Taan FOREST

BCTS
BC Timber Sales
Chinook

FSC® Management Plan – Appendix 3

Annual Monitoring Report 2011

From the Land and Spirit of the Haida

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Introduction

A monitoring report will be compiled on an annual basis, in support of the FSC certification of Group Members and the monitoring plan contained within the FSC Management Plan.

The Monitoring Report and development of indicators was completed by Jillene West, RPF and Shayne Boelk, RPF, BIT (Zimmfor Management Services Ltd.) and Laurie Kremsater, M.Sc., RPF, RPBio. Support and data was also provided by several key staff at Taan Forest LP and BC Timber Sales. Performance reporting for several key indicators was also generated utilizing the Forest and Range Evaluation Program (FREP) monitoring data.

Indicators have been developed to address the FSC requirements for monitoring (i.e., Elements) and establishing benchmarks to enable assessment of current performance against historical performance. Group Members have also developed targets in addition to reporting current status or benchmarks, to reflect internally established "goal posts" that in some cases may be the same as the benchmark or historical performance (for example any indicators based on legal requirements) and at times may vary from the benchmark (for example where we are striving for improved performance or continual improvement). It is anticipated that in some cases, targets will be periodically reviewed and revised to drive continual improvement, where applicable. Management Strategies associated with each indicator outline typical management actions to achieve targets and also outline adaptive strategies should targets fail to be met. These approaches form the backbone of the 'Adaptive Management' cycle and ensure results of monitoring will feedback to appropriately change management.

The default timeline for indicator reporting and the period which targets should be met is one year (based on annual reporting). Where specific indicators and targets are to be measured on alternate timeframes, it will be specified under the indicator descriptions.

In general, the reporting period includes January 1 to December 31 of each year. This may be re-aligned in future with the timeframes of the Land Use Order annual reporting requirements, once they are set (for example, a data 'cut-off' date of early December may be selected to facilitate compilation prior to the submission date).

The monitoring report is provided to stakeholders, the Haida Nation and to the general public under the FSC Consultation requirements in the FSC Management Plan.

In addition, the results of monitoring are also reviewed during the Taan (Group Manager) Management Review process under the Corporate Management System to review and discuss continual improvement and adaptive management in terms of both implementation and effectiveness (documentation of the review and any proposed changes to the FSC Management Plan, Assessments, Monitoring Plan and/ or indicators, benchmarks and targets are recorded within the Management Review meeting minutes and/ or the Taan Corporate Tracker (action plan tracking)).

Summary of Changes

This section includes a summary of the changes to the Indicators or Targets that have been made since the last version as a result of continual improvement, management review, monitoring and adaptive management, results of audits, or feedback from stakeholders and the Haida Nation.

Date	Indicator	Description of Change
N/A	N/A	N/A

2011 is the first annual monitoring report to be published. It includes the preliminary indicators and benchmarks from the first version of the FSC Management Plan (August 2011). Many significant changes have been made to the first set of indicators to address gaps and audit findings (too many to summarize above in a meaningful way). As such, this report will serve as the indicator set going forward and future changes will be highlighted above.

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Summary of Results

In 2011, Group Members achieved the established targets on 29 of 36 indicators (overall performance score of 81%).

The following table provides an overview summary of the indicators where the targets were not achieved, as well as the proposed action items to address deficiencies and adapt management strategies to achieve improved performance:

Indicator	Summary of Results – Target not Met	Action Required[1]
Waste & Residue	Waste & Residue results for 2011 showed elevated results as a result of a time period of poor market conditions for pulp wood. FSC requires adequate management strategies to be in place to ensure that waste and residue is minimized, regardless of market conditions.	Internal thresholds were established to reflect continual improvement over 2011 results. Taan has developed new strategies to address waste, including tighter supervision on logging crews to minimize waste as well as commitments to bring pulp logs to roadside during poor markets to facilitate future utilization of the wood at a later date, either for pulp markets when they improve or for salvage/ firewood and/ or bioenergy fuel in the event that the project comes to fruition. BCTS is increasing the component of timber sales sold under the new Innovative Timber Sale program, which is proving to contain lower waste levels than conventional TSLs.
Stand Level Biodiversity	Target for number of internal retention patches for cutblocks >10ha not met under FRPA.	Review and discuss at Management Review Meeting - consider development more specific management strategies for internal retention required on larger cutblocks as well as minimum patch size of 2ha per monitoring recommendations. Future development of management strategies regarding forest influence calculations is also being reviewed and may replace this indicator.
Sensitive Species Habitats	MAMU – deficits have been identified for the LUO targets.	FSP Signatories must locate and identify areas of suitable MAMU habitat to recruit (i.e., areas of younger stands) to set aside from harvesting and identify as MAMU recruitment areas.
Riparian Management Effectiveness	S4, S5 and S6 streams –, falling and yarding across streams and stream crossings demonstrated erosion and sedimentation into the streams (road surface and cut/ fill slope).	Review and discuss in August 2012 Management Review Meeting to develop action plans; assess cross stream falling/ yarding and road sedimentation during internal audit 2012.
FSC Riparian Budgets – Watershed Level	Target of 100% of watersheds meeting FSC Riparian Budgets was not met using the analysis criteria.	Implementation of the Stand Level FSC Riparian Budget Tracker and Management Strategy was developed in early 2012 to address the deficits. It is also anticipated that errors in site series information in the forest inventory data resulted in underestimates of the contributions of the riparian buffers under the Land Use Order for Type I and Type II streams (fish streams). Recommendations for future analysis include correcting or using alternate methods that may be more accurate. The analysis will be updated and corrected during 2012/2013 and the updated results will be incorporated into the FSC Management Plan, operational implementation and this monitoring report.
Accident Frequency Rate	Taan Contractor and BCTS accident rates need to be reduced to meet targets.	Review and discuss at Management Review Meeting 2012 to generate effective action plans.

Indicator	Summary of Results – Target not Met	Action Required[1]
Inorganic Wastes – Seedling Protectors	At the time of the Annual Monitoring Report the required information has not been compiled in regards to an inventory of existing seedling protectors.	The inventory and action plan to address removal of seedling protectors where they are no longer needed is an existing action item resulting from the external audit 2011 that is already being tracked for completion. No new action item is required.
High Conservation Value Forests	Analysis and monitoring plans are under development.	Analysis and monitoring plans are under development.

[1] Refer to the Action Plans section below for further explanation of actions required to address any indicators where the target was not achieved. Actions are entered into and tracked using the Taan Forest (Group Manager) Corporate Action Tracker.

Action Plans

The results of the 2011 annual report have generated several action items for 2012 (these are tracked for follow-up and completion in the Group Manager Corporate Tracker):

1. Management Review Meeting 2012 discussion items:
   - Closely monitor the results of waste and residue assessments as they are completed during 2012 to ensure that thresholds are achieved and management strategies can be adjusted accordingly in the event that further actions are required. Review categories of waste by stumps, bucking versus sawlog.
   - Discuss accident frequency rates and brainstorm ideas to address accident rates for Taan Contractors and BCTS. Specific action plans to be developed and tracked through the Management Review process and the Taan Corporate Tracker (action tracker).
   - Review and discuss solidifying the commitment to plant cedar (western red cedar and yellow cedar) at target stocking levels that exceed the minimum cedar content requirements in the Forest Stewardship Plan (group members currently strive to plant at levels higher than required, but this is not documented as part of the corporate management strategies).
   - Group Members should consider development of cutblock planning procedures to assess forest influence on proposed blocks as well as addition of some minimum thresholds to achieve on a cutblock basis to achieve forest influence and stand level retention objectives (e.g., larger blocks required to have internal retention, consider minimum patch size of 2ha). Communications with BCTS indicate that this is already being implemented.
   - Review and discuss cross stream falling/ yarding prescriptions (i.e., are we implementing fall/ yard away where we can?) Review road sedimentation/ monitoring plans and follow up to ensure progress is being made. Review effectiveness of the monitoring in next year's report.
   - Discuss potential for conducting fertilization projects on the Haans Creek Residual3 (TFL 60); Heather Lake (Haida Tenure); and Newcombe Inlet Residual6 watersheds (BCTS) to expedite the hydrological recovery of these watersheds that are demonstrating current conditions much lower than the LUO & FSC ECA thresholds (these are not sensitive watersheds).
   - Discuss proposed management strategy for Goshawk known nest sites and protection of 30-40% of foraging habitat within 3.5kms of the nest sites, as recommended via discussions with local biologist (Todd Manning). Need to get the updates modelling info in Sept. 2012 to assess potential impacts of the proposed management strategy. May work well with watershed constraints already in place?

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2. Explore opportunities for aligning the FREP monitoring program for CWD (method of measurement) with waste and residue surveys. FREP conducts transects and records the diameter of the CWD at the point of intersect with the transect as well as a length. This is not conducive to generating any accurate reports of volume of CWD but reports in pieces/ ha and length categories. Conversely, waste and residue assessments and legal thresholds for maximum waste include measurements of bottom diameter, top diameter and length and a volume measurement of m^3/ha is reported. Some sort of alignment of the data collection is required in order to properly assess whether current waste and residue thresholds (above which penalties are issued to licensees) are consistent with natural stand benchmarks. Possible to conduct some waste and residue assessments on natural stands to create a natural benchmark of CWD m^3/ha in diameter categories?
3. Report on the status update on addressing the deficits of MAMU habitat in the FSP Area and specifically for Group Members in the FSC Management Unit. Per the FSP, areas of younger stands must be designated for recruitment to facilitate the requirements for representation targets of old and mature seral stages.
4. Explore opportunities to cooperate with FREP to increase the sample size to measure soil conservation/ disturbance and stand level development (mid seral growth for TSR comparisons).
5. Explore opportunities for MFLNRO to set the BEC or the VRI plots as PSPs to enable tracking of ecosystem changes as a result of climate change (further discussion required on mechanism to implement).
6. Continue work on analysis and forecasting of coarse woody debris, snags, sensitive species and landscape level biodiversity indicators such as seral stages, ecosystem representation, forest interior, etc. to further examine effectiveness of current management strategies and revise if forecasting indicates objectives may not be achieved.
7. Consider updating the Watershed level analysis of FSC Riparian Budgets and consider adding in the non-contributing land-base portions of each watershed to contribute to the riparian retention contributions. Can also consider factoring in Watersheds with current ECA constraints where no harvesting can occur until the watersheds recover their hydrological conditions to the established ECA thresholds (FSC 25% all watersheds, LUO 20% for Sensitive Watersheds. It is also anticipated that errors in site series information in the forest inventory data resulted in underestimates of the contributions of the riparian buffers under the Land Use Order for Type I and Type II streams (fish streams). Recommendations for future analysis include correcting or using alternate methods that may be more accurate.
8. Continue work on the forest health indicator to obtain the GIS info from the Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) and review for applicability of forest health issues in the FSC Management Unit. Determine if any field inspections are required to follow up and assess any 'severe' forest health issues in the MU (as categorized by MFLNRO).
9. Consider conducting an on-site review of the specific cublocks and stream locations identified within the Management Unit as moderate sedimentation potential to assess potential for rehabilitation as well as whether changes to management strategies could have improved the results.
10. Contact MOE to explore cooperation regarding species recovery plans for key species northern goshawk and marbled murrelet. Obtain updated modeling for northern goshawk from MOE (expected to be completed September 2012) and update monitoring plans/ management strategies as required. Complete current status reporting for Sensitive Species indicator (heron reserves, bear dens, monumentals).
11. Continue work on analysis and further development of monitoring plans for Landscape Level Biodiversity & HCVF. Preliminary analysis is in progress at this time.
12. Report progress on pilot project to establish plots within retention patches to collect stand description information at time of cruise (assessing feasibility and economics).

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Yield of all Forest Products

Indicator: Forest Products

Element	Objective	Indicator	Target
FSC 8.2.1 & 5.2.2: Yield of all products harvested	Ensure optimal yield and value of forest products	Volume and species harvested is relatively consistent with the forecasted harvesting profile	Harvest Volumes are within +/- 20% of the 20 year forecasted harvesting profile each year, but within 5% over a 10 year period

Rationale for Indicator & Target

By ensuring a balanced harvest profile that is consistent with the forecasted profile, Group Members can help demonstrate that optimal yield is achieved without high-grading (or harvesting only the best timber). The target is based on the results of the recent Timber Supply Review by the Haida Gwaii Management Council (Analysis Report, Figure 10 and associated data tables) demonstrating the allocation of the harvest by species forecasted into the future; a twenty year term was selected out of the forecasted 400 years for relevance to annual reporting periods. This target assumes that the species profile is evenly apportioned across tenure holders (which it may not be in reality). However, since the current ACC does not include partitions based on species, assuming even distribution was the most achievable scenario. The targets will need to be adjusted later in 2012 once the new AAC for Haida Gwaii is allocated.

Current Status/ Results

Year	Group Member	Total Volume Harvested (m3)	Volume Harvested by Species (m3)					Lumber Sales (fbm)	Value Added	Target Met (Y/N)
			Red Cedar	Cypress	Hemlock	Spruce	Other			
2011	Taan	186,050	72,319	7,616	35,957	68,820	1,338	466.48	0	Y
	BCTS	60,438	28,910	20	16,134	4,733	7,198	n/a	n/a	
	Total	246,488	101,229	7,636	52,091	73,553	8,536	-	-	
			41%	3%	22%	30%	4%	-	-	
20 year forecast			41%	7%	39%	11%	2%	-	-	

[1] Other species include minor species such as pine, deciduous etc.

In 2011, a small component of 'other' species was comprised of Lodgepole Pine and Red Alder. A detailed breakdown of the various log grades can be obtained upon request to the Taan Forest CMS Administrator and the BCTS SFI Certification Annual Report. A trial is also underway by Taan in spring 2012 to produce value added cedar planks for cooking use.

Lumber Sales and value added products for Taan are also reported under this indicator. While there are no specific targets set, they provide valuable additional information in relation to reporting of the forest products produced in the Management Unit.

The recent Timber Supply Review completed by the Haida Gwaii Management Council indicates (Analysis Report section 3.1.5-Species Distribution) that the harvesting profile is anticipated to change the next 80 years, as the volume of harvested cedar declines as a result of the lag between diminishing harvestable old growth and contributions from second growth stands to the harvest profile.

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Summary of Management Strategies

There general management strategies related to optimizing the yield for Taan is based on balancing the economic returns with available markets with planning and development of blocks. The goal is to work towards increasing planning and development to enable a more diverse selection of areas to choose from when examining economic margins and markets when doing harvest planning. The objective is to allow for annual variations and flexibility in harvesting the forecasted profile, but ensure that over the long term, the harvesting profile is generally consistent with the forecast in the timber supply analysis. In addition, Taan maintains bucking specifications for each area/ sale in order to ensure maximum utilization based on the parameters of the current market conditions and sale orders.

The BCTS mandate is to provide competitive cost and price benchmarks for timber harvested from public land in British Columbia. Harvesting a representation of the profile is paramount to producing competitive costing as well as the BCTS sustainable forest management commitments. BCTS does not maintain or enforce utilization requirements on Timber Sale Holders other than implementing the waste and residue monetary penalties for volumes in excess of the allowable waste thresholds.

Each Group Member maintains internal analysis in relation to ensuring economic efficiencies of each Cutting Permit/ Road Permit and or Timber Sale based on the current market conditions and stumpage fees, costs, etc.

Waste and residue generated from harvesting is a key component to assessing optimal utilization and is discussed under the Waste & Residue Indicator.

Adaptive Management Strategies

Not applicable at this time.

Database & Reporting Parameters

Annual harvest volumes are recorded and maintained by the Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) Harvest Billing System Database (based on submitted scale data). The database can be accessed by members of the public, industry and government. Various options exist for generating queries and reports that can be downloaded or emailed to the recipient generating the query.

The query report includes Harvest Reports by Date of scale: volume harvested January 1 to December 31 for all of Haida Gwaii, including normal and waste, by client/ licensee, volume, species and grade (for reference, parameters of each report are also recorded at the bottom of the report print-out).

Taan also maintains internal records related to production (harvest volume) by species (reports can be generated by log scaling personnel through the Netscale software).

