# Marine Mammals – Harbour Porpoise Distribution

## description

At 1.6 metres in length, the harbour porpoise *(Phocoena phocoena)* is the smallest cetacean in British Columbia. Often confused with Dall's porpoise due to its size, the harbour porpoise is more solitary in nature and is usually found in groups of one to three individuals. They have a circumpolar distribution and are found throughout the waters of the northern hemisphere.

Data illustrated are modelled values representing the distribution of the harbour porpoise in terms of relative densities. These density estimates are based upon porpoise 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) 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 homogeneous within.

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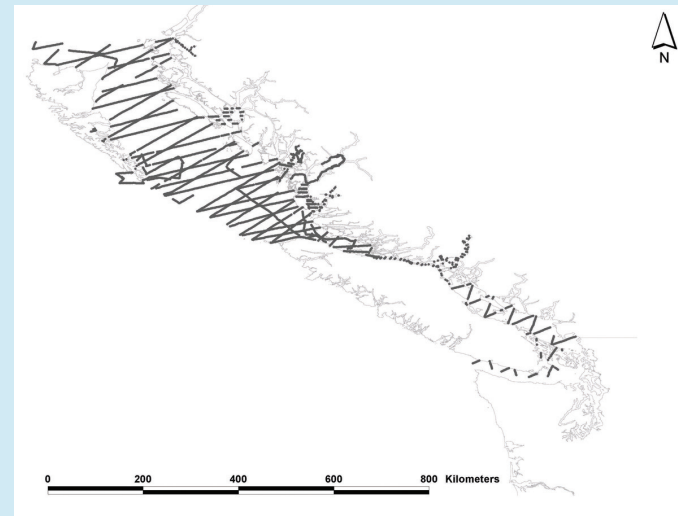


PHOTO: GEORGE PATERSON



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

- Anna Hall, UBC Marine Mammal Research Unit
- Rob Williams, UBC Marine Mammal Research Unit

## reviewer comments

- It's uncertain if any of the inlets are actually high porpoise density; that does not appear to represent what is known about these cetaceans.
- According to fishermen, the mouth of the Skeena River is good habitat for harbour porpoise. The waters near Victoria are particularly good for harbour porpoise and there are some hotspots that have high porpoise density. There are also regionally high-density regions that are not reflected in his map.

## 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. *www.raincoast.org/files/WAS_report/whats_at_stake_ver1.pdf*
- Opportunistic sightings data are available through the British Columbia Cetacean Sightings Network (BCCSN), through the Vancouver Aquarium. See: *www.vanaqua.org/conservationinaction/killerwhales/network.htm*
- At the time of publication, Anna Hall is finishing her PhD work at the University of British Columbia that includes a fine scale analysis for the southern waters of Vancouver Island to elucidate harbour porpoise habitat. Her results suggest that harbour porpoise predictably use areas of complex sea floor bathymetry related to tidally well mixed areas.
- 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
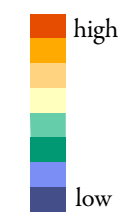
- Visit *www.bcmca.ca/data* for more information.

## 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 Porpoise Distribution

Alaska

Nass River

Skeena River

Haida
Gwaii

British

Columbia

Fraser River

PACIFIC

OCEAN

Vancouver
Island

Washington

### Legend
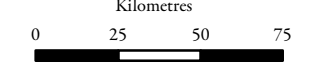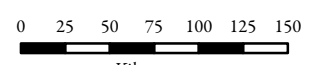
**Estimated Porpoise Density**
(porpoises per square kilometre)

high

low

Notes:
- Porpoise densities range from 0 - 1 porpoises per square kilometre.
- Classification based on 8 natural breaks.

