



VANCOUVER ISLAND
UNIVERSITY

SCIENCE & TECHNOLOGY

FORESTRY

IRM Planning Project Spring 2014

Introduction

The IRM spring project provides an opportunity for second year forestry students to integrate their training in measurements, engineering, ecology, silviculture, forest health and integrated resource management. The project is organized in two stages. Part 1 is an ***Inventory*** of an assigned management area for physical and biological characteristics. The area is part of the VIU Woodlot. Students gather relevant information about non-timber resource values, and confirm the timber inventory data that is provided from the Woodlot. Part 2 is an ***Integrated Resource Management Plan***. Each student prepares a formal report outlining management strategies to achieve specific objectives for his/her assigned area. Students will present their completed inventories and plans during a seminar at the end of the semester as part of FRST242.

Part 1. Inventory

The field inventory will be carried out in groups of five students (Appendix 1). Each group will develop and implement a strategy to inventory all forest resource values in a comprehensive manner. Some resource information such as timber, wildlife and recreation values may not have to be collected in the field but will have to be identified through existing resource use and management plans. Other information such as ecological conditions, engineering constraints and critical site factors will have to be obtained through field inventories.

Field time will be allotted in FRST242 and FRST262 during January and February (see Schedule). Some members of your team may not be available during the class periods outside of FRST242; therefore, you may have to schedule some work for other times or allocate non-field data gathering tasks accordingly. You may also need some additional field visits to confirm information as your plan develops.

Maps of the four “defined forest areas” of the VIU Woodlot will be provided as a separate document accompanying this project description.

Field Inventory Planning

Prior to starting the inventory each crew will prepare a **Field Safety Plan**. Time will be given in class to develop this plan. The safety plan must be approved prior to starting field work and followed throughout the duration of the project.

Each crew will also prepare an **Inventory Strategy**. For this brief written report:

1. Produce a **list of resource value information** that will be required. Identify the sources of information, including existing data (e.g., maps, photos, inventories, plans) and data that you will have to collect in the field.
2. Describe **methodology** for sampling, analysis and summary of the inventory data. The inventory expectations are outlined below; however, you need not limit yourselves to these minimum requirements. If you think that additional information needs to be collected for your plan—this is encouraged!
3. Develop a **project timeline**. The timeline must include a series of crew-instructor meetings to discuss progress and issues.
4. Assign **responsibilities**. The strategy must identify the team member(s) responsible for each aspect of the field inventory, mapping and write-up. You must include a page with signatures from all team members indicating their commitment to the tasks. This is your team “contract” to help ensure that work is distributed fairly.

The report is due January 31st.

Forest Inventory

Forest inventory focuses on the present condition of forest stands and is generally less intense than timber cruising for appraisal purposes. You will be supplied forest cover and timber inventory data from the VIU Woodlot. You are expected to verify the forest cover types and timber inventory during your fieldwork by doing a reconnaissance-level survey. Your team will have to develop a suitable approach. Note any significant deviations from the inventory that you observe (e.g., species composition, volume). You may also collect data to supplement the existing inventory.

Forest cover map and stand summary

Your inventory report must include:

- A forest cover map. Mapped timber types should be no smaller than one hectare and should be labeled as per the Woodlot License Plan.
- A summary of your field recce procedures and any supplemental data collected.
- A table summarizing timber volumes by species (per ha and total) for each stand and for the entire area.

Your original field notes will constitute part of your report, so make sure they are complete, accurate and legible. Copies are not acceptable.

Silviculture

The essence of Silviculture is to develop a management strategy that addresses the objectives while preserving or enhancing the ecological integrity of the site. In order to accomplish this, you must have knowledge of the existing stand and site conditions, an understanding of the silvics of the tree species and the characteristics of other vegetation, and awareness of the “critical site factors” that will have an impact on your planning approach and strategy. Critical site factors include a wide range of issues, such as sensitive soils, exposure to wind damage, unique or endangered species and important wildlife habitat features. In addition to forest cover, the site series classification, soil characteristics and forest health conditions need to be described as part of a comprehensive inventory to support silvicultural strategies.

Ecosystems (site series)

Map site series at a broad reconnaissance level for your management area. The minimum map unit size should be 2 ha unless special site characteristics justify a smaller unit. At this level of detail, your map will likely have polygons with complexes (i.e., up to 3 site series in a polygon). Include a brief description of each site series in the inventory report. You must also provide a general classification and description of the soil types in your defined area with notes on those areas with management issues. The soils inventory should include a description of soil texture, general depth, humus types, soil drainage and site factors relevant to harvesting and silviculture activities.

In addition, map areas of sensitive ecosystems using the designations in the Woodlot License Plan, as well as any areas with sensitive soils (i.e., vulnerable to compaction, erosion, etc.). Examples include rock outcrops with grassy meadows that support unique plants, riparian areas and skunk cabbage swamps. You may observe more sites during your field assessment than are mapped on the Woodlot forest cover map because your survey is more detailed. You should update existing map information using what you observe in the field. (For further background on the Sensitive Ecosystem Inventory, see: <http://www.env.gov.bc.ca/sei/>).