Indicator: Non-Timber Forest Products

Element	Objective	Indicator	Target
FSC 8.2.2: Yield of all products harvested	Ensure optimal yield of harvested forest products	Volume of NTFP by type (m3, kg, etc.)	Cooperate with local organizations/ groups requesting access to NTFPs

Rationale for Indicator & Target

The Indicator is based on the FSC requirements to ensure optimal use of forest products, including non-timber forest products (where applicable), as well as monitor the harvesting profile to compare with management objectives over time. The target reflects that harvesting of non-timber forest products (NTFPs) is currently not regulated/ measured by Group Members (i.e., there are no established maximum cut levels nor is any 'stumpage' or fees charged to user groups for accessing the forests for NTFPs).

Current Status/ Results

Year	Group Member	# of Requests for access to the MU for NTFP	# of Requests Granted	Summary of Communication/ Cooperation to develop NTFP	NTFP Type	Volume Harvested (various units)	Target Met (Y/N)
2011	Taan	1	1	Cooperation with local resident for Conifer Oil Extraction Pilot Project	Conifer Oil	Not available	Y
	BCTS	0	0	-	-	0	Y

In 2011, a local individual contacted Taan to inquire about access to the management unit for developing a local NTFP business for tree oils. A pilot project is under way to collect boughs and create oil and planning is underway to expand the project with a larger boiler in 2012. Access to the Management Unit and communications have been on-going and continue into 2012.

Summary of Management Strategies

Group Members are committed to continuing to explore cooperative efforts with interested parties in regards to maintaining access to the forests for NTFPs, including the mushroom habitat areas. At this time, NTFPs are not regulated, measured or tracked on the Management Unit.

Mushroom picking occurs across Haida Gwaii but harvests are not currently regulated. Key mushroom habitat areas have been identified in various studies and are highlighted on overview maps provided in the FSC Management Plan. A significant amount of mushroom habitat is located within protected areas and other Land Use Order constrained areas as well as in the non-contributing land-base (i.e., areas that are typically not economical to be harvested). In addition, for mushroom habitat areas located in the harvestable area, Group Members include consideration of mushroom picking during cutblock level planning by reviewing the ecosystem classification in relation to habitat suitability for mushrooms as well as noting the level of mushroom populations to determine potential for activity. Placement of stand level reserves can also assist in protecting any specific areas noted with higher populations of mushroom habitat.

In future, Taan may explore regulation of NTFPs through the new First Nations Woodland License that includes provisions to permit regulation of botanicals.

In the event that progress is achieved in regards to a regular non-timber forest products program, the target will be re-visited to consider developing a numerical target.

Adaptive Management Strategies

Not applicable at this time.

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Database & Reporting Parameters

Communication regarding cooperation with local organizations/ groups in relation to non-timber forest products is maintained within each Group Members central File System.

In the event that an industry is developed, associated volumes harvested from the Management Unit will be recorded by Group Members (likely excel format or within accounting systems) and reported.

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Indicator: Sustainable Harvest Rates

Element	Objective	Indicator	Target
FSC 5.6.5 & 5.6.6: Sustainable Harvest Rates	Maintain sustainable harvest rates consistent with the FSC Standard requirements	Total volume harvested (m3) as a % of Long Term Harvest Level (LTHL)	Annual harvest rate is ≤125% of the projected LTHL; the ten year average following initial certification is ≤ 100% of the projected LTHL

Rationale for Indicator & Target

The indicator and target reflect specific FSC requirements for Indicator 5.6.5 and 5.6.6.

Current Status/ Results

Year	Group Member	Tenure	Volume Harvested (m3)	LTHL (m3)	% of LTHL	Target Met (Y/N)
2011	Taan	TFL 60	115,412	342,462	33.7	Y
		Haida Tenure	70,637	129,300	54.6	Y
	BCTS	TSA 25/ TFL 25	60,438	221,819	27.2	Y
2010	Taan	TFL 60	26,000	1,040,000	2.5	Y
		Haida Tenure	26,000	129,300	20.1	
	BCTS	TSA 25/ TFL 25	43,828	323,000	13.6	Y

The Long Term Harvest Level (LTHL) is derived from the Haida Gwaii Management Council Timber Supply Review Analysis Package (January 2012) and resulting Allowable Annual Cut (AAC) determination for Haida Gwaii. The AAC announced April 4, 2012 significantly reduced the harvest levels as a result of the timber supply analysis that incorporated the implications of the Haida Gwaii Land Use Objectives Order (ecosystem based management objectives). The LTHL for the portions of the Management Unit within the TSA have been pro-rated using the current AAC distribution and the total LTHL for the TSA (550,000 m^3).

Summary of Management Strategies

Harvest rates are determined through the *Forest Act*, Allowable Annual Cut requirements. In consideration of establishing the AAC for Haida Gwaii, the Haida Gwaii Management Council considers the Long Term Harvest Level indicates by the various inventory layers and management scenarios. At this time, no special management strategies are required to meet the target, as they are generally consistent with legal requirements. However, this indicator must be monitored closely on an annual basis and in the event results are showing significant deviation from the target, then appropriate management strategies will need to be developed within the FSC Management Plan, in order to ensure that targets are maintained.

Adaptive Management Strategies

Not applicable at this time.

Database & Reporting Parameters

Annual harvest volumes are recorded and maintained by the Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) Harvest Billing System Database (based on submitted scale data). Various options exist for generating queries and reports that can be downloaded or emailed to the recipient generating the query.

The query report parameters include Harvest Reports by Date of scale: volume harvested January 1 to December 31 for all of Haida Gwaii, including normal and waste, by client/ licensee, volume, species and grade (for reference, parameters of each report are also recorded at the bottom of the report print-out).

BCTS completes an annual review of the Volume Harvested versus the Volume Allocated by Management Unit Form (Summary of Timber Sale Volumes) and reports the results.

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Indicator: Waste & Residue

Element	Objective	Indicator	Target
FSC 5.2.2, 5.3.1, 8.2.1 & 8.2.9: Yield of all products harvested	Ensure optimal yield of harvested forest products	Average billable waste results of as a function of harvest area (m^3/ha)	Avoidable Waste is ≤ 25 m^3/ha for second growth stands and ≤ 45 m^3/ha for old growth stands

Rationale for Indicator & Target

The indicator is based on FSC requirements to minimize waste and ensure maximum utilization. Avoidable waste is the portion of the waste and residue that is evaluated for penalties under the *Forest Act*. Avoidable waste above thresholds of 10m^3/ha for second growth and 35m^3/ha for old growth are subject to penalties. Ideally, the target would reflect the thresholds established in the Waste and Residue Manual. However, historically these thresholds have not been achieved on a consistent basis as a result of a combination of market conditions and harvesting practices. Therefore, the target established in the spring of 2012 is based on discussions with operations personnel to set a threshold that demonstrates the commitment to continual improvement in harvesting practices to increase utilization but reflects results that operations feel are achievable based on allowing for some flexibility to respond to poorer market conditions. A larger margin is set for second growth timber, as these stands tend to include a higher level of pulp wood than old growth stands. Maintenance of a component of Large Woody Debris (LWD) is also very important or biodiversity values and further work is needed to explore the relationship between minimizing waste and still providing for biodiversity values provided by LWD (also refer to the Stand Level Biodiversity Indicator for CWD values).

Current Status/ Results

Year	Stand Type	Avoidable Waste (m^3/ha)					Target Met (Y/N)
		Taan	BCTS-TSL	BCTS-ITSL	Haida Gwaii Forest District	Coast Region[1]	
2011	Second Growth	110.27	-	47.79	95.26	67.30	N
	Old Growth	37.48	85.29	50.40	80.77	123.90	N
	# of Samples	2	1	3	309	Not available	-

[1] Historical waste and residue records for Haida Gwaii and the Coast Region were obtained via email communication from MFLNRO Coast Cruising and Waste Specialist (generated from the MFLNRO WASTE System database) and includes data from 2004-2011. Discussion with the MFLNRO Waste Specialist indicates that waste levels for the last few years have been higher than historical averages as a result of the poor markets for lower grade and pulp markets.

In 2011, waste levels were generated from a very low sample size (as little harvesting was completed). One second growth block (LAW005) was assessed for Taan Forest and the results were used to reflect the levels for two other cutblocks (i.e., the parent block option was selected for the assessment type).

BCTS only had one regular Timber Sale License (TSL) sale in 2011 where harvesting was completed and waste surveys were done. The rest of the regular TSL's are ongoing and no waste information is available. The other BCTS timber sales were all Innovative Timber Sales Licenses (see description below), which are anticipated to reduce waste levels over traditional TSLs. The monitoring data from 2011 supports this concept. Further monitoring should be planned for 2012 to allow for an increased sample size to further support the claims of less waste.

Taan has also initiated cooperation with FP Innovations to begin bioenergy assessments in order to gather information to support planning initiatives for an on-island Co-gen facility. If this project proceeds, there is significant opportunity to manage post-harvest waste levels through this program. Work will continue in 2012. BCTS has also been working with FP Innovations on this same issue and will work cooperatively with Taan.

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Summary of Management Strategies

Specific management strategies in relation to minimization of waste and optimization of large coarse woody debris are located within the FSC Management Plan – Coarse Woody Debris section. The general management strategies are to increase development opportunities (cutblock planning) so that operations have a greater selection of areas to select from when developing harvesting schedules to better facilitate responding to market conditions (e.g., when pulp markets are low, avoiding harvesting of blocks with identified high contents of pulp). Secondly, close monitoring of harvesting operations to ensure optimal utilization and adherence to bucking specifications help to minimize waste.

Taan is also exploring the potential to focus material and wood fibre collection priorities on the cutblocks with high waste and residue results through the bioenergy program (under development), the salvage program and firewood cutting. The bioenergy project will involve moving more material to roadside for collection and use and thus leaving less debris dispersed in the cutblock.

The BCTS Innovative Timber Sale License (ITSLs) pilot program do not require waste assessments as the cutblock is sold as a whole unit, with all of the volume available being owned by the TSL holder, thus encouraging maximum utilization. BCTS has undertaken an assessment of a few ITSL sales to determine their waste levels to determine if ITSL's result in greater fibre utilization; i.e., lower waste. There were insufficient plots to be able to generate any meaningful waste information for reporting period at this time.

Adaptive Management Strategies

Adjustments to management strategies were completed during 2012 and are included above. This indicator will be monitored closely through 2012 (waste and residue assessments are anticipated for 2012 cutblocks in late August/ early September). Analysis of new results will also include review of different categories of waste of logs, stumps and bucking waste to better determine specific areas where improvement may be required and to direct management strategy changes (if applicable). Results will be reviewed in detail in the fall of 2012 and adjustments will be made where required to address any concerns if the current management strategies are not resulting in targets being achieved.

Database & Reporting Parameters

The Logging Residue and Waste System (WASTE) System allows for the recording, viewing, updating and printing of logging waste information, to allow the Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) to invoice licensees for monetary and cut control charges. WASTE is a web-based system which allows clients to enter, view, update print and submit waste assessment plans and data via the internet. A "ledger' report can be generated for specified date ranges and generates an excel spreadsheet report detailing the avoidable and unavoidable waste in m^3/ha for immature (2^{nd} growth) and mature (old growth).

In addition, waste reports can also be generated out of the MFLNRO Harvest Billing System database, although the database is more limited in ability to create queries of more detailed information.

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Growth Rates, Regeneration & Condition of the Forest

Indicator: Growth & Yield Plots

Element	Objective	Indicator	Target
FSC 8.2.3: Growth rates, regeneration and condition of the forest	Monitor growth rates	# of PSP/ G&Y plots identified during forest management planning; # harvested	No MFLNRO PSP/ G&Y plots are harvested unless 'approval' is received from MFLNRO

Rationale for Indicator & Target

The indicator represents the provincial initiatives for monitoring of forest growth rates in support of the timber supply review processes and calculations of the Allowable Annual Cuts for licensees. The target is based on the results of re-measuring monitoring in 2010 that demonstrated that a significant number of Permanent Sample Plots (PSPs) had been harvested and valuable data/ information was lost. There are currently no legal requirements established to protect PSPs from harvesting. However, Group Members are working closely with MFLNRO to identify critical plot locations and ensure that they are protected from harvesting. There may be specific cases where MFLNRO consents to harvesting of specific PSPs (e.g., if not needed for future monitoring for various reasons, sufficient number of additional plots exist in the same stand composition/ site series, re-measurement is completed prior to harvesting, etc.).

Current Status/ Results

Year	Group Member	# of Growth & Yield Plots Identified		# of Growth & Yield Plots Harvested		Target Met (Y/N)
		MFLNRO Established	Licensee Established	MFLNRO Established	Licensee Established	
2011	Taan	207 (163 active)*	58	0	0	Y
	BCTS	463*	0	0	0	Y

*Note: Further work is needed in 2012 to improve on the information obtained for growth and yield plots in the Management Unit as there are several sources for information and discrepancies noted between the sources. Taan will work with MFLNRO to rectify the information in 2012.

For Taan, one block harvested in 2011 (MAM001) identified a plot within the block that was later removed from the harvest area (even though approval was received from MFLNRO to harvest the plot location). The block boundary was located slightly within the 300m buffer area from the plot center. 1 additional plot was later located outside of the block boundary in the south west corner.

The Ministry of Forests, Lands and Natural Resource Operations is planning a Vegetation Resource Inventory (VRI) for Haida Gwaii from 2012-2014 (Strategic Plan released June 20, 2011). The VRI contains information related to forest inventory and is comprised of photo interpretation and ground sampling. This project should provide for updated base layer/ inventory information that will be a valuable asset for many monitoring aspects. The Group Manager will also explore getting BEC or the VRI plots set as PSPs to enable tracking of ecosystem changes as a result of climate change.

Summary of Management Strategies

The BC Forest Branch (now MFLNRO) began installing permanent GY plots in the 1920's, many of which are still active today. The program evolved over time and in 1986, many different programs and plots were amalgamated into one provincial Permanent Sample Plot (PSP) program. Long-term PSP data are an exceptionally important source of stand dynamics, regeneration and mortality data for Growth and Yield modelling. Recently, long term PSP data and age cores have been used in calibration of Carbon/Climate models.

The Ministry of Forests, Lands &Natural Resource Operations has the responsibility for maintaining the Ministry Permanent Sample Plots (PSPs) and the associated data base for the province. There are approximately 9,000 Permanent Sample Plots located in the province of which approximately 5,000 are owned or managed by the Ministry (http://www.for.gov.bc.ca/hts/vri/psps/psp.html). Some of the sample data has been re-measured several times over many years and have provided the ministry with valuable information.

PSP's are not officially protected from harvesting; however Group Members have committed to ensuring that the specific plots identified by MFLNRO and/ or the licensee are not harvested through their individual Management System Operational and Planning Procedures (e.g., Taan Planning SOP).

The total MFLNRO plots identified above within the reporting data for Taan Forest, have been identified by MFLNRO as being of importance and selected for protection from harvesting (i.e., there are additional plots that may be located within the MU, but these have not been selected for keeping by MFLNRO).

Adaptive Management Strategies

Discrepancies exist in the different data sets for G&Y/ PSP plots that have been provided to Taan (e.g., some plots are listed as active in the MFLNRO data set but have been identified to Taan from another MFLNRO contact as inactive or harvested). Work is continuing through 2012 to rectify the datasets and ensure one accurate data set is used going forward.

Database & Reporting Parameters

Group Members maintain GIS mapping layers related to previously identified MFLNRO and individual licensee PSPs, where applicable. Planning procedures include provisions to ensure that these known locations are considered during planning, field locations confirmed, and measures established during site level planning to ensure that the MFLNRO PSPs are not harvested.

The Land and Resource Data Warehouse (LRDW) maintain a database containing the majority of the known locations of established PSPs in BC: http://geobc.bc.ca/ . Group Member GIS personnel are responsible for ensuring that the GIS database remains current and is updated periodically to match the data sources.

