

EBMWG Project Close-Out Report

Project #: EI 02a

Project Title: Focal Species Inventory

Steering Committee Members: Jody Holmes, Glenn Dunsworth/Sally Leigh Spencer, Steve Gordon/Buck Tanner, and Ron Diederichs

1.0 FUNDING

The Ecosystem Based Management Working Group (EBM WG) allocated \$240,370 to collaboratively fund seven focal species inventory projects with the Ministry of Environment. Of this total, \$24,320 was contributed by MoE. Significant additional funding was provided by MoE to complete these projects, however this total has not yet been calculated.

2.0 PURPOSE

The purpose of this project was to complete habitat inventories for focal species identified in the North and Central Coast plan areas, according to inventory gaps identified by MOE Regional staff.

Specific focal species mapping projects undertaken include:

- a) Marbled Murrelet Air Photo Interpretation in the South-Central Coast
- b) Grizzly Bear Habitat Inventory and Ranking in the North Coast
- c) Grizzly Bear Class 1 and 2 Habitat Digitization for Gap Areas (in Parks and Conservancies) within the Central Coast
- d) Northern Goshawk Nest Searches and Habitat Confirmation in the Central Coast
- e) Northern Goshawk Nest Searches and Habitat Confirmation in the South-Central Coast
- f) Tailed Frog Potential Wildlife Habitat Areas (WHAs) in the Central Coast
- g) Black tailed deer habitat mapping in the South-Central, Central and North Coast

3.0 EXTENT TO WHICH PROJECT OBJECTIVES WERE ACHIEVED

Project	Objective	Evaluation	Summary*
1. Marbled Murrelet Air Photo Interpretation	<ul style="list-style-type: none">• Deliver a digital coverage of MAMU habitat ranking in Arc GIS format.• Conduct an aerial verification to test the accuracy of the air photo interpretation protocol. Deliver a report that describes the aerial verification procedure and the results of the air photo interpretation.		Fully met
2. Grizzly Bear Habitat Inventory and Ranking	<ul style="list-style-type: none">• Delineate and describe important habitat polygons for Grizzly Bear in the North Coast plan area• Characterize habitat polygon values for		Fully met

Grizzly Bear in the North Coast plan area		
3. Grizzly Bear Class 1 and 2 Habitat Digitization	<ul style="list-style-type: none"> Digitize grizzly class 1 and 2 habitat polygons identified on Smokehouse, Kynoch and Sheep Passage portions within Fjordlands, Young, Crag and Atnarko (until funding is exhausted for the 108 air photos). Deliver spatially explicit, shape files of grizzly bear class 1 and 2 habitat polygons for the Landscape Units outlined above. 	Partially met
4. Northern Goshawk Nest Searches in the Central Coast	<ul style="list-style-type: none"> Conduct nest searches and establish habitat plots Develop a spatially explicit dataset specifying new nest site, locations, search locations, and habitat plot locations Delineate a set of WHA boundaries according to IWMS standards with an associated report on the methods used 	Fully met
5. Northern Goshawk Nest Searches in the South-Central Coast	<ul style="list-style-type: none"> Develop a workplan and define study area Implement sample plan and prepare field maps Conduct field survey to assess goshawk habitat suitability ratings and verify key forest cover attributes Enter and summarize field data and provide an estimate of model accuracy at stand (10-50ha) and study area scales for the southern portion of the CCLRMP. Provide model experts from the Habitat RIG of the Recovery Team with data to evaluate and refine ratings for specific areas of uncertainty 	Fully met
6. Tailed Frog Potential Wildlife Habitat Areas	<ul style="list-style-type: none"> Conduct inventories, including habitat evaluations, on the Central Coast Deliver a spatially explicit dataset specifying presence sites and all plot locations Deliver a set of WHA/key spatial anchor boundaries according to IWMS standards with an associated report on the methods used. 	Fully met
7. Black tailed deer habitat mapping	<ul style="list-style-type: none"> The Contractor will prepare habitat suitability mapping for deer winter range by applying specified parameters to the following data layers: slope, aspect, elevation, Biogeoclimatic Ecosystem Classification, and Vegetation Resources Inventory. 	Partially met

