

WHERE DO PIGEON GUILLEMOTS FROM CALIFORNIA GO FOR THE WINTER?

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The Pigeon Guillemot (*Cephus columba*) nests at numerous small colonies and scattered individual sites from the Channel Islands, California, north to Alaska (Ewins et al. 1993). During the nonbreeding season birds are virtually absent from California, Oregon, and the outer coast of Washington (e.g., Briggs et al. 1987), and the winter distribution of Pigeon Guillemots breeding along the west coast of North America is at best incompletely known. The species' postbreeding movements have been thought to be to the north from California and Oregon, though systematically collected data are minimal. There is evidence that at least some move north to relatively protected waters of the Strait of Juan de Fuca, Puget Sound, and adjacent areas ("inland marine waters") of Washington and British Columbia (e.g., Ainley et al. 1990, Ewins 1993, Ewins et al. 1993), where some census records indicate that numbers increase during the winter (e.g., Campbell et al. 1990). Here we contribute to the understanding of the wintering areas of Pigeon Guillemots along the Pacific coast by summarizing records from one-day boat trips off southwestern Washington over 28 years.

Between September 1971 and October 1999 we systematically censused seabirds during 316 one-day bird-watching cruises aboard chartered sportfishing vessels off Grays Harbor, Washington (see Wahl and Tweit 2000). Effort was greatest in January and from April through mid-October (Table 1). Numbers of birds were counted or estimated for census periods of about 30 minutes (within "depth habitats"; Table 2). A total of 6306 individual census periods covered 43,758 km. Guillemots were recorded only from March into October, and our analysis is for those months only (Tables 2 and 3). In addition to these cruises, Wahl spent four weeks total in September, January, and April on a University of Washington research vessel off Copalis Beach, Washington, about 20 km north of Grays Harbor, censusing birds and mammals to 126° 30' W (data not used in Tables 1-3).

Though census effort was much greater offshore, almost 90% of guillemots recorded were in the Grays Harbor entrance channel and immediately offshore within

Table 1 Pigeon Guillemot Censuses from Grays Harbor out to 2000-m Depth, September 1971–October 1999

Month	Total birds	Census effort (km)	Birds/km
Jan	0	1,232	0
Feb	0	262	0
Mar	62	461	0.13
Apr	173	2,481	0.07
May	809	4,783	0.17
Jun	252	869	0.29
Jul	749	5,798	0.13
Aug	1507	11,262	0.13
Sep	136	11,592	0.01
Oct	40	4697	0.01
Nov	0	197	0
Dec	0	124	0

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Table 2 Pigeon Guillemot Numbers by Depth, March–October

Depth	Total birds	Census effort (km)	Birds/km
Grays Harbor channel	2909	2938	0.99
<20 m	400	3,016	0.13
20–50 m	227	4,253	0.05
50–100 m	67	9,261	0.01
100–200 m	75	13,684	0.01
200–1000 m	45	7,360	0.01
1000–2000 m	5	867	0.01
>2000 m	0	565	0.00
Total	3728	41,944	0.09

the 20-m-depth contour, and another 6% were just outside of that (Table 2). Highest numbers—from May to July (Table 3)—reflected at least in part the nesting activity of some 10–20 pairs (Speich and Wahl 1989, unpubl. obs.). In August, and to a lesser extent in September, we noted adults in postbreeding plumage, usually in small groups, flying north, with a few birds recorded to the edge of the continental shelf over depths of 1000 to 2000 m (Table 3), as far west as 125° 07' W. These birds were flying a route that would be essentially a straight line from northern California and Oregon to the entrance to the Strait of Juan de Fuca. In September, birds per kilometer dropped by over 90% from May–August numbers, with only a few noted far offshore. On surveys additional to the trips summarized here, two guillemots were seen 30–40 km offshore, one each in September 1968 and 1976 (Wahl unpubl.). By October no birds were seen offshore. None at all were seen on November–February trips (Table 1), on research cruises west to 126° 30' W, or on two late January–early February trips south along 125° W off Washington and Oregon (Wahl unpubl.), strongly suggesting that Pigeon Guillemots do not winter offshore. Our spring (March–May) survey sample size is small, but the eight birds seen offshore then may indicate a southbound offshore movement.

Table 3 Pigeon Guillemots per Kilometer off Grays Harbor by Ocean Depth and Month, 1971–1999

	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Grays Harbor channel	1.41	1.31	1.53	2.23	1.51	0.12	0.11	
<20 m	—	0.15	0.39	0.01	0.16	0.17	0.02	0.02
20–50 m	0.02	—	0.14	0.94	+ ^a	0.02	0.01	0.00
50–100 m	—	+	+	—	+	0.02	0.01	—
100–200 m	0.01	+	+	—	—	0.02	+	—
200–1000 m	—	—	—	0.01	—	0.02	+	—
1000–2000 m	nc ^b	—	—	nc	—	0.02	—	—
>2000 m	nc	—	—	nc	nc	nc	—	—
All depths	0.13	0.07	0.17	0.29	0.13	0.13	0.01	0.01

^aPresent, <0.01.

^bnc, no census.

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Briggs et al. (1987) stated that guillemots "almost leave" California from August through February. Ainley et al. (1990) reported a northward seasonal shift of recoveries of fledglings banded on the Farallon Islands to at least as far as British Columbia and that after October one-third of recoveries were from Washington north. Christmas bird count (CBC) data indicate small numbers of birds along the Oregon coast in winter. In British Columbia, Vermeer and Morgan (1997) stated that few guillemots remain in the Queen Charlotte Islands after early September. Campbell et al. (1990) described movement of birds from the British Columbia coast into Queen Charlotte Sound and protected waters of the straits of Georgia and Juan de Fuca; thus it is likely that birds breeding north of Washington also winter in inland marine waters.

Systematic, year-round census data covering all of Washington's inland marine waters are lacking, though there have been a number of surveys covering parts of the region. Comparisons between seasons are complicated by varying census methods, seasonal variations in observation conditions, and differences in the detectability and identification of Pigeon Guillemots. Dispersing and foraging birds from a few large colonies further complicate analysis of existing data. Numbers from CBCs in Washington suggest that guillemots shift into inland marine waters in winter. At Grays Harbor guillemots were found on 11 of 24 CBCs from 1972 to 1997, with a maximum of five birds. In contrast, counts in inland marine waters were relatively high, (e.g., a maximum of 1221 on 22 December 1989 at Sequim-Dungeness). Other surveys in the San Juan Islands, Georgia Strait, and Puget Sound south to Olympia produced winter numbers far above summer breeding numbers. One consistent effort in 1978–79 (Wahl et al. 1981), in which birds were censused monthly from a ferry through the San Juan Islands, showed that November–March numbers of Pigeon Guillemots were about five times those in June and July (Wahl unpubl.). Comparison of 14 CBCs in inland marine waters with data from other censuses covering the same areas (Wahl et al. 1981; unpubl.) suggest winter numbers may be twice as large as summer populations and are too large to consist of summer residents only.

Data from our surveys off Grays Harbor support the concept of a postbreeding migration of Pigeon Guillemots north from California, Oregon, and the outer coast of Washington to inland marine waters. Such a seasonal northward migration for the winter corresponds with that of many Brandt's Cormorants (*Phalacrocorax penicillatus*; Boekelheide et al. 1990) and Common Murres (*Uria aalge*; Briggs et al. 1992) and with patterns of postbreeding dispersal of Brown Pelicans (*Pelecanus occidentalis*) and Heermann's Gulls (*Larus heermanni*; Boekelheide et al. 1990).

Guillemots' occurring generally near shore makes them vulnerable to oil spills (Ewins et al. 1993). From our data, it appears that a large proportion of the southern population of Pigeon Guillemots concentrates in a relatively limited area of Washington and British Columbia in winter. This area also supports heavy ship traffic, four oil refineries, and many other industries. A major winter oil spill here could pose a significant risk to the entire southern population. For this risk to be assessed, detailed information on the size, distribution, and geographic origins of the wintering population in the waters of Washington and British Columbia is needed.

