SPECIMEN RECORD OF A LONG-BILLED MURRELET FROM EASTERN WASHINGTON, WITH NOTES ON PLUMAGE AND MORPHOMETRIC DIFFERENCES BETWEEN LONG-BILLED AND MARBLED MURRELETS

CHRISTOPER W. THOMPSON, Washington Department of Fish and Wildlife, 16018 Mill Creek Blvd., Mill Creek, Washington 98012, and Burke Museum, Box 353100, University of Washington, Seattle, Washington 98195

KEVIN J. PULLEN, Conner Museum, Washington State University, Pullman, Washington 99164

RICHARD E. JOHNSON, Conner Museum and School of Biological Sciences, Washington State University, Pullman, Washington 99164

ERIC B. CUMMINS, Washington Department of Fish and Wildlife, 600 Capitol Way North, Olympia, Washington 98501

ABSTRACT: On 14 August 2001, Robert Dice found a *Brachyramphus* murrelet approximately 12 miles east of Pomeroy in eastern Washington state more than 200 miles from the nearest marine waters. The bird died later that day. It had begun definitive prebasic body molt, but not flight feather molt. Necropsy indicated that the bird was a female, probably in her second calendar year. Johnson and Thompson identified the bird as a Long-billed Murrelet, *Brachyramphus perdix*, on the basis of plumage and measurements; it is the first specimen of this species for Washington state. Contrary to many recent publications stating that Long-billed and Marbled Murrelets have white and brown under wing coverts, respectively, we confirmed that both species typically have white under wing coverts prior to definitive prebasic molt and brown under wing coverts after this molt. Absence of any extensive storm systems in the North Pacific in the days preceding 14 August suggest that the specimen discussed here became disoriented during postbreeding migration rather than having been blown inland by easterly winds.

At approximately 1100 PST on 14 August 2001, Robert Dice, an upland wildlife restoration biologist with Washington State Department of Fish and Wildlife, found a moribund robin-sized brownish bird on a rural county road approximately 12 miles west of Pomeroy, Garfield County, eastern Washington. The location is near the border of Idaho, approximately 210 and 270 miles from the nearest point in Puget Sound and the Pacific Ocean, respectively. The bird was apparently heat-stressed because the ambient temperature was 90–95° F. Dice took the bird to the home of a local resident and tried to resuscitate it, but it died at about 1600 that afternoon. The bird was taken to Washington State University in Pullman, where Johnson tentatively identified it as a Long-billed Murrelet, *Brachyramphus perdix*. Pullen prepared the specimen (KJP 4328) as a round study skin with an associated extended wing (Spaw 1989, Winker 2000) and sent it to Thompson to confirm its identity.

IDENTIFICATION OF THE SPECIMEN

The specimen was a female with a mature ovary (13 × 6 mm) and slightly enlarged ova (2 mm), indicating the bird was at least one year old. The bird's

plumage further corroborates this conclusion: its ventral feathers were broadly edged with brown, giving the breast and belly a scalloped or mottled appearance, typical of adult Long-billed and Marbled Murrelets, *Brachyramphus marmoratus*, in first and definitive alternate plumage (Thompson unpubl. data). In contrast, the breast and belly of both of these species are finely flecked with brown in juvenal plumage in their first summer and fall, are completely white in first basic plumage except for a small percentage of birds that retain some juvenal breast and belly plumage in their first winter and subsequent spring, and are always completely white in definitive basic plumage (Thompson unpubl. data). In addition, the bird was in the early stages of definitive prebasic body molt (e.g., lesser and median wing coverts) but had not yet begun flight-feather molt.

Long-billed Murrelets have bills about 15% to 30% longer, on average, than those of Marbled Murrelets (Table 1); as a result, Sealy et al. (1991) suggested that birds with bills exceeding 18 mm can reliably be identified as the Long-billed. Long-billed Murrelets also are generally larger in overall body size than Marbled Murrelets, as reflected by a variety of standard body measurements (Table 1).

Table 1 Measurements of an Adult Female Long-billed Murrelet from Eastern Washington in Relation to Those of Adult Female Marbled and Long-billed Murrelets[a]

Measurement	Marbled Murrelet	Specimen from eastern Washington	Long-billed Murrelet
Exposed culmen	17.4 ± 0.9, 108[b]	19.6	21.2 ± 0.7, 5[c]
Bill depth	5.7 ± 0.3, 107[b]	6.2	6.6 ± 0.1, 5[c]
Tarsus length	16.9 ± 0.6, 107[b]	19.1	18.3 ± 0.3, 5[c]
Wing (flattened)			
Adults"	124.1 ± 3.5, 45[d, e]		142.9 ± 4.7, 5[c]
Juvenal[f]	115.6 ± 4.4, 10[d]	132	131.0 ± 2.8, 2[g]
Tail length			
"Adults"	31.7 ± 1.6, 7[f, g]		35.9 ± 1.5, 5[h]
Juvenal[f]	30.9 ± 0.7, 5[g]	31	31, —, 1[g]

[a]All measurements in millimeters. Data presented as mean ± standard deviation, *n*.

[b]Data from "adult females" in British Columbia (Sealy 1975).

[c] Data from California Academy of Sciences 68017, Hoffman and Woolfenden (1988), and Sealy et al. (1991).

[d] Data from specimens in University of Washington Burke Museum, University of California Museum of Vertebrate Zoology and California Academy of Sciences.

[e] Data from probable adult females, i.e., specimens exhibiting evidence of breeding (brood patch, enlarged ovaries and/or oviduct) and/or with no bursa of Fabricius; these birds have likely replaced their juvenal primaries at least once.

[f]Data from females with discernible retained juvenal plumage. These birds have not replaced their juvenal primaries.

[g] Data from specimens in University of Washington Burke Museum.

[h]Data from Stejneger (1886), Hoffman and Woolfenden (1988), Sealy et al. (1991: U.S. National Museum 599498), and University of Washington Burke Museum 44434 and 44435.

Similarly, many plumage characters also have been argued to be reliable indicators of one species or the other in alternate plumage. It has been claimed that in alternate plumage Long-billed Murrelets have (1) more pronounced white crescents or arcs immediately above, and especially below, the eye than do Marbled Murrelets (Stejneger 1886, Ridgway 1919, Jehl and Jehl 1981, Harrison 1983, Sibley 1993, Piatt et al. 1994, Konyukhov and Kitaysky 1995), (2) entirely dark plumage above their gape, whereas Marbled Murrelets often have a pale stripe above their gape (Sibley 1993, Konyukhov and Kitaysky 1995), and (3) a completely dark maxilla, whereas the maxilla of Marbled Murrelets is always partially white (Konyukhov and Kitaysky 1995). Lethaby's (2000) subsequent evaluation of these plumage differences, however, found them to be unreliable.

Two additional characters, wing lining and outer rectrix color, also have been suggested as consistent differences between the Long-billed and Marbled Murrelets. The wing lining (underwing coverts) of Marbled Murrelets usually has been described as dark, e.g., "dusky brown" to "smoky brownish black" (Coues 1868), "clear ash" (Barrows 1877), "smoky gray" (Baird et al. 1884), "grayish brown" to "dusky gray" (Stejneger 1886), and "uniform fuscous" (Ridgway 1919). In contrast, National Geographic's *Field Guide to the Birds of North America* (4th ed., 2002), Gaston and Jones (1998: plate 8), and Sibley (2000) illustrate the under wing coverts of Long-billed Murrelets as being extensively white. Similarly, Lethaby (2000) noted that most (13 of 15) Long-billed Murrelets in alternate plumage that he examined had "obvious pale feathering on the under wing coverts" and concluded that "presence of extensive pale in the under wing coverts is strongly supportive, *but not diagnostic* (italics his), for alternate-plumaged Long-billed Murrelets."

However, Lethaby's tentative conclusion is incorrect. Indeed, many authors have previously noted that Long-billed Murrelets have wing linings that are brownish or vary in color from white to brown. Specifically, Dement'ev and Gladkov (1951) stated that the wing lining of adult Long-billed Murrelets is "grayish" or "gray-brown." Sealy et al. (1991) published a ventral photo of a Long-billed Murrelet specimen with its wings partially outstretched that clearly shows dark under wing coverts. Oka (1999) described two of three Long-billed Murrelets that he assumed were adults as having "brown" and "dark brown" under wing coverts. In contrast to these previous descriptions of underwing-covert color in the Long-billed Murrelet, Shibaev (1990) noted that these coverts may vary from "solidly brownish-gray" to almost white. Lethaby (2000) also noted that 2 of 15 Long-billed Murrelets he examined had "all-dark" under wing coverts.

This apparent discrepancy has arisen because in both the Marbled and Long-billed Murrelets the color of the underwing coverts is an indicator of age. In the Long-billed Murrelet this variation was recognized more than a century ago by Taczanowski (1893), who stated that the under wing coverts of adults are "gray-brown," whereas those of second-year birds are "white with a little brown"; Dement'ev and Gladkov (1951) subsequently noted Taczanowski's findings. Kozlova (1957) also stated that underwing coverts of adults are "brownish-gray" whereas those of birds in juvenal plumage are "brownish gray with some white."

Regarding the Marbled Murrelet, Coues (1868:64) noted that the underwing coverts of birds in juvenal and first basic plumage vary from being dark as in adults (e.g., USNM 46547) to being "dusky along the edge of the wing, but...elsewhere variegated with dull whitish" (e.g., USNM 46542). Nelson (1997) also noted that underwing coverts of birds in juvenal plumage are "brownish gray with some white," whereas those of birds in definitive basic and definitive alternate plumage are "uniform fuscous" and "uniform gray brown," respectively. Lethaby (2000) subsequently noted that "virtually all" Marbled Murrelets (n = 34) in juvenal, first basic, and first alternate plumage "showed at least some and often extensive white in the under wing coverts," whereas all birds in subsequent definitive basic and alternate plumages (n = 33) "showed completely dark under wings."

Thompson examined additional Long-billed and Marbled murrelet specimens (see acknowledgments for museums) and corroborated that wing-lining color in these species is an indication of age and not a species-specific character; nine of nine hatch-year Long-billed Murrelets in juvenal or first basic plumage (aged by retention of juvenal plumage and/or bursa size) had white wing linings (underwing coverts), whereas four of five birds in alternate plumage had brown wing linings. Similarly, for the Marbled Murrelet, 89% (64 of 72) of hatch-year birds in juvenal or first basic plumage had white wing linings, whereas 91% (160 of 176) of birds in alternate plumage or definitive basic plumage had brown wing linings. In addition, Marbled Murrelets banded as juveniles and recaptured as second-year birds typically have white wing linings (F. Cooke, N. Parker, L. McFarlane Tranquilla, unpubl. data). This suggests that in most cases specimens in alternate plumage that have white wing linings probably are second-year birds. The specimen found in eastern Washington has a white wing lining (Figure 1), suggesting that it was a second-year bird, though reproductively mature (discussed above). This is unusual, however, because Marbled Murrelets, and presumably Long-billed Murrelets, are generally believed to reproduce for the first time in the third, rather than their second, calendar year of life (Beissinger 1995, DeSanto and Nelson 1995).

Second, although this character was not mentioned by Mlodinow (1997) or Lethaby (2000), Dement'ev and Gladkov (1951), Konyukhov and Kitaysky (1995) and Shibaev (1990) stated that the outer vane of the outermost rectrices (rectrix 6) of Long-billed Murrelets has "more or less well-developed white marbling," "a narrow, white marginal stripe," and "narrow fringes or mottles (white with reddish)," respectively, whereas Marbled Murrelets do not exhibit this character. Kozlova (1957) stated that the outer rectrices of adult Long-billed Murrelets "occasionally" have "narrow white margins and brownish dots," whereas birds in juvenal plumage always have "white bars" on their outer rectrices. However, only 4 of 16 Long-billed Murrelets that Thompson examined possessed whitish or buff on their outermost rectrices, so absence of this character does not identify specimens as Marbled Murrelets. Conversely, none of the 464 Marbled Murrelet specimens we examined had any white in the outer rectrices, so such a pattern appears to be a reliable criterion for identifying the Long-billed Murrelet in the hand.

In alternate plumage, the most reliable field character "for separating the two species is the pale throat of the Long-billed Murrelet: The chin and sides

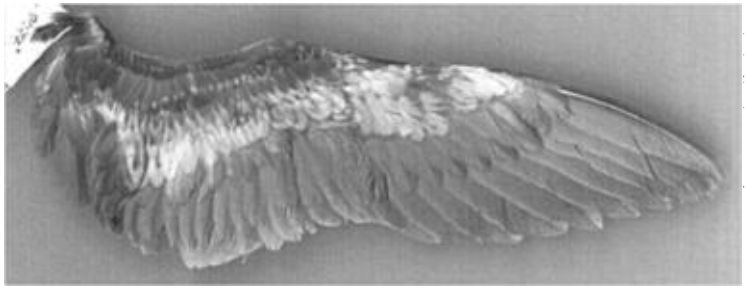

Figure 1. Ventral view of the wing of the Long-billed Murrelet specimen (Charles R. Conner Museum [Washington State University] no. 01-37) found dead in eastern Washington state on 14 August 2001.

of the throat all the way to the base of the neck are pale.... In contrast, Marbled Murrelets do not show pale sides to the throat" (Lethaby 2000). In the hand, but to a lesser degree in the field, the most accurate plumage character for discriminating between these species in alternate plumage is the presence of "cinnamon-edged" or "rufous" feathers in the mantle and scapulars of the Marbled but not the Long-billed (Ridgway 1919, Piatt et al. 1994, Lethaby 2000).

The specimen found in eastern Washington is clearly a Long-billed Murrelet on the basis of its pale throat, lack of any rufous on its mantle (Figure 2; photos also at http://www.ups.edu/biology/museum/LBMU01-37.jpg [round skin]), and slight whitish edges on its outermost rectrices.

Measurements of the specimen also support its being a Long-billed Murrelet; its exposed culmen of 19.6 mm and tarsus of 19.1 mm are too long for a Marbled Murrelet (Table 1). The relatively short wing (chord 132 mm) and tail (31 mm) of the specimen support our suggestion that it is a second-year bird, i.e., a bird with retained juvenal flight feathers shorter than those of subsequent generations of flight feathers worn by older birds (Table 1).