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Indicator: Stand Development

Element	Objective	Indicator	Target
FSC 8.2.3: Growth rates, regeneration and condition of the forest	Monitor growth rates	Actual growth rates compared to those used in the Timber Supply Review (mid seral)	Develop and implement monitoring plan; respond to results

Rationale for Indicator & Target

The recent Timber Supply Review completed by the Haida Gwaii Management Council identified a need to evaluate actual growth rates in comparison to those used in the Timber Supply Analysis in order to provide for more accurate analysis in the future. Assessment of actual growth rates in comparison to the models used in the TSR is paramount to ensuring sustainable harvest rates.

This indicator and target are based on the Forest and Range Evaluation Program (FREP) monitoring for Stand Level Development that is currently under development. "The Stand Development Monitoring (SDM) protocol has been designed to assess the health and productivity of young stands between the ages of 15 and 40 years. Stands in this age range will have typically achieved the FG milestone, and are currently assumed to remain in that healthy well-stocked condition. SDM collects and provides introductory analysis of data in five specific areas: stand density (total, well-spaced (WS) and free-growing (FG) stems per hectare), stand species composition, pest incidence, tree volume and site index. SDM data can be used for a variety of purposes in tracking how stand attributes change in managed forests. Given its direct tie to management practices through the use of operational silviculture records, SDM is uniquely positioned to provide a benchmark measure on which to base a systematic approach of adaptive management for many silvicultural practices" (FREP SDM Protocol). There are four objectives to SDM:

- Assess the health and productivity of young stands under changing environmental conditions;
- Review the effectiveness of government policies and forest management practices that govern stand initiation, resource sustainability and risk to the Crown;
- Support sustainable forest management (SFM) certification processes; and
- Develop in-house expertise within the Ministry regarding the health and productivity of managed stands in all Timber Supply Areas (TSAs).

Current Status/ Results

The FREP monitoring protocol for Stand Level Development is currently being created (a draft was completed in March 2011). A training session for field data collection to meet this indicator (and support several other indicators) is being held in July 2012 (Taan is sending 2 staff to the training).

Adaptive Management Strategies

Not applicable at this time.

Summary of Management Strategies

Taan is working with FREP representatives in Haida Gwaii to cooperate and support the FREP monitoring program in general, and specifically in relation to this indicator as well.

The primary focus of the FREP stand development monitoring is to report on forest health issues, but also to compare growth rates to those expected. Taan will assess FREP results for the blocks in the Taan area (9 plots at least) and determine if further plots targeted to specific areas (e.g., BEC, productivity class) would be useful. Opportunities exists to cooperate with MFLRNO to augment or participate in FREP's stand development monitoring activities.

Taan is also considering LIDAR technology which would enable a high level of accuracy in analysis of forest inventory, growth rates, etc. from the LIDAR data (e.g., accurate tree heights can be obtained from LIDAR imagery).

Database & Reporting Parameters

FREP Information Management System database.

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Indicator: Planting

Element	Objective	Indicator	Target
FSC 8.2.4: Growth rates, regeneration and condition of the forest	Ensure areas harvested are successfully regenerated; maintain the natural species profile	# of trees planted by species; % seed source from Haida Gwaii	≥90 % of seed source is from Haida Gwaii

Rationale for Indicator & Target

The indicator is based on ensuring that in general terms, areas are being reforested in similar compositions as was harvested (variations are permitted based on ecological conditions of the site and the selection of the best species to meet reforestation objectives, consistent with the approved stocking standards under the Forest Stewardship Plan (which accounts for ecosystems, microsites and best suited species selection)). The use of local seed is best suited to ensuring the Range of Natural Variation is considered during reforestation. The target allows for slight variation to account for possible initiatives to respond to forest health events such as pests and climate change (i.e., planting resistant species or varieties or trials to assess climate change).

Reforestation may also occur using natural regeneration and monitoring of these areas is captured under the Reforestation Monitoring indicator in terms of achievement of Free Growing status.

Current Status/ Results

Year	Group Member	Trees Planted by Species (#)					% of Seed from Haida Gwaii	Target Met (Y/N)
		Cedar	Hemlock	Pine	Spruce	Total		
2011	Taan	0	0	0	0	0	n/a	n/a
	BCTS	0	0	0	0	0	n/a	n/a

Taan has not completed any planting activities on the Management Unit since the inception of the company in 2010. Seedlings have been ordered and sown for a spring 2012 planting program. The 2012 program includes the following order: 111,000 western red cedar, 39,000 western hemlock, 12,000 pine, and 56,500 sitka spruce for a total of 218,500 seedlings ordered. All seedlings for 2012 are grown from Haida Gwaii seed. In 2011, approximately 5ha of site preparation was also completed to create plantable area in one cutblock within the Haida Tenure. All of Taan's seedlings are pesticide free.

Taan also hired the Abfam mill to produce cedar stakes needed for the seedling protector installations on the planted cedar.

BCTS undertook no planting in 2011. Seedling stock is typically not pesticide free during the initial growth at the nursery but no pesticides are used to maintain plantations on Haida Gwaii.

Summary of Management Strategies

The Forest Stewardship Plan (FSP) includes the approved stocking standards for regeneration for the Management Unit, based on legal requirements under the Land Use Order (cedar regeneration) and the *Forest and Range Practices Act*. Silviculture Plans/ Regimes are developed for each cutblock as part of the –pre-harvest planning to prescribe the planned regeneration methods and species for the specific ecosystems and site characteristic. A combination of planting and natural regeneration is completed on the Management Unit.

Work is underway in 2012 regarding potential seed collection in Haida Gwaii (in cooperation with other licensees) as well as reviewing potential to re-vive the seed orchard breeding program using Haida Gwaii parent trees/ seed source.

Adaptive Management Strategies

Not applicable at this time.

Database & Reporting Parameters

The total planted trees by species is generated from the Cengea Resources Database for planting completed within the reporting year. The provincial government Seed Planning and Registry System database contains the Seedlot Detail reports on seedlings planted within the Management Unit such as registration, genetic gain (where applicable), and seed source information/ location.

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Indicator: Reforestation Monitoring

Element	Objective	Indicator	Target
FSC 8.2.3: Growth rates, regeneration and condition of the forest	Ensure areas harvested are successfully regenerated and free growing status is achieved	Hectares of interim surveys/ stand monitoring completed by category (e.g., survival, regeneration/ stocking, brushing, etc.); % of area with free growing due that meet free growing	Report on the areas monitored for reforestation to demonstrate it is occurring over time; 100% of areas with free growing due are declared FG

Rationale for Indicator & Target

The indicator and target are based on legal requirements for reforestation (regeneration delay and free growing milestones) and the due diligence monitoring that is required to ensure that legal milestones for reforestation are successfully achieved.

Current Status/ Results

Year	Group Member	Assessment Type/ Area Surveyed (ha)				% of area with FG due that meet FG	Target Met (Y/N)
		Survival	Stocking/ Regen	Brush	Free Growing (FG)		
2011	Taan	0	0	0	195.0	n/a	Y
	BCTS	0	98.9	0	0	n/a	Y

[1] the hectares reported for Taan free growing surveys in 2011 are based on the planned area as report have not yet been compiled. This will be updated during the next reporting period to reflect actual surveyed area (once report information is received from the contractor).

In 2011, Taan did not have any outstanding silviculture liabilities for free growing, as WFP still held the TFL 60 license. Since the Haida Tenure is a new tenure, there are no areas with Free Growing due as of yet. A large survey program is planned for 2012.

BCTS has met all Regen and Free to Grow obligations.

Summary of Management Strategies

Each Group Member maintains internal procedures relating to assessment and confirmation of achievement of the reforestation requirements established under the Land Use Order (cedar regeneration) and the Forest Stewardship Plan (cedar regeneration and stocking standards). The overall objective is to ensure that periodic reforestation monitoring takes place in order to ensure that the legally required free growing objective and results can be achieved within the specified timeframes.

Adaptive Management Strategies

Not applicable at this time.

Database & Reporting Parameters

Cengea Resources Database (cutblock and road tracking software); Records of surveys are maintained by Group Members and summaries are recorded within the database (e.g., stocking, species, height, etc.).

Free Growing obligations and compliance are maintained within the MFLNRO RESULTS database (data is entered and maintained by Industry and MFLNRO).

For any areas not meeting free growing commitments, report on the issues and concerns for each specific area above under current status.

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Indicator: Forest Health

Element	Objective	Indicator	Target
FSC 8.2.3: Growth rates, regeneration and condition of the forest	Monitor forest health	Report on the status of the forest health for Haida Gwaii; (and Management Unit where possible)	Act on trends of importance that can be managed; minimize possibilities of outbreaks; early detection of any new introduced species.

Rationale for Indicator & Target

The indicator is established to monitor and track forest health and utilizes the data collected by the Ministry of Forests, Lands and Natural Resource Operations (MFLNRO). Forest health, primarily insects and disease, can affect expected products from the forest. Although losses to forest health agents are relatively low on Haida Gwaii and on the coast (as compared to other areas of the province), the potential for outbreaks and disease centres exists and should be monitored. Although large areas may be affected, mortality caused by pests on Haida Gwaii is usually low and effects on growth do not usually require a management response. However, Group Members can note and act on trends of importance. It is possible that management can target outbreak areas or act to prevent conditions that enable outbreaks. For example, root rot pockets can be planted with resistant species; if extensive Hemlock looper or western black-headed budworm outbreaks cause mortality, then those can be harvested while the wood is still sound; planting of yellow cedar should focus on areas where the trees are doing relatively well and avoid where they area stressed and in decline. With climate change there is potential for outbreaks to increase, so trends should be tracked. Monitoring can note areas affected and levels of mortality. If mortality due to insects and disease increases that should be reflected in TSR. As well, new species should be reported if noticed. Any outbreaks of new species should be acted on quickly.

Current Status/ Results

Year	Category	Summary of Impacts to Forest Health (ha)[1]						Target Met (Y/N)
		Western Blackheaded Budworm	Green Spruce Aphid	Yellow Cedar Decline	Windthrow	Landslide	Fire	
2011	Light	22,578.24	-		-	-	-	
	Moderate	22,578.24	-		-	-	-	
	Severe	22,578.24	-		1,348.23	84.41	8.95	
2010	Light	43,515.25	-	658.96	-	-	-	
	Moderate	20,303.87	-	-	-	-	-	
	Severe	23,677.62	-	-	215.56	251.39	-	
2009	Light	3,406.72	-	121.16	-	-	-	
	Moderate	5,369.13	-	-	-	-	-	
	Severe	5,161.28	-	-	-	-	-	Y
2008	Light	-	-	3,033.53	-	-	-	
	Moderate	-	-	-	-	-	-	
	Severe	-	-	1,735.34	-	-	-	
2007	Light	-	-	3,033.53	-	-	-	
	Moderate	-	-	-	-	-	-	
	Severe	-	604.11	1,735.34	116.1	-	-	

[1] Information is reported for all of Haida Gwaii, including protected areas and is not limited to the Management Unit.

Recent research completed by the U.S. Forest Service indicates that the yellow cedar decline in Alaska and BC is caused by climate change impacts relating to a decline in snow cover causing the roots to freeze in the cold winter months, particularly in cases where yellow cedar is planted in shallow, wet soils. MFLNRO was working on an Assisted Migration climate change research project that may have assisted with development of mechanisms to adjust management, but this program was recently cancelled (Refer to Indicator: Research & Monitoring Projects for more information on Assisted Migration work in Haida Gwaii).

In 2012, the Group Manager will continue to follow up with this indicator to obtain the GIS files associated with the forest health surveys from MFNRLO so that the information can be reviewed for applicability to the Management Unit.

Summary of Management Strategies

Group Members will work in cooperation with the MFLNRO and the Forest Health Program to report any new sightings/ information of infestations. In addition, forest health concerns that are identified in the Management Unit, either through this process or otherwise (e.g., planning activities, comments received, etc.) will be assessed to determine severity and evaluate appropriate action plans (such as salvage harvesting to capture volume before it is lost, grass seeding and/ or planting of landslides, planting of alternate species, etc.).

If MFLRNO reports high severity outbreaks, Taan will work with the Ministry to ensure that more detailed assessments/ sample areas are completed to assess mortality levels.

Losses to the Timber Harvesting Land-Base (THLB) as a result of both abiotic and biotic factors on Haida Gwaii were considered in the recent Timber Supply Review completed by the Haida Gwaii Management Council, and appropriate deductions from the THLB were factored in.

Adaptive Management Strategies

Not applicable at this time.

Database & Reporting Parameters

Since 1999, the B.C. Ministry of Forests has surveyed the majority of the forested land in the province using an overview survey to record general trends in disturbance patterns across the provincial forested land base (including provincial parks, private land, and Tree Farm Licences but not Federal parks). The Ministry develops an annual summary report (www.for.gov.bc.ca/hfp/health/overview). Copies of the annual report spreadsheet are downloaded from the website and filed in the monitoring records. GIS information is also included in the available information and has been added to the Group Manager's GIS database for future tracking.

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Indicator: Soil Conservation Effectiveness

Element	Objective	Indicator	Target
FSC 6.3.14 & 8.2.3: Growth rates, regeneration and condition of the forest	Maintain ecosystem productivity	Average % permanent access; % of cutblocks where soil conservation objectives are being met	Maintain average of ≤ 7% permanent access; 100% of cutblocks achieve soil conservation objectives

Rationale for Indicator & Target

The indicator is established to track effectiveness of soil conservation practices. The Group's approach is to follow legal guideline to stay below 7% permanent access and follow soil conservation objectives set and monitored by the Forest and Range Evaluation Program (FREP). Considerable thought went into the objectives set by FREP and the monitoring methods they use were designed to be efficient and practical while still providing important information. The permanent access portion of this indicator is derived from actual results from Group Members for the year and the soil conservation data is reported using FREP data.

The FREP objectives for soil conservation are derived from the *Forest and Range Practices Act* (FRPA) and include:

- to limit the extent of soil disturbance caused by harvesting and silviculture activities that negatively affect the physical, chemical, and biological properties of the soil;
- to conduct forest practices in a manner that addresses the inherent sensitivity of a site to soil-degrading processes to minimize detrimental soil disturbance, landslides, soil erosion, and sediment delivery to streams; and
- to limit the area of productive forest land that is occupied by permanent roads, landings, pits, quarries, and trails to the minimum necessary to safely conduct forest practices.

Under FRPA, disturbance is classified into two main types: areas occupied by permanent access structures; and areas occupied by soil disturbance in the net area to be reforested. Soil disturbance in the net area to be reforested is further categorized as the area occupied by corduroyed trails, compacted areas, areas of dispersed disturbance, and un-rehabilitated temporary access structures. The target for Permanent Access remains conservative in relation to past performance as it is anticipated that implementation of the Land Use Order will results in smaller cutblocks, which may lead to increased PAS calculations. This will be somewhat off-set by using the Total Area Under Prescription (TAUP) that includes stand level retention areas to calculate the PAS.

Current Status/ Results

Year	Group Member	Soil Conservation						Target Met (Y/N)
		Average % Permanent Access[1]	% of Cutblocks where Soil Conservation Objectives met (FREP)				# of Cutblocks Sampled (FREP)	
			Objectives Achieved	Moderate Achievement	Not Achieved	No Decision		
2011	Taan	5.0	100	0	0	0	5	Y
	BCTS	5.8						Y

[1] The permanent access calculations were determined for all cutblocks harvested in the year by group members. Soil Conservation Objectives are reported using FREP data for the Management Unit.

Permanent access calculations are based on the Total Area Under Prescription (TAUP) and the area of the cutblock planned / occupied by permanent access structures (roads, pits). The soil conservation data reported above for 2011 reflects results of the Forest and Range Evaluation Program (FREP) from 2006-2010, for all of Haida Gwaii but is based on a small sample size that was limited to five helicopter blocks. The results for the province of BC as a whole indicate that a range of 77-86% of cutblocks achieved the soil conservation objectives.

Further work is being planned under FREP to evaluate the role of large coarse woody debris on effectiveness of soil conservation. CWD is addressed under a separate indicator within this monitoring report.

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Summary of Management Strategies

The Group Member Forest Stewardship Plans contain thresholds for the maximum allowable permanent access (7%) and soil disturbance limits (5% for sensitive soils, 10% for non-sensitive soils, 25% for roadside work areas) that are consistent with legal requirements under the *Forest and Range Practices Act* and FSC. The majority of soils in Haida Gwaii are categorized as sensitive soils under the legal definitions as a result of soil texture, moisture, etc. As such, the soil disturbance limit for sensitive soils is 5%.

