Bank Quereau, North Atlantic Ocean.	Sept. 13, 1878	R. L. Newcomb.	163	90	16	6	24.8	20.3	26.5
12648 <sup>1</sup>	do	Potomac River	—, 185—	J. Varden	151.5	87.5	15	6.8	23.5	18.8	20
111858 <sup>1</sup>	do	Off Cape Sable, Nova Scotia.	Aug. 30, 1887	W. Palmer	155	86	17	6.5	23	22	23.5
111765 <sup>1</sup>	do	Penguin Island, Newfoundland.	July 24, 1887	do	158	84	15.5	6	24.5	21.8	17.7

<sup>1</sup> Used in measurement averages on p. 166.

*Measurements of specimens of Oceanodroma leucorhoa leucorhoa*—Continued.

U. S. N. M. No.	Sex.	Locality.	Date.	Collector.	Wing.	Tail.	Exposed culmen.	Height of bill at base.	Tarsus.	Middle toe without claw.	Fork of tail.
108426 <sup>1</sup> ....	Female.	Fox Islands, Maine..	June 19, 1880	M. Hardy...	mm. 161	mm. 88	mm. 16.8	mm. 6	mm. 24	mm. 22	mm. 20.5
211228.....	do....	Near Midway Island Pacific Ocean, Lat. 26° N.; Long. 174° 16' E.	Nov. 11, 1907	P. Bartsch..	150	86	15.4	5.6	24.5	21	17.5
201458.....	do....	About 100 miles east of Miedni Island, Commander Islands, Kamchatka.	June 12, 1906	A. H. Clark.	157.5	83.5	16	6.2	25.5	19.5	17.5
93006.....	.....	Off Nantucket Shoals, Mass.	July 27, 1883	J. E. Benedict.	153	82	16	6.2	24.5	21	15
12857.....	.....	Bay of Fundy, New Brunswick.	.....	J. R. Willis.	156.5	91	15.8	6.4	24.2	19.1	25
211227.....	.....	Near Midway Island, Pacific Ocean, Lat. 26° N.; Long. 174° 16' E.	Nov. 11, 1907	P. Bartsch..	154	84	16	5.9	25.7	18.5	16

<sup>1</sup> Used in measurement averages on p. 166.

## OCEANODROMA LEUCORHOA BEALI Emerson.

*Oceanodroma beali* EMERSON, Condor, vol. 8, March 20, 1906, p. 54 (Sitka Bay, Alaska).

*Oceanodroma beldingi* EMERSON, Condor, vol. 8, March 20, 1906, p. 54 (Netarts Bay, coast of Oregon).

*Subspecific characters.*—Similar to *Oceanodroma leucorhoa leucorhoa*, but decidedly smaller, particularly the wing, tail, exposed culmen, and middle toe.

*Measurements.*—Male:<sup>2</sup> Wing, 138–151 (average, 144.8) mm.; tail, 75–84 (80.1); exposed culmen, 14.5–15.2 (14.8); height of bill at base, 5.5–6.5 (5.8); tarsus, 22.5–24 (23.2); middle toe without claw, 17.2–19.8 (18.3); fork of tail, 13–22 (18.2). Female:<sup>3</sup> Wing, 143.5–152 (average, 147.6) mm.; tail, 78.5–84.5 (81.6); exposed culmen, 14.5–15.1 (14.9); height of bill at base, 5.5–6 (5.7); tarsus, 22.1–24.2 (23.1); middle toe without claw, 18–19.5 (18.7); fork of tail, 15–18.8 (17.4).

*Type-locality.*—Sitka Bay, Alaska.

*Geographic distribution.*—Coast region of northwestern North America: breeds from southeastern Alaska south to the coast of Oregon; migrates south to the coast of California.

*Remarks.*—There is apparently no color difference between this race and *Oceanodroma leucorhoa leucorhoa*, nor any appreciable difference in the depth of the fork of the tail, but the present form is sufficiently smaller to warrant subspecific separation; in fact, birds from Washington and Oregon have been commonly referred to *Ocea-*

<sup>2</sup> Eleven specimens, from the coast of Oregon and Washington.

