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Winter Marine Bird Surveys

February 16-March 6 2012

Prepared by
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On behalf of Oregon Wave Energy Trust

March 2012

This work was funded by the Oregon Wave Energy Trust (OWET). OWET was funded in part with Oregon State Lottery Funds administered by the Oregon Business Development Department. It is one of six Oregon Innovation Council initiatives supporting job creation and long-term economic growth.

Oregon Wave Energy Trust (OWET) is a nonprofit public-private partnership funded by the Oregon Innovation Council. Its mission is to support the responsible development of wave energy in Oregon. OWET emphasizes an inclusive, collaborative model to ensure that Oregon maintains its competitive advantage and maximizes the economic development and environmental potential of this emerging industry. Our work includes stakeholder outreach and education, policy development, environmental assessment, applied research and market development.

Summary

Information on winter marine bird and mammal distributions in Oregon coastal waters has been identified as a data need for marine spatial planning of ocean energy development. As part of the annual marine mammal surveys of the critical habitat for Endangered Species Act (ESA)-listed Southern Resident Killer Whales (*Orcinus orca*), National Oceanic and Atmospheric Administration (NOAA) Fisheries mobilized a winter research survey during 16 February to 06 March 2012. To study marine birds. Partnership between NOAA Fisheries Northwest Fisheries Science Center (Conservation Biology and Fish Ecology divisions) and the Oregon Wave Energy Trust (OWET) allowed the principal investigator to place two contract seabird observers on board the *Shimada* for the entire survey. Deployment of seabird observers during this winter survey allowed quantitative information of marine bird species, abundance and behavior to be collected during all daylight hours when the ship was under way and weather conditions permitted.

This report is meant to provide a concise data summary of methods, survey dates and locations, and basic information about bird species seen during the surveys. It is not a final analysis, nor have data been fully processed to provide absolute at-sea density estimates.

Marine mammal observations and other ecosystem data collection were funded entirely by NOAA Fisheries; these data are in the custody of M. Bradley Hanson and Dawn Noren, who served as Chief Scientists for the 2012 research survey.

Methods – Marine Bird Observations

Bird survey data were collected using strip transect methods (Tasker et al. 1984). Observations were recorded during daylight hours when the vessel was moving at speeds in excess of 8 $m \cdot s^{-1}$ (4 knots) and when weather conditions permitted observation. Observations began at dawn each morning. A pair of dedicated bird observers counted and identified all flying or sitting birds within a strip transect extending 300 m out from the bow to the beam of the ship (90° arc). Strip width was determined using a calibrated range-finder (Heinemann 1981). Observations were collected from NOAA Ship *Bell M. Shimada* on the side of the vessel with the least visual glare. During mild weather, observations were collected from the flying bridge (deck height = 12.6 m) on the side of the vessel with the best viewing conditions for each survey (e.g., no glare). In the event of precipitation exceeding a light drizzle, observations were collected from the covered bridge wing in the lee of the wind or from inside the bridge (deck height 10.3 m).

Individual sightings were categorized into three distance bins from the ship: 0-100 m, 101-200 m and 201-300 m. Sightings of interest beyond 300 meters were recorded opportunistically only when it did not compromise complete observer coverage of the primary survey area. Sightings of interest, while off survey effort during daylight hours, were also recorded opportunistically. Species identification, counts and behaviors (e.g. resting, feeding, flight direction, etc), were noted and recorded. Binoculars of at least 8x magnification were used to aid in counting and species identification.

During survey efforts, the primary and secondary observer scanned the survey area for birds. When a bird was detected the primary observer verbally called out the sighting details to the secondary observer, who immediately typed the data into a weatherproof laptop computer

running the “See-Bird” data acquisition program V.4.1.5.0 (Southwest Fisheries Science Center, La Jolla, CA). The computer was linked to the ship’s GPS satellite data input so that each observation entered was associated with a time stamp, and a latitude and longitude position. Observers traded primary scanning and data entry duties every few hours and took breaks when appropriate for meals.

Raw data were error-checked at the close of each day and upon return from sea while being entered into an MS-Access database. The data remain in the custody of Dr. Jeannette E. Zamon, NOAA Fisheries, Northwest Fisheries Science Center. Preliminary summaries of those data are presented in this report.

Survey Dates, Locations and Kilometers

A total of 1,503.6 kilometers of on-effort survey observations were collected between 16 February 2012 and 6 March 2012; total effort for each day is shown in Table 1. Observation conditions during data collection were generally good: average Beaufort sea state was 4.4, winds ranged between 4-16 knots and the Observing Condition factor, which is a qualitative measure of the ability to detect small, fast-moving species such as phalaropes or storm-petrels, was categorized as ‘good’ for all surveys by the observers.

No observations were taken on 18 and 19 February because the vessel had to return to port for repairs to the radar system. Additionally, poor weather conditions prohibited observations on 21 and 25 February.

A combination of stormy weather on the outer coast of Oregon and Washington and inshore movement of the killer whales resulted in a considerable number of sea days being spent within the protected waters of the Strait of Juan de Fuca and the Salish Sea.