In order to ensure that soil conservation thresholds are met, Group Member Management Systems include appropriate field procedures relating to minimizing soil disturbance, use of puncheon and other means to reduce impacts on machine trails, rehabilitation of trails, maintaining natural drainage patterns, following designated trails and/ or stream crossing locations, etc. Soil disturbance and permanent access limits are also addressed within Site Plans (site level planning document).

Internal pre-works, inspections and audits also monitor adherence to the procedures and plans.

Effectiveness monitoring of the management strategies is partially addressed through the internal inspections (i.e., whether procedures are adequate to ensure limits are consistently being met and whether procedures are being implemented/ followed) and is also measured as part of the FREP program.

Efforts will be made in 2012 to work with FREP to increase soil conservation monitoring (increase sample size to include conventional harvesting blocks).

Adaptive Management Strategies

Not applicable at this time.

Database & Reporting Parameters

FREP Soil Conservation Effectiveness Monitoring – Information Management System database Extension Note #23 and Report #31. Specific parameters for data collection and analysis are recorded under the FREP procedures for each indicator. Explanatory notes are also provided within the exported data reports (MS Excel).

Cengea Resources Database (cutblock and road tracking software); Records of internal inspections are maintained by Group Members.

Permanent access is measured for blocks with harvesting completed within the calendar year.

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Indicator: Stand Level Biodiversity Effectiveness

Element	Objective	Indicator	Target
FSC 5.1.4, 8.2.3, 9.4.1 & 9.4.3: Growth rates, regeneration and condition of the forest; HCVF effectiveness	Monitor the condition of the forest and disturbances resulting from forest operations ; maintain stand level biodiversity; contribute to coarse filter maintenance of habitat and HCVF	Stand level biodiversity as evaluated using key indicators	Specific targets are identified below
		Stand level retention includes spatial records of area and attributes of each specific retention area	Develop a complete spatial database of stand level constraints/ retention (area and attributes

Rationale for Indicator & Target

Stand Level Biodiversity is an important component of monitoring overall landscape level biodiversity and is intended to capture some of the values and indicators that may not be fully captured in landscape level analysis. The indicator utilizes the indicators of the Forest and Range Evaluation Program (FREP). The target reflects the anticipation that the benchmarks will improved over time as full implementation of the Land Use Order occurs. It is expected that new benchmarks may be established following a two to three complete years of LUO implementation (i.e., 2013-2014). The benchmark data and future monitoring can provide valuable management direction to ensure that stand level biodiversity attributes are maintained over time. Because the level of stand level retention is such an important part of maintaining biodiversity, Taan (and BCTS) also intend to track all retention in the MU, both numerically and with spatially explicit maps. This provides an indication of the level of retention under the Land Use Order (while current FREP data pre-dates the Land Use Order). The indicator and target are based on initiatives by Group Members to spatially record and monitor stand level implementation of the Land Use Order by recording all LUO no harvest areas within the Total Area Under Prescription as well as record information within the GIS database to ensure that the restrictions to harvesting these areas are recorded and tracked (i.e., what each specific retention area is set aside for). This information may assist with future timber supply analysis/ reviews.

Current Status/ Results

Stand Level Biodiversity

Indicators	Year: 2006-2011	Sample Size	Target	Target Met (Y/N)
Avg. Opening Size	20.6 ha	33 cutblocks (CWH vh, CWH wh)	23 ha (coast wide avg.); use range of opening sizes	N (anticipate improvement under LUO)
Avg. Patch Size (Retention)	2.7 ha (range 2.7-2.9)		3.14 ha (coast wide avg.); For cutblocks ≥10ha, target at least one retention patch within/ internal to the block or connected to edges	N (anticipate improvement under LUO)
Average Internal Patches for blocks ≥10ha	6/25 = 24%		For cutblocks ≥10ha, target at least one retention patch within/ internal to the block or connected to edges	N
Avg. Stand Level Retention	13.2 %(range 12.9-15.3)		23% (coast wide average, but 31% in CWH vh2 and 16% in CHW wh1 and wh2))	N (but met now with LUO implementation)
Avg. Large Snag in Patch	11.9-22.4 (25-50 % of baseline)		Stay above 50% of baseline. Baseline is 44.76 snags >30 cm dbh and 10 m height /ha (coast wide CWH wh1 and wh2)	N (anticipate improvement under LUO)
Avg. Large CWD in Patch	20 piece/ ha (31% of baseline)		Stay above 50% of baseline. Baseline is 64 pieces /ha (coast avg.)	N (anticipate improvement under LUO)
Avg. Large CWD in Harvest Area	61 piece/ha (95% of baseline)		Stay above 50% of baseline; Use above patch CWD as baseline	Y
Avg. Windthrown Trees	8 %		Stay below 8.9 % (coast wide avg.)	Y

Large Snag refers to the stems per hectare of dead trees that are ≥ 30cm dbh and ≥ 10m height; baselines come from cruise data collected coast wide bu FREP for CWH wh1 and wh2)
Large Coarse Woody Debris (CWD) includes species with diameter >= 20cm and length = 10m (no./ha Coast wide average refers to FREP data for CWH vh2, CWHwh1 and CWH wh2.

The data reported above for 2011 reflects results of the Forest and Range Evaluation Program (FREP) from 2006-2010, for the Management Unit. Baselines are generated under the FREP program using natural stands.

Spatial Stand Level Retention Records

Year	Group Member	Total Area Under Prescription (TAUP ha)	Area Harvested (gross ha)	Stand Level Retention[1] (TAUP ha – gross ha)	% Stand Level Retention	Target Met (Y/N)
2011	Taan	441.2	329.0	112.2	25.4	Y
	BCTS	190.2	109.3	74.19	40.4	Y

[1] Area constrained includes any areas excluded from the block at the stand level to address implementation of the Land Use Order such as riparian, cultural features, monumental cedar, bear dens, red and blue listed ecosystems, etc. It does not include the protected reserves such as cedar stewardship areas and forest reserves. Each specific feature is identified in the GIS to allow for future queries and tracking of specific stand level retention areas.

Implementation of the LUO was in progress during 2011, and harvesting during the year included a significant portion of previously developed cutblocks, prior to the LUO. This indicator demonstrates that stand level retention under the LUO is significantly higher than under FRPA, as reported in the previous Stand Level Biodiversity Indicator (FREP data).

In 2012, reporting will also include a summary of the specific values captured in the stand level retention areas (e.g., which LUO objectives). This information is required to be reported to the Haida Nation and MOFR each year as well.

Forecast

Forecasting of the anticipated levels of snags and downed wood in the future in relation to harvesting activities is currently under development. Results will be reported in the next annual report.

Summary of Management Strategies

The management objectives for stand level biodiversity are a combination of the legal requirements under the Land Use Order (and related Forest Stewardship Plan), the *Forest and Range Practices Act* (FRPA), the FSC Management Plan, and Group Member Management Systems (e.g., planning procedures) and relate to Stand Level Retention, windthrow management, and coarse woody debris management.

The most significant area noted in the FREP report for room for improvements were increasing the number and improving the placement of culverts, reducing the placement of roads parallel to streams and ensuring ditch water does not flow directly into streams, completing armouring and grass seeding to minimize erosion and sedimentation, the importance of road maintenance to manage crowns and grader berms.

Where monitoring indicates targets are not being achieved, further investigation will be completed by Group Members in order to evaluate the specific contributing factors and provide direction regarding alterations to management strategies so that targets can be achieved (e.g., increasing stand level retention, retention of large woody debris, increasing wind-firming treatments, minimum patch size parameters and focussing stand level retention placement to meet values such as forest influence, snags, etc.).

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Group Members have also implemented a unique tracking mechanism to permit spatial tracking of stand level implementation of the Land Use Order constraints (using the Total Area Under Prescription). This will allow for future tracking of constrained areas, as well as improved analysis of the full impacts of the LUO over time. There are no quantifiable targets at this time associated with this indicator, as the objective is to establish and implement a recording and tracking system for implementation of the Land Use Order at the stand level, and to provide a live inventory of the stand level impacts to assist in other monitoring related to the FSC Assessments (Environmental Risk, Riparian and HCVF). Moreover, this data will be used to build on the existing constraints that have been spatially identified (e.g., forest reserves, cedar stewardship areas, etc.).

Annual reporting by Haida Gwaii licensees is required under the Land Use Order and Forest Stewardship Plan for a number of items, including but not limited to: information on regionally significant species; cultural features; cedar retention areas; western yew patches & individual yew tree retention; cultural cedar stands; CMTs; Monumental Cedar; Type I & II Fish Habitat; Active Fluvial Units; Forested Swamps; Old Forest Reserves; Red & Blue-listed Plant Communities; Black Bear Dens; Forest Reserves; and any associated Reserves, Reserve Zones, Management Zones and Stand Level Retention. Refer to Indicator LUO Reporting for details.

Forest influence is also a very important consideration in assessing stand level biodiversity. FREP monitoring does a preliminary assessment of forest interior conditions by looking at interior versus external retention patches. Group Members should consider development of cutblock planning procedures to assess forest influence on proposed blocks as well as addition of some minimum thresholds to achieve on a cutblock basis to achieve forest influence and stand level retention objectives. Communications with BCTS indicate that this is already being implemented.

Adaptive Management Strategies

Explore potential for future reporting on large snags /ha for blocks (retention and harvest area) using Site Plan data, aerial photos, etc. A project is being initiated by Taan in August 2012 to assess the efficiencies/ costs of establishing some sample cruise plots within retention areas for the sole purposes of collecting FSC information on snags, merchantable trees and coarse woody debris to contribute to this indicator reporting. Further discussion is also required to determine whether to develop new management strategies that consider assessment of forest influence during cutblock planning, requirements for internal retention or connected to edges component on larger cutblocks and minimum patch size of 2ha for internal retention.

Database & Reporting Parameters

FREP Biodiversity Effectiveness Monitoring – Information Management System database (exported reports received from MFLNRO for the Management Unit) and Report #30. Specific parameters for data collection and analysis are recorded under the FREP procedures for each indicator. Explanatory notes are also provided within the exported data reports (MS Excel).

During development area planning, all areas removed from the development area as a result of the Land Use Order objectives, are mapped and tracked within the GIS database, including descriptions relating to the specific stand level values protected within the constrained areas (e.g., Haida Features, bear dens, red and blue listed ecosystems, riparian reserves and management zones, monumental cedars, yew, pacific crab apple, etc.). A GIS query is completed annually to provide data for this indicator, for all areas with harvest completion in the reporting year. LUO/ FSP reporting requirements are maintained within Group Member GIS Database/ Inventories. LUO Reporting parameters have not yet been established by the Haida Gwaii Management Council (but discussions are underway).

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Indicator: Environmental Incidents

Element	Objective	Indicator	Target
FSC 5.1.4 & 8.2.3: Growth rates, regeneration and condition of the forest	Report on condition of the forest resulting from disturbance related to forest operations or otherwise; mitigate environmental & social cost	Report on the number and size (ha) of environmental incidents related to forest management activities: reportable spills, fires, landslides and avalanches.	Minimize the number and size of environmental incidents; ≤ 5 events per Group Member

Rationale for Indicator & Target

The indicator is based on Group Member corporate commitments under their existing Management Systems to record and monitor environmental incidents. The current target is based on a review of the benchmark status, while considering that operations were not running at full capacity in 2011.

Current Status/ Results

Year	Group Member	Reportable Spills	Fires	Landslides	Avalanche	Target Met (Y/N)
2011	Taan	0	0	1 (0.18 ha)	0	Y
	BCTS	0	0	1 (0.1ha)	0	Y

In 2011, Taan Forest reported two landslides, one related to a plugged culvert on an old road being reactivated (Tow Main, 0.18ha), and one of natural causes initiating in old growth timber (Blackwater, 2.8 ha). Five spill reports were received, none of which were reportable. All five were a result of equipment failure (hydraulics, etc.) on road surfaces, and volumes ranged from 3-40L.

In TSL 79833 (BCTS) there was a slope failure that originated approximately 20m above the road within the cut block. The material travelled through the block across the road and stopped at the base in a gully/creek system. In terms of material it is approximately 0.1ha in size (80m x 10m).

In general terms, incidents will be considered to be related to forest management activities under the following conditions: all reportable spills; fires caused by industrial activities (excluding naturally caused fires); Landslides and avalanches initiating within cutblocks and/ or road prisms or those determined to be caused by forest management activities.

Summary of Management Strategies

Group Members maintain Corporate or Environmental Management Systems that include evaluation of risk to the environment (and to some degree safety) as a result of various forest management activities. The risk assessment drives the development of operational controls or field procedures in order to mitigate the identified risks. In addition, the management systems contain procedures to address emergency preparedness and response and incident reporting/ investigations for all of the above incident types. Incident Report/ Investigation forms include an evaluation of immediate and root cause and require development of action items to address both the immediate and root cause. Action plans are then monitored for follow up and completion in a timely manner. Action plans would include remediation of the site and reforestation where applicable. Part of the evaluation includes determination whether the management system procedures were adequate or not to prevent the occurrence and whether persons involved were following the procedures. This helps to determine the appropriate corrective actions such as changes to existing procedures where determined to be inadequate, or training of personnel to ensure that they know the procedures to be followed.

The proposed target is intended to allow for some variation from year to year among different events and considers that weather conditions impacting fires, landslides and avalanches can vary significantly from year to year based on regular weather cycles. The target was arbitrarily selected and may need to be revised over time as data is obtained to develop a historical benchmark.

Incidents are reviewed periodically by management through Group Member Management Review processes that consider trends and severity and develop further action items to address any deficiencies as required.

Adaptive Management Strategies

Not applicable at this time.

Database & Reporting Parameters

Taan environmental (& safety) incident reporting is required under the Corporate Management System (C-04-Incident Reports). Reports are reviewed and summarized above.

BCTS compiles the reported environmental incidents as part of their Environmental Management System and annual reporting for certification purposes. Incidents are also tracked in the Cengea Incident Tracking System (ITS) database.

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Composition & Observed Changes to Flora & Fauna

Indicator: Species at Risk

Element	Objective	Indicator	Target
FSC 8.2.4 & 9.4: Composition and observed changes in the flora and fauna	Monitor status of species at risk or species of high conservation concern known to occur in the Management Unit	Species at risk identified within Haida Gwaii; and those identified as dependent on old forests	Species status is tracked and appropriate management responses are undertaken

Rationale for Indicator & Target

The indicator is derived from recommendations of the High Conservation Value Forest Assessment peer review. The High Value Conservation Framework describes high priority species (including species at risk) for Haida Gwaii. We considered high priority species to include species of global concern (G1 or G2), BC's red or blue listed species, COSEWIC's endangered, threatened or special concern; and/or species ranking priority 1 for any of the 3 goals of BC's Conservation Framework. Those categories yielded 128 high priority species on Haida Gwaii. Taan/we assigned those species to six 'species groups' to enable efficient monitoring and help direct management. Detailed discussion of the species groups and tables of high priority species are in the HCVF report, only a very brief summary is presented here.

Current Status/ Results

Species Group	Number of high priority species2012	Types of management	Target Met (Y/N)
Non-forested (group 6)	60	n/a	Y
Generalists (group 1)	15	None needed	Y
Seral Distribution (group 2)	15	Mostly provision of adequate old forest	Y
Habitat Structures and Riparian (group 3)	32	Protection of riparian habitats; supply of snags and down wood	Y
Localized habitats (group 4)	4	Protect when sites are known	Y
Forest Distribution (group 5)	2	Provision of habitat and monitoring of Mamu and Nogo	Y
Total high priority species	128		

The complete species lists along with their specific habitat needs and management and monitoring actions are available through Taan Forest (data reports are quite large and were not included within this report). These lists will be updated annually as part of the monitoring report and updated lists will be retained on file to support this report.