* Use: Fully met (100%), Substantially met (>75%), Partially met (25-75%), Marginally met (0-25%), Not met (0%)

4.0 MAJOR TASKS COMPLETED

Tasks	Date
<ul style="list-style-type: none"> Coordinate and conduct habitat inventories for focal species identified in the North and Central Coast plan areas, according to inventory gaps identified by MOE Regional staff. 	March 2008-March 2009
<ul style="list-style-type: none"> Identify key areas for habitat inventory priority by focal species in consultation with regional MOE staff and considering available resource information (i.e. air photos, TEM mapping, etc.) 	March, 2009
<ul style="list-style-type: none"> Develop criteria for stratification of inventory efforts, including but not limited to: environmental risk, land status, development pressures, status of species inventory in plan areas, overlap with current Detailed Strategic Planning efforts and ability to support decision making in a timely fashion. 	March 2008-March 2009
<ul style="list-style-type: none"> Ensure inventory methods employed are consistent with accepted methodologies, according to focal species habitat being assessed. 	March 2008-March 2009
<ul style="list-style-type: none"> Develop a map of key habitats for focal species in support of Wildlife Habitat Area delineation and placement of coarse filter reserves under EBM. 	March, 2009
<ul style="list-style-type: none"> Provide recommendations for refinement of existing habitat models to guide future focal species habitat identification and prioritization 	March, 2009
<ul style="list-style-type: none"> Return all materials supplied by the Province by March 31st 2009. 	March, 2009

5.0 KEY PRODUCTS

Project	Key Products	Completion date	Location
1. Marbled Murrelet Air Photo Interpretation	<ul style="list-style-type: none"> digital coverage of MAMU habitat ranking for LU 1 to 23 A with report and polygon layer showing habitat rankings. A report that describes the aerial verification procedure and the results of the air photo interpretation. 	22 June/09	To be posted on the EBMWG Website

2. Grizzly Bear Habitat Inventory and Ranking	<ul style="list-style-type: none"> • Spatially define important Grizzly Bear habitat polygons using air photos, in the North Coast plan area, in support of fine-filter components of EBM. • Habitat polygon attributes will be assessed/defined and entered into an ecological database (Excel format), consistent with the Coastal GRBE Habitat Mapping Methods, also identifying project-specific recommendations for consideration in other future projects 	31 Mar/09	To be posted on the EBMWG Website
3. Grizzly Bear Class 1 and 2 Habitat Digitization	<ul style="list-style-type: none"> • Digitization of grizzly habitat polygons from air photos • Meta data of grizzly habitat polygons from data base of grizzly habitat polygons. 	31 Mar/09	To be posted on the EBMWG Website
4. Northern Goshawk Nest Searches in the Central Coast	<ul style="list-style-type: none"> • Spatially explicit dataset specifying new nest site, locations, search locations, and habitat plot locations • Final report delineating WHA boundaries and methods used 	31 Mar/09	To be posted on the EBMWG Website
5. Northern Goshawk Nest Searches in the South-Central Coast	<ul style="list-style-type: none"> • Workplan • Field maps with sample site locations • Transect data including locations, and habitat ratings • Report of model accuracy at the stand level and at the study area level. • Final report with model expert's feedback incorporated 	31 Mar/09	To be posted on the EBMWG Website
6. Tailed Frog Potential Wildlife Habitat Areas	<ul style="list-style-type: none"> • Spatially explicit dataset specifying presence sites and all plot locations • Final report 	31 Mar/09	To be posted on the EBMWG Website
7. Black tailed deer	<ul style="list-style-type: none"> • Habitat suitability mapping for deer winter range for three coastal sub-regions (North Coast, Mid Cast and South Coast) in raster format including any scripts used in the processing of the data. 	31 Mar/09	To be posted on the EBMWG Website

6.0 PEER REVIEW

Domain expert peer review was completed on final deliverables (map and/or report products) as follows:

- 1) Marbled Murrelet air photo interpretation in the SCC – MoE internal review by Dave Donald (wildlife and ecosystems biologist)
- 2) Grizzly bear habitat inventory and ranking in the NC – peer review provided Tony Hamilton (MoE domain expert for grizzly bear)
- 3) Grizzly bear class 1 and class 2 habitat digitization for gap areas – peer review provided by Tony Hamilton (MoE domain expert for grizzly bear)
- 4) Northern Goshawk nest searches and habitat confirmation in the Central Coast – peer review by E. McClaren (MoE), T. Mahon and F. Doyle. These persons provided feedback at all project stages.
- 5) Northern Goshawk nest searches and habitat confirmation in the South-Central Coast – peer review by E. McClaren (MoE) and members of the Northern Goshawk Recovery Team.
- 6) Tailed frog potential WHAs in the Central Coast – peer review conducted by P. Friele (tailed frog domain expert)
- 7) Black-tailed deer habitat mapping in the South-Central, Central and North Coast – MoE review and comment (K. Brunt, K. Dunsworth, T. Larden, G. Schultze)

7.0 MAJOR FINDINGS/CONCLUSIONS

1. **Marbled Murrelet (MAMU) air photo interpretation in the SCC** – report described the aerial photo interpretation procedures used to derive and map habitat suitability for 92 LUs on the south-central and mid-coast. The report provides a comparison of hard copy air photo, and digital air photo (with *PurVIEW* digital viewing software/hardware) methodologies for identifying and ranking MAMU nesting habitat. In general, both these methods are more selective (accurate) than current suitability model results, but each method has its' own advantages/disadvantages in terms of time, hardware and software requirements, data storage, etc.
2. **Grizzly bear habitat inventory and ranking in the NC** – completion of habitat inventory and suitability rankings and mapping for grizzly bear. The focus of the mapping was again on important seasonal feeding habitat with a secondary focus on security habitat for bedding and travel within and adjacent to important feeding areas. Habitat polygons were identified and ranked using air photos (and a subsample were verified using aerial and ground verification methods). These polygons were digitized resulting in a final grizzly bear map depicting Class 1 and Class 2 habitat polygons for the north coast.
3. **Grizzly bear class 1 and class 2 habitat digitization for gap areas** -- completion of habitat inventory, suitability rankings and digitization for grizzly bear in “gap” areas which were needed to complete mapping coverage. The focus of the mapping was again on important seasonal feeding habitat with a secondary focus on security habitat for bedding and travel within and adjacent to important feeding areas.

Completed Landscape Units were: Smokehouse, Crag, Green, Kynock and Sheep Passage. However, in 7 LUs, habitat polygons were drawn but due to budgetary constraints, these units were NOT digitized. – these were: Middle and Upper Klinaklini, Atnarko, Klekane, Aaltanash, Khutze and Young. Subject to funding availability, this work will be completed in 2009-10 under separate MoE contract.