Species Counts and Relative Community Composition

A total of 8,955 seabirds were observed and counted during on-effort transects within the 300 meter strip transect (Table 2). Thirty-seven species were identified throughout the survey. The observed species composition indicated an assemblage of resident breeding species (e.g. murres, auklets, gulls) and non-breeding winter migrants (e.g. kittiwakes, northern fulmars *Fulmarus glacialis*). Seventy-five percent of all birds counted comprised two species: common murre (*Uria aalge*, 60.4%) and black-legged kittiwake (*Rissa tridactyla*, 15.4%).

Parakeet auklets (*Cyclorrhynchus psittacula*) were the third most commonly observed species. Parakeet auklets breed in the Aleutian Islands of Alaska during the summer months, where they feed on jellies, plankton and fishes. Little is known about their winter ecology, although they have been regularly observed in small groups (2-6 individuals) off the Oregon and Washington coast during winter months. The numbers observed during the 2012 winter survey were the largest yet seen during NOAA Fisheries winter data to this date.

Small numbers of nearshore bird species including red-breasted merganser (*Mergus serrator*) and bald eagle (*Haliaeetus leucocephalus*) were seen as a result of surveys inside the Strait of Juan de Fuca and Salish Sea. Common murres, the most commonly observed species, occurred throughout the survey region, but there were some distinct locations of increased numbers of birds, including just north of the Columbia River off Willapa Bay, off central

Oregon, and near the mouth of the Strait of Juan de Fuca (Figure 1). This pattern is probably related to local breeding colonies as well as ideal foraging habitat conditions.

A species that was notably for its absence during the 2012 survey was the sooty shearwater (*Puffinus griseus*). When present, sooty shearwaters typically dominate the seabird community. Shearwaters migrate to the US west coast in the late spring by the millions from the southern hemisphere. Very few data are available on the timing of their arrival on the Oregon coast.

Literature Cited

Heinemann, D. 1981. A Range finder for pelagic bird censusing. J. Wildlife Manage. 45(2): 489-493.

Tasker, M.L., Hope Jones, P., Dixon, T., Blake, B.F. 1984. Counting seabirds at sea from ships: a review of methods employed and a suggestion for a standardized approach. Auk 101(3): 567-577.

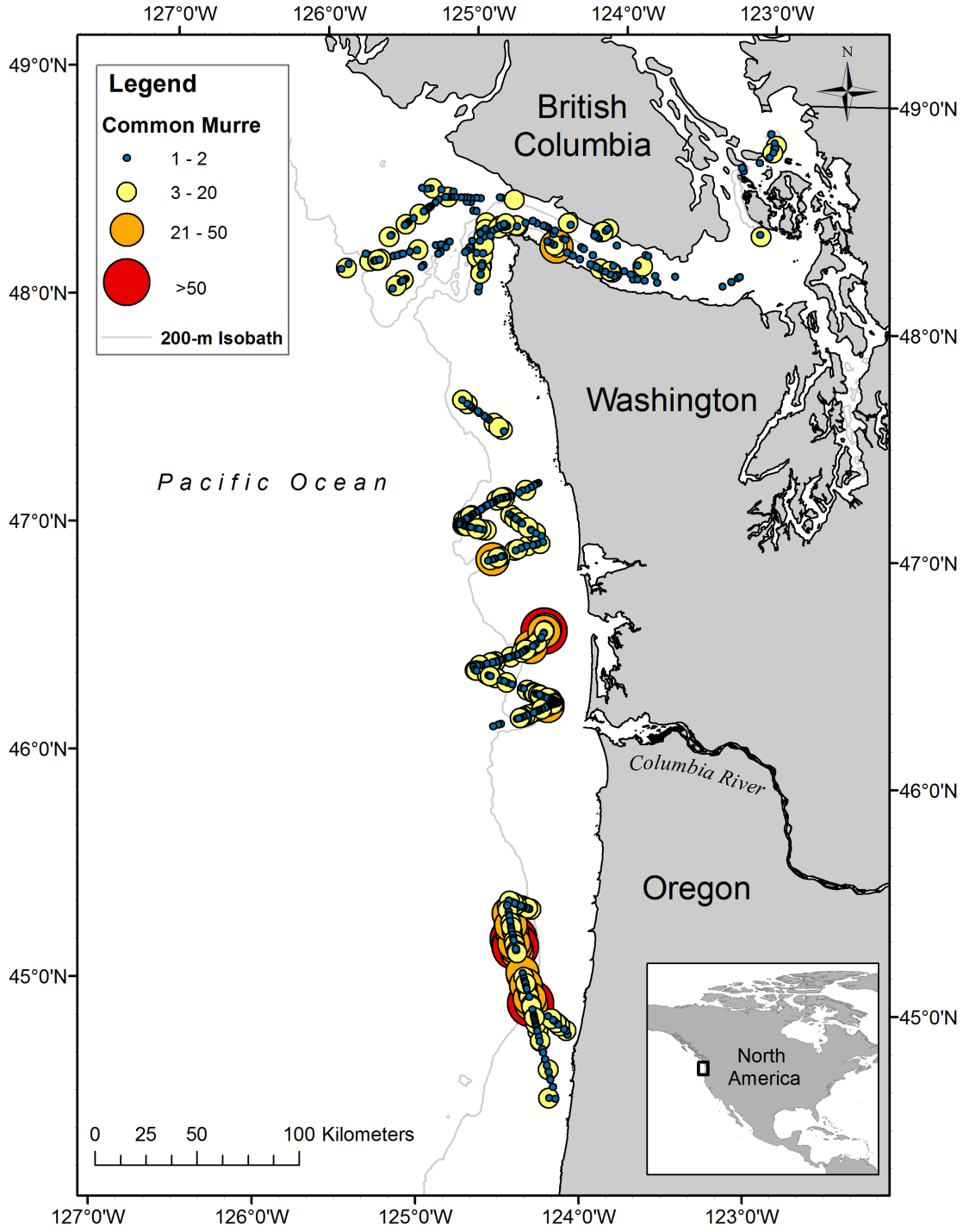
Table 1. Marine bird survey effort, in linear distance surveyed per day.