<sup>3</sup> Nine specimens, from the coast of Oregon and Washington.

*nodroma leucorhoa kaedingi*, but, as shown below, they are certainly not the same as that bird. Specimens from the coast region of Washington and Oregon are most different from *Oceanodroma leucorhoa leucorhoa*, and in present comparisons these have therefore been used as typical. Those from the latter locality form the basis of *Oceanodroma beldingi* Emerson.<sup>1</sup> The birds from the vicinity of Sitka, described by Emerson as *Oceanodroma beali*,<sup>1</sup> do not, however, as supposed by him, differ in color from the birds of Oregon, such difference as was noted by the describer<sup>1</sup> being due to individual variation. Although the birds from Sitka (*Oceanodroma beali*) are, it is true, slightly larger than those from Oregon, the difference is altogether too slight to warrant recognition in nomenclature, and the two supposed races must therefore be united under the name *Oceanodroma beali*, which name has anteriority.

Average measurements of birds from the different parts of the range of this subspecies are added below:

Locality.	Wing.	Tail.	Ex- posed culmen.	Height of bill at base.	Tarsus.	Middle toe without claw.	Fork of tail.
Eleven males from the coast of Washington and Oregon.....	mm. 144.8	mm. 80.1	mm. 14.8	mm. 5.8	mm. 23.2	mm. 18.3	mm. 18.2
Ten males from the vicinity of Sitka, Alaska.....	146.7	81.1	15.3	6.0	23.2	18.5	19.2
Nine females from the coast of Washington and Oregon.....	147.6	81.6	14.9	5.7	23.1	18.7	17.4
Ten females from the vicinity of Sitka, Alaska.....	149.0	81.3	15.3	5.9	23.3	18.9	18.7

A nestling taken by Mr. G. Willett (No. 239960, U.S.N.M.) on St. Lazaria Island, Alaska, August 11, 1912, has the body barely covered with down, and is so young that the feathers apparently have just begun to grow. In color it is, above, plain grayish brown, between mouse gray and hair brown; and below, of the same color but darker. The date of this specimen indicates the breeding season of the species, which is further corroborated by a nestling taken on Carroll Island, Washington, on August 10, 1915.

Altogether, 99 specimens of this race have been available. In addition to the localities already mentioned and those included in the table of measurements below, the following localities are represented by specimens:

Neah Bay, Washington; Destruction Island, Washington (July 11, 1915); Chemuluro Island, Alaska (May 24 and 28, 1884; June 21, 1884); Belkofski Island, Alaska (September 10, 1893); and Forrester Island, Alaska (June 23, 1887, July, 1913, June 23 and 29, 1914).

<sup>1</sup> Condor, vol. 8, Mar. 20, 1906, p. 54.

Measurements of specimens of *Oceanodroma leucorhoa beali*.

