

## Marine Birds – At-sea Density of Marbled Murrelet

### description

This atlas page illustrates the best available data describing marine habitat use by Marbled Murrelet at sea. Marbled Murrelets (*Brachyramphus marmoratus*) are small marine birds that are black and white in the winter and have a marbled brown plumage in the summer. The species is listed as threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and considered a global priority in the Conservation Framework developed by the Province of British Columbia.

Source data used to develop this map consisted of a range of ship-based surveys, which were focused on recording Marbled Murrelet counts and locations. Midpoints were generated for each survey transect from each dataset. Observations of the Marbled Murrelet were totalled and divided by the survey area of each transect to generate a density of Marbled Murrelet for each transect midpoint. All of the midpoints that fell within a single planning unit were averaged, adjusting for survey effort, to calculate the illustrated metric, average density of Marbled Murrelet by planning unit. The density values range from 0.01 birds per square kilometre to 3,300 birds per square kilometre with the vast majority of the density values at the low end of the range. The values were symbolized using 6 quantiles so that the number of values within each class is the same but the class intervals vary in size and are larger at the extremes. (A quantile is established by dividing the frequency distribution of a variable into equal groups: that is, each quantile contains the same fraction of the total number of values being measured.)



PHOTO: U.S. FISH AND WILDLIFE SERVICE

### data sources

- Environment Canada (Canadian Wildlife Service) - BC Ferry Surveys
- Environment Canada (Canadian Wildlife Service) – Marine Bird Database
- Environment Canada (Canadian Wildlife Service) - Pelagic Seabird Surveys
- Alan Burger - Southwest Vancouver Island Shelf Surveys
- Alan Burger – Trevor Channel Transects
- Laskeek Bay Conservation Society – Laskeek Bay Surveys
- Parks Canada Agency – West Coast Trail Surveys
- Bernard Schroeder – MAMU (Marbled Murrelet) Surveys

Additional data that could be used to inform marine habitat use by Marbled Murrelet at sea are known to be available from:

- Raincoast Conservation Society – At-sea surveys of marine birds and mammals

### data resolution

- Source survey data transects were generally about 1 kilometre in length. We calculated weighted averages for each 2 kilometre x 2 kilometre planning unit.

### date collected

- 1987-2012

### date compiled

- 2012

### reviewers

- Bernard Schroeder, Consultant
- Representatives from Environment Canada, Canadian Wildlife Services

### reviewer comments

- Some reviewers felt that Marbled Murrelet should have been included with the other listed species to create a single feature instead of two separate density features for listed marine birds.

### caveats of use

- The density values in an area can change over time in response to natural population fluctuations and changes in habitat conditions (natural or anthropogenic).
- Survey effort is not consistent across all planning units or across all areas of the coast and some species tend to be under-represented by some survey methods. Areas with no data may not have been surveyed and these data gaps are not necessarily indicative of an absence of Marbled Murrelets. Some locations may still be important to marine birds but currently lack associated data to confirm their value.
- This feature is a compilation of data collected by many people, for different purposes, using different survey techniques with different methodologies within each technique and, therefore, considerable care must be taken when using the data.
- 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](http://www.bcmca.ca/data) for more information.



**BCMCA Atlas**

**Marine Birds**

**At-sea Density of  
Marbled Murrelet**

**Legend**

**Birds per square kilometre  
standardized by effort**

- 0.00
- 0.01 - 0.82
- 0.83 - 1.90
- 1.91 - 3.84
- 3.85 - 10.28
- 10.29 - 3,319.59

Note:  
- Classification based on 6 quantiles.

**Data Sources:**

Environment Canada  
(Canadian Wildlife Service),  
Alan Burger,  
Laskeek Bay Conservation Society,  
Parks Canada,  
Bernard Schroeder

