BACKGROUND DOCUMENT TO ACCOMPANY BC COASTAL MARBLED MURRELET HABITAT SUITABILITY MAPS

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The British Columbia Coastal Marbled Murrelet Habitat Suitability Mapping Project is an ongoing project of the Marbled Murrelet Habitat Recovery Implementation Group, the Ministry of Environment and the Integrated Land Management Bureau. GIS mapping and analysis was conducted by Jamie Duncan, Byron Woods, Dan Hirner and Rick Page.

The BC Coastal Marbled Murrelet Suitability Model is an ongoing project intended to provide the best available strategic information on Marbled Murrelet habitat suitability as of 2002 which is the bench-mark for recovery planning. As the model is made for the entire coast of British Columbia, multiple data sets were used at various scales and therefore sections of the map have different levels of accuracy.

Purpose of the BC Coast Marbled Murrelet Suitability Model

The Marbled Murrelet Habitat Recovery Implementation Group coordinated the application of a model to estimate the amount of Marbled Murrelet nesting habitat and its distribution throughout the provincial range of the species. The objective of this model is to estimate the distribution of existing habitat at a strategic level and determine how much habitat is protected. This will help determine habitat protection requirements to meet the conservation goals of the Marbled Murrelet Conservation Assessment and Recovery Team guidelines (MMRT 2003) and the Marbled Murrelet Recovery Strategy and Action Plan. The analysis identified and summarized amounts of habitat in parks and protected areas, Non-contributing forest and Timber Harvesting Landbase (THLB).

Websites with BC Coast Marbled Murrelet Habitat Suitability Maps:

1. Identified Wildlife Management Strategy Environmental Stewardship Website: http://www.env.gov.bc.ca/wld/frpa/iwms/index.html

2. Approved Wildlife Habitat Area link: http://www.env.gov.bc.ca/wld/frpa/iwms/index.html
3. FRPA notices link: http://www.env.gov.bc.ca/wld/frpa/notices/index.html

Click on forest district name in table to find background information such as BC Coast Marbled Murrelet suitability model.

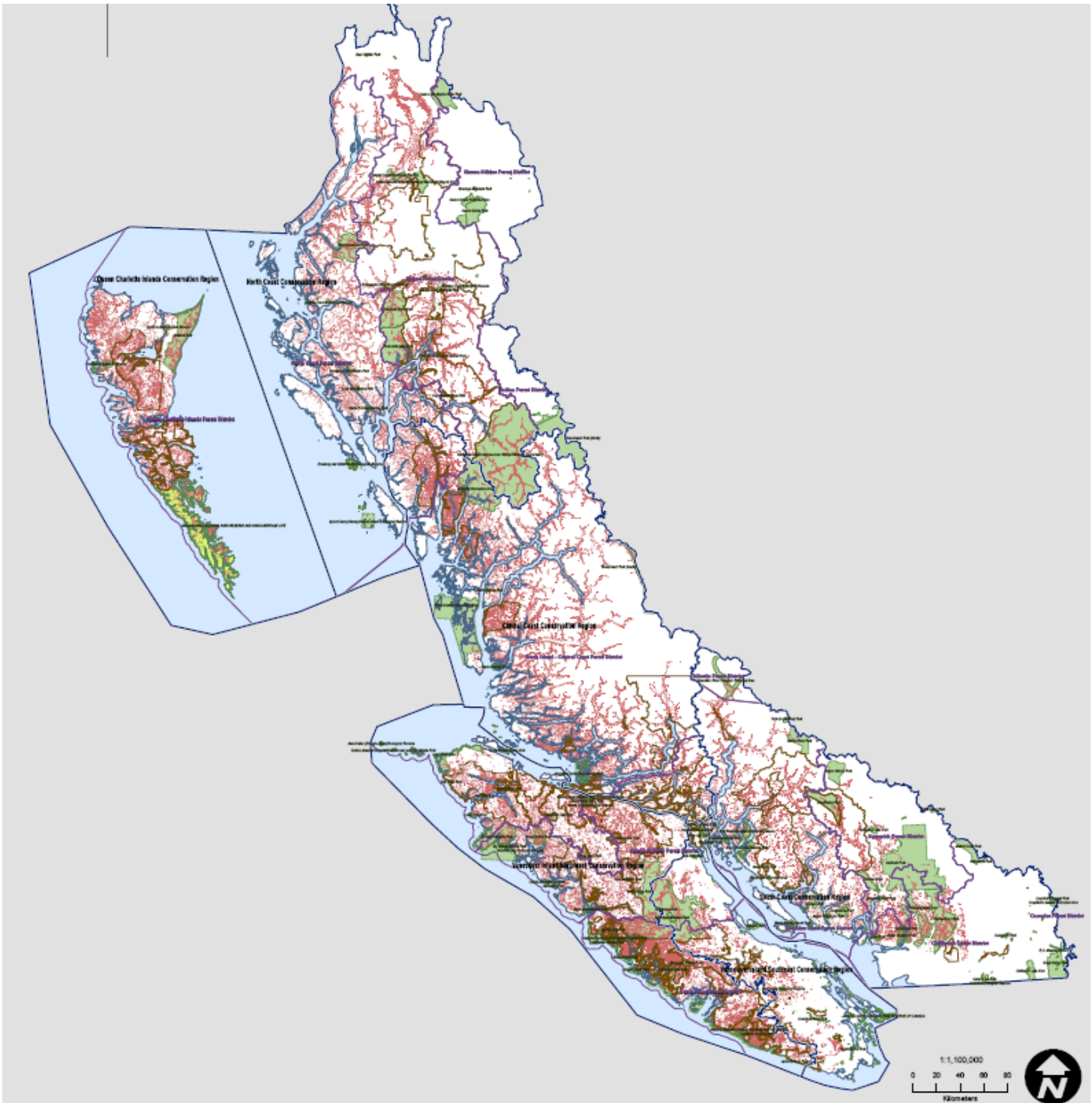
FTP sites with digital BC Coast Marbled Murrelet Suitability Maps

