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Coastal Washington
Marine Mammal and Bird Geodatabases

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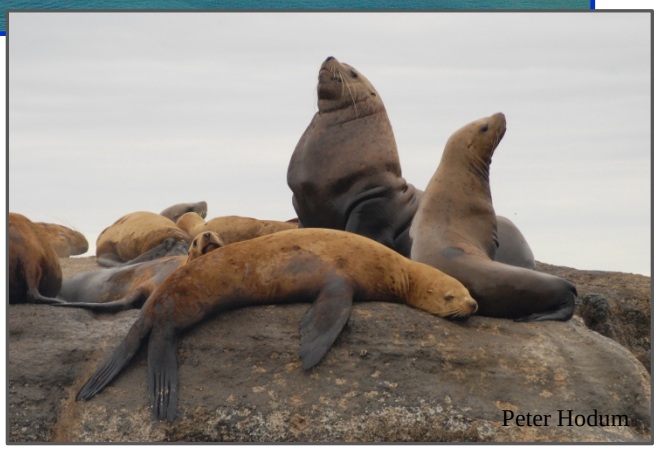
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Overview of the Bird and Mammal Geodatabase Project

We created five geodatabases and associated FGDC metadata using historic and recently gathered data from bird and mammal survey projects (Table 1). The purpose of each project differed and included: 1) identifying locations for key life history events such as seabird nesting locations or marine mammal haulout sites, or 2) their goal was intended to estimate population sizes and trends for rare or recovering populations. The goal of this current effort was to create or update existing datasets and make them publically available so that they could be used in ongoing marine spatial planning efforts. Specifically, we hope that the information that these databases contain will prove useful when considering the potential interactions between wildlife distribution and abundance and human uses of the marine environment (e.g., alternative energy development) or in response to marine contamination such as an oil spill. In addition, these data may be useful in ongoing and future research to help us understand the marine environment. To accomplish these goals, we are placing these geodatabases on the DNR marine spatial planning portal (http://www.msp.wa.gov/learn/) where they will be publically available and can be queried for a variety of purposes.

Table 1. A brief description of the four marine bird and mammal databases and the appropriate citation for understanding how the data were gathered.

Data base Title	Description	Methods
Catalog of Washington's Seabird Colonies	The original intent of this effort was to identify the locations and population sizes of all of Washington's seabird colonies. For each of Washington's colonies, we provide counts or estimates of number of seabirds by species that was included in the original Catalog and we provide updated information when available for some species/colonies.	Speich and Wahl 1989
Atlas of Seal and Sea Lion Haulout Sites	The original intent of this project was to identify the locations and approximate count for all of Washington's seal and sea lion haulouts. We provide counts by species from summer aerial surveys for individual haulouts or assemblages of haulouts (e.g., sandy habitats in Grays Harbor). We moved the original Atlas (points) into a polygonal geodatabase feature class and provided updated and more detailed survey information in a relational format. The new format includes daily counts per species from annual survey efforts as opposed to single ranges of average detections at a location as with the original atlas.	Jeffries et al. 2000
Spring/summer bird and mammal encounter rates	The intent of this annual survey effort is to estimate the population and trend of the federally threatened marbled murrelet. However, all birds and mammals encountered during the survey are recorded. The geodatabase provides the annual average number of birds/mammals encountered by species per km traveled in both nearshore and offshore subunits of 20 km long primary sampling units. We only included relatively abundant mammals and birds that breed locally and are more abundant in the nearshore.	Raphael et al. 2007
Sea otter concentration areas	The goal of this project was to provide a population estimate and annual trend for an introduced population on Washington's coast. We provide point occurrences of sea otters detected and summer concentration areas (polygons) from summer aerial surveys conducted during 2012 and 2013.	Jameson and Jeffries 2014
Winter bird and mammal encounter rates	The goal of this project is to provide flyway population estimates of waterfowl and seaducks. In this database, we provide the number of birds detected from an airplane per square km surveyed during a single winter survey in 2011. Survey includes both along shore transects and periodic transects perpendicular to shore.	Evenson 2011

In Figures 1 – 5 below, we provide example maps and information that can be produced from these datasets. These databases are currently static with no dedicated funds or effort to provide regular updates. However, when opportunities arise, we will update these databases and provide updates to the marine spatial planning portal and to Washington's Priority and Habitats databases.