4. **Northern Goshawk nest searches and habitat confirmation in the Central Coast** – call playback surveys were conducted at 630 sample points along with completion of 148 habitat plots throughout predicted high and moderate suitability classes. A total of seven potential WHAs in four landscape units were identified, each representing individual goshawk territories.
5. **Northern Goshawk nest searches and habitat confirmation in the South-Central Coast** – summarizes habitat model verification work in the south-central coast region in order to provide estimates of model accuracy and rigour. Verification involved comparing model ratings to field ratings for nesting and foraging habitat suitability. The project sampling design consisted of 55 sample units with 9 subsamples in each, located across the project area using a random cluster design. Targets for model accuracy set a priori by the Northern Goshawk Recovery Implementation Group were 70% model accuracy. The project provided an assessment of model accuracy results at 3 spatial scales (0.8 ha, 10 ha, 3 million ha). Model field testing revealed that both the nesting, and to a lesser degree, foraging model outputs have a substantial error rate at the 0.8 ha and 10 ha sample unit scales. This requires precautionary use of the model outputs at these scales, possibly including air photo verification or ground truthing.
6. **Coastal tailed frog potential WHAs in the Central Coast** – conducted habitat sampling in order to assess occurrence patterns and habitat suitability for coastal tailed frogs. 356 sites in and outside of protected areas were sampled on the Central Coast, which facilitated identification of 87 potential WHAs in 28 landscape units. WHAs were not established in all relevant landscape units due to lack of detectability of frogs in targeted sampling sites, and to insufficient sampling resources (personnel and funding).
7. **Black-tailed deer habitat mapping in the South-Central, Central and North Coast** – There are currently inconsistencies/inaccuracies in the suitability model parameters (e.g., input variables such as overstorey species composition) for the MC and NC areas, and a lack of knowledge and inventory of deer habitats on the NC. Model input problems are as follows:
 - Cedar (Yc, Cw) and mountain hemlock were removed from the forest cover layer model input for the SC, but only the mountain hemlock on the MC..
 - The habitat cut-offs are a bit different; Also, the MC layer didn't have the same level of scrutiny and iteration as the SC. The habitat cut-offs are slightly different as the SC has the same cut-off for high in the coast and mtn ecosections (4 – 6) and the MC has cut-offs of 4 – 6 in the coastal ecosections and 4 – 7 in the mtn ecosections

- The MC mapping may have picked up large areas on the outer coast of rolling bogs that aren't actually good habitat

Overall, there was a higher level of scrutiny of the South Coast mapping compared to the Mid Coast. To determine the discrepancies in the mapping and to make appropriate model input changes would require reviewing the MC and SC maps and simultaneously manipulating the appropriate model inputs (e.g., forest cover, topography) with GIS. Adequate resources were not available within this project budget to do so. **Consequently in the interim, the following has been recommended by MoE regional biologists.**

- Describe the problems with the mapping for the central and north coast areas in the final Focal Species Project report, and recommend that the layers not be used in co-location exercises until the habitat modeling/mapping issues are resolved
- That co-location work continue to use the designated ungulate winter ranges in both the SC and MC as these have been carefully mapped and most have been field-truthed.
- The mapping for the South-central Coast provides a reasonable approximation of deer winter range for the purposes of strategic planning. However, for strategic planning purposes, the **current SC deer winter range mapping should only be used with the clear proviso that users be aware of its' limitations.**

8.0 STEERING COMMITTEE RECOMMENDATIONS

The LRF TLC recommends acceptance of all of the EI02a focal species inventory projects except the Black-tailed deer project (in the central (mid) and north-coast areas).

9.0 RELEVANCE/SIGNIFICANCE FOR EBM IMPLEMENTATION

Relevance of project findings to EBM implementation is summarized below, and are organized by project.

Marbled Murrelet air photo interpretation in the SCC

Digital mapping coverage for high suitability murrelet habitats will be used to assist co-location of focal species values at both strategic and detailed landscape reserve planning phases.

Grizzly bear habitat inventory and ranking in the NC

Habitat suitability ranking of grizzly habitat polygons will allow implementation of EBM objectives for Class 1 and Class 2 grizzly bear habitat under the North Coast Land Use Order.

Grizzly bear class 1 and class 2 habitat digitization for gap areas

Completion of habitat suitability ranking of grizzly bear habitat polygons in specific landscape units in Parks and Conservancies where this mapping had not yet been

conducted. This information will assist with implementation of EBM, increase the amount of known habitat protected and assist with future monitoring.

Northern Goshawk nest searches and habitat confirmation in the South-Central and Central Coast

These two projects tested the accuracy of the habitat suitability index model predictions (for nesting and foraging habitat), and will aid forest planners and managers in identifying potential WHAs and co-locating goshawk habitat with other land use planning objectives for this area.

Coastal tailed frog potential WHAs in the Central Coast

A better understanding of tailed frog habitat requirements and habitat use/selection will help facilitate EBM planning for this focal species. This includes locations of potential WHAs which can be included within landscape reserves in the EBM plan area.

Black-tailed deer habitat mapping in the South-Central, Central and North Coast

Improved knowledge of Black-tailed deer winter range requirements and associated habitat suitability mapping .