**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\*

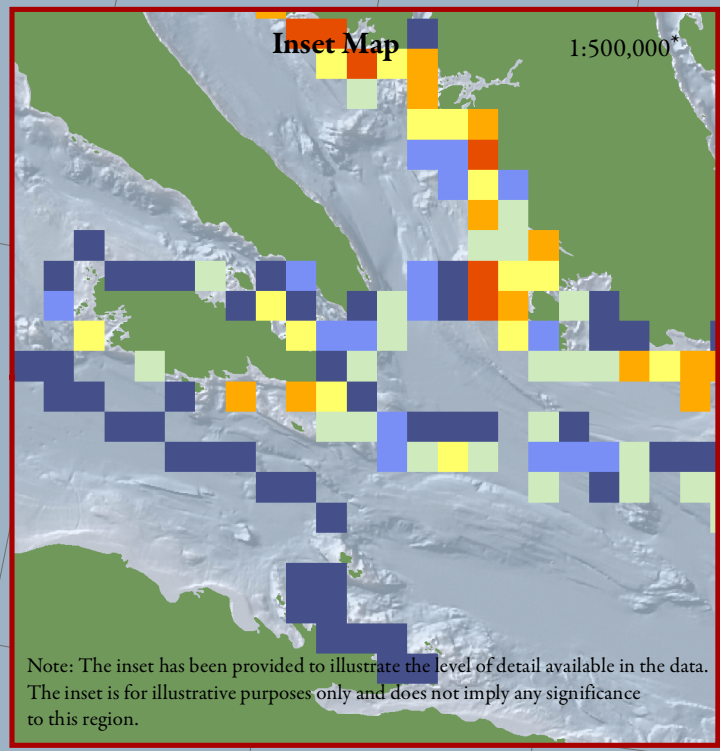
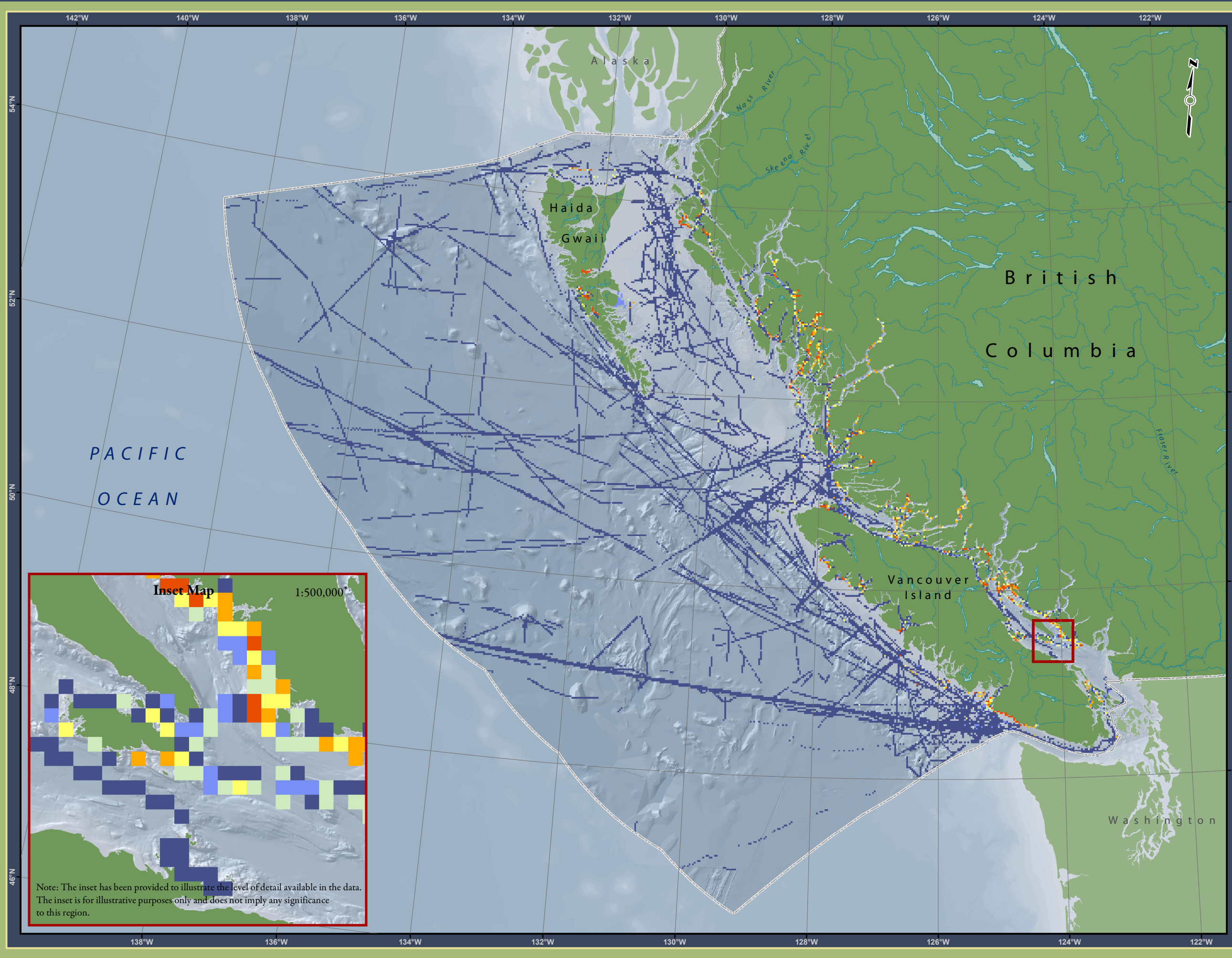
\* Written scales are approximate and  
are based on a 11 x 17 inch paper size.

Prepared for:



Map template by Caslys Consulting Ltd.

December 5, 2012



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.