Thanks are due D. R. Paulson, B. LaBar, P. Anderson, a number of other assisting observers, and, especially, participants who financed trips. D. G. Ainley and J. Hodder made very helpful comments for corrections of a sloppy manuscript.

LITERATURE CITED

- Ainley, D. G., Boekelheide, R. J., Morrell, S. H., and Strong, C. S. 1990. Pigeon Guillemot, in *Seabirds of the Farallon Islands* (D. G. Ainley and R. J. Boekelheide, eds.), pp. 276–305. Stanford Univ. Press. Stanford, CA.
- Boekelheide, R. J., Ainley, D. G., Morrell, S. H., and Lewis, T. J. 1990. Brandt's Cormorant, in *Seabirds of the Farallon Islands* (D. G. Ainley and R. J. Boekelheide, eds.), pp. 163–194. Stanford Univ. Press. Stanford, CA.

NOTES

- Briggs, K. T., Tyler, W. B., Lewis, D. B., and Carlson, D. R. 1987. Bird communities at sea off California: 1975–1983. *Studies Avian Biol.* 11.
- Briggs, K. T., Varoujean, D. H., Williams, W. W., Ford, R. G., Bonnell, M. L., and Casey, J. L. 1992. Seabirds of the Oregon and Washington OCS, 1989–1990, in Oregon and Washington marine mammal and seabird surveys. Final report (J. J. Brueggeman, ed.), pp. 3-1–3-156. OCS Study MMS 91-0093. U.S. Dept. Interior, Minerals Mgmt. Service, Pacific OCS Office, 1340 W. Sixth St., Los Angeles, CA 90017.
- Campbell, R. W., Dawe, N. K., McTaggart-Cowan, I., Cooper, J. M., Kaiser, G. W., and McNall, M. C. E. 1990. *The Birds of British Columbia*, vol. 2. Royal Br. Columbia Mus., Victoria.
- Ewins, P. J. 1993. Pigeon Guillemot (*Cepphus columba*), in the *Birds of North America* (A. Poole and F. Gill, eds.), no. 49. Acad. Nat. Sci., Philadelphia.
- Ewins, P. J., Carter, H. R., and Shibaev, Y. V. 1993. The status, distribution, and ecology of inshore fish-feeding alcids (*Cepphus* guillemots and *Brachyramphus* murrelets) in the North Pacific, in *The status, ecology and conservation of marine birds of the North Pacific* (K. Vermeer, K. T. Briggs, K. H. Morgan, and D. Siegel-Causey, eds.), pp. 164–175. Can. Wildlife Serv. Spec. Publ., Ottawa.
- Morgan, K. H. 1997. The distribution and seasonality of marine birds of the Queen Charlotte Islands, in *The ecology, status and conservation of marine and shoreline birds of the Queen Charlotte Islands* (K. Vermeer and K. H. Morgan, eds.), pp. 78–91. Can. Wildlife Serv. Occas. Paper 93.
- Speich, S. M., and Wahl, T. R. 1989. Catalog of Washington seabird colonies. U.S. Fish & Wildlife Serv. Biol. Rep. 88 (6). MMS 89-0054.
- Wahl, T. R., Speich, S. M., Manuwal, D. A., Hirsch, K. V., and Miller, C. 1981. Marine bird populations of the Strait of Juan de Fuca, Strait of Georgia and adjacent waters in 1978 and 1979. U.S. Environmental Protection Agency, DOC/EPA Interagency Energy/Environment Res. & Dev. Program Rep. EPA/600/f-81/156. Natl. Oceanic & Atmospheric Admin., 7600 Sand Point Way NE, Seattle, WA 98115.
- Wahl, T. R., and Speich, S. M. 1984. Survey of marine birds in Puget Sound, Hood Canal and waters east of Whidbey Island, Washington, in summer 1982. *W. Birds* 15:1–14.
- Wahl, T. R. and B. Tweit. 2000. Seabird abundances off Washington, 1972-1998. *W. Birds* 31:69–88.

Accepted 9 May 2000