Forest Health

For your plan area, you are to assess all potentially important forest health agents. Note that these would include biotic and abiotic pathogens (fungi, parasitic plants, mammals, wind, etc.) and forest insect pests. Pests of an incidental nature need not be included; however, if there is reasonable chance that damage could occur, then you should include the pest or pathogen. Referring to the *Hazard & Risk* section of the ***Tree Doctor*** will provide a list of probable forest health agents that may affect your management objectives. Be sure to familiarize yourself with the signs and symptoms of these agents before conducting your inventory. Also, you will need to consider how you will assess the present abundance and future potential of significant forest health agents.

- Map and classify units where there is a present or potential significant forest health agent. Note that these units may coincide with timber types or ecological types or be distinct forest health polygons. Use whatever is most appropriate. Note, while some agents will have distinct areal extents (i.e., can be delineated on a map), others may not.

- For each forest health unit provide an indication of severity (hazard and risk). For those agents that are ubiquitous in nature and cannot be mapped, an estimate of severity is still required.

Other Resource Values

Integrated resource management involves sustaining a wide range of resource values together over a management unit. To accomplish this goal, an inventory of non-timber and timber resources is essential. The inventory will include spatial data (map polygons, lines or points) and non-spatial data (text descriptions, tables or graphs). Strategies for non-timber values can then be developed to show how specific objectives for these resources will be achieved.

Streams and wetlands

Map and classify streams, lakes and wetlands (or wetland complexes where features are numerous but small). The minimum stratum size is 0.25 ha. If your plan area includes Flynnfall and/or McGarrigle Creeks, confirm the presence of downstream water licenses and users. Your management plan should consider downstream uses and proximity to other landowners.

Wildlife and biodiversity

Create a list of red- and blue-listed species that have potential to occur within the plan area (see: <http://www.env.gov.bc.ca/wld/serisk.htm>). If you should encounter any such species, note the location where the species was observed and develop a management strategy in your plan.

Map and describe significant concentrations of snags or trees with old growth attributes that contribute to wildlife and biodiversity values. Other wildlife features that should be identified include nest trees, bear dens, etc. Estimate the number of snags or potential wildlife trees per hectare by forest cover type.

Recreation

Map and describe major recreation trails and other features that may be significant to recreational uses. Potential features to consider include viewpoints, campsites, rock outcrops, waterfalls, etc. Depending on the location of your study area, note whether any parks are located in close proximity.

First Nations

Observe and map any evidence of First Nations use (e.g., bark stripping). Map areas of cedar timber types or areas with some noteworthy patches of mature or merchantable cedar that may be of interest to First Nations. The minimum stratum size is 0.5 ha.

Visuals

Check the Woodlot License Plan for any visual landscape polygons that fall within your plan area. Describe the visual quality objectives associated with any polygons in your report.

Harvest Planning and Roads

A long-term harvest plan requires that you determine the Timber Harvesting Land Base (THLB), how and when each parcel of timber is logged, and what resources are required to accomplish the task. To do this requires you to classify the land base into logical harvesting units of similar harvest systems, and plan the route to haul the timber from each unit.

- Map and classify the THLB according to the optimal harvest system (e.g., hoe forwarding, ground skidding, etc.). Unit boundaries should be features such as streams, wetlands, gullies, timber types, rock, or roads. Identify non-harvestable units that will not be considered part of the THLB (e.g., riparian reserves). Consider the operating capabilities of the harvest systems to ensure that skidding or forwarding distances are reasonable.
- Map and classify all the roads in your plan area. Three classifications are required:
 1. Overgrown Roads (roads that require considerable work to upgrade to Class 5);
 2. Pickup Access Roads (roads that are drivable by pickup truck but will need work to bring them to a Class 5 standard);
 3. Standard Class 5 haul roads (no upgrades currently needed).

Inventory Report

Your resource information must be mapped (as appropriate) and succinctly described in the inventory report. Here is a checklist of the requirements described above:

Topic	Maps	Text or Tables
Timber	Forest cover	Field recce procedures, supplemental data, stand/species volume table, field notes
	THLB: Potential harvest units by system, and non-harvestable areas	Description of typical equipment, factors used for classification
	Road classification	Description of three classes used
Silviculture	Ecosystems (site series)	Description of site series and soil types
	Sensitive ecosystems and soils	Description of sensitive ecosystems (e.g., rocky meadows, riparian) and sensitive soils
	Forest health (agent, severity)	Description of current and potential forest health issues
	Streams, lakes and wetlands	Classification, description, confirm water users
Other Values	Wildlife features (snags, bear dens, nest trees, OG veterans)	Potential red- and blue-listed species list, estimate of wildlife trees/snag per hectare
	Recreation trails and other features	Location of adjacent parks
	First Nations use, cedar areas	Description of features
	Visual landscape polygons	Visual Quality Objectives
	All	

The inventory report is a joint effort and submission by your group. You will have to work as a team to divide the workload equitably and complete the report on time. Some maps may be combined. Marking criteria are given in Appendix 3. The inventory report is due on March 10th.