1. : ftp://ftpnan.env.gov.bc.ca/pub/outgoing/for_mamu/mmcr_maps/large_size/ This site also provides the digital and PDF maps of the Marbled Murrelet Coast Suitability Habitat Model that could be used for estimating how much MAMU habitat is in a chart area and/or Non-Contributing landbase.
2. ftp://ftpnan.env.gov.bc.ca/pub/outgoing/for_mamu/data/ has the model in digital format for the whole province (not divided up by mamu conservation regions) if needed. Depending on who is accessing these maps (public or government) a password may be needed. It is "**aseabird**"
3. Ministry of Forests Forest and Range Practices Act planning ftp site:ftp://ribftp.env.gov.bc.ca/pub/outgoing/cdc_data/Approved_FRPR_sec7_WLPPR_sec9_Notices_and_Supporting_Info/Species_at_Risk/. This site provides PDF maps for Marbled Murrelet by Forest District under the FIG sub-file.

Habitat Algorithm used to create model

The maps show areas considered to be suitable Marbled Murrelet habitat. They do not show habitat classes.

- Included tree age classes 8 (141-250 yrs) and 9 (250+ yrs) with height class 4 (28.5 m) or greater.
- Elevation included 0-900 m except in the North and Central Mainland Coast conservation regions where 600 m was highest elevation included and 500 m in the Haida Gwaii (Queen Charlotte Islands) region.
- On the Central Mainland Coast, provincial protected areas included both biodiversity and management areas recently approved.
- In Haida Gwaii, age and height classes were corrected from the provincial database and new modified estimates were included dated from 2000. Elevation was limited to less than 500 m.
- In the East Vancouver Island Conservation Region, habitat predicted on the southern Gulf Islands was removed as there has not been any evidence of nesting in these small fragments of older forest.



BC Coast Marbled Murrelet Nesting Habitat Model

Data Sources

The primary data source for the majority of the maps was the **Seamless Forest Cover Inventory,** a large spatial database with detailed information on B.C.'s forests. This inventory was assembled in 2002/3 from four spatial databases described below. The first three were interpreted from air photos, calibrated with ground samples, and mapped at 1:20,000 scale (it requires about 7,000 map sheets to cover B.C. at this scale). Unless specified otherwise, databases are maintained by the B.C. government. Stand age and height classes were used to locate nesting habitat.

- The **Timber Supply Area (TSA) Inventory** covers more than 88% of the province at a scale of 1:20,000 and provides information on forest stand attributes (species, ages, height, volumes, ownership, etc.) and non-forest areas (lakes, urban areas, etc). Most of these data were collected in 1995 for the Timber Supply Review (TSR-2). Inventory data were updated for disturbances (burns, harvesting and insect infestations) in the late 1990s and 2000 for all areas including TFL's and parks.\

- The **Tree Farm Licence (TFL) Inventory**, consisting of data maintained by forest companies holding tree farm licences, was used for some of the province. Information is similar to the TSA inventory, however the quantity and quality of data, such as updating for harvesting or burns, varies among TFLs (between 1993 and 1997). The contribution classes are not distinguished for the TFL data, thus amounts of non-contributing habitat are not known (although the overall amount of suitable habitat is estimated in the TFLs).