Summary of Management Strategies

Very little information is available related to most species at risk habitat requirements and population dynamics. The majority of species at risk are managed through coarse filter habitat and biodiversity conservation measures, and the species accounting groups help focus management and monitoring. For example, monitoring and management are not needed for the species that do not usually use forests or are habitat generalists (75 of the 128 species). In contrast, it is necessary to know the seral stages and broad habitat types available across the Management Unit to be able to assess if any group 2 species (those associated with broad seral stages and forest habitat types) are likely at risk. Several species associated with broad forest seral stages use the older ones and maintaining old forest with both conifer and deciduous components is important. If old forest levels drop below 30% in an LU then some of the group 2 species will be chosen to monitor. Above 30% old forest we will assume those species have adequate habitat to persist. This indicator will therefore be directly linked to the Landscape Level Biodiversity Indicator performance reporting as dropping below these thresholds would trigger additional monitoring under this indicator.

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Two species are quite sensitive to the distribution of their old forest habitat (group 5 species) and merit monitoring even when levels of old forest are above 50% – northern goshawk and marbled murrelet. Taan will track trends in habitat, maintain levels as required by LUO (refer to Sensitive Species Indicator for further details) and support/assist efforts of MoE and Recovery Teams for any direct species monitoring on the MU.

Twenty seven of the 32 species associated with particular stand structure (group 3 species) are associated with riparian zones. Careful attention to riparian zones is required by the LUO and Forest Stewardship Plan and adequate habitat is likely provided. Any monitoring of riparian zones will also track presence of some of those species to ensure current riparian practices are providing habitat. If species using localized habitats (group 4 species) are found (falcon nest sites, ancient murrelet nest sites; and *Sphagnum wilfi* habitat) then their habitats will be protected using appropriate methods. At present all group 4 species are found either offshore or in protected areas.

Coarse filter measures support the group 2, 3 and 5 species; these coarse filter measures are established by the Land Use Order's landscape and stand level retention requirements and implemented through the Forest Stewardship Plan. The LUO specifies reserves that increase for retention of old growth forests (e.g., forest reserves, cedar stewardship areas, ecosystem representation, wildlife habitat, etc.) -- all these measures contribute to the coarse filter provisions of habitat. In addition to general habitat management strategies, the Land Use Order places special emphasis on the key species that have been identified to be of particular importance to Haida Gwaii and the Haida Nation: marbled murrelet, northern goshawk, northern saw-whet owl, great blue heron and black bear. All those species have been included in the species accounting groups noted above and approaches for their management and monitoring are noted in data reports maintained on file (contact Taan Forest for more information).

Adaptive Management Strategies

Review results of Landscape Level Biodiversity indicators in relation to the species specific monitoring thresholds identified within this indicator.

Database & Reporting Parameters

The BC Government (Ministry of Environment), Conservation Data Center (CDC) maintains a central database on plants, animals and ecosystems at risk in the province. The database includes information on status, locations and level of protection for key species.

The FSC High Conservation Value Forest Assessment contains a full list of the species identified within the Management Unit as of March 2011. These lists were updated though this Monitoring Report in summer of 2012.

This indicator is intended to monitor status of species at risk. In the event that changes are made within the interim period between updates to the HCVF Assessment, a report will be generated from the database on an annual basis and the full list of species will be evaluated against the list from the previous year, and any changes to the species listed will be reported. Changes will be evaluated as they occur to attempt to determine whether forest management activities in the MU may have impacted the changes to the species status and adjust management strategies where appropriate.

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Indicator: Sensitive Species Habitat

Element	Objective	Indicator	Target
FSC 8.2.4 & 8.2.5: Composition and observed changes to the flora and fauna	Monitor the habitat for sensitive species and observed changes over time	MAMU Class 1 and 2 habitat area Northern Goshawk reserve area Northern Saw-whet Owl reserve area Great Blue Heron reserve area Black Bear den area	Maintain reserves; protect Mamu habitat as guided by LUO; maintain Nogo foraging habitat near known nest sites.

Rationale for Indicator & Target

The indicator is based on available known information for the key sensitive species identified through the Land Use Order to be of special significance to Haida Gwaii and the Haida Nation. For some of the sensitive species (see current status table below), targets can be met by respecting reserve boundaries; for others, information on availability and location of habitat is required to enable its protection.

Current Status/ Results

Sensitive Species Habitat	Total Habitat in MU	Habitat in Reserve + LUO Constrained[2]	Habitat in NCLB	Total Habitat outside of THLB	Target	Target Met (Y/N)
MAMU Class 1 & 2 habitat (ha)	1,158.2	90,382.3	-	-	Targets by LU set in the LUO	N (deficits have been identified as part of the FSP Analysis that need to be addressed)
Northern Goshawk high forage habitat (ha)	To be determined – review and report when updated models are available (expected September 2012)				Under Development	N/A; will wait to complete until models updated (September 2012)
Northern Goshawk high nesting habitat (ha)	To be determined – review and report when updated models are available (expected September 2012)				Add potential nest sites if current distribution has gaps where there is suitable habitat; check when updated models available	N/A; will wait to complete until models updated (September 2012)
Northern Goshawk Reserve (ha)	1,981 ha in reserve	N/A	N/A	N/A	Respect reserve boundaries	Y
Northern Saw-whet Owl Reserve (ha)	362 ha in reserve	N/A	N/A	N/A	Respect reserve boundaries	Y
Great Blue Heron Reserve (ha)	? ha in reserve (in progress)	N/A	N/A	N/A	Respect reserve boundaries	Y
Black Bear Den Reserve (ha)	? dens found (in progress)	N/A	N/A	N/A	Diligent searches for bear dens; Respect reserve boundaries;	Y; dens and monumental cedar have appropriate reserves
Monumental Cedars #	? cedars; ? clumps found (in progress)	N/A	N/A	N/A	Locate and reserve monumental cedars, buffer as per LUO	Yes; All monumental cedars have appropriate reserves.

[1] Potential habitat for Northern Goshawk currently available from the analysis report by Cortex Consulting for Coastal BC in 2008 and represents all of Haida Gwaii. That work is being updated for new habitat parameters and revised outputs will be available during September 2012.

[2] LUO Constrained refers to parks, conservancies, cedar stewardship areas, forest reserves, goshawk reserves, saw-whet owl reserves and Type I and II fish habitat not already accounted for within reserve areas noted. Overlap of reserve areas has all been netted out.

[3] Mamu Data sourced from FSP Analysis June 2012.

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Summary of Management Strategies

The Land Use Objectives Order provides objectives related to the management of the key indicator species of importance to the people of Haida Gwaii, including the Haida Nation. In addition to the landscape level protection of old forests through the established protected areas, cedar stewardship areas, forest reserves, and ecosystem representation, the LUO also directly provides objectives for high value habitat and reproduction sites for Marbled Murrelet, Northern Goshawk, Northern Saw-whet Owl, Great Blue Heron and the Black Bear such as reporting identified reproduction areas and implementing required no harvest zones (these are captured and reported annually under the LUO).

Several Recovery Teams have also been jointly established through cooperation with government, industry and environmental groups, including the Marbled Murrelet Recovery Team, the Northern Goshawk Recovery Team, and the Northern Saw-Whet Owl Recovery Team. Background work related to key wildlife and their recovery recommendations was considered during the development of the Land Use Order.

Reserve boundaries will be carefully respected. All known goshawk nests on Haida Gwaii are in reserves and the area has been carefully surveyed. Nonetheless Taan/ Group Member forests will be aware of goshawks and look for nests during timber cruises and other field work. Any new nests will be protected by reserves (as required under the LUO) which includes provisions for retaining target levels for forage habitat. Once the new Nogo model is available, planning will include provision of foraging habitat near known nests. Efforts are being undertaken to address deficits in Mamu habitat in protected status. Bear dens are protected both by reserves around den trees, and also by reserves around monumental cedars. That essentially protects all cedars over 100 cm dbh and provides a good distribution of potential den sites. Recruitment of 100 cm trees is planned. Habitat for Saw Whet owl is provided both by reserves and by coarse filter habitat provisions (older forest near mix of seral stages). As well as monitoring habitat and maintaining habitat, Taan will also assist in any direct species monitoring by MoE or Recovery Teams.

Adaptive Management Strategies

Review updated Nogo nesting and forage habitat modelling data when available in September 2012. Assess for planning considerations of ensuring proportion of forage habitat is conserved in the vicinity of known nest sites and potential areas for new nest sites based on nesting potential. Review the LUO reserve zones and forage habitat, as the reserve zones have been established to consider inclusion of forage areas. Request or develop maps to demonstrate the projected changes over time to the nest and forage habitat from the model and review in comparison to management strategies. Discussions with a local Biologist indicate that the following may be a suitable target for Nogo foraging habitat: “Maintain 30 to 40% of area within 3.5 km radius of nest in suitable foraging habitat; check when updated models available”. Once the new models are reviewed, a suitable target will be developed that considers the recommendations and influences on the land-base.

Forecast

Forecasting of this indicator is currently under development and will be reviewed and reported in the next annual report.

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Database & Reporting Parameters

The LUO incorporated MAMU habitat suitability mapping and reserve areas for Northern Goshawk and Northern Saw-whet Owl (and established related objectives). Recording and tracking is also required for several objectives such as newly identified nest locations and bear dens. This information is included within the Group Members GIS layers and reported annually to the Province of BC and the Council of the Haida Nation (refer to the LUO Reporting indicator for details).

Cortex Consultants produced a NOGO habitat modelling report for Coastal BC in 2008. The report includes modelling habitat under past, present and future conditions and different forest management scenarios. A separate model was developed for Haida Gwaii. The results show that for both nesting and foraging habitat under Current management (Base Case 2), across a time series from 200 years in the past to 250 years into the future, the greatest changes in habitat occurs in the period leading up to the present (25 and 26). The amount of foraging habitat in the landscape reaches equilibrium about 20 years into the future, and nesting habitat reaches equilibrium in about 50 years. That model is being updated and new information will be available during September 2012. Further development of actions for goshawk will await results of those models to help assess and locate foraging habitat and, perhaps, locate additional potential nest sites.

Environmental & Social Impacts

Indicator: Watershed Disturbance

Element	Objective	Indicator	Target
FSC 5.1.4, 8.2.6 & 9.4: Environmental and social impacts of harvesting and other operations	Provide multiple benefits/ mitigate environmental & social cost; maintain landscape level biodiversity	# of watersheds with ECA >25%; # of sensitive watersheds with ECA >20%	# of watersheds exceeding the established thresholds improves over time until all watersheds are within the allowable thresholds

Rationale for Indicator & Target

The indicator is based on FSC requirements for all watersheds and legal requirements under the Land Use Order for Sensitive Watersheds. The target is based on expected outcome of implementation of the Land Use Order over time as harvesting within watersheds in excess of the allowable thresholds is curtailed until such time that the thresholds allow harvesting to occur (as recruitment and growth of previously harvested areas occur).

Current Status/ Results

Watershed Results are reported for all of Haida Gwaii and are not split by tenure as watershed boundaries and Landscape Units cross tenure boundaries in many cases. A detailed analysis is available that demonstrates the watershed distributions based on representation within each tenure.

The LUO process (by definition of terms in the LUO) did not include consideration of LUO reserves and riparian reserves for Type I and Type II streams. Group Members feel that this skewed the results of Equivalent Clearcut Area (ECA) calculations, as there is potential for a lot of hydrologically recovered area in a watershed unit to be tied up in reserves that was not permitted to count towards the recovery calculations/ recovered area.

Year	Group Member	FSC Requirement		Legal Requirement		Target Met (Y/N)
		# of Watersheds ECA >25%	ECA Area for Watersheds >25% (ha)	# of Sensitive Watersheds ECA >20%	Area of Sensitive Watersheds ECA >20%	
2011	Haida Gwaii	32	13,243.31	19	10,876.64	Y

Breakdown by ECA categories:

Year	Watershed ECA Category	# of Watersheds	ECA Area (ha)	Sensitive Watershed Category	# of Watersheds	ECA Area (ha)
2011	0	37	4.95	0.1-5.0	14	503.15
	0.1-10	163	9,488.07	5.1-10.0	12	1,537.18
	10.1-20	95	24,604.5	10.1-15.0	15	3,738.13
	20.1-25	33	13,302.03	15.1-20.0	16	6,700.24
	25.1-30	18	6,236.64	20.1-25.0	11	6,404.39
	30.1-40	6	2,861.29	25.1-30.0	6	2,667.19
	40.1-60	7	4,134.84	30.1-40.0	1	1,106.7
	100	1	10.53	50.1-60.0	1	698.35
	Total	360	60,642.85	Total	76	23,355.33

Buckley Bay Residual3 Watershed has a current ECA of 100% (the 'watershed' residual is a total of 10.5ha). Seven Watersheds have a current ECA of 40.1-60% and these are: Deena Creek Residual 1, Gray Bay Cumshewa, Haans Creek Residual2, Haans Creek Residual3, Heather Lake, Macintyre Creek and Newcombe Inlet Residual6. Three of these are located in the Management Unit: Haans Creek Residual3, Heather Lake and Newcombe Inlet Residual6.

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Two Sensitive Watersheds have a current ECA that is significantly higher than the allowable 20%, they are Deena Creek 2 and Macintyre Creek. A very small portion of the Deena Creek 2 watershed is located in the Taan Haida Tenure and Macintyre Creek is not located in the Management Unit (both are largely within Teal Jones tenure areas).

Summary of Management Strategies

Sensitive watersheds are managed through the legal requirements under the Land Use Order and the Forest Stewardship Plan, which establishes a maximum disturbance level of 20% for each designated watershed. Analysis and tracking of watershed condition in relation to harvest planning is a requirement of the FSP.

In addition, under the FSC certification, every watershed must be managed to maintain the ECA or disturbance level at less than or equal to 25%. I.e., up to one quarter of the watershed area may be harvested at any given time. This is implemented through the FSC Management Plan and site level planning (including Site Plans).

In the event that watersheds exceed allowable ECA thresholds, no harvesting is permitted until the targets are achieved. In addition, the allowable thresholds can also limit harvesting levels to ensure that proposed harvesting continues to maintain the watershed at the allowable ECA thresholds.

Group Members could also consider conducting fertilization projects in the three 'watersheds' within the Management Unit that currently have an ECA much higher than the allowable thresholds: Haans Creek Residual3 (TFL 60); Heather Lake (Haida Tenure); and Newcombe Inlet Residual6 watersheds (BCTS).

Adaptive Management Strategies

Not applicable at this time.

Database & Reporting Parameters

Watershed status is maintained within Group Member GIS. Under the Haida Gwaii FSP, analysis is required to confirm current status of each watershed unit in relation to the allowable thresholds to harvest planning. As a result of the analysis, a Ledger will be developed to ensure periodic maintenance of the current status in relation to harvested and planned areas as part of the FSP maintenance and agreements.

Copies of the FSP Analysis results were utilized to generate the watershed disturbance categories to generate meaningful reporting information for this report.

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Indicator: Riparian Management Effectiveness

Element	Objective	Indicator	Target
FSC 5.1.4 & 8.2.6: Environmental and social impacts of harvesting and other operations	Maintain riparian function/ values	Stream conditions by stream class	Continually improve the percentage of properly functioning, streams.

Rationale for Indicator & Target

The indicator is developed to evaluate the effectiveness of both implementation of the Land Use Order and site specific management strategies and selection of location for site level riparian buffers (where flexibility is permitted in legislation) and utilizes the indicators and data from the Forest and Range Evaluation Program (FREP). The FREP riparian indicators are intended to assess:

- Are riparian forestry and range practices effective in maintaining the structural integrity and functions of stream ecosystems and other aquatic resource features over both short and long terms?
- Are forest road stream crossings or other forestry practices maintaining connectivity of fish habitats?
- Are forestry practices, including those for road systems, preserving aquatic habitats by maintaining hill-slope sediment supply and the sediment regimes of streams and other aquatic ecosystems?

The target is focussed on improved management of the smaller stream classes (S4-S6) and reflects the anticipation that the benchmarks will improved over time as full implementation of the Land Use Order and the FSC Management Plan Riparian Budgets occurs. It is expected that new benchmarks may be established following a two to three complete years of LUO and FSC implementation (i.e., 2013-2014).