POSSIBILITY OF HYBRIDIZATION

Although the Long-billed and Marbled Murrelets appear to be more similar to one another in plumage color and morphology than to any other alcid species, they are not sister taxa. Genetic evidence indicates that the Kittlitz's Murrelet, *Brachyramphus brevirostris*, is the Marbled Murrelet's sister species (Pitocchelli et al. 1995, Zink et al. 1995, Friesen et al. 1996a, b, 1997). Hybridization between Kittlitz's and Marbled murrelets is unknown. Thus it is unlikely that Long-billed and Marbled Murrelets would hybridize even if their breeding ranges were partially sympatric, but their breeding ranges are not known to overlap. However, identifying a Long-billed X Marbled Murrelet hybrid may be impossible except by genetic methods. Examination of the population genetics of Marbled Murrelets from Alaska and the Aleutian Islands, including specimens from Adak (n = 5) and

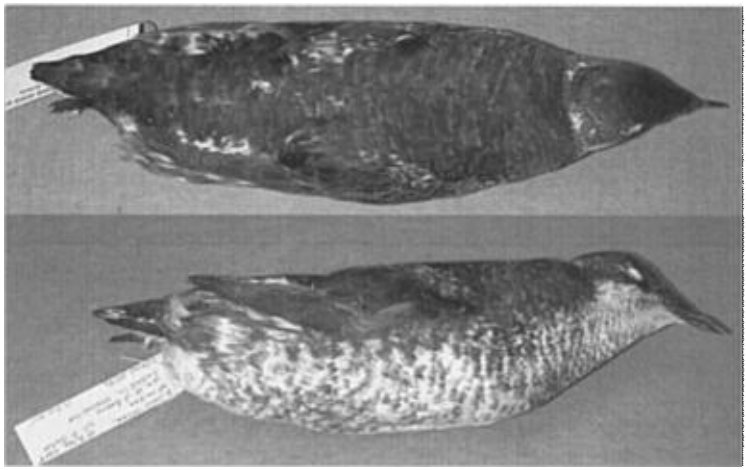

Figure 2. Dorsal (top) and lateral (bottom) view of the Long-billed Murrelet specimen (Charles R. Conner Museum [Washington State University] no. 01-37) found dead in eastern Washington state on 14 August 2001.

Attu (n = 9), found no evidence of hybridization with the Long-billed Murrelet (Congdon et al. 2000). It is likely that Marbled Murrelets breed as far west as Adak (Kessel and Gibson 1978) and possibly as far west as Attu (Sealy et al. 1982) in the Aleutian Islands, about 300 km east of the Commander Islands, the easternmost possible breeding locality of the Long-billed Murrelet. Thus, it is possible, though probably unlikely, that these species hybridize in the western Aleutian Islands.

BREEDING AND WINTERING RANGE OF THE LONG-BILLED MURRELET

The Long-billed Murrelet breeds in Russia on the Kamchatka Peninsula, the Kuril Islands, Sakhalin Island, and along the northern and western shores of the Sea of Okhotsk and Sea of Japan south to Olga Bay (Stejneger 1898, Labzyuk 1987, Konyukhov and Kitaysky 1995, Nelson 1997). There are also summer records from Japan on eastern Hokkaido, suggesting the birds may breed there in small numbers, possibly only intermittently (Brazil 1991); recent evidence of breeding is lacking (Nelson et al. 1997). Summer records of Long-billed Murrelets from the Commander Islands (Hartert 1920, Kuzyakin 1963), just west of the Aleutians, also suggest that the species may breed there as well; however, Stejneger (1885) did not report seeing them in the vicinity of the Commander Islands, and Kozlova (1957) stated that Long-billed Murrelets "certainly do not breed" there.

The Long-billed Murrelet is more migratory than the Marbled, typically wintering about 500 miles south of its breeding locations, mainly in the

vicinity of Sakhalin Island, Hokkaido, Honshu (including inland lakes; Oka 1999), with smaller numbers as far south as coastal waters of Kyushu, Amami-O-shima, and Kume-jima (Japan), and China, North Korea, and South Korea (Austin 1948, Vaurie 1959, Nechaev 1986, Shibaev 1990, Brazil 1991, Nelson 1997; see distribution maps in Konyukhov and Kitaysky 1995, Mlodinow 1997).

POSSIBLE EXPLANATION FOR THIS VAGRANT RECORD

Vagrancy in seabirds is common, especially in procellariids (Bourne 1967), but also in some alcids (Bent 1919, Grinnell 1938, Porsild 1943, Salomonsen 1944, Munyer 1965, Nero 1968, Sealy et al. 1971, Roberson 1980, Pitman et al. 1983). Among alcids, however, some species are much more prone to vagrancy than others; for example, the Ancient Murrelet, *Synthliboramphus antiquus* (Munyer 1965, Smith 1966, Verbeek 1966, Sealy and Carter 1980), Dovekie, *Alle alle* (Murphy and Vogt 1933, Sprunt 1938, Snyder 1953), and Parakeet Auklet, *Aethia psittacula* (Jones et al. 2001) are frequent vagrants whereas most other alcids are not.

Because the Long-billed Murrelet's breeding range is much farther from the west coast of North America than the Marbled Murrelet's, one would expect more vagrants in North America of the Marbled than of the Long-billed. However, the opposite is true: there is not a single inland record of a vagrant Marbled Murrelet for North America. In contrast, more than 50 vagrant Long-billed Murrelets have been recorded inland throughout the United States and Canada (Sealy et al. 1991, Langridge 1994, DiLabio 1996, Mlodinow 1997, Anon 1998, Grzybowski 1998, Roberson et al. 1998, 1999, Ellison and Martin 1999, Gilligan 1999, Lubahn 1999, Sundell 1999, Tessen 1999, Domagalski 2000, Korducki 2000, Martin 2000, Rottenborn and Morlan 2000, Erickson and Hamilton 2001, Burgiel et al. 2002, Kratter et al. 2002), and even Europe (Knaus and Balzari 1999, Maumary and Knaus 2000a, 2000b). This may be because the Long-billed Murrelet is more migratory than the Marbled (Konyukhov and Kitaysky 1995). The current record is the seventh documented record, first specimen record, and only inland record for Washington state (Skriletz 1996, Aanerud and Mattocks 1997, 2000, Mlodinow 1997, Aanerud 2002).

Mlodinow (1997) suggested that the Long-billed Murrelet is more predisposed to vagrancy because it is more migratory than the Marbled Murrelet. Most vagrant Long-billed Murrelets have occurred from early July through late August or from late October through early December (Mlodinow 1997). Because July and August correspond to the normal period of fledging and postbreeding dispersal/migration, Mlodinow (1997) suggested that vagrant records from this time period may represent birds that became disoriented during normal postbreeding dispersal/migration. Similarly, Mlodinow (1997) found a tendency for records from October through December to be correlated with "storms that occurred off the east coast of Asia between Japan and the Kamchatka Peninsula within two to three days of each record." He also found records of the Long-billed Murrelet significantly more frequent when the mid-tropospheric atmospheric circulation (about three

miles above the Earth's surface) tracks from the Gulf of Alaska and North Pacific into the interior of Alaska.

Robert Dice, who found the specimen in eastern Washington, told Thompson that a severe storm had occurred in the area the previous night. However, our review of broader regional climatic conditions in Washington state and west across the North Pacific between 11 and 14 August found no large-scale severe storm systems in the Pacific Northwest or North Pacific Ocean during that time. As a result, we suspect that this specimen became disoriented during postbreeding migration as suggested by Mlodinow (1997) but was grounded locally by a storm.

ACKNOWLEDGMENTS

We thank Fred Cooke, Nadine Parker, and Laura Tranquilla McFarlane for access to unpublished data on Marbled Murrelets. Russ Bradley, Janet Hinshaw, Falk Huettemann, Kim Nelson, Hal Opperman, Dennis Paulson, and Terry Wahl provided citations and photocopies of literature regarding the Long-billed Murrelet. Janet Hinshaw, Ian Jones, Alexander (Sasha) Kitaysky, Jevgeni Shergalin, and Francis Weise provided translations of Russian and French literature. George Divoky provided relevant climatological data. Dennis Paulson and Joe Morlan provided extensive comments on drafts of the manuscript that greatly improved the paper. Dennis Paulson also provided the photographs. For access to their bird collections, we thank Doug Long (California Academy of Sciences), Leo Joseph (Philadelphia Academy of Natural Sciences), Ned Johnson, Carla Cicero, and Chris Conroy (Museum of Vertebrate Zoology, University of California, Berkeley), Dennis Paulson (Slater Museum of Natural History, University of Puget Sound), and Rob Faucett, Sievert Rohwer, and Chris Wood (Burke Museum, University of Washington). Dennis Paulson also helped verify the specific identity of the specimen discussed in this paper.

LITERATURE CITED

Aanerud, K. 2002. Fifth report of the Washington Bird Records Committee. Wash. Birds 8:1–18.

Aanerud, K. R., and Mattocks, P. W., Jr. 1997. Third report of the Washington Bird Records Committee. Wash. Birds 6:7–31.

Aanerud, K., and Mattocks, P. W., Jr. 2000. Fourth report of the Washington Bird Records Committee. Wash. Birds 7:7–24.

Anonymous. 1998. 1997 report of the Kansas Bird Records Committee. Kans. Ornithol. Soc. Bull. 49:26–29.

Austin, O. L, Jr. 1948. The birds of Korea. Bull. Mus. Comp. Zool. 101.

Baird, S. F., Brewer, T. M., and Ridgway, R. 1884. The water birds of North America, vol. 2. Mem. Mus. Comp. Zool. 13.

Barrows, W. B. 1877. Catalogue of the Alcidae contained in the museum of the Boston Society of Natural History, with a review and proposed classification of the family. Proc. Boston Soc. Nat. Hist. 19:150–165.

Beissinger, S. R. 1995. Population trends of the Marbled Murrelet projected from demographic analyses, in Ecology and Conservation of the Marbled Murrelet (C. J. Ralph, G. L. Hunt, M. G. Raphael, and J. F. Piatt, eds.), pp. 385–394. U.S.D.A. Forest Serv. Gen. Tech. Rep. PSW-GTR-152, Pac. Southwest Res. Sta., Albany, CA.

Bent, A. C. 1919. Life histories of North American diving birds. U. S. Natl. Mus. Bull. 107.

Bourne, W. R. P. 1967. Long-distance vagrancy in the petrels. Ibis 109:141–167.

Brazil, M. A. 1991. The Birds of Japan. Smithsonian Inst. Press, Washington, D.C.

Burgiel, J. C., Paxton, R. O., and Cutler, D. A. 2002. Hudson–Delaware region. N. Am. Birds 56:158–161.

Congdon, B. C., Piatt, J. F., Martin, K., and Friesen, V. L. 2000. Mechanisms of population differentiation in Marbled Murrelets: Historical versus contemporary processes. Evolution 54: 974–986.

Coues, E. 1868. A monograph of the Alcidae. Proc. Acad. Nat. Sci. Philadelphia Ser. 2., 20:2–81.

Dement'ev, G. P., and Gladkov, N. A. 1951. Birds of the Soviet Union, vol. 2. 1968 English translation by Israel Program for Scientific Translations, Jerusalem.

DeSanto, T. L., and Nelson, S. K. 1995. Comparative reproductive ecology of the auks (family Alcidae) with emphasis on the Marbled Murrelet, in Ecology and Conservation of the Marbled Murrelet (C. J. Ralph, G. L. Hunt, M. G. Raphael, and J. F. Piatt, eds.), pp. 33–48. U.S.D.A. Forest Service Gen. Tech. Rep. PSW-GTR-152, Pac. Southwest Res. Sta., Albany, CA.

Di Labio, B. M. 1996. First record of an Asiatic Marbled Murrelet in Ontario. Ont. Birds 14:15–22.

Domagalski, B. 2000. Long-billed Murrelet: (*Brachyramphus perdix*): 6 March 2000, Big Cedar Lake, Washington County. Passenger Pigeon 62:321–322.

Ellison, W. G., and Martin, N. L. 1999. New England region. N. Am. Birds 53:30–34.

Erickson, R. A., and Hamilton, R. A. 2001. Report of the California Bird Records Committee: 1998 records. W. Birds 32:13–49.

Friesen, V. L., Baker, A. J., and Piatt, J. F. 1996a. Phylogenetic relationships within the Alcidae (Charadriiformes: Aves) inferred from total molecular evidence. Mol. Biol. Evol. 13:359–67.

Friesen, V. L., Piatt, J. F., and Baker, A. J. 1996b. Evidence from cytochrome B sequences and allozymes for a "new" species of alcid: The Long-billed Murrelet (*Brachyramphus perdix*). Condor 98:681–690.

Friesen, V. L., Congdon, B. C., Walsh, H. E., and Birt, T. P. 1997. Intron variation in Marbled Murrelets detected using analyses of single-stranded conformational polymorphisms. Mol. Ecol. 6:1047–1058.

Gaston, A. J., and Jones, I. L. 1998. The Auks: Alcidae. Oxford Univ. Press, New York.

Gilligan, J. 1999. Field notes: Western Oregon. Ore. Birds 25:53.

Grinnell, J. 1938. Ocean waifs and what they mean for distribution. Condor 40:242–245.

Grzybowski, J. A. 1998. The migration season: August 1–November 30, 1997. Southern Great Plains. Natl. Audubon Soc. Field Notes 52:82–86.

Harrison, P. 1983. Seabirds: An Identification Guide. Croom Helm, London.

Hartert, E. 1920. The birds of the Commander Islands. Novit. Zool. 27:128–158.

Hoffman, W. and Woolfenden, G. E. 1988. A specimen of the Asiatic Marbled Murrelet from Florida. Fla Field Nat. 16:37–38.

Jehl, D. R., and Jehl, J. R., Jr. 1981. A North American record of the Asiatic Marbled Murrelet (*Brachyramphus marmoratus perdix*). Am. Birds 35:911–912.

Jones, I. L., Konyukhov, N. B., Williams, J. C., and Byrd, G. V. 2001. Parakeet Auklet (*Aethia psittacula*), in The Birds of North America (A. Poole and F. Gill, eds.), no. 594. Birds N. Am., Philadelphia.

Kessel, B., and Gibson, D. D. 1978. Status and distribution of Alaska birds. Studies Avian Biol. 1.

Knaus, P., and Balzari, C. 1999. Seltene vogelarten und ungewohnliche vogelbeobachtungen in der Schweiz im Jahre 1998. [Rare and unusual bird observations in Switzerland in 1998.] Ornithol. Beobachter 96:157–182.

Konyukhov, N. B., and Kitaysky, A. S. 1995. The Asian race of the Marbled Murrelet, in Ecology and Conservation of the Marbled Murrelet (C. J. Ralph, G. L. Hunt, M. G. Raphael, and J. F. Piatt, eds.), pp. 23–29. U.S.D.A. Forest Serv. Gen. Tech. Rep. PSW-GTR-152, Pac. Southwest Res. Sta., Albany, CA.

Korducki, M. 2000. Long-billed Murrelet: (*Brachyramphus perdix*): 6 March 2000, Big Cedar Lake, Washington County. Passenger Pigeon 62:323.

Kozlova, E. V. 1957. Fauna of the USSR. Birds, vol. 2, part 3. Charadriiformes, Suborder Alcae. 1961 English translation by Israel Program for Scientific Translations, Jerusalem.

Kratter, A. W., Webber, T., Taylor, T., and Steadman, D. W. 2002. New specimen-based records of Florida birds. Bull. Fla. Mus. Nat. Hist. 43:111–161.

Kuzyakin, A. P. 1963. On the biology of the Long-billed (Marbled) Murrelet. Ornitologiya 6:315–320.

Labzyuk, V. I. 1987. A sudden occurrence of the nest of *Brachyramphus marmoratus* in Southern Primorye, in Distribution and Biology of Seabirds of the Far East (N. M. Litvinenko, ed.), pp. 85–86. Akademia Nauk SSSR, Vladivostok, USSR. [In Russian: English translation by P. T. Gilbert].

Langridge, H. P. 1994. Florida region. Field Notes 48:290–292.

Lethaby, N. 2000. The identification of Long-billed Murrelet in alternate plumage. Birding 32:438–444.

Lubahn, S. 1999. Long-billed Murrelet (*Brachyramphus perdix*): 24 November 1998, Virmond Park in Ozaukee County. Passenger Pigeon 61:202–203.

Martin, R. 2000. Northern Great Plains. N. Am. Birds 54:67–68.

Maumary, L., and Knaus, P. 2000a. Marbled Murrelet in Switzerland: A Pacific Ocean auk new to the Western Palearctic. Br. Birds 93:190–199.

Maumary, L., and Knaus, P. 2000b. Erstnachweis der Asiatischen unterart des Marmelalken *Brachyramphus marmoratus perdix* in der Schweiz und der Westpaläarktis. [First record of the Asian subspecies of the Marbled Murrelet *Brachyramphus marmoratus perdix* in Switzerland and the western Palearctic.] Ornithol. Beobachter 97:243–248.

Mlodinow, S. G. 1997. The Long-billed Murrelet (*Brachyramphus perdix*) in North America. Birding 29:461–475.

Munyer, E. A. 1965. Inland wanderings of the Ancient Murrelet. Wilson Bull. 77:235–242.

Murphy, R. C., and Vogt, W. 1933. The dovekie influx of 1932. Auk 50:325–349.

Nechaev, V. A. 1986. New data on the seabirds of Sakhalin Island, in Seabirds of the Far East (N. M. Litvinenko, ed.), pp. 71–81. Akademia Nauk SSSR, Vladivostok, USSR. [In Russian: English translation by D. Siegel-Causey].

Nelson, S. K. 1997. Marbled Murrelet (*Brachyramphus marmoratus*), in The Birds of North America (A. Poole and F. Gill, eds.), no. 276. Acad. Nat. Sci., Philadelphia.

Nelson, S. K., Ono, K., Fries, J. N., and Hamer, T. E. 1997. Searching for the Long-billed Murrelet on Hokkaido Island, Japan. Pac. Seabirds 24:62–68.

Nero, R. W. 1968. Manitoba Black Guillemot specimen. Blue Jay 26:14–15.

Oka, N. 1999. First records of Marbled Murrelets *Brachyramphus marmoratus perdix* wintering on Lake Shinji, Japan. J. Yamashina Inst. Ornithol. 31:98–102.

Piatt, J. F., Friesen, V., and van Vliet, G. 1994. Status of a "new" rare alcid, the Long-billed Murrelet. Pac. Seabirds 21:47–48.

Pitman, R. L., Newcomer, M., Butler, J., Cotton, J., and Friedrichsen, G. 1983. A Crested Auklet from Baja California. W. Birds 14:47–48.

Pitocchelli, J., Piatt, J. F., and Cronin, M. A. 1995. Morphological and genetic divergence among Alaskan populations of *Brachyramphus* murrelets. Wilson Bull. 107:235–250.

Porsild, A. E. 1943. Birds of the MacKenzie Delta. Can. Field-Nat. 57:19–35.

Ridgway, R. 1919. The birds of North and Middle America, vol. 8. U.S. Natl. Mus. Bull. 50.

Roberson, D. 1980. Rare Birds of the West Coast of North America. Woodcock Publ., Pacific Grove, CA.

Roberson, D., Bailey, S. F., and Singer, D. S. 1998. Middle Pacific Coast region. Field Notes 52:251–255.

Roberson, D., Singer, D. S., Terrill, S. B., and Rottenborn, S. C. 1999. Middle Pacific Coast region. Field Notes 53:99–103.

Rottenborn, S. C., and Morlan, J. 2000. Report of the California Bird Records Committee: 1997 records. W. Birds 31:1–37.

Salomonsen, F. 1944. The Atlantic Alcidae: The seasonal and geographic variation of the auks inhabiting the Atlantic Ocean and the adjacent waters. Göteborgs Kungliga Vetenskaps- och Vitterhets-Samhälles Handlingar, Sjätte Följden, Serie B, 3(5):1–138.

Sealy, S. G. 1975. Aspects of the breeding biology of the Marbled Murrelet in British Columbia. Bird-banding 46:141–154.

Sealy, S. G., and Carter, H. R. 1980. Inland Ancient Murrelets: An update. Pac. Seabird Group Bull. 7:57.

Sealy, S. G., Carter, H. R., and Alison, D. 1982. Occurrences of the Asiatic Marbled Murrelet (*Brachyramphus marmoratus perdix* (Pallas)) in North America. Auk 99:778–781.

Sealy, S. G., Carter, H. R., Shuford, W. D., Powers, K. D., and Chase, C. A., III. 1991. Long-distance vagrancy of the Asiatic Murrelet in North America, 1979–1989. W. Birds 22:145–155.

Sealy, S. G., Fay, F. H., Bédard, J., and Udvardy, M. D. F. 1971. New records and zoogeographical notes on the birds of St. Lawrence Island, Bering Sea. Condor 73:322–336.

Shibaev, Y. V. 1990. Marbled Murrelet, in Birds of the USSR: Auks (Alcidae) (V. E. Flint and A. N. Golovkin, eds.), pp. 82–88, Nauka, Moscow.

Sibley, D. 1993. An Asiatic Marbled Murrelet in Ontario. Birders' J. 2:276–277.

Sibley, D. A. 2000. The Sibley Guide to Birds. Knopf, New York.

Skriletz, J. 1996. First Washington record of the "Long-billed" Marbled Murrelet. Wash. Birds 5:53–54.

Smith, B. 1966. A second record of Ancient Murrelet from Nevada. Condor 68:511–512.

Snyder, D. E. 1953. A great flight of Dovekies (*Plautus alle*). Auk 70:87–88.

Spaw, C. 1989. Combination specimens à la Burke Museum, in Notes from a Workshop on Specimen Preparation (S. L. Rogers and D. S. Wood, eds.), pp. 21–28. Section of Birds, Carnegie Mus. Nat. Hist., Pittsburgh.

Sprunt, A., Jr. 1938. The southern Dovekie flight of 1936. Auk 55:85–88.

Stejneger, L. 1885. Results of the ornithological explorations in the Commander Islands and in Kamtschatka. U. S. Natl. Mus. Bull. 29.

Stejneger, L. 1886. On *Brachyramphus perdix* (Pall.) and its nearest allies. Zeitschrift fur die gesammte Ornithologie 3:210–219.

Stejneger, L. 1898. The birds of the Kuril Islands. Proc. U.S. Natl. Mus. 21:269–296.

Sundell, R.H. 1999. Long-billed Murrelet (*Brachyramphus perdix*): 24 November 1998, Virmond Park in Ozaukee County. Passenger Pigeon 61:203–204.

Taczanowski, L. 1893. Faune Ornithologique de la Sibérie Orientale. Mem. Acad. Imp. Sci. Saint-Petersbourg 39:685–1278.

Tessen, D. D. 1999. Western Great Lakes region. N. Am. Birds 53:53–57.

Vaurie, C. 1959. Birds of the Palearctic Fauna. H. F. & G. Witherby, London.

Verbeek, N. A. M. 1966. Wanderings of the Ancient Murrelet: Some additional comments. Condor 68:510–511.

Winker, K. 2000. Obtaining, preserving, and preparing bird specimens. J. Field Ornithol. 71:250–297.

Zink, R. M., Rohwer, S., Andreev, A. V., and Dittmann, D. L. 1995. Trans-Beringia comparisons of mitochondrial DNA differentiation in birds. Condor 97:639–649.

Accepted 24 September 2003