Figure 1. Location of all of Washington's seabird colonies. The number of species and their local population count or estimate can be queried for each colony. This effort was intended to be consistent with similar catalogs for all of the west coast states.

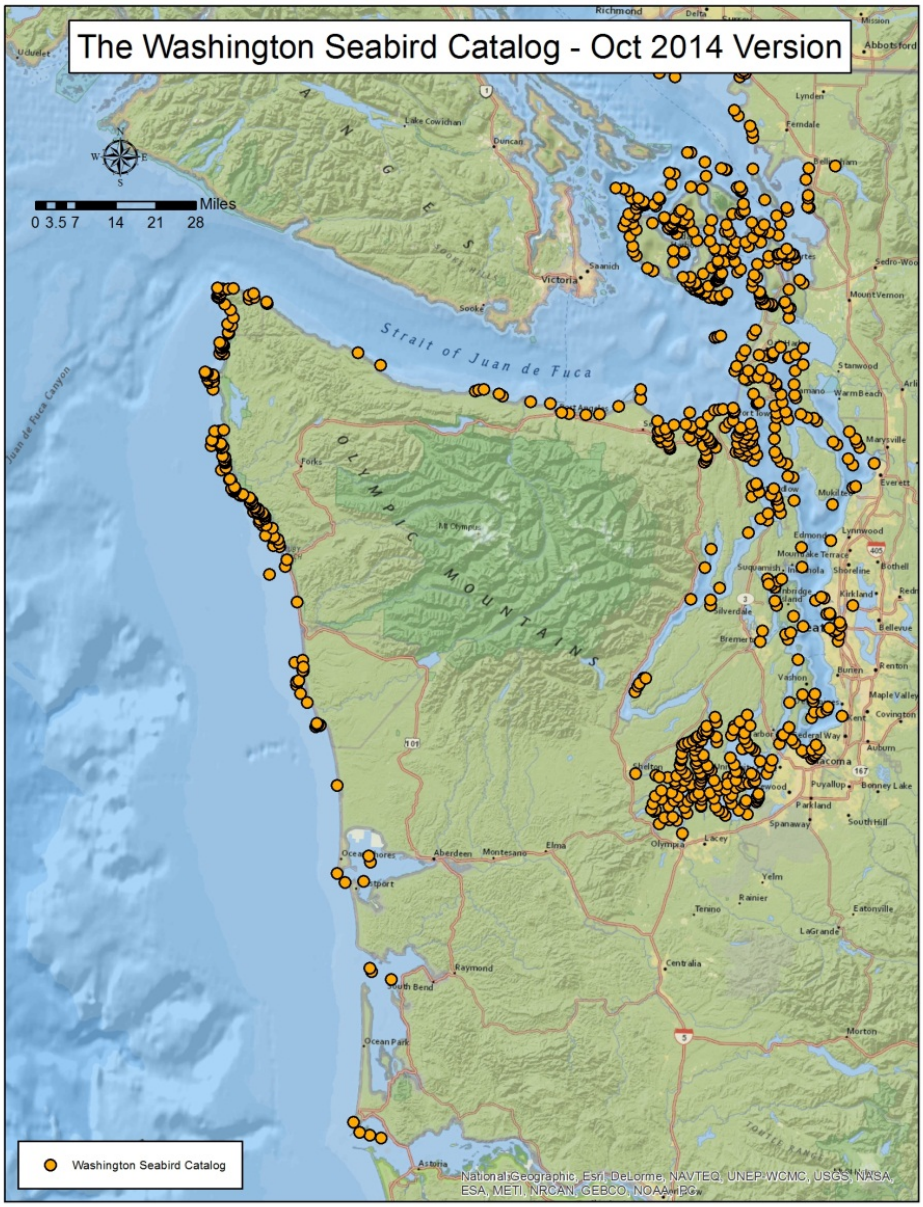


Figure 2. Seal and sea lion haulout polygons for Grays Harbor, Willapa Bay and the Columbia River estuary. Haulouts were clustered because these environments and the suitable conditions for haulouts change spatially over time and because these areas are surveyed as a unit.

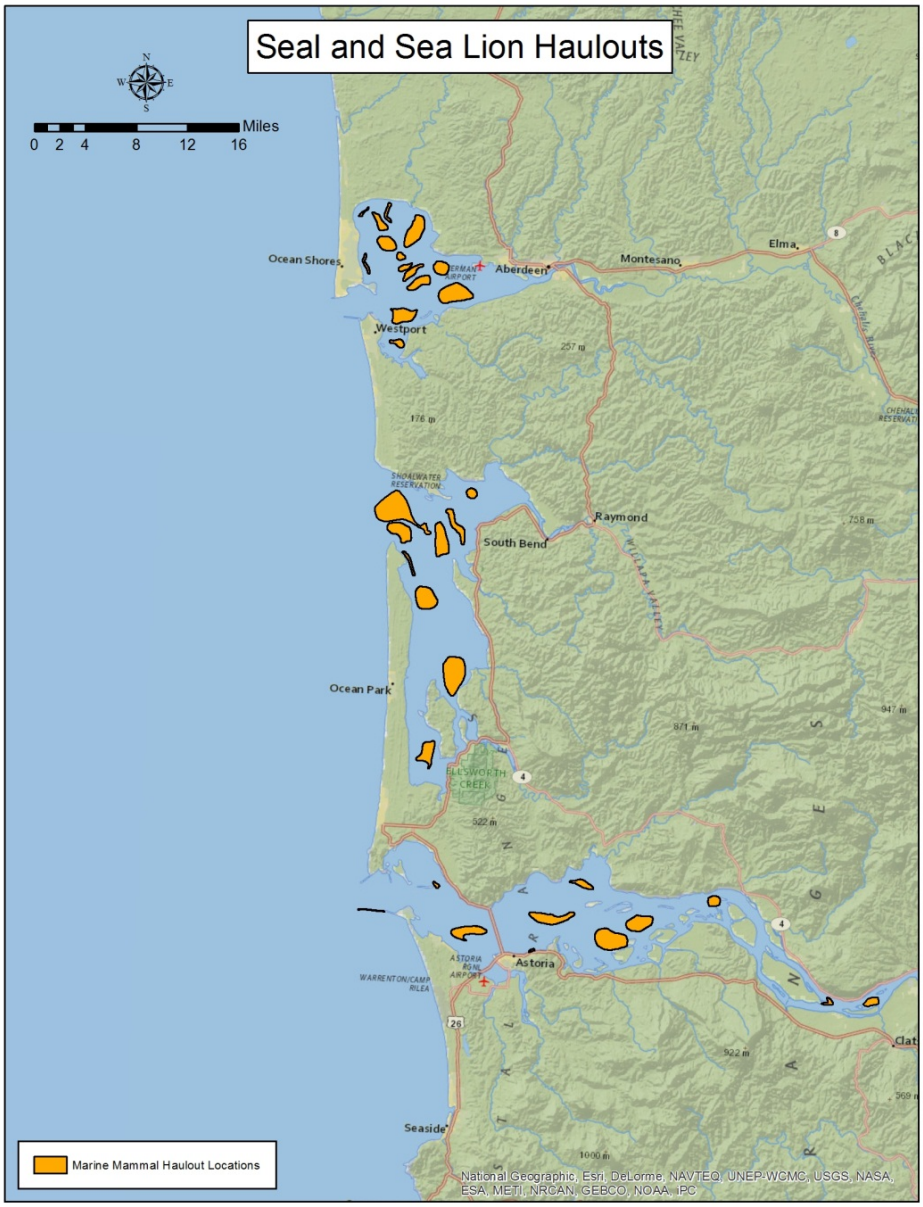


Figure 3. 2013 encounter rates for the ancient murrelet in both the nearshore and offshore portions of 14 primary sampling units along Washington's outer coast.

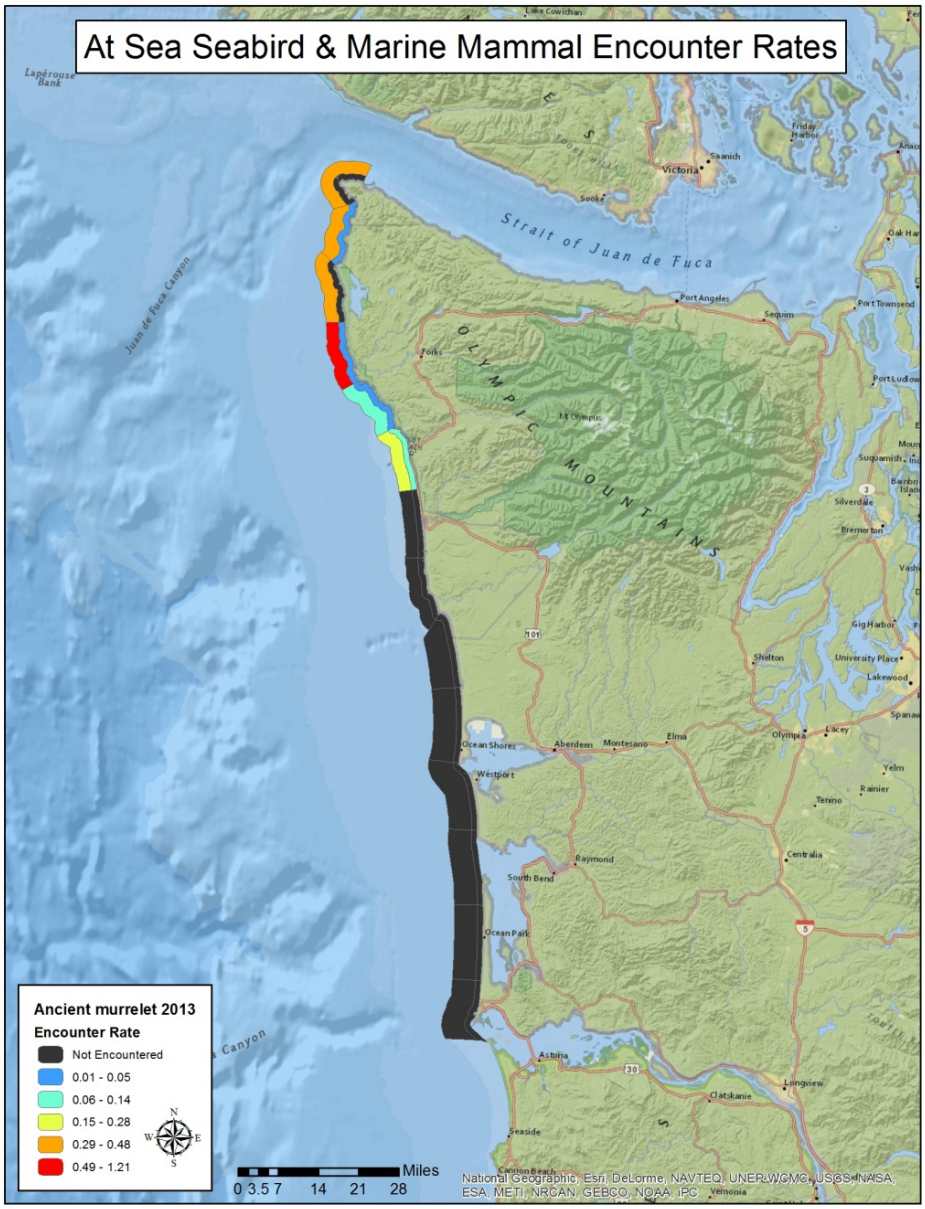


Figure 4. 2012-2013 Sea otter detection locations and summer concentration areas on Washigton's coast.

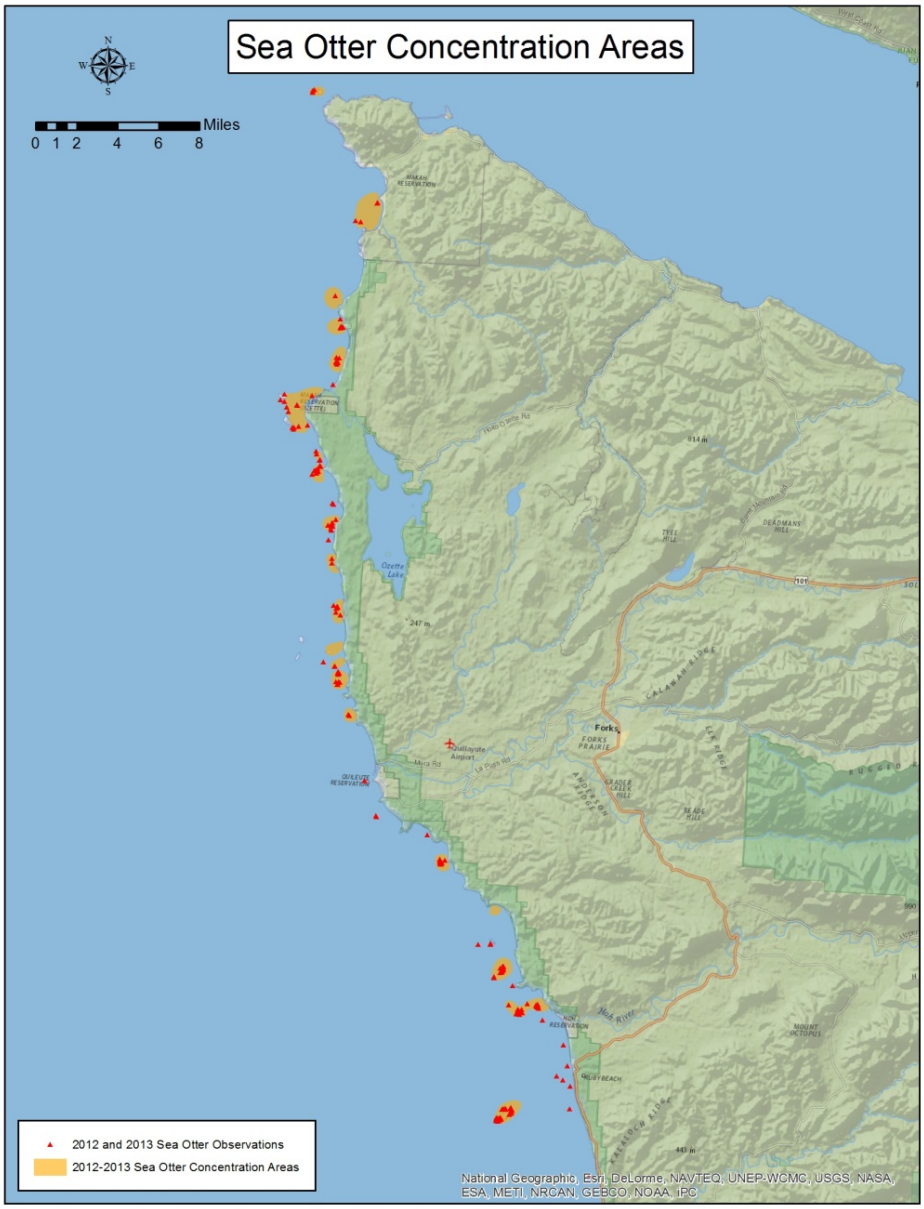
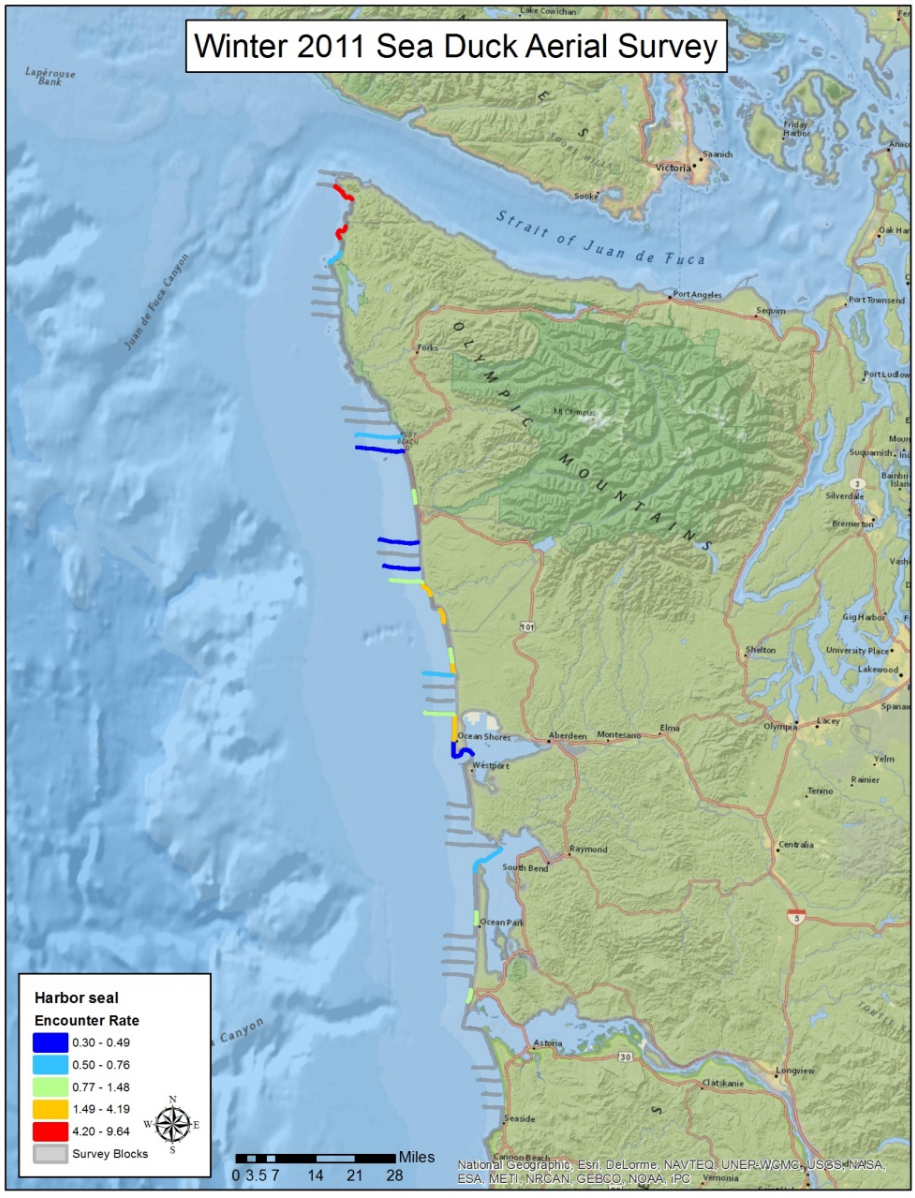


Figure 5. Per transect Harbor seal encounter rates per square km surveyed during the winter 2011 sea duck aerial surveys



Literature Cited

Evenson, J., T. Cyra, B. Murphie, and D. Kraege. 2011. Summary of the Winter 2011 Sea Duck Aerial Surveys of the Pacific Coast of Oregon and Washington. Washington Department of Fish and Wildlife.

Jameson, R.J., and S. Jeffries. 2014. Results of the 2013 Survey of the Reintroduced Sea Otter Population in Washington State. Washington Department of Fish and Wildlife Science Program, Lakewood, Washington.

Jeffries, S.J., P.J. Gearin, H.R. Huber, D.L. Saul, and D.A. Pruett. 2000. Atlas of Seal and Sea Lion Haulout Sites in Washington. Washington Department of Fish and Wildlife, Wildlife Science Division, 600 Capitol Way North, Olympia Washington.

Raphael, M.G., J. Baldwin, G.A. Falxa, M.H. Huff, M. Lance, S.L. Miller, S.F. Pearson, C.J. Ralph, C. Strong, and C. Thompson. 2007. Regional population monitoring of the marbled murrelet: field and analytical methods. Gen. Tech. Rep. PNW-GTR-716. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Speich, S.M., and T.R. Wahl. 1989. Catalog of Washington seabird colonies. U.S. Fish and Wildlife Service Biological Report. 88(6).