Current Status/ Results

Year	Class		FREP Riparian Indicators								# of streams sampled	Target Met (Y/N)
			Properly Functioning		Properly Functioning but at Risk (limited impacts)		Properly Functioning but at High Risk (impacts)		Not Properly Functioning			
			Adj.	In block	Adj.	In block	Adj.	In block	Adj.	In block		
2011	LUO Type I	S1	-	-	-	-	-	-	-	-	0	N
		S2	100%	-	-	-	-	-	-	-	3	
		S3	75%	-	25%	-	-	-	-	-	4	
	LUO Type II	S4	33%	-	-	33%	-	33%	-	-	3	
	LUO Upland Stream	S5	50%	-	-	25%	25%	-	-	-	4	
		S6	7%	7%	-	29%	-	50%	-	7%	14	
	Total MU		10	1	1	6	1	8	0	1	28	
			39%		25%		32%		4%			
2011	S1		75%		25%		-		-		4	N/A
	S2		56%		24%		21%		-		34	
	S3		51%		32%		8%		9%		53	
	S4		40%		32%		12%		16%		25	
	S5		58%		16%		15%		11%		73	
	S6		20%		28%		30%		23%		266	
	Total Coast		34%		26%		23%		17%		455	

Streams were assessed by FREP for indicators of intactness, % disturbance, maintenance of morphology, sufficient windthrow protection, connectivity unimpeded and sediment minimized. Most questions are evaluated using a yes (pass) or no (fail) answer/ response. A portion of negative results are related to natural events such as windthrow.

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The data reported above for 2011 reflects results of the Forest and Range Evaluation Program (FREP) from 2006-2010, for the Management Unit. 22 cutblocks were sampled.

Specific procedures for FREP data collection, including descriptions of the indicators (e.g., 'intact', 'undisturbed', etc.) are described within the FREP Riparian Management Effectiveness indicator protocols and can be accessed on the FREP website.

In comparison of the results for the Management Unit in relation to the rest of the coast (34 % properly functioning, 26% properly functioning but with limited impacts, 23% properly functioning but with impacts and 17% not properly functioning), the Management Unit is demonstrating better performance.

The primary forestry-related causes were: road-associated generation and transport of fine sediments, low levels of Riparian Management Area (RMA) tree retention, windthrow, falling and yarding trees across streams, and harvest-related machine disturbance in the RMA (FREP Report #27).

Low tree retention was cited most often for S6 headwater stream reaches (65% of affected sites), followed by S4 fish-bearing streams (40%) and non-fish-bearing S5 streams (36%). Low tree retention was also identified as a cause of impacts for several S2 and S3 stream reaches where mandatory reserves were left in place. For these sites, low tree retention in the outer management zone of the RMAs was a main factor contributing to excessive windthrow in the streamside reserve zone. On streams without reserves, impacts associated with low retention were primarily attributed to reduced LWD supply to streams and (or) significant changes to the composition of the riparian vegetation and its form, vigour, or recruitment and the consequences for the aquatic environment (FREP Report #27).

Indicators of maintenance of morphology and large woody debris show very positive results (100%).

Summary of Management Strategies

Riparian management is legislated under the Land Use Order and through the overlap requirements under the *Forest and Range Practices Act* which are implemented through the Forest Stewardship Plan and site level planning. In addition, Group Members maintain standard operating procedures/ field procedures to guide operations in harvesting and road building related to sediment management, streamside protection, required machine free zones, etc.

In addition to the legal requirements, there are specific riparian retention requirements under the FSC Certification. The certification Group Members have completed a Riparian Assessment according to the FSC requirements and have assessed the overlap and gaps between the legal requirements and those under FSC. Specific management strategies to address the identified gaps for Upland Streams (S5/S6) and ocean edges have been included in the FSC Management Plan. This is implemented through site level planning.

FREP recommends the following best management practices to improve the monitoring results for streams and fish management (FREP Report #27):

- Limiting the introduction of logging-related woody debris in channels (leave natural debris in place);
- Avoiding physical contact with the streambed and stream banks (e.g., through falling and yarding away from channels whenever feasible);
- Retaining riparian vegetation, at minimum, non-merchantable trees, understory, and smaller vegetation within 10 m of the channel;
- Minimizing fine sediment delivery to channels from roads and stream crossings throughout the entire road life cycle; and
- focussing best practices on those S6 streams connected to downstream fish habitat and (or) downstream water quality concerns will likely result in the most improved outcomes for the least cost

Within the Management Unit, FREP data indicates that the following areas are of concern to riparian management effectiveness:

- S4, S5 and S6 streams – low retention, machine disturbance, falling and yarding across streams and stream crossings demonstrated erosion and sedimentation into the streams (road surface and cut/ fill slope).

Implementation of Group Management system procedures and FSC requirements in the FSC Management Plan address several of the recommended best practices above and should contribute to reducing the impacts: SOPs require crews to leave natural LWD in place in the streams (e.g., do not disturb embedded large woody debris), falling and yarding away prescriptions (where possible to implement), FSC machine free zones and understory vegetation retention of 7m (except for crossings) and FSC requirements for riparian buffers on the portions of S5 and S6 streams that are located directly upstream of fish habitat (250m).

Road and Bridge inspection and maintenance schedules should also contribute to minimizing fine sediment delivery to channels from road and stream crossings throughout the entire road life cycle.

Further monitoring will demonstrate whether current procedures under Group Member Management Systems and under the Land Use Order are effective in improving the results of the riparian management (particularly sedimentation and cross stream falling/ yarding).

Adaptive Management Strategies

Consideration of adaptation of falling and yarding prescriptions on S4-S6 streams to be less generalized by using the 'Fall and yard away where possible". Examples include for specific streams and situations where it is feasible to be more specific and utilize "fall and yard away" or "fall to span and lift away, yard across only where deflection is adequate to ensure the stream bank is not impacted".

Database & Reporting Parameters

FREP Riparian Effectiveness Monitoring – Information Management System database (exported reports received from MFLNRO for the Management Unit) and Report #27. Specific parameters for data collection and analysis are recorded under the FREP procedures for each indicator. Explanatory notes are also provided within the exported data reports (MS Excel).

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Indicator: FSC Riparian Budgets – Watershed Level

Element	Objective	Indicator	Target
FSC 5.1.4 & 8.2.6: Environmental and social impacts of harvesting and other operations	Maintain riparian function/ value	% of FSC riparian budgets maintained at the watershed level	100% (for both fish and non-fish streams)

Rationale for Indicator & Target

The indicator and the target is based on FSC Requirements for riparian budgets. Operational implementation of the new management strategies for stand level riparian budgets (and incorporation of the indicator monitoring for operational implementation below) and improvements in data/ mapping information should facilitate improvements over time and achievement of the target.

Current Status/ Results

Year	Total # of Watersheds	# of Watersheds) that meet FSC Budgets for fish streams	# of Watersheds that meet FSC Budgets for non-fish streams	% of Watersheds meeting FSC Budgets for fish streams	% of Watersheds Meeting FSC Budgets for non-fish streams	Target Met (Y/N)
2011	282	258	224	91.5	79.4	N

A detailed summary table is available by request to Taan Forest (data files are quite large and were not included within this report).

It is anticipated that errors in site series information in the forest inventory data resulted in underestimates of the contributions of the riparian buffers under the Land Use Order for Type I and Type II streams (fish streams). Recommendations for future analysis include correcting or using alternate methods that may be more accurate. The analysis will be updated and corrected during 2012 and the updated results will be incorporated into the FSC Management Plan, operational implementation and this monitoring report.

Summary of Management Strategies

The overall objective is to ensure that FSC Riparian Budgets are met at the watershed level, providing for flexibility to vary riparian retention by stream class within each watershed (i.e., focussing retention on key areas/ streams within the watershed).

FSC Riparian Budget requirements are implemented and maintained at two levels: watershed level and stand level. In general, the riparian requirements for FSC are largely met through the Land Use Order requirements for Type I and II streams. The FSC Riparian Assessment identified some gaps between the LUO and FSC requirements for upland streams/ lakes and ocean edges.

Specific stand level requirements have been implemented through the FSC Management Plan to address the gaps and implement stand level retention requirements for these areas and ensure that at the stand level, 100% of the FSC Riparian Buffer requirements are met. A cutblock Riparian Budget Tracker has been developed to ensure that FSC requirements are maintained at the cutblock level.

Further work will be done in 2012 or 2013 to evaluate the updated mapping information and analysis criteria and determine if further analysis work can fill the gaps to demonstrate FSC requirements can be met at the watershed levels using the analysis. In the interim, stand level riparian management strategies have been developed to ensure FSC riparian budgets can be met at the stand level.

As we gain more information, correct data errors, fine tune analysis methods and monitor the implementation and effectiveness, that management strategies will likely evolve over the next few years.

Adaptive Management Strategies

The next update to the Riparian Assessment will also include a review of the parameters used and the potential to refine criteria to allow for improved watershed level analysis that may negate the need for a cutblock level assessment.

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Database & Reporting Parameters

Analysis and data for 2011 was generated through the FSC Riparian Assessment report, and is recorded within the report tables 16 and 17. In addition, Group Members have developed and are implementing a cutblock level Riparian Budget Tracker in order to assist in recording/ tracking of information at the cutblock level to fill the 'gaps' in the watershed level data (refer to the report for details).

Specific parameters for conducting the analysis, as well as recommendations for improvements for the next analysis are recorded within the Riparian Assessment report.

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Indicator: FSC Riparian Budgets – Stand Level

Element	Objective	Indicator	Target
FSC 5.1.4 & 8.2.6: Environmental and social impacts of harvesting and other operations	Maintain riparian function/ value	% of Riparian budgets maintained at the stand level	100%

Rationale for Indicator & Target

The indicator is based on FSC Requirements for riparian budgets, that have been applied at the stand level to assist implementation of management strategies (i.e., FSC requires maintenance of riparian budgets at the watershed level). The target is based on demonstrating that stand level riparian retention fills the gaps in the results for demonstrating that Group Members are achieving the FSC requirements at the watershed level.

Current Status/ Results

Year	Group Member	# of Cutblocks Harvested	# of Site Plans Reviewed	% Conformance with Stand Level Riparian Budgets	Target Met (Y/N)
2011	Taan	N/A	N/A	N/A	N/A
	BCTS	N/A	N/A	N/A	

The cutblock Riparian Budget management strategies and Tracker were not finalised and implemented until March 2012. Reporting on this indicator is therefore not available for 2011.

Summary of Management Strategies

The overall objective is to ensure that FSC Riparian Budgets are met at the watershed level, providing for flexibility to vary riparian retention by stream class within each watershed (i.e., focus retention on key areas/ streams within the watershed).

FSC Riparian Budget requirements are implemented and maintained at two levels: watershed level and stand level. In general, the riparian requirements for FSC are largely met through the Land Use Order requirements for Type I and II streams. The FSC Riparian Assessment identified some gaps between the LUO and FSC requirements for upland streams (S5, S6, lakes) and ocean edges. Specific stand level requirements have been implemented through the FSC Management Plan to address the gaps and implement stand level retention requirements for these areas.

As part of the Adaptive Management plan and per the Riparian Assessment recommendations, an investigation is to be completed in 2012 on a sample (10-20%) of development areas to assess implementation of the Riparian Budget requirements at the stand level. The review will include the Site Plan and related assessment reports, Harvest Plan and the Riparian Budget Tracker and evaluate how the flexibility of implementing the riparian buffers is applied (i.e., effectiveness of choices made by planners) and whether calculations are being completed correctly. The results of the investigation will determine and assign action plans if further work is needed and if additional investigations are required to assess effectiveness of implementation. Additional field work follow up may also be considered to help evaluate effectiveness of planning decisions in placement of riparian reserve and management zones. Use of the FREP process/ indicators should be considered.

Adaptive Management Strategies

Taan is exploring the potential to generate the cutblock level riparian budget assessment through the use of GIS rather than the manually completed Excel Worksheet. The next update to the Riparian Assessment will also include a review of the parameters used and the potential to refine criteria to allow for improved watershed level analysis that may negate the need for a cutblock level assessment.

Database & Reporting Parameters

Data will be maintained within completed cutblock Riparian Budget Trackers and maintained in Group Member files. The Site Plan also contains a section related to documentation of due diligence for meeting FSC requirements, including the FSC Riparian Budgets. Group Members will also explore data management/ database options for tracking the information collected at a larger scale (an action item has been added to the Taan Corporate Tracker and BCTS has begun preliminary work on exploring database development to track FSC specific requirements from the Site Plan).

These results will be compared with the overall change to the status of the watershed level benchmarks over time to assess effectiveness of the riparian budget management strategies.

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Indicator: Water Quality Effectiveness

Element	Objective	Indicator	Target
FSC 5.1.4 & 8.2.6: Environmental and social impacts of harvesting and other operations	Provide multiple benefits/ mitigate environmental & social cost; maintain water quality	Level of fine sediment generated from forest harvesting, road construction/ maintenance/ deactivation and landslides within cutblocks and road prisms	≥90% of areas measured have very low-low potential for amount of fine sediment entering a stream

Rationale for Indicator & Target

The indicator is developed to assess water quality effectiveness in relation to impacts from harvesting and road activities on the Management Unit and is based on the indicator and data reported by the Forest and Range Evaluation Program (FREP) from their water quality effectiveness monitoring. The target is based on current benchmarks for Haida Gwaii, considering current management practices under the *Forest and Range Practices Act* and Group Member Management Systems (it is anticipated that under the new Riparian Budget management strategies under the FSC Management Plan, that improvements may occur over the next few years, particularly on the non-fish stream class).

The FREP program uses the following criteria to assess water quality effectiveness:

- the connectivity, or ability to transport generated fine sediments, from the identified surface to a natural drainage, whether a stream, river, or lake;
- the area of exposed soil and active road (or other disturbed) surface drained by overland flow towards a water body. This included road surfaces, ditches, cut banks, slope failures, and any other forestry-related disturbance features; and
- the relative degree to which the identified surfaces may erode and generate sediment.

Current Status/ Results

Year	Group Member	Potential for the Amount of Fine Sediment Entering a Stream (%)					# of Sites Assessed	Target Met (Y/N)
		Very Low	Low	Moderate	High	Very High		
2011	Management Unit	58%	34%	8%	0%	0%	62	Y
	Coast	38%	37%	22%	2%	1%	1,282	N/A
	BC	34%	36%	25%	4%	1%	-	N/A

The data reported above for 2011 reflects results of the Forest and Range Evaluation Program (FREP) from 2006-2010, for the Management Unit. 62 sites/ locations were assessed for sediment levels (in some cases several sites were assessed in one cutblock).

Ratings of very low to low represent effective management strategies ranging down to high-very high potential reflecting management strategies that are not effective at minimizing sediment inputs to streams. In comparison with the water quality results from the coast region and for the province, the Management Unit is demonstrating better results in effectiveness of water quality management.

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The thresholds used by FREP to assign water quality impact ratings were as follows (copied from FREP Extension Note #22):

VOLUME OF FINES* GENERATED (M3)	SITE CLASS	SITE DESCRIPTION	TYPICAL SITE	EFFECTIVENESS OF MANAGEMENT
< 0.2	Very Low	Site does not generate significant amounts of sediment. Reflects best management practices.	Most deactivated roads; recent, well-engineered crossings	Very High ↕ Very Low
0.2–0.99	Low	Site generating some sediment but would still be within the range considered normal for background levels.	Light to moderate used, well-managed, industrial roads	
1–4.99	Moderate	Site generating measureable levels of fine sedimentation and, under special situations, of interest to watershed managers.	Moderate to heavy used industrial roads under a range of conditions	
5–19.99	High	Site generating unacceptable levels of fine sediment having a significant impact on water quality in a watershed. Remedial action required to reduce water quality impacts.	Heavily used main lines built more than 20 years ago in sensitive location	
> 20	Very High	Site generating very high levels of fine sediment with major consequences for water quality within a watershed. Remedial action critical for protection of water resources.	Slope failure caused by road or harvesting. Poor location and (or) water management	

* ≤ 1 mm in diameter.

Summary of Management Strategies

FREP concluded that the conditions most associated with water impacts at sites repeatedly emphasized the importance of artificial drainage management and ensuring that disturbed sites are either quickly re-vegetated or armoured.