Part 2. Integrated Resource Management Plan

Outline

Each student will prepare an Integrated Resource Management Plan (IRMP) for your defined forest area following one of the five scenarios described in Appendix 2. The report must be bound and include all supporting information in Appendices, including maps. Digital files must also be uploaded to the assignment drop-box in D2L.

A management plan has three major requirements: landowner goals and objectives, inventories, and management strategies. The IRMP must include at a minimum, the following components:

1. Description of the Scope of the Project
2. Description of the Defined Forest Area
3. General Management Goals
4. Summary of Inventory Information
 - i. Timber
 - ii. Stream-riparian
 - iii. Recreation
 - iv. Cultural features
 - v. Wildlife
 - vi. Road access
 - vii. Etc...
5. Management Objectives, Strategies and Practices
 - i. Timber
 - a. Timber development plan
 - b. Road access
 - c. Initial harvest unit
 - ii. Silviculture
 - a. Silvicultural systems
 - b. Reforestation
 - c. Stand tending
 - d. Forest health
 - iii. Other Resource Values
 - a. Biodiversity
 - b. First Nations
 - c. Recreation
 - d. Wildlife
 - e. Other
 - iv. Etc...
6. References
7. Appendices (Inventory, Maps)

In the interest of fostering creativity, the preceding outline is simply an example. You may organize the presentation of your report in any logical format.

Content Requirements

- The IRM Plan must be consistent with BC Forest Legislation and meet or exceed the requirements of the Woodlot License Plan for Woodlot 020.
- Goals and strategies for relevant Forest Resource Practices Act (FRPA) values must be included in the IRM Plan.
- You must calculate an **Allowable Annual Cut (AAC)** for your defined forest area once you have determined the THLB. Extrapolate this AAC to the entire 1700 ha Woodlot and describe the method you used, along with any mitigating factors (i.e. how your area may differ from the Woodlot as a whole). Compare this AAC to the current 4800 m³ AAC for the Woodlot, calculate the % change, and discuss the impact of your scenario and plan on the long-term harvest levels.
- Produce a **Timber Development Plan** (see below). Because the area for your IRMP is quite small, your harvesting plan will not be constrained by the calculated AAC for your plan area. The assumption is that the entire Woodlot is being managed under your scenario, not just your plan area. Therefore, the current AAC for Woodlot 020 of 4800 m³ or the extrapolated AAC for the entire Woodlot that you calculated will apply, whichever is less.
- Identify a reforestation strategy to achieve your management goals.
- Consult the BC Conservation Data Centre (CDC) website for known or likely occurrences of red- and blue-listed species and plant communities, particularly those with legal status as species at risk.
- Consider these stakeholders and interest groups in your IRM plan:
 - Snuneymuxw First Nation and Nanoose First Nation
 - Nanaimo Mountain Bike Club
 - Nanaimo Motocross Association
 - Nanaimo Area Land Trust
 - Nanaimo Naturalists

Timber Development Plan

The "Total-Chance" concept is the name given to planning over an entire development area for the best overall realization of the management objectives. The timber within the THLB for your defined area of Woodlot 020 should be considered for the most logical road development and harvesting sequence consistent with your scenario before dividing it into cutblocks. Consider the management objectives, regulatory constraints, timber prices, road development and harvesting costs when designing your plan to ensure that it is feasible.

The objectives of the total chance timber development plan are to:

1. Address the constraints and management objectives within your plan scenario;
2. Choose the best combination of harvest systems for the least total cost of road development and harvesting to meet your objectives;

3. Ensure that the timber development is consistent with the requirements of the Woodlot License.

This plan is a projection of harvesting and road construction over your entire area for one rotation. First, you must select an area and design your first cutblock with a projected harvest volume of between 2500 m³ and the maximum AAC (i.e., 4800 m³ or your extrapolated value for the Woodlot). Provide a detailed description of this harvest unit in the report. Next, divide the remaining area of your THLB into logical harvest units of roughly similar size to this initial block (unless your plan justifies an alternative approach). The volume and size of cutblocks can vary to conform to logical units that fit the topography and road layout. On a separate map, show your initial cutblock, future harvest blocks and road construction.

In a table within your report, summarize this harvest plan by identifying the cutblock number, projected volume, area and silviculture system(s). Number the cutblocks in the projected sequence of harvesting. You do not have to identify the harvesting year of each unit in your report; however, the text description of your plan should discuss the desired interval between harvest entries in your defined area, including the minimum time between harvesting adjacent cutblocks.

Report Standards and Expectations

The IRMP report must be professionally presented in a format that would meet the standards of the business world.

- Organization into numbered headings and sub-headings is required
- Paragraph and sentence structure, grammar and spelling are important
- Tables, Figures and Photos should be labeled and sequentially numbered
- References and data sources should be correctly cited within the main body of the report and included in a List of References at the end of the main body
- Appendices should be numbered and listed in the Table of Contents
- The report should be bound in a clean three ring binder or other presentation folder

Ask for advice if you are uncertain about any aspect of your report. Marking criteria for the IRM Plan are given in Appendix 4. The report is due on April 7th.

IRM Plan Presentations

Students will present their completed inventories and plans during a seminar at the end of the semester as part of FRST242. We will use class time from FRST262 as well (see Schedule). The purpose of the presentations is to be able to review and discuss the diversity of ideas that were generated by the management plans. Each group will have 20 minutes to present the results of their inventory. It is up to the group to organize the presentation format, but all group members must take part. Following the group presentation, individuals will have 10 minutes each to describe their IRM Plan for the scenario they were assigned. There will be approximately two hours per group for the combined group and individual presentations, followed by discussion.

Guidelines and marking criteria for the presentations are given in Appendix 5.

Grade Distribution and Marking Criteria

The following table shows the breakdown of points for the IRM Plan:

Component		Scenario				Total (%)
		A/E	B	C	D	
Inventory	Strategy (G)					5
	Maps (G)					10
	Report (G)					15
Management Plan (I)		A/E	B	C	D	
	Timber, Biomass	20	15	15	15	50
	Silviculture	15	15	15	15	
	Other values	15	20	20	20	
	General sections, Format, English, References					10
Presentation	Inventory (G)					5
	Scenario (I)					5
TOTAL						100

G=Group; I=Individual. See **Appendix 1** for group assignments.

Scenarios: A=Timber, B=Biodiversity, C=Recreation & Visuals, D=Non-Timber Products, E=Energy from Biomass

Appendices 3 - 5 present marking criteria for the three major components. Note that the **Field Safety Plan** is required and must be approved, but will not be marked.

Schedule

The table on the following page shows the schedule of action items, products and due dates for the Inventory and IRM Plan. Marks will be deducted for late reports.

Schedule

Week #	Week of	Action Items and Completion Dates
3	Jan 20	Review outline of the IRM Spring Project, group assignments Groups form a Safety Plan (due Jan 24th, end of class)
4	Jan 27	Field recce (Monday afternoon, no class) Begin information gathering from the Woodlot License Plan Inventory Strategy is due Jan 31st
5	Feb 3	Field data collection (Monday afternoon, no class) Complete information gathering from the Woodlot License Plan
6	Feb 10	Family Day Holiday (no class on Monday)
7	Feb 17	Continue field inventory <i>Students meet with assigned advisors for progress updates</i>
8	Feb 24	Study Days (no classes all week)
9	Mar 3	Assemble maps and summaries from inventory Prepare Inventory Report
10	Mar 10	Inventory Report due March 10th
11	Mar 17	Work individually on IRM Plan <i>Students meet with assigned advisors</i>
12	Mar 24	Work individually on IRM Plan
13	Mar 31	Work individually on IRM Plan
14	Apr 7	Management Plan is due April 7th Presentations in class on April 7th, 9th (FRST262 time), & 11th
15	Apr 14	Final exams April 17, 22-30

Appendix 1. Group Assignments

This table shows the students assigned to each group for the inventory component of the project, including the group portion of the presentations. Students are listed in alphabetical order; there is no assigned “group leader.” Each group will have a different area of the VIU Woodlot to complete the field data collection, inventory report and maps.

Group 1	Group 2	Group 3	Group 4
Mike Anderson	Matthew Boeckmann	David Dompreeh	Luc Faucher
Thomas Giles	Will Hallstrom	Zach Fisher	Anthony Hawkes
Adrienne Langley	Cody Jackman	Rob Harder	Taylor Martin
Josh McLennan	Ken Pitt	Darren Kelly	Shane Price
Matt Van Den Tillart	Reid Wyatt	Chris Leitao	Rhys Turner

Appendix 2. Management Scenarios

You will be assigned one of the following management scenarios. Note that the weighting of marks for the management plan varies depending upon which scenario you have.

A. Enhanced Forestry

Your defined forest area falls under the umbrella of the Vancouver Island Land Use Plan. The Mount Benson Enhanced Forestry Zone (EFZ) captures all of your operating area. You must now prepare an Integrated Resource Management Plan (IRMP) for your defined forest area that meets the following land use objectives:

- Manage forest lands with an emphasis on timber production.
- Maximize the net economic return of lands in the EFZ while meeting legal requirements for other forest values.

Forest management objectives under the EFZ are intended to result in a timber supply and production increase; however, all legislated environmental stewardship provisions under the Forest and Range Practices Act (FRPA) and other legislation apply in the EFZ area. Emphasis on timber production should not be at the expense of maintaining basic provisions for the 10 other FRPA resource values.

Strategies should include increased timber harvesting and enhanced silviculture practices. You will need to use your judgment on silviculture systems, forest fertilization and other practices.

The plan should maintain recreational opportunities that are compatible with the timber production goals.

B. Biodiversity Emphasis

Your defined forest area falls under the umbrella of the Vancouver Island Land Use Plan. You have been notified that The Benson Special Management Zone (SMZ) has been recently recognized. It captures all of your operating area and the resource objectives were legalized under the Land Act. You must now prepare an Integrated Resource Management Plan (IRMP) for your defined forest area that meets the following land use objectives:

- Create, enhance and maintain biodiversity and old-forest attributes.
- Reduce the impact of invasive species on native plants and minimize new introductions.

Strategies for biodiversity and old-forest attributes must be applied to the entire area, and management must include timber harvesting. Some suggested strategies include careful selection of silviculture systems and intermediate cuts, and thoughtful location of reserves using forest cover units and/or biophysical inventories. Consider overlapping reserves that meet more than one resource goal.

The plan should maintain recreational opportunities that are compatible with the biodiversity goals.

C. Recreation and the Visual Landscape

Your defined forest area falls under the umbrella of the Vancouver Island Land Use Plan. You have been notified that The Saanich to Qualicum Special Management Zone (SMZ) has been recently recognized. It captures all of your operating area. You must now prepare an Integrated Resource Management Plan (IRMP) that meets the following land use objectives:

- Integrate and enhance multiple recreational opportunities on managed forest lands located on southeast Vancouver Island while minimizing the impact to other resource values. The opportunities will include but are not restricted to hiking, mountain biking, geo-caching and horseback riding.
- To maintain and enhance the visual quality to residents of Nanaimo and viewers traveling along the Inland Island Highway. Viewpoints include: Harewood, Westwood Lake and the Northfield Road rest area.

Woodlot 020 provides an array of recreational opportunities. Conflicts arise between motorized and non-motorized activities, as well as between recreation uses and forest management activities. The IRMP must propose strategies and forest activities in a manner that addresses the new recreation objectives while minimizing the impact on timber production.

Strategies to enhance a variety of recreational uses and maintain visual quality should include careful selection of silviculture systems and intermediate cuts, and thoughtful location of reserves using forest cover and bio-physical inventories.

The recreation and visual landscape goals must be clearly identified and accompanied by specific results and strategies. Some strategies could include overlapping reserves that meet more than one resource goal. Other possibilities include the notion of zonation.

There are scenic areas established on Vancouver Island that have specific visual quality objectives. The Woodlot License Plan map has VQOs identified in portions of the woodlot that are labeled R (Retention) and PR (Partial Retention). This requires that alteration (harvesting) of the forest will be subordinate in the landscape from officially designated viewpoints.

D. Non-Timber Forest Products

The Snuneymuxw First Nation recently entered into a co-management agreement with the VIU Forestry Department to manage Woodlot 020 under a new BC government program designed to enhance non-timber forest products. You must now prepare an Integrated Resource Management Plan (IRMP) that meets the following land use objectives:

- Enhance opportunities for production of non-timber forest products on managed forest lands located on southeast Vancouver Island while minimizing the impact to other resource values;
- Increase revenues to the co-management partners from the commercial sale of non-timber forest products.

The IRMP will propose strategies and forest activities in a manner that addresses the non-timber forest products objectives while minimizing the impact on timber production.

Strategies to enhance non-timber forest products should include careful selection of silviculture systems, intermediate cuts and harvesting patterns, and thoughtful location of reserves using forest cover and biophysical inventories. The plan must develop strategies for maintaining a variety of non-timber forest products (e.g., floral salal, cedar boughs, wild berries, mushrooms, venison, etc.).

The plan should maintain recreational opportunities that are compatible with the non-timber forest products goals.

E. Biomass for Energy Production

The City of Nanaimo recently entered into an agreement with the VIU Forestry Department to manage Woodlot 020 under a new BC government program designed to produce electrical power from a variety of non-fossil fuel sources, including wood biomass. You must now prepare an Integrated Resource Management Plan (IRMP) that meets the following land use objectives:

- Manage forest lands with an emphasis on production of biomass for energy.
- Maximize the net economic return of forest lands in the Woodlot under biomass production while meeting legal requirements for other forest values.

Forest management objectives under this scenario are intended to result in a continuous, annual supply of biomass for the city's new biofuels power plant at Duke Point. The plant utilizes organic waste from domestic and commercial sources as well as wood waste from other local forest lands. All legislated environmental stewardship provisions under the Forest and Range Practices Act (FRPA) and other legislation apply to the Woodlot (i.e., emphasis on biomass production should not be at the expense of maintaining basic provisions for other FRPA resource values).

Strategies should include harvesting and silviculture practices consistent with the objectives. You will need to use your judgment on silviculture systems, forest fertilization and other practices. Your plan may require a transition period to adjust to the new management regime.

The plan should maintain recreational opportunities that are compatible with the biomass production goals.

Appendix 3. Marking criteria for inventory

FRST242 IRMP Inventory												
Group: _____				Students: _____								
CATEGORY	4			3			2			1		
% Range:	100 - 85 (A+/A)			84 - 72 (A-/B)			71 - 55 (B-/C-)			< 55 (D/F)		
Forest cover/volume Map, recce methods, suppl data, vol table	~All of the elements are covered well			Most of the elements are covered well			Some of the elements are missing or not covered in enough detail			Many of the elements are missing or not covered well		
	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8
Harvest units/roads Map, classes by system, equip, factors, non-harv areas, roads	~All of the elements are covered well			Most of the elements are covered well			Some of the elements are missing or not covered in enough detail			Many of the elements are missing or not covered well		
	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8
Ecosystems Map, site series, sens ecos & soils descr	~All of the elements are covered well			Most of the elements are covered well			Some of the elements are missing or not covered in enough detail			Many of the elements are missing or not covered well		
	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8
Forest health Map, descr of current and potential issues	~All of the elements are covered well			Most of the elements are covered well			Some of the elements are missing or not covered in enough detail			Many of the elements are missing or not covered well		
	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9
Streams, lakes, wetlands Map, classn, descr, water users	~All of the elements are covered well			Most of the elements are covered well			Some of the elements are missing or not covered in enough detail			Many of the elements are missing or not covered well		
	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9
Wildlife features Map, R&B spp, snags, bear dens, OG vets	~All of the elements are covered well			Most of the elements are covered well			Some of the elements are missing or not covered in enough detail			Many of the elements are missing or not covered well		
	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9
Recreation Map, trails, other features	~All of the elements are covered well			Most of the elements are covered well			Some of the elements are missing or not covered in enough detail			Many of the elements are missing or not covered well		
	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9
First Nations Map, FN use, cedar areas	~All of the elements are covered well			Most of the elements are covered well			Some of the elements are missing or not covered in enough detail			Many of the elements are missing or not covered well		
	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9
Visuals Map, VQOs described	~All of the elements are covered well			Most of the elements are covered well			Some of the elements are missing or not covered in enough detail			Many of the elements are missing or not covered well		
	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9
Field Notes Original field notes, all aspects	~All of the elements are covered well			Most of the elements are covered well			Some of the elements are missing or not covered in enough detail			Many of the elements are missing or not covered well		
	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9
Overall quality Maps and report	Information is very organized; quality presentation			Mostly; some improvement needed			Could be improved significantly			Not adequate		
	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8
Points												
TOTAL Score _____ / 30												

Appendix 4. Marking criteria for management plan

FRST242 IRM Plan												
Student: _____									Scenario: _____			
CATEGORY	4			3			2			1		
% Range:	100 - 85 (A+/A)			84 - 72 (A-/B)			71 - 55 (B-/C-)			< 55 (D/F)		
Content <u>Timber or Biomass</u> Objectives, Strategies, Practices	Complete, clear and concise presentation; development plan, harvesting, roads			Mostly; some improvement needed			Could be improved significantly			Not adequate		
	15	14	13	12.5	12	11	10.5	9	8.5	8	7	6
Content <u>Silviculture</u> Objectives, Strategies, Practices	Complete, clear and concise presentation; Silvi. Systems, reforestation, tending, health			Mostly; some improvement needed			Could be improved significantly			Not adequate		
	15	14	13	12.5	12	11	10.5	9	8.5	8	7	6
Content <u>Other Resource</u> <u>Values</u> Objectives, Strategies, Practices	Complete, clear and concise presentation; biodiversity, FNs, Visual, Recr., NTFP, Wildlife, Streams			Mostly; some improvement needed			Could be improved significantly			Not adequate		
	20	19	18	17	16	15	14	13	12	11	10	9
Content Introduction, Goals, Inventory	Intro: project scope, area and scenario description, mgt goals, inventory summary			Mostly; some improvement needed			Could be improved significantly			Not adequate		
	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9
Format Organization	Information is very organized; headings and sub-headings			Mostly; some improvement needed			Could be improved significantly			Not adequate		
	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9
Format Graphics	Graphs, tables, illustr. are neat, accurate and add to understanding			Mostly; some improvement needed			Could be improved significantly			Not adequate		
	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9
English Structure and Mechanics	Well constructed sentences/paragraphs; little or no errors in grammar, spelling and punctuation			Mostly; some improvement needed			Could be improved significantly			Not adequate		
	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9
References	All sources doc. in proper format, in text & lit.cited			Mostly; some improvement needed			Could be improved significantly			Not adequate		
	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9
Points												
TOTAL Score _____ / 60							<i>*Note: total points for Timber and Non-Timber are reversed for the Timber (A) and Biomass for Energy (E) Scenarios</i>					

Appendix 5. Guidelines and marking criteria for presentations

GUIDELINES – Group Inventory Talks

Length: Your group will have a total of 20 minutes to present your inventory results, plus a question/answer period of up to 5 minutes. You may organize the presentation as you see fit (e.g., 4 x 5 minute segments by your group members on different aspects of the inventory, or...some other format). Everyone must take part. Your presentation should fit the time slot. If you go overtime, you may be cut off by the instructors.

Media: You are not required to use any form of media for your presentation; however, some visual aids usually help (e.g., props, PowerPoint slides, flipcharts, chalkboard, posters).

Structure: Your talk should follow an organized sequence for describing the inventory (introduction, general description of your area, methods, results, summary). There should be a logical flow and smooth transitions from one topic or speaker to the next, and a short summary that highlights your key findings.

Content: The focus of the inventory presentation is what you found from field work and other information sources for your area.

Delivery: You may use notes, but you are not allowed to read your talks.

Evaluation: Your presentation will be evaluated using the scoring criteria on the accompanying form. Criteria include the content, delivery, structure, use of media, timing and overall impact of your talks. The emphasis for this project is on the content.

GUIDELINES – Individual Scenario Talks

Length: 7 to 8 minutes, plus a question/answer period of 2 to 3 minutes [Total: 10 min]. Your talk should fit the time slot. If you go overtime, you may be cut off by the instructors.

Media: You are not required to use any form of media for your presentation; however, some visual aids usually help (e.g., props, PowerPoint slides, flipcharts, chalkboard, posters).

Structure: Your talk should follow an organized sequence for describing your IRMP. There should be an opening to introduce your topic, an outline, a main body of the talk with a logical flow and smooth transitions from one point to the next, and a short summary or conclusion that highlights your key message for the audience.

Content: You can assume everyone is familiar with the different scenarios, so you should include only a very brief description. Avoid repeating descriptions already provided in the group presentation on Inventory. The focus of the talk is your plan. How are you going to accomplish the objectives? What are your strategies and practices? What makes your approach special or innovative?

Delivery: You may use notes, but you are not allowed to read your talk.

Evaluation: Your presentation will be evaluated using the scoring criteria on the accompanying form. Criteria include the content, delivery, structure, use of media, timing and overall impact of your talk. The emphasis for this project is on the content.

Final IRMP Group Presentations : FRST242

Group: _____

Students: _____

CATEGORY	4	3	2	1
Percent Range	80 - 100%	70 - 79%	60 - 69%	50 - 59%
Preparation & Content Overall level of preparation, understanding of the project; level of detail	Completely prepared; shows a full understanding of the project; just the right amount of detail.	Reasonably prepared; shows a good understanding of most of the project; either a bit too much or too little detail.	Somewhat prepared; shows a good understanding of parts of the project too much detail, or lacking enough detail.	Not adequately prepared; does not seem to understand the project very well; way too much or way too little detail.
	10 9 8	7.8 7.4 7.0	6.8 6.4 6.0	5.8 5.4 5.0
Content - Methods Design, field inventory methods, analysis	~All of the elements are covered well	Most of the elements are covered well	Some of the elements are missing or not covered in enough detail	Many of the elements are missing or not covered well
	6 5.4 4.8	4.7 4.5 4.2	4.1 3.8 3.6	3.5 3.2 3.0
Content - Timber Forest cover, harvest units, road classes	~All of the elements are covered well	Most of the elements are covered well	Some of the elements are missing or not covered in enough detail	Many of the elements are missing or not covered well
	6 5.4 4.8	4.7 4.5 4.2	4.1 3.8 3.6	3.5 3.2 3.0
Content - Silviculture Site series, sensitive ecos, soils, forest health	~All of the elements are covered well	Most of the elements are covered well	Some of the elements are missing or not covered in enough detail	Many of the elements are missing or not covered well
	6 5.4 4.8	4.7 4.5 4.2	4.1 3.8 3.6	3.5 3.2 3.0
Content - Other Values Streams, FNs, Recreation, Wildlife, Visuals, NTFP	~All of the elements are covered well	Most of the elements are covered well	Some of the elements are missing or not covered in enough detail	Many of the elements are missing or not covered well
	6 5.4 4.8	4.7 4.5 4.2	4.1 3.8 3.6	3.5 3.2 3.0
Structure Opening and closing, talk organization, flow, transitions	Attention-getting opening, great intro, showed an outline; logical flow, good trans; memorable closing	Good opening / intro, outline; logical flow, transitions; adequate closing	Adequate opening / intro, +/- outline; flow, transitions need improvement; closing needs work	Weak opening, no/poor outline; talk is poorly organized, awkward flow or lacking transitions; talk ends abruptly
	4 3.6 3.2	3.0 2.8	2.6 2.4	2.2 2.0
Delivery - Physical Actions Posture, manner, gestures, eye contact, facial expression	Good posture, confident, enthusiastic; eye contact with entire room; freq. effective use of gestures, expression	Good posture nearly all the time; eye contact with most of the room; some effective use of gestures, expression	Posture is not good some of the time; eye contact with part of the room, freq. on screen or notes; few gestures, expression	Slouches or leans on the desk; appears bored or nervous, eyes mostly on screen or notes; little or no gestures, expression
	3 2.7 2.4	2.3 2.1	2.0 1.8	1.7 1.5
Voice - Clarity & Volume Speaks clearly, easily understood, appropriate speed, good volume	Speaks clearly all of the time; good speed and volume	Speaks clearly with good speed and volume most of the time	Hard to understand or hear some of the time; occasionally too fast or slow	Often hard to understand or hear; too fast or too slow
	3 2.7 2.4	2.3 2.1	2.0 1.8	1.7 1.5
Visual aids Effective use of slides and/or other visual aids	Visuals show considerable work & creativity; visuals enhance the talk	Visuals well prepared; visuals enhance the talk	Visuals mostly well prepared; occasionally distract from the talk	Visuals appear to be a last-minute effort; many detract from the talk
	3 2.7 2.4	2.3 2.1	2.0 1.8	1.7 1.5
Time-Limit (20 min) Good timing of the presentation	Presentation is right on time or just slightly under.	Presentation is slightly over time or noticeably under.	Presentation is only 2/3 of the allotted time or noticeably over.	Presentation is less than half the allotted time, or considerably over.
	3 2.7 2.4	2.3 2.1	2.0 1.8	1.7 1.5
Points				

TOTAL Score _____ / 50 (x 0.10 for total IRMP points)

Final IRMP Individual Presentations : FRST242

Student: _____

Scenario: _____

CATEGORY	4			3			2			1		
Percent Range	80 - 100%			70 - 79%			60 - 69%			50 - 59%		
Preparation & Content Overall level of preparation, understanding of the project; level of detail	Completely prepared; shows a full understanding of the project; just the right amount of detail.			Reasonably prepared; shows a good understanding of most of the project; either a bit too much or too little detail.			Somewhat prepared; shows a good understanding of parts of the project too much detail, or lacking enough detail.			Not adequately prepared; does not seem to understand the project very well; way too much or way too little detail.		
	10	9	8	7.8	7.4	7.0	6.8	6.4	6.0	5.8	5.4	5.0
Content - Goals Clear, concise description	Clear, concise summary of goals			Good descript., some improvements needed			Description needs work			Weak description		
	6	5.4	4.8	4.7	4.5	4.2	4.1	3.8	3.6	3.5	3.2	3.0
Content - Timber Dev.plan, harvesting, roads	~All of the elements are covered well			Most of the elements are covered well			Some of the elements are missing or not covered in enough detail			Many of the elements are missing or not covered well		
	6	5.4	4.8	4.7	4.5	4.2	4.1	3.8	3.6	3.5	3.2	3.0
Content - Silviculture Silv. Systems, regen, tending, health	~All of the elements are covered well			Most of the elements are covered well			Some of the elements are missing or not covered in enough detail			Many of the elements are missing or not covered well		
	6	5.4	4.8	4.7	4.5	4.2	4.1	3.8	3.6	3.5	3.2	3.0
Content - Other Values Biodiversity, FNs, Recr, Wildlife, Streams, NTFP	~All of the elements are covered well			Most of the elements are covered well			Some of the elements are missing or not covered in enough detail			Many of the elements are missing or not covered well		
	6	5.4	4.8	4.7	4.5	4.2	4.1	3.8	3.6	3.5	3.2	3.0
Structure Opening and closing, talk organization, flow, transitions	Attention-getting opening, great intro, showed an outline; logical flow, good trans; memorable closing			Good opening / intro, outline; logical flow, transitions; adequate closing			Adequate opening / intro, +/- outline; flow, transitions need improvement; closing needs work			Weak opening, no/poor outline; talk is poorly organized, awkward flow or lacking transitions; talk ends abruptly		
	4	3.6	3.2	3.0	2.8		2.6	2.4		2.2	2.0	
Delivery - Physical Actions Posture, manner, gestures, eye contact, facial expression	Good posture, confident, enthusiastic; eye contact with entire room; freq. effective use of gestures, expression			Good posture nearly all the time; eye contact with most of the room; some effective use of gestures, expression			Posture is not good some of the time; eye contact with part of the room, freq. on screen or notes; few gestures, expression			Slouches or leans on the desk; appears bored or nervous, eyes mostly on screen or notes; little or no gestures, expression		
	3	2.7	2.4	2.3	2.1		2.0	1.8		1.7	1.5	
Voice - Clarity & Volume Speaks clearly, easily understood, appropriate speed, good volume	Speaks clearly all of the time; good speed and volume			Speaks clearly with good speed and volume most of the time			Hard to understand or hear some of the time; occasionally too fast or slow			Often hard to understand or hear; too fast or too slow		
	3	2.7	2.4	2.3	2.1		2.0	1.8		1.7	1.5	
Visual aids Effective use of slides and/or other visual aids	Visuals show considerable work & creativity; visuals enhance the talk			Visuals well prepared; visuals enhance the talk			Visuals mostly well prepared; occasionally distract from the talk			Visuals appear to be a last-minute effort; many detract from the talk		
	3	2.7	2.4	2.3	2.1		2.0	1.8		1.7	1.5	
Time-Limit (10 min w/ Q&A) Good timing of the presentation	Presentation is right on time or just slightly under.			Presentation is slightly over time or noticeably under.			Presentation is only 2/3 of the allotted time or noticeably over.			Presentation is less than half the allotted time, or considerably over.		
	3	2.7	2.4	2.3	2.1		2.0	1.8		1.7	1.5	
Points												

TOTAL Score _____ / 50 (x 0.10 for total IRMP points)