- The **Park Inventory** covers 2% of the province (11 of B.C.'s provincial and federal parks), and is similar to, but more generalized, than the other inventories. The forest cover inventory in the parks was based on aerial photography and field work from the 1950s. Tree ages were projected to January 1999. Species composition of forests changes over time, but this ecological succession was not modeled in the projection.

- **Baseline Thematic Mapping (BTM),** a more generalized database, was used for the remaining 2% of the province not covered by the TSA, TFL and Park inventories. These areas are comprised largely of private land and parkland. The BTM database, which was compiled from Landsat satellite imagery from the early 1990s at a scale of 1:250, 000 and consists of 20 generalized land use and land cover classes covering the province. Old growth forests are identified as forests 140 years and above. Some of the forests classified as old growth will therefore not be suitable.

Limitations

For the purposes of this analysis classes of habitat quality were not defined. The definition of habitat is approximately equivalent to the Marbled Murrelet Conservation Assessment's classes of *Most Likely* and *Moderately Likely* habitat combined (MMRT

2003). Vertical canopy complexity, canopy closure and site productivity indices were not used as the available information is patchy.

The accuracy of the data is limited to that obtained in Timber Supply Review number 2 in the mid 1990's. Updates of harvesting activity since then have been included up to 1999 in the TFL's and 2000 in the TSA. Harvesting since then will not be represented until the model is updated.

Use of Marbled Murrelet Suitability Maps

This set of maps is intended to be used for strategic purposes, and not for site level purposes such as locating individual Wildlife Habitat Areas. Potential uses can include the following with recognition of the limitations of the different scales of the mapping inputs:

1. To calculate the amount of suitable Marbled Murrelet habitat and suitable protected habitat by Marbled Murrelet Conservation Region or Landscape Unit.
2. To evaluate effectiveness of various conservation and management options and how they meet Recovery Plan objectives.
3. To evaluate habitat loss from the 2002 baseline through comparisons with up-to-date satellite imagery.
4. To calculate the amount of suitable Marbled Murrelet habitat in the Non-Contributing Land Base for the purposes of Forest Stewardship Planning (see FRPA Section 7 Notices concerning Species-at-Risk Marbled Murrelets)
5. To evaluate effectives of Marbled Murrelet conservation in Forest Stewardship Plans

How to use the BC Coast Suitability Map for calculating the amount of Marbled Murrelet habitat required in the Non-Contributing

1. **Step 1.** Open the first E00 files on Marbled Murrelet Suitability for the area of interest. Add the Forest Develop Unit (FDU) boundary.
2. **Step 2**. Calculate the amount of Suitable Habitat in the FDU. **(Figure 1)**
3. **Step 3**. Overlay the Non Contributing forest landbase layer.
4. **Step 4.** Calculate the overlap of Suitable Marbled Murrelet Habitat with Non-Contributing Land Base **(Figure 2)**. This is an approximation of the first amount required in the Section 7 Notices.

Figure 1.

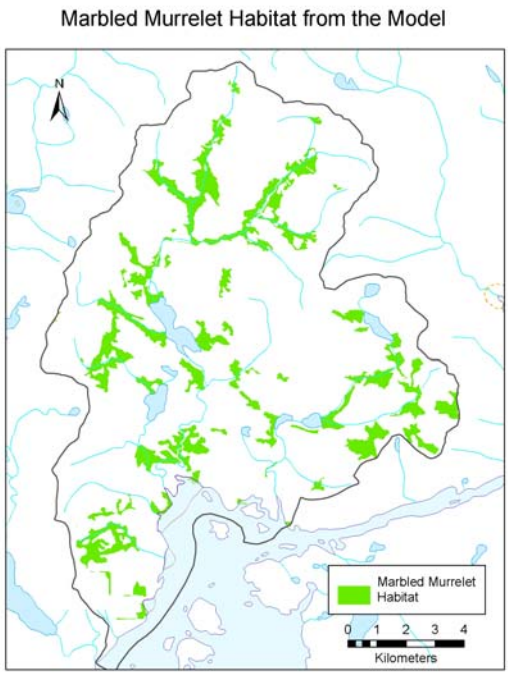


Figure 2.