Museum and number.	Sex.	Locality.	Date.	Collector.	Total length. <sup>1</sup>	Wing.	Tail.	Ex-posed culmen.	Height of bill at base.	Tarsus.	Middle toe without claw.	Fork of tail.
					mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
J. Grinnell 1440	Male	Sitka, Alaska <sup>2</sup>	Aug. 5, 1896	J. Grinnell	203	149.5	81	15.8	5.5	22.5	18.7	19
U.S.N.M. 240790	do.	St. Lazaria Island, Sitka Sound, Alaska.	July 27, 1913	G. Willett	194	146.5	80.5	15.4	6	23.5	18.8	20.2
U.S.N.M. 239614	do.	do.	July 31, 1912	do.	203	141	77.5	16	6.2	24.2	19	18.7
U.S.N.M. 239595	do.	do.	do.	do.	208	152	86	15.5	6	23.6	18.8	21.5
U.S.N.M. 239590	do.	do.	do.	do.	201	148	85	15	6.8	22.5	18.5	22.8
U.S.N.M. 239609	do.	do.	Aug. 1, 1912	do.	203	148.5	83	14.8	5.8	23.5	18	18.5
U.S.N.M. 239599	do.	do.	do.	do.	199	142	78.5	15.1	6	23.8	19	17
U.S.N.M. 239605	do.	do.	Aug. 2, 1912	do.	203	144	81	15	6.3	23	18.5	19.2
U.S.N.M. 239606	do.	do.	do.	do.	193	145.5	77	15	5.8	22.2	18	16
U.S.N.M. 239611	do.	do.	Aug. 11, 1912	do.	147	147	82	14.5	6.2	23	19	20
H. T. Bohlman 53 <sup>3</sup>	do.	Netarts, Netarts Bay, Oregon <sup>4</sup>	June 6, 1901	H. T. Bohlman	143	143	82	15	6.5	22.5	17.5	19
H. T. Bohlman 54 <sup>3</sup>	do.	Three Arch Rocks, Netarts, Oregon	June 7, 1901	do.	145	145	77	15	5.6	23.7	17.9	13
Game Dept. Oreg. 1225 <sup>3</sup>	do.	do.	July 2, 1914	S. G. Jewett	147	147	79.5	14.5	5.9	23.8	18	15.2
Game Dept. Oreg. 1261 <sup>3</sup>	do.	do.	July 4, 1914	do.	147	147	81	14.8	5.6	23.6	19.8	21
U.S.N.M. 157751 <sup>3</sup>	do.	La Push, Washington	June 19, 1897	R. T. Young	149	149	79.5	15	5.5	24	18.5	19
U.S.N.M. 157757 <sup>3</sup>	do.	do.	June 20, 1897	do.	138	138	75	15.2	6	23	17.2	17
U.S.N.M. 157756 <sup>3</sup>	do.	do.	do.	do.	139	139	83	15	6	23	18	18
U.S.N.M. 157753 <sup>3</sup>	do.	do.	do.	do.	144.5	144.5	77	14.5	5.5	22.5	19	15
U.S.N.M. 157760 <sup>3</sup>	do.	do.	June 21, 1897	do.	151	151	84	14.5	6	23.3	18	21.5
U.S.N.M. 157518 <sup>3</sup>	do.	Granville, Washington	July 8, 1897	do.	142	142	81.5	15	5.5	22.8	18.5	22
U.S.N.M. 157517 <sup>3</sup>	do.	do.	do.	do.	193	148	78.5	15.1	5.8	24.3	20.3	19
U.S.N.M. 239591	Female	St. Lazaria Island, Sitka Sound, Alaska.	July 31, 1912	G. Willett	194	148.5	82	15.5	6	23.5	18	18
U.S.N.M. 239592	do.	do.	do.	do.	197	154	83.5	15.8	6	23	19.5	20
U.S.N.M. 239598	do.	do.	Aug. 1, 1912	do.	197	143	76.5	15	5.5	22.3	18.5	14.5
U.S.N.M. 239601	do.	do.	do.	do.	194	147	79	15.5	5.5	23	19	18
U.S.N.M. 239607	do.	do.	Aug. 2, 1912	do.	150	150	81	14.8	5.8	22.8	18.7	19.5
U.S.N.M. 240791	do.	do.	Aug. 2, 1913	do.	197	141	79.5	14.5	6	22.6	18.5	16.2
U.S.N.M. 239603	do.	do.	Aug. 2, 1912	do.	206	152	85	15	6	23.8	18.2	19.5
U.S.N.M. 239608	do.	do.	Aug. 3, 1912	do.	210	155	84.5	16.5	6.5	24.5	18.8	22
U.S.N.M. 239612	do.	do.	Aug. 11, 1912	do.	202	151.5	83	15.3	6	23.5	19.5	19.8
U.S.N.M. 239613	do.	do.	do.	do.	148	148	80	15	5.5	22.1	18	17
H. T. Bohlman 13 <sup>3</sup>	do.	Puffin Rock, Three Arch Rocks, Netarts, Oregon.	June 6, 1901	H. T. Bohlman	152	152	84.5	14.8	6	23.8	19.5	17.8
Game Dept. Oreg. 1257 <sup>3</sup>	do.	Three Arch Rocks, Netarts, Oregon	July 2, 1914	S. G. Jewett	150.5	150.5	83	15	5.5	23.5	19	15.5
U.S.N.M. 157750 <sup>3</sup>	do.	La Push, Washington	June 19, 1897	R. T. Young	146	146	78.5	15.1	5.5	23	19	17.5
U.S.N.M. 157752 <sup>3</sup>	do.	do.	June 20, 1897	do.	148	148	82	14.8	5.8	24.2	18	18.3
U.S.N.M. 157758 <sup>3</sup>	do.	do.	do.	do.	145	145	82	14.9	6	22.3	18	15
U.S.N.M. 157754 <sup>3</sup>	do.	do.	do.	do.	150	150	81	15	5.5	22.8	19	18.7
U.S.N.M. 157757 <sup>3</sup>	do.	do.	do.	do.	145	145	80	14.5	5.8	23	19.5	18.8
U.S.N.M. 157755 <sup>3</sup>	do.	do.	do.	do.	143.5	143.5	83	15.1	5.5	23.2	18.1	18
U.S.N.M. 157761 <sup>3</sup>	do.	do.	June 21, 1897	do.	143.5	143.5	83	15.1	5.5	23.2	18.1	18

<sup>1</sup> Measured in the flesh by the collector.

<sup>2</sup> Type of *Oceanodroma beali* Emerson.

<sup>3</sup> Used in measurement averages on p. 168.

<sup>4</sup> Type of *Oceanodroma bealingsi* Emerson.

*OCEANODROMA LEUCORHOA KAEDINGI* Anthony.

*Oceanodroma kaedingi* ANTHONY, Auk, vol. 15, No. 1, January, 1898, p. 37 ("at sea near Guadalupe Island, Lower California").

*Subspecific characters*.—Similar to *Oceanodroma leucorhoa beali*,<sup>2</sup> but decidedly smaller, especially the wing, tail, tarsus, and middle toe, the greatest difference appearing in the shortness of the tail; tail much less forked; and pileum more distinctly plumbeous.

*Measurements*.—Male:<sup>1</sup> Wing, 137–145 (average, 140.4) mm.; tail, 66.5–74.5 (71.1); exposed culmen, 12.8–15 (13.9); height of bill at base, 4.5–6 (5.4); tarsus, 20–21.5 (20.6); middle toe without claw, 15.3–17.2 (16.5); fork of tail, 9.8–17.5 (13.6). Female:<sup>2</sup> Wing, 138–145.5 (average, 142.6) mm.; tail, 67.5–77 (72.4); exposed culmen, 13.5–14 (13.9); height of bill at base, 5–6 (5.5); tarsus, 19.5–21.3 (20.7); middle toe without claw, 15–17.8 (16.4); fork of tail, 10–18.5 (12.6).

*Type-locality*.—Pacific Ocean off the coast of northern Lower California, in latitude 31° N.; longitude 117° W.

*Geographic distribution*.—The Pacific coast and islands of Lower California, south to Clarion and Socorro Islands in the Revillagigedo group, Mexico, and north probably also to southern California.

*Remarks*.—This race is similar to *Oceanodroma leucorhoa leucorhoa*, but in size differs decidedly more from the typical subspecies than it does from *Oceanodroma leucorhoa beali*. Although the depth of the forking of the tail varies somewhat, as may be seen in the appended table of measurements, it is much less in *Oceanodroma leucorhoa kaedingi* than in either of the two other subspecies, and is an excellent character for distinguishing the present race. Although *Oceanodroma leucorhoa beali* is of the same color as *Oceanodroma leucorhoa leucorhoa*, the present form seems to differ in the more distinctly plumbeous shade of the pileum, which the excellent series at our disposal shows to be fairly constant. As may be seen by the above-given characters, *Oceanodroma leucorhoa kaedingi* is much more different from either *Oceanodroma leucorhoa leucorhoa* or *Oceanodroma leucorhoa beali* than the two latter are from each other, but it is undoubtedly only a subspecies, since its characters intergrade individually with those of *Oceanodroma leucorhoa beali*.

All the specimens of *Oceanodroma leucorhoa kaedingi* at present known have been taken at sea near Guadalupe Island, Lower California, or off the coast of northern Lower California, or in the region southward to the Revillagigedo Islands. Its breeding ground is not definitely known, but may be assumed to be some of the islands within this area. However, it may be a breeding bird on the islands off central and southern California, as birds of this species from the

<sup>1</sup> Seventeen specimens, from the Pacific Ocean, off the coast of northern Lower California.

<sup>2</sup> Eight specimens, from the Pacific Ocean, off the coast of northern Lower California.

Farallon Islands, California, have not been available in the present connection.

Among the birds examined, not only of this form, but of the two other subspecies of *Oceanodroma leucorhoa* as well, are specimens in which the middle upper tail-coverts are more or less extensively, sometimes wholly, brown; and in the series of *Oceanodroma leucorhoa kaedingi* are four specimens, males and females, that have very little white on the upper tail-coverts, this being restricted to the outer vanes of the shortest lateral feathers. This variation is apparently individual, but it may be a lingering mark of the juvenal plumage.

Twenty-five specimens of this form have been examined, all of which are included in the following table of measurements:

*Measurements of specimens of Oceanodroma leucorhoa kaedingi.*

Carnegie Museum No.	Sex.	Locality.	Date.	Collector.	Wing.	Tail.	Exposed culmen.	Height of bill at base.	Tarsus.	Middle toe without claw.	Fork of tail.
22210 <sup>1</sup>	Male...	Pacific Ocean, near Guadalupe Island, Lower California, Lat. 28° 35' N.; Long. 118° 31' W.	1897 July 18	A. W. Anthony.	mm. 145	mm. 70	mm. 14.5	mm. 5.2	mm. 21	mm. 16	mm. 11.8
22219 <sup>1</sup>	...do....	Pacific Ocean, off northern Lower California, Lat. 31° N.; Long. 117° W. <sup>2</sup>	July 25	.....do.....	144	74.5	14.5	4.5	20.5	15.5	16
22228 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	137.5	70	14.5	5.1	20	16.2	14
22226 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	139	72	13.8	5.8	20	17	15.2
22221 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	140	71	13.8	6	20.5	17.2	14
22232 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	143	70	14	5.5	21	15.8	13
22225 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	138	70	13	6	21	16	15
22237 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	140	71	.....	5.2	20.5	17	12
22222 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	141	69	12.8	5.5	21	17	10.5
22216 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	139.5	66.5	14.3	5.1	20	17.2	9.8
22213 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	140.5	73	13.8	5.5	20.8	16	14.8
22238 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	137	71	14	5	20.2	17	16.3
22223 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	138	71.5	13.5	5.5	20.5	17	13
22236 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	142	72.5	14.5	5.2	21	16.8	14.7
22214 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	139.5	73	13	6	21.5	17	11.8
22231 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	143	74	15	5.8	21	17.2	17.5
22217 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	140	69	13.5	5.2	20	15.3	12.2
22211 <sup>1</sup>	Female	Pacific Ocean, near Guadalupe Island, Lower California, Lat. 28° 35' N.; Long. 118° 30' W.	July 18	.....do.....	143	67.5	14	5.1	21	17.3	13
22229 <sup>1</sup>	...do....	Pacific Ocean, off northern Lower California, Lat. 31° N.; Long. 117° W.	July 25	.....do.....	144	70	14	5.5	21.3	17.8	11.7
22227 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	140	73.5	14	6	21	17.2	11.5
22218 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	145	77	14	5.2	21	16	11
22234 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	145.5	75.5	13.7	5.8	19.8	15.8	18.5
22233 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	144	74	13.5	5.1	19.5	15	13
22224 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	138	69	13.8	5	21	16	10
22235 <sup>1</sup>	...do....	.....do.....	.....do.....	.....do.....	141	72.5	14	6	21	16	12.3

<sup>1</sup> Used in measurement averages on p. 171.

<sup>2</sup> Type of *Oceanodroma kaedingi* Anthony.





Oberholser, Harry C. 1917. "A review of the subspecies of the Leach petrel, *Oceanodroma leucorhoa* (Vieillot)." *Proceedings of the United States National Museum* 54(2230), 165–172. <https://doi.org/10.5479/si.00963801.54-2230.165>.

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