Group Member Management Systems include appropriate planning and field procedures relating to minimizing sedimentation and maintaining water quality (e.g., road locations, stream crossing design and construction, culvert placement, erosion and sediment control through grass seeding and armouring, road maintenance/ deactivation etc.). Availability of rock material for armouring can be a challenge in some areas Haida Gwaii.

Internal pre-works, inspections and audits also monitor adherence to the procedures. Effectiveness monitoring is completed through the Forest and Range Evaluation Program (FREP).

Adaptive Management Strategies

Consider conducting an on-site review of the specific cublocks and stream locations identified within the Management Unit as moderate sedimentation potential to assess potential for rehabilitation as well as whether changes to management strategies could have improved the results.

Database & Reporting Parameters

FREP Water Quality Effectiveness Monitoring – Information Management System database (exported reports received from MFLNRO for the Management Unit) and Extension Note #22.

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Indicator: Research & Monitoring Projects

Element	Objective	Indicator	Target
FSC 5.1.4 & 8.2.7: Environmental and social impacts of harvesting and other operations	Provide multiple benefits/ mitigate environmental & social cost	# of Haida Gwaii research and/ or monitoring projects participated in, or supported	Report on participation and cooperation levels

Rationale for Indicator & Target

The indicator was developed as part of the evaluation of impacts for forest management on social and environmental values, considering potential measures to mitigate the impacts. Participation or cooperation in advances in local research and monitoring is one venue to assess impacts. The target is a vague reference to reporting and communicating such participation and specific numerical targets have not been set at this time to account for variables affecting participation such as available projects and funding capacity.

Current Status/ Results

Year	Group Member	# of Haida Gwaii Research & Monitoring Projects Supported		Target Met (Y/N)
2011 (and earlier)	Taan	6	-Preliminary discussions underway to complete a LIDAR trial to improve inventory information and forest planning. Target is summer 2012. -Research and monitoring regarding the economic and employment components of the Taan Strategic Plan – specifically Bioenergy technology assessments (40-50 person days and $5,000 in expenditures); on island Music Blank manufacturing opportunities (20 person days and $2,000 in expenses); on island manufacturing trial of moulding material from Hemlock planning for 2012; and working with FP Innovations on Bioenergy Biomass assessments scheduled for completion March 31, 2012 (costs approximately $3,500). -MFLNRO Assisted Migration Adaptation Trial (AMAT) – province wide climate change trial, thee test sites on Haida Gwaii. Note that this research project was cancelled in late 2011/ early 2012.	Y
	BCTS	6	-Support for the Ecosystem Based Management principles through application to two operating areas on Haida Gwaii to help understand the impacts at the operational level to help support the Land Use Planning process that led to the Land Use Objectives Order -UBC Windthrow models – Haida Gwaii (& other areas) -Goshawk and Marbled Murrelet field surveys and development of General Wildlife Measures -Honna Watershed Sedimentation Study -Chanterelle Mushroom Study -Development of VEGMAN software to enable active and on-going monitoring of plantations to ensure legal targets and timelines will be met.	Y

In 2012, Group Members also plan on exploring opportunity to support/ cooperate with the Forest and Range Evaluation Program.

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Summary of Management Strategies

Group Members are generally committed to providing support (including in-kind support) for research projects located within, or with applicability to, Haida Gwaii, where sufficient resources exist to provide support. Priority will be allocated to Haida Gwaii specific research projects, particularly to those that are conducted through association or participation of local groups/ organisations.

BCTS also supports the Ministry of Forests research programs at the regional and provincial levels for forest health, geosciences and silviculture.

Adaptive Management Strategies

Not applicable at this time.

Database & Reporting Parameters

Updates to support for research projects are completed through communications of Group Member representatives.

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Indicator: Government Revenue

Element	Objective	Indicator	Target
FSC 5.1.4, 8.2.7 & 8.2.9: Environmental and social impacts of harvesting and other operations	Provide multiple benefits/ mitigate social cost	$ paid to government (stumpage, taxes, etc.)	100% of required payments are completed in a timely manner (within 30 days)

Rationale for Indicator & Target

The indicator is intended to provide information related to support for social objectives through revenue that is payable to government as a result of Group Member forest operations. The target is based on legal requirements to submit required payments on time, corporate objectives, as well as FSC requirements for stumpage payments to be current.

Current Status/ Results

Year	Group Member	$ Paid to Government	$ Outstanding Payments	Target Met (Y/N)
2011	Taan	545,073	0.00	Y
	BCTS	1,093,851	379,891.70	Y*

A detailed breakdown of the expenditures is available on file.

*Note: "For BCTS, Outstanding Payments" are defined as payments that are due by December 31st of the reporting year and not received. The dollar value shown is gross revenue not net revenue and is the amount of stumpage paid by BCTS Licensees not BCTS. There is no connection between outstanding billing and fiscal years as harvesting can extend over multiple years. Also until a sale is Logging Complete there is no need to pay the stumpage so there is no ability to report on outstanding payments to the crown.

Outstanding payments are defined as more than 30 days overdue.

Summary of Management Strategies

There are no specific management strategies related to payments to government other than to ensure that all payments to government are made within allowable timeframes (per legal requirements, corporate objectives and FSC requirements).

Adaptive Management Strategies

Not applicable at this time.

Database & Reporting Parameters

The Taan accounting software (Quickbooks) contains all of the accounts receivable and accounts payable records. A report is generated annually to summarize the total payments to government for CPP, EI, Taxes, Stumpage and License Payments.

The Ministry of Forests, Lands and Natural Resource Operations, Forest Revenue Branch maintains a web page dedicated to reporting on status of accounts receivable by licensee. The web page contains a current report that can be easily printed showing status of payments.

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Indicator: Local Support & Agreements

Element	Objective	Indicator	Target
FSC 5.1.4 & 8.2.7: Environmental and social impacts of harvesting and other operations	Provide multiple benefits/ mitigate social cost	Donations made to Haida Gwaii organizations/ groups ($ or in-kind); # of Agreements/ Joint Ventures with local businesses	Report on support/ donation levels; maintain completed agreements

Rationale for Indicator & Target

The indicator was developed as part of the evaluation of impacts for forest management on social and values, considering potential measures to mitigate the impacts. Participation or cooperation in advances in local support for promoting local employment is one venue and is one of the primary objectives of the Haida Nation, the Haida Development Corporation and Taan Forest. The target is a vague reference to reporting and communicating such participation and specific numerical targets have not been set at this time to account for variables affecting participation such as available projects and funding capacity.

Current Status/ Results

Year	Group Member	$/ In-Kind Support for Local Groups	# of Agreements/ Joint Ventures with Local Businesses	Target Met (Y/N)
2011	Taan	Skidegate Band Council – Skidegate Days Village of Port Clements Skidegate Junior Saints Moresby Island Management Committee Edge of the World Music Festival Slim Pickings – 2011 Graduation Training Program for development of on-island Scaling Services Total: 11, 760.00	Timber Supply Agreement-Old Masset FLP & Abfam Enterprises Skidegate Band Council – Pole Plant (in progress)	Y
	BCTS	0	0	Y

Old Massett Forestry Limited Partnership and Abfam Enterprises (Abfam) have recently signed a Joint Venture Agreement for the purposes of upgrading and operating the Abfam sawmill in Port Clements. Supplemental to this agreement is a ten-year term Timber Supply Agreement for Taan to provide roughly 60,000m^3 annually.

Taan is also working towards a joint venture and Timber Supply Agreement with the Skidegate Band Council to develop a pole plant within the Management Unit. As of February 2012, construction to develop the site is underway and the agreement is almost complete. Discussions are also underway regarding potential for joint ventures and agreements in regards to a bio-energy or co-generation facility. Research and monitoring is underway to complete bioenergy technology assessments and cooperative work with FP Innovations (refer to the Research & Monitoring Indicator for details).

Taan has also agreed to work with the Northwest Community College towards creating an on-island cabinet making course in Masset by assisting in sourcing the logs and lumber required for the program.

BCTS and Taan are also working towards developing a management agreement in regards to forest planning and harvesting within the BCTS chart areas of the TSA.

BCTS Chinook has not provided any in-kind support for local groups in the reporting year of 2011

Summary of Management Strategies

Group Members are committed to building a strong local economy that provides employment and benefits to the local communities. This includes providing support to local organisations/ groups, where possible.

Adaptive Management Strategies

Not applicable at this time.

Database & Reporting Parameters

Monetary contributions are tracked and reported from the Group Member accounting software.

Records relate to in-kind support are maintained on file and communicated by Group Member representatives, as applicable.

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Indicator: Local Employment

Element	Objective	Indicator	Target
FSC 4.1.1, 5.1.4 & 8.2.7: Environmental and social impacts of harvesting and other operations	Provide multiple benefits/ mitigate social cost	% of employees from Haida Gwaii; % of contractors from Haida Gwaii (based on exposure hours)	Employment opportunities are advertised locally and preference is given to local hires (provided other qualifications are met).

Rationale for Indicator & Target

The indicator is based on FSC requirements and Group Member objectives to support and promote local employment. The target reflects variables that cannot be directly controlled by Group Members such as available skilled/ qualified workforce in some aspects of forest management.

Current Status/ Results

Year	Group Member	% Local Employees	% Employees Haida Nation	% Local Contractors	% Contractors Haida Nation employment	Target Met (Y/N)
2011	Taan	43	17	89	44	Y
	BCTS	14	0	69	Not available	Y

In 2011, Taan employed seven staff and also supported the Council of the Haida Nation summer student program by allowing one student to 'shadow' the engineering/ planning crews. Job postings were also advertised for two junior level positions in the Planning Team (engineering and forestry) early in 2012 and three local people were hired in July 2012 (increasing the local employment from 43% to 60%).

BCTS has 28 fulltime employees in its organization. Of these 28 employees 4 work full time on Haida Gwaii. There are no Haida employed by BCTS Chinook on Haida Gwaii. In terms of local contractors, BCTS Chinook has 4 multiphase contractors. The two largest; Chartwell Consultants (CCL), Ltd and Infinity Pacific Stewardship Group (IPSG) have no Haida employees. The planting contractor is from Haida Gwaii.

Summary of Management Strategies

Group Members are committed to supporting local employment and ensuring that employment opportunities include preference to Haida Gwaii residents, while considering knowledge, experience and skill set. Refer to the FSC Management Plan, Local Employment section for details.

In particular, Taan Forest is a company under the Haida Enterprise Corporation (HaiCo) which has three principal objectives, one of which is to provide employment, career and business opportunities for Haida people.

Adaptive Management Strategies

Not applicable at this time.

Database & Reporting Parameters

Taan maintains employment statistics as part of the corporate tracker for Accident Frequency Rate (C10-02). Employment (and accidents) are reported monthly and typically updated on a quarterly basis.

In March 2012, BCTS implemented a safety statistics tracking mechanism that includes statistics on local employment. The worksheets will be used to generate reporting on this indicator (contractors will submit quarterly to BCTS).

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Indicator: Local Supplies & Services

Element	Objective	Indicator	Target
FSC 5.1.4, 8.2.7 and 8.2.9: Environmental and social impacts of harvesting and other operations	Provide multiple benefits/ mitigate social cost	Expenditures for local supplies and services; Monumental Cedar provided to the Cultural Wood Program	Preference is given to local supplies and services (all other qualifications being equal)

Rationale for Indicator & Target

The indicator is based on FSC requirements and Group Member corporate objectives to support local supplies and services. However, the target reflects the challenges associated with operating in a remote location such as Haida Gwaii and considers that some supplies and services may not be locally available and significant variations in price may exist between Haida Gwaii and other locations.

Current Status/ Results

Year	Group Member	Expenditures for Haida Gwaii Supplies and Services	Monumental Cedar Provided to the Cultural Wood Program	Target Met (Y/N)
2011	Taan	52%	0 pieces	Y
	BCTS	unavailable	8 m^3	Not available

In 2011, the local vendors for Taan increased from 25 to 34. The harvest profile of the cutblocks in 2011 did not provide any options for the cultural wood program. However, the plans for 2012 include some cutblocks that will contribute volume to the program.

BCTS is not able to provide these statistics for column #1 at this time but systems are being developed to be able to report on this indicator next year. 8 m^3 of monumental cedar were provided to the Haida Nation from TSLA68535.

Summary of Management Strategies

Group Members are committed to supporting the procurement of local supplies and services wherever feasible and economical. Refer to the FSC Management Plan, Local Supplies and Services section for details.

Adaptive Management Strategies

Not applicable at this time.

Database & Reporting Parameters

Reports generated annually from Group Member accounting software to demonstrate annual expenditures for local supplies and services by vendor. Local contract services for forest planning, harvesting and road construction etc. are also included. Volume provided to the cultural wood program is communicated by Operations personnel (likely by piece size and not volume).

BCTS has just begun the process of collecting this information from their contractors and Licensees, as well as, in-house staff expenditures while traveling to Haida Gwaii for FSC related activities. As part of a Continuous Improvement mandate a new reporting structure will be in place for 2012 reporting requirements.

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Indicator: Accident Frequency Rate

Element	Objective	Indicator	Target
FSC 5.1.4 & 4.2.2 Accident frequency rate	Provide multiple benefits/ mitigate environmental & social cost	Accident frequency rate (AFR)	MIR ≤ 8.00 AFR / 100,000m^3 ≤ 1.04

Rationale for Indicator & Target

The indicator is based on FSC requirements and Group Member Corporate objectives to demonstrate low accident frequency rates. Little information is available on what constitutes a 'low' accident rate. Ultimately, the true target for accident rates is zero. However, this is difficult to achieve so in the spirit of continual improvement, a surrogate low accident rate was used as a target. A target for the MIR was also included as another measure to demonstrate accident rates, as this is the typical method used by industry to calculate accident frequency rates. At this time, group members have determined an MIR of 8.0 and an accident frequency rate of one third of the provincial forestry average (as communicated by the BC Forest Safety Council as a possible measure) will be used for demonstrating a low accident rate.

The 2011 provincial average accident rate for the Forest Industry (Harvesting) is 3.12 per 100,000 m^3 harvested volume, and has been steadily improving since 2007, as communicated by a BC Forest Safety Council Representative via email communication. One third of 3.12 is 1.04.

Current Status/ Results

Year	Group Member	Medical Incident Rate (MIR)	Accident Frequency Rate / 100,000m^3 Harvested	BC Forestry (Harvesting) Average (AFR /100,000m^3)	Target Met (Y/N)
2011	Taan	Taan – 0.00	0.00	3.12	Y
		Contractor – 7.09	1.61		N
	BCTS	N/A	1.65		N

In 2001, contractors for Taan contractors reported three incidents that qualify for MIR Tracking, one motor vehicle accident resulting in medical treatment for stitches, one chest pain resulting in medical treatment, and one lost time repetitive stress/ reoccurring injury. Taan contractors also reported one motor vehicle accident involving impact with a deer, no injuries were sustained.

In 2011, BCTS did not have a system in place for tracking medical incident rate, rather an accident frequency rate was calculated using the data from WorkSafe BC and Forest Safety Council, based on harvesting rates. A new system was implemented spring 2012 and will be used in future reporting to include MIR calculations specific to BCTS. BCTS statistics include both staff, contractors and licensees.

Summary of Management Strategies

Taan maintains a Corporate Management System (CMS) that includes management for both safety and environmental considerations (consistent with legal requirements). Under the CMS, pre-works and internal inspections are completed for each development area to confirm employees and contractors are meeting the requirements.

Taan also includes provisions within contracts for adherence to safety and environmental legal requirements and maintenance of a safety program.

BCTS has a corporate policy that requires all contractors to be SAFE certified under the BC Forest Safety Council. Requirements of the certification include meeting all legal requirements, periodic inspections, safety meetings, etc.

Safety statistics are received on a regular basis by Group Members and are reviewed during data inputs to calculate accident rates. In the event that high accident rates are occurring, they will be reviewed and discussed to develop action plans in order to ensure that preventative action is occurring promptly.

Adaptive Management Strategies

Not applicable at this time. Accident rates are scheduled to be reviewed and discussed at the 2012 Management Review Meeting to consider ideas and strategies to improve accident rates.