Survey Date	Total kilometers surveyed
February 16, 2012	17.6
February 17, 2012	123.9
February 20, 2012	89.7
February 22, 2012	34.4
February 23, 2012	151.6
February 24, 2012	79.5
February 26, 2012	87.5
February 27, 2012	59.6
February 28, 2012	99.7
February 29, 2012	102.7
March 1, 2012	21.3
March 2, 2012	97.1
March 3, 2012	196.5
March 4, 2012	115.3
March 5, 2012	119.1
March 6, 2012	108.0
Total	1,503.6

Table 2. Seabird species recorded during marine bird surveys, 16 February to 06 March 2012. Sightings are reported in descending order of abundance. All seabirds were seen between 0-300 meters from the research vessel during regular, on-effort survey transects. Counts include both birds on the water and birds flying through the strip transect.

Common Name	Scientific Name	Total Count	Percentage of total
Common Murre	*Uria aalge*	5,414	60.44
Black-legged Kittiwake	*Rissa tridactyla*	1,380	15.41
Parakeet Auklet	*Cyclorrhynchus psittacula*	400	4.47
Cassin's Auklet	*Ptychoramphus aleuticus*	375	4.19
Western x Glaucous-winged Gull	*Larus occidentalis x glaucescens*	324	3.62
Rhinoceros Auklet	*Cerorhinca monocerata*	210	2.34
Mew Gull	*Larus canus*	143	1.60
Herring Gull	*Larus argentatus*	136	1.52
Glaucous-winged Gull	*Larus glaucescens*	89	0.99
Pacific Loon	*Gavia pacifica*	73	0.82
Northern Fulmar	*Fulmarus glacialis*	62	0.69
Brant	*Branta bernicla*	50	0.56
Black-footed Albatross	*Phoebastria nigripes*	38	0.42
Ancient Murrelet	*Synthliboramphus antiquus*	32	0.36
Thayer's Gull	*Larus thayeri*	25	0.28
Brandt's Cormorant	*Phalacrocorax penicillatus*	24	0.27
Short-tailed Shearwater	*Puffinus tenuirostris*	23	0.26
Unidentified Gull	*Larus spp.*	22	0.25
Western Gull	*Larus occidentalis*	20	0.22
Surf Scoter	*Melanitta perspicillata*	18	0.20
Red-breasted Merganser	*Mergus serrator*	17	0.19
Red-throated Loon	*Gavia stellata*	14	0.16
Marbled Murrelet	*Brachyramphus marmoratus*	11	0.12
Bald Eagle	*Haliaeetus leucocephalus*	7	0.08
California Gull	*Larus californicus*	7	0.08
Tufted Puffin	*Fratercula cirrhata*	7	0.08
Pelagic Cormorant	*Phalacrocorax pelagicus*	6	0.07
Pigeon Guillemot	*Cepphus columba*	6	0.07
Long-tailed Duck	*Clangula hyemalis*	3	0.03
Mottled Petrel	*Pterodroma inexpectata*	3	0.03
Unidentified Alcid	Alcidae	3	0.03
Canada Goose	*Branta canadensis*	2	0.02
Fork-tailed Storm-petrel	*Oceanodroma furcata*	2	0.02
Peregrine Falcon	*Falco peregrinus*	2	0.02
Unidentified Loon	*Gavia spp.*	2	0.02
Common Merganser	*Mergus merganser*	1	0.01
Double-crested Cormorant	*Phalacrocorax auritus*	1	0.01
Laysan Albatross	*Diomedea immutabilis*	1	0.01
Mallard Duck	*Anas platyrhynchos*	1	0.01
Manx Shearwater	*Puffinus puffinus*	1	0.01
Total		**8,955**	**99.98**

Figure 1. Distribution of common murres, 16 February – 06 March 2012. Since murres were the most common bird seen during the survey, sightings on this map provide a general idea of the geographical area covered by on-effort marine bird surveys.



Appendix A: Research Team

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