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**

### Inset Map

1:500,000*
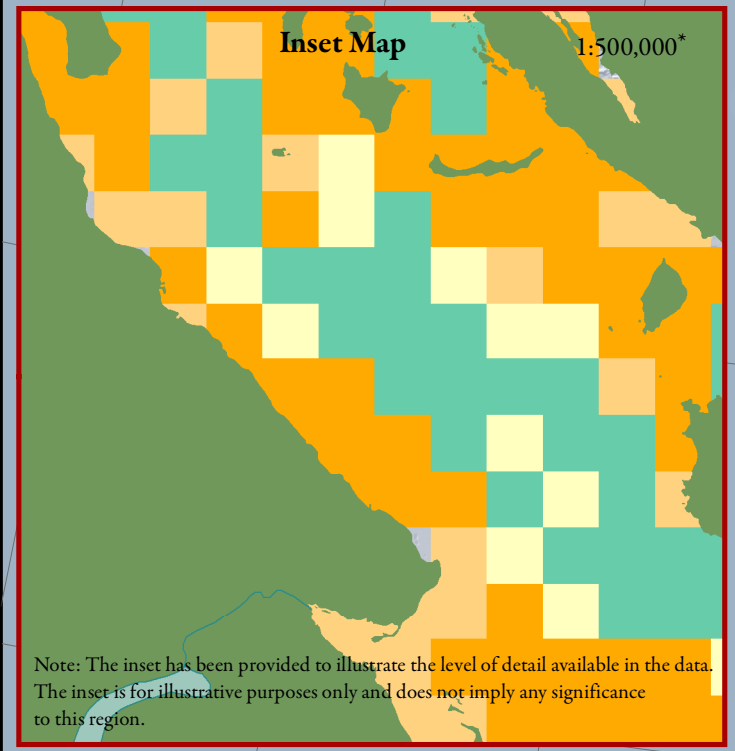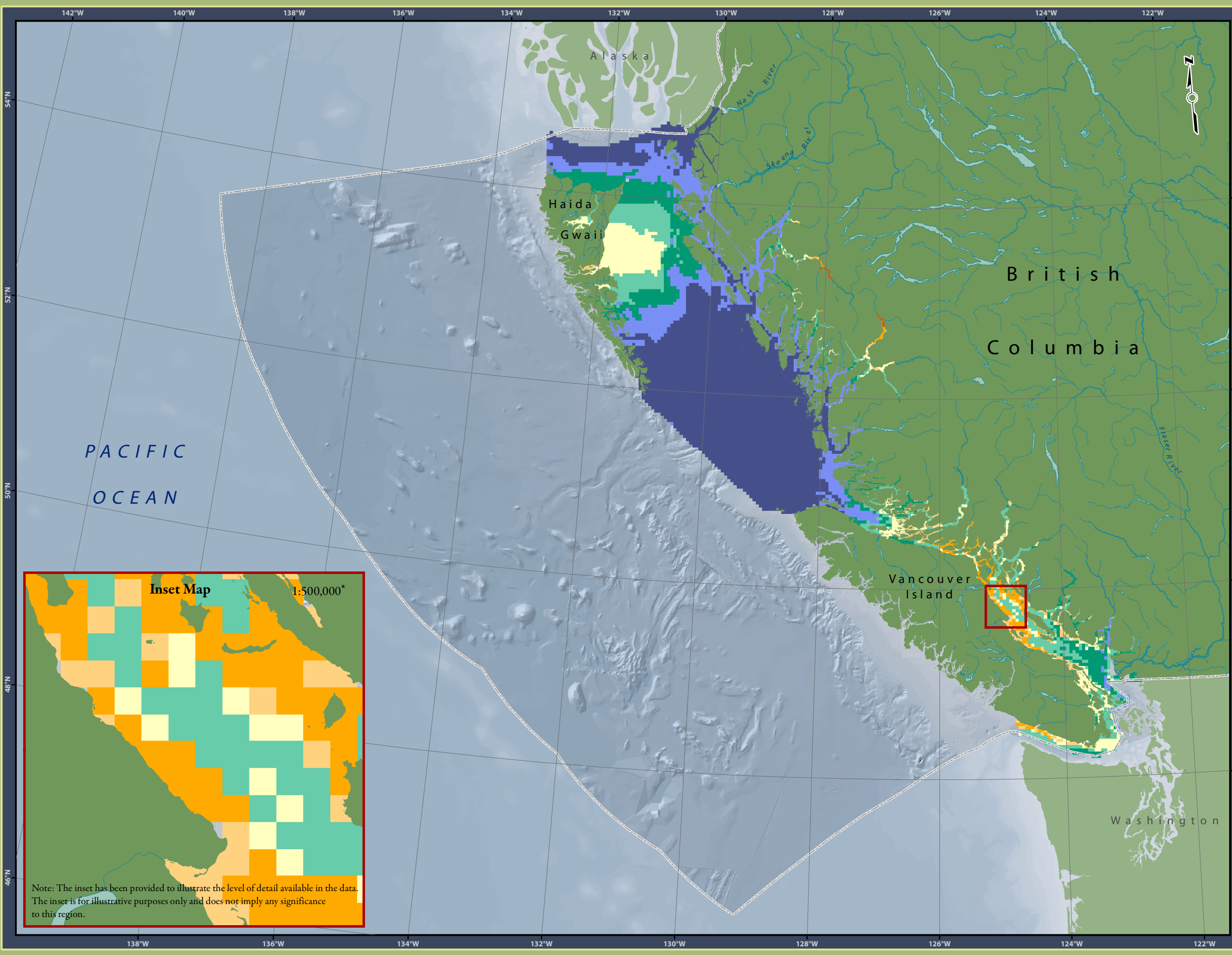
Note: The inset has been provided to illustrate the level of detail available in the data. The inset is for illustrative purposes only and does not imply any significance to this region.