Database & Reporting Parameters

MIR is calculated using the industry standard formula of the sum of medical treatment, restricted work cases and lost time cases x 200,000/ total exposure hours. Note that fatalities are classified as Lost Time accidents.

Taan maintains an accident frequency spreadsheet (updated quarterly) that includes employee and contactor accident statistics (File C10-02).

BCTS has recently implemented a safety statistic reporting system (updated quarterly) that will provide for more detailed reporting for 2012.

Calculations are also completed on an annual basis using the MIR statistics to tally the number of MIR category accidents in relation to the total volume harvested in order to facilitate comparison of the accident frequency rate with the statistics provided by the BC Forest Safety Council.

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Indicator: FSC Consultation

Element	Objective	Indicator	Target
FSC 5.1.4 & 8.2.7: Environmental and social impacts of harvesting and other operations	Provide multiple benefits/ mitigate social cost	# of complaints and/ or disputes received by Stakeholders or Haida Nation related to forest resources and other impacts (e.g., noise, traffic, smoke, access, etc.)	100% of comments, complaints and disputes are resolved in a timely manner

Rationale for Indicator & Target

The indicator is intended to represent overall level of satisfaction of local residents regarding forest management activities. It incorporates general complains and issues as well as a general summary of the outcome of FSC consultation and whether any formal disputes have been submitted to Group Members. The target is intended to reflect corporate objectives and FSC requirements to obtain general "free and informed consent" from local residents and rights holders.

Current Status/ Results

Year	Group Member	FSC Consultation – Comments Received	Complaints Received	Disputes Received	Target Met (Y/N)
2011	Taan	Mount Moresby Adventure Camp	1 (VPC)	0	Y*
	BCTS	Village of Port Clements (VPC)	1 (resident)	0	Y

Consultation with Mount Moresby Adventure Group is on-going regarding addressing their values and concerns for the Mosquito Lake area. Management strategies have been added to the FSC Management Plan to ensure future consultation occurs, particularly in the event that forest management activity is planned for the Mosquito Lake Area.

*The Village of Port Clements raised a complaint/ concerns in 2011 relating to local employment, community support and a request for on-going communication in the form of a minimum of two public meetings with Taan per year. To date, public meetings have not been held, but the two parties have met on various occasions to discuss concerns and future planning. Additional meetings are planned for 2012. A public meeting is planned for the fall of 2012 (after the purchase of TFL 60 is finalised).

BCTS Chinook was contacted by a resident of Haida Gwaii who wanted to know why wood was moving off island rather than being processed on island. It was explained that the FSC Standard states that fibre must be made available to for local purchase but a fair market value. In cases where fair market value is not being offered, the wood may be moved off island.

General comments were also raised to Rainforest Alliance regarding inorganic waste in the forests as a result of the seedling protector cones. These concerns are incorporated into Indicator: Inorganic Waste - Seedling Protectors.

Summary of Management Strategies

The FSC Management Plan contains the management strategies in relation to FSC Consultation, including definitions of terms and a dispute resolution process. A 'Dispute' refers to a formal complaint received in writing from a person or person's rights or interests are directly affected by a Group Member's forest management activities, after regular consultative avenues have been explored to resolve the differences. A complaint is intended to refer to concerns expressed either in writing or verbally during FSC consultation or otherwise (e.g., road conditions, smoke, logging traffic speed, etc.)

Information received in relation to specific complaints and/ or disputes will be considered for additional indicator development in future revisions to the FSC Monitoring Plan and Annual Report, where applicable (e.g., seedling protector waste management was raised in 2011 to Rainforest Alliance through the FSC Consultation process and forwarded to the Group Manager and has been developed into a separate indicator to monitor progress).

Adaptive Management Strategies

Not applicable at this time.

Database & Reporting Parameters

FSC Consultation records are maintained on file by the Group Manager (Taan) and tracked for follow up within the Corporate Tracker. Group Members may also receive and record/ file comments, concerns, complaints or disputes in relation to the FSC Certification and/ or forest management activities. In the event that Group Members receive any complaints or disputes, they must communicate any concerns to the Group Manager and provide updates on progress towards resolution.

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Indicator: Dryland Sort Wood Waste

Element	Objective	Indicator	Target
FSC 5.1.4 & 8.2.8: Environmental and social impacts of harvesting and other operations	Mitigate environmental & social cost; manage waste and other contaminants	Volume of waste disposal (e.g., m3, Kg, etc.)	DLS waste disposal is ≤10% of the volume harvested

Rationale for Indicator & Target

The indicator was selected as one of the available measures of waste generated by Taan Forest in response to social and environmental 'costs' or impacts of forest operations. The target is based on the results for 2011 but is based on a function of the total volume harvested to help account for the low harvest level in 2011. Dryland sort waste is not measured for BCTS, as the wood is owned by the Timber Sale holder upon harvesting.

Current Status/ Results

Year	Group Member	Waste Type	Quantity	% of Volume Harvested	Method of Disposal	Target Met (Y/N)
2011	Taan	Dryland Sort (DLS) Wood Debris	1,368.4	7.3%	Landfill	Y

In 2011, the quantity of DLS waste as a function of the total volume harvested (186,050m^3) was 7.3% and the average length of waste generated from the DLS was 17m and average top was 20.6cm.

Summary of Management Strategies

Taan hires a local contractor to transport waste related to the dryland sorts to authorized landfill sites (e.g., Ferguson). Taan is currently exploring bioenergy opportunities that have the potential to contribute to reductions in waste from the DLS and in the woods.

All TSL holders are required to remove any waste and/or contaminates off site to an acceptable facility. BCTS does not track this indicator at this time.

Inorganic wastes related to tree seedling protectors are reported under a separate indicator.

Adaptive Management Strategies

Not applicable at this time.

Database & Reporting Parameters

Taan maintains records related to waste removal from the Dryland Sort in relation to the contract provisions related to the waste removal. A Netscale Report (scaling database) is produced annually to show the total volume of waste from the DLS debris.

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Indicator: Inorganic Waste - Seedling Protectors

Element	Objective	Indicator	Target
FSC 5.1.4, 8.1.3, 8.2.7 & 8.2.8: Environmental and social impacts of harvesting and other operations	Mitigate environmental & social cost; manage waste and other contaminants	Complete inventory of backlog areas with cones established	Develop action plans for removal over the next 5 years. Demonstrate implementation of removal plans

Rationale for Indicator & Target

The indicator is intended to directly respond to concerns of local residents related to inorganic waste related to the seedling protectors, and specifically, the older cutblock areas where cones are still present on the trees but are no longer required to protect the seedlings from browse damage (i.e., the seedling height has extended beyond the top height of the cones). The target is based on a continual improvement scenario at this time rather than a definitive target, as the full inventory of current regenerating areas with cones established is still in progress.

Current Status/ Results

Year	Group Member	Inventory of Total Area containing Seedling Protectors (ha)	Total Inventory of Seedling Protectors established	# of Seedling Protectors Removed	# of Seedling Protectors Re-used	Target Met (Y/N)
2011	Taan	In progress	In progress	88,700	50,000	N
	BCTS	After 2003 = 1,467.6	513,235	44,343	44,000	N

Historical information on existing seedling protector cones (inventory) is currently in progress. BCTS has prepared an inventory of seedling protectors for areas planted after 2003, but has yet to complete an inventory of older reforestation areas. Taan just received the Cengea Resources database records for TFL 60 on July 19, 2012. A report will be generated very soon regarding the seedling protector inventory.

Taan completed one cone removal project in 2011 and is currently completing another in July 2012.

From 2003 to 2011, BCTS also completed maintenance activities on 963.9ha (roughly 337,085 protectors), a portion of which would have included removal.

Summary of Management Strategies

During FSC Consultation in 2011, concerns were raised by local residents regarding non-biodegradable plastic wastes in the forest of Haida Gwaii as a result of use of the seedling protectors in the regenerated cutblocks (concerns raised to Rainforest Alliance).

Due to the significant deer population on Haida Gwaii, seedling protectors are required in order to ensure regeneration of cedar and cypress are achieved per the legal stocking standards and objectives under the Land Use Order. Local residents have expressed concern regarding seedling cone protectors, in relation to in-organic wastes in the forest.

The FSC Management Plan includes management strategies for waste in the Management Unit.

Progress is underway in 2011 and 2012 to gather information regarding inventory of past seedling cone installations in order to establish priorities for removal and where possible, re-use of the cones. A work plan will be developed in 2012. Group Members may also explore potential cooperation with the Haida Gwaii Youth Stewardship Program for cone removal projects.

Discussion with MFLNRO in July 2012 indicate there may be some LBIP funding available for cone removal project for older areas that have been previously reported as free growing and no longer require protection from deer browse.

The Cowichan Lake Research Center is also working on a breeding program to select for qualities that make the cedar less desirable to deer populations. They are planning some research trials on Vancouver Island.

Adaptive Management Strategies

Group Members are exploring the potential to utilize some different seedling protector products (e.g., different biodegradable ratings, etc.). Taan has also contacted Researchers in Lake Cowichan regarding potential to establish trials in Haida Gwaii for the new cedar/ cypress seedlings that have been bred to reduce the palatability to deer.

Database & Reporting Parameters

Reports are generated out of the Group Member's silviculture tracking database (Cengea), silviculture planting activities reports. In 2011, Taan inventory includes a summary of reports provided by WFP for the TFL 60 areas. This inventory was used to guide cone removal projects in 2011 and 2012.

In 2011, BCTS used reports generated out of the MOFLNRO RESULTS database for areas planted with cedar (as all planted cedar requires seedling protectors to be established).

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Indicator: Carbon Credits (Under Development)

Element	Objective	Indicator	Target
FSC 5.1.4: Environmental and social impacts of harvesting and other operations	Mitigate environmental & social cost; manage waste and other contaminants	# of carbon credits generated	Under development

Rationale for Indicator & Target

Under development.

Current Status/ Results

Under development.

Summary of Management Strategies

This indicator is currently under development.

The Haida Enterprise Corporation (HaiCo) and the Council of the Haida Nation are exploring opportunities related to carbon credits. BCTS Chinook is also looking into this issue and will cooperate with Taan and/or the Haida Nation moving forward.

Adaptive Management Strategies

Not applicable at this time.

Database & Reporting Parameters

Report on progress via communication updates from the Taan President.

Costs, Productivity & Efficiency

Indicator: Forest Management Efficiencies

Element	Objective	Indicator	Target
FSC 5.1.4 & 8.2.9: Costs, productivity and efficiency of forest management	Efficient forest management (evaluate costs and production)	# of completed pro-formas	Pro-formas are completed and evaluated for every development area

Rationale for Indicator & Target

Cost and margins are evaluated on a regular basis by ach group member as a normal function of business management processes during cutblock planning and cutting permit/ road permit preparations. This indicator is one representation of how development costs are evaluated in relation log markets to determine whether development of specific areas is economical or not. Decisions on specific margins of loss or gain for each development area are made by upper management of each group member. The target is generic in nature to demonstrate that group members are assessing costs and margins on a regular basis to ensure efficiencies. The indicator was selected as one means to demonstrate that costs are evaluated, as it does not contain confidential information of actual costs for forest management.

Current Status/ Results

Year	Group Member	# Pro-Formas	Target Met (Y/N)
2011	Taan	45	Y
	BCTS	16	
2010	Taan	0	
	BCTS	13	

In 2011, 38 areas were assessed for margins in the TFL and 7 areas were evaluated in the Haida Tenure.

Summary of Management Strategies

Group Members record and monitor costs, productivity and efficiency of forest management activities on a regular basis as part of the corporate business structures and budget process.

In addition to corporate level evaluations, Taan Forest also implements a Pro-Forma evaluation of every cutblock during the planning development stages to determine if harvesting is economical based on projected costs and value. Then a final pro-forma evaluation is completed following completion of planning.

BCTS follows a similar format as Taan and every block goes through an evaluation process to determine economic viability. Blocks may be grouped or dispersed depending upon economics of a block or groups of blocks.

Adaptive Management Strategies

Not applicable at this time.

Database & Reporting Parameters

Taan Pro-Forma worksheets filed under the Tenure Files (Pro-forma folders).

BCTS maintains records of costs and evaluation of sales in their central file system.

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High Conservation Value Forests

It is important to note that several previous indicators all contribute to monitoring of High Conservation Value Forests such as Species at Risk and watershed/ riparian indicators.

The following indicators have been developed to assess effectiveness of management strategies for protection of landscape level biodiversity and High Conservation Value Forests and specifically address several key indicators of landscape connectivity, ecosystem representation and large landscape level forests.

Indicator: Landscape Level Biodiversity - Overview

Element	Objective	Indicator	Target
FSC 9.4.1, 8.2.3 & 8.2.4: High Conservation Value Forests (HCVF) and attributes	Maintain landscape level biodiversity effectiveness	Seral stage, interior forest, roads in THLB, NCLB and protected areas	Maintain at least 30% of an LU in old seral, minimize roads (ensure careful road planning to avoid unnecessary roads), and maintain a geographic distribution of forest interior.

Rationale for Indicator & Target

The indicator is intended to provide a coarse filter overview of landscape level biodiversity and is based on the indicator being developed by the Forest and Range Evaluation Program (FREP) for landscape level biodiversity effectiveness. The status of basic indicators such as seral stage, forest interior, and roads in the main land classes (THLB, NCLB, and Protected Areas), gives a broad indication of the vulnerability or risk level of an LU. Until FREP develops targets or baselines, the target is to maintain at least 30% of an LU in old seral, minimize roads (ensure careful road planning to avoid unnecessary roads), and maintain a geographic distribution of forest interior. This is an overview indicator and most of these measures are developed further in subsequent indicators (see representation, connectivity and intact forests below)

Current Status/ Results

Under development.

Forecast

Work is under way to develop forecasting models into the future to assess potential impacts to the current status as a result of forest management activities in order to assess the effectiveness of management strategies in ensuring the targets are met in the future. Results of the forecasts may drive changes to the management strategies through the adaptive management process.

Summary of Management Strategies

Under development.

Adaptive Management Strategies

Under development.

.Database & Reporting Parameters

Some preliminary data for Haida Gwaii was provided by FREP (email communication) for the first two indicators. However, the data set was not complete, as it was missing the TFL information.

The Group Manager will continue to review the status of the FREP program and provide information as it develops.

In the interim, we have developed our own parameters for GIS analysis to generate our own measures for landscape level biodiversity indicators for seral stage (old forest representation) and forest interior conditions.

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Indicator: Landscape Level Biodiversity - Connectivity

Element	Objective	Indicator	Target
FSC 9.4.1, 8.2.3 & 8.2.4: High Conservation Value Forests (HCVF) and attributes	Maintain HCVF values of large landscape level intact forests; ensure viable populations of most or all naturally occurring species exist in natural patterns of disturbance and abundance	Connections between reserves at both the landscape and stand levels	Linkages of reserves exist from high to low elevation and from coast to inland. Stand retention creates a permeable matrix for old forest species

Rationale for Indicator & Target

Connectivity is a term describing the linkages of habitats, species and processes throughout an area that allows the flow of energy, nutrients, organisms, and genes at many scales. Because connectivity includes so many things, measuring connectivity is a complicated endeavour. If we could answer "connected for what" then connectivity becomes more tractable, but when management for all of biodiversity is the goal, then the best approach is to maintain connections at a variety of scales, from landscape to stands. For coastal forests we are most often concerned about connections for old forest species because forestry impacts that habitat more than others. Part of ensuring connectivity is ensuring enough interior habitat for those species sensitive to edges.

Current Status/ Results

Minimum Connections & Minimum Interior habitat

Under development.

Summary of Management Strategies

Landscape level connections include linkages of reserves to each other by other reserves as well as linkages provided by the NHLB and by mature and old forest in the THLB. Riparian areas often serve as useful linkages as do coastal strips (in general though, reserves should be large, not narrow). Connections at the stand level include reserved patches and dispersed trees. Patches that help maintain forest influence over the block are most useful, but patches between block (still at the stand level) are also useful. Research on how much habitat is sufficient to allow species to move (or to provide living space for those species that disperse slowly), is very limited. At present, the only practical way to assess connectivity is by visual assessment. Are there connections between/among watersheds? Within watersheds, are reserves connected from ocean to high elevation, do cross-valley corