Marine Mammals – Harbour Seal Distribution

description

Harbour seals *(Phoca vitulina)* are one of the most common marine mammals in British Columbia. These true seals have spotted coats in colours ranging from white to grey to brown and measure up to two metres in length. They are commonly seen around marinas and harbours, relatively close to shore in the water or hauled out on small islets and rocks along the British Columbia coast. In the Pacific, Harbour seals occur from central Baja California to Alaska.

Data illustrated are modelled values representing the distribution of harbour seals in terms of relative densities. These density estimates are based upon seal observations recorded during systematic surveys in the summers of 2004, 2005 and 2006, and environmental parameters including latitude, longitude, and depth. Survey results and modelling work has been peer reviewed (Williams and O'Hara, 2010; Williams and Thomas, 2007). Distribution illustrated here is restricted to the extents surveyed (Figure 1).

Data were received in 2010 as points with values and coordinates. The points were plotted and converted to a comprehensive 2 nautical mile by 2 nautical mile grid. Density values were classified for illustration into 8 classes based on Jenks natural breaks classification.

The Jenks' natural breaks classification scheme (automated in ESRI ArcGIS software) (Jenks, 1977 and Fisher, 1958) determines the best arrangement of values into classes by iteratively comparing sums of the squared difference between observed values within each class and class means. The "best" classification identifies breaks in the ordered distribution of values that minimizes within-class sum of squared differences, and thus identifies classes that are most homogenous within.

Estimated density values range from zero to twelve seals per square kilometre and the vast majority of density values are at the low end of the range.

PHOTO: WORLDS WILDLIFE WONDERS

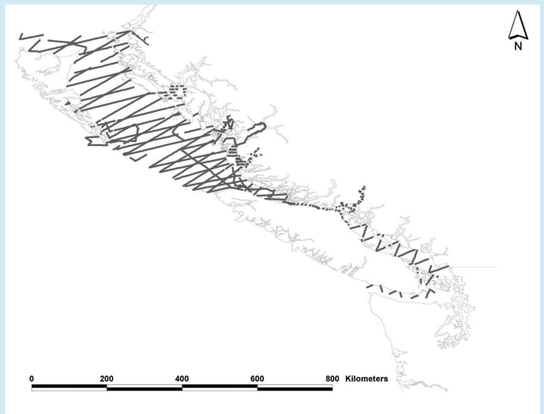

FIGURE 1. TRACKLINES THAT ILLUSTRATE THE SPATIAL EXTENTS OF RELATED SURVEY EFFORT.

data sources

- Rob Williams, UBC Marine Mammal Research Unit

data resolution

- Estimates were generated for midpoints of grid cells measuring 2 nautical miles by 2 nautical miles. The data are illustrated in this grid cell format.

date of analysis

- Peer-reviewed publications describing data collection and estimation of distribution and abundance were published in 2007 and 2010.

date collected

- Systematic sighting surveys were undertaken in the summers of 2004, 2005 and 2006.

reviewers

- Rob Williams, UBC Marine Mammal Research Unit

reviewer comments

- None provided.

caveats of use

- Modelled distribution is for the area covered by systematic surveys, and during the temporal extent of the surveys (Figure 1). While data are lacking for areas and seasons beyond the illustrated data, this does not imply these areas are of no importance to marine mammals.
- Please refer to the "Harbour Seal Haulouts" page in this atlas for additional information on the extent of harbour seal habitat in the Canadian Pacific. *www.raincoast.org/files/WAS_report/whats_at_stake_ver1.pdf" \t "_blank*
- Survey data for two additional years may be available from Raincoast Conservation. Recommend compiling all years of data. See: *www.raincoast.org/files/WAS_report/whats_at_stake_ver1.pdf*
- Recommended date of expiry for use of these data in a marine planning context: None provided.

map, feature data and metadata access

- Visit *www.bcmca.ca/data* for more information.

references

- Fisher, W. D. On grouping for maximum homogeneity. *Journal of the American Statistical Association.* 1958. 53, 789-798.
- Jenks, G. F. Optimal data classification for choropleth maps. *Occasional paper No. 2. Lawrence, Kansas: University of Kansas, Department of Geography.* 1977.
- Williams, R. and Thomas, L. 2007. Distribution and abundance of marine mammals in coastal waters of British Columbia, Canada. *Journal of Cetacean Research and Management.* 9(1):15–28.
- Williams, R. and O'Hara, P. 2010. Modelling ship strike risk to fin, humpback and killer whales in British Columbia, Canada. *Journal of Cetacean Research and Management.* 11(1):1-8.

BCMCA Atlas

Marine Mammals

Harbour Seal Distribution

Legend

Estimated Seal Density
(seals per square kilometre)

high

low

Notes:
- Seal densities range from 0 - 12 seals per square kilometre.
- Classification based on 8 natural breaks.

Data Sources:
Rob Williams

Base Data:
ESRI Base Data, GeoBase, GeoBC, NOAA, Natural Resources Canada, USGS, Washington State Government

Thematic Data:
For more information on data sources and methods please refer to the facing page to this map

Projection: BC Albers NAD83

0 25 50 75 100 125 150
Kilometres

0 25 50 75
Nautical Miles

1:4,250,000 *

* Written scales are approximate and are based on a 11 x 17 inch paper size.

Prepared for:

BC Marine Conservation Analysis

Map template by Caslys Consulting Ltd.

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Alaska

Haida Gwaii

British Columbia

Vancouver Island

Washington

PACIFIC OCEAN

Nass River

Skeena River

Fraser River

142°W 140°W 138°W 136°W 134°W 132°W 130°W 128°W 126°W 124°W 122°W

54°N 52°N 50°N 48°N 46°N

Inset Map 1:500,000*

Note: The inset has been provided to illustrate the level of detail available in the data. The inset is for illustrative purposes only and does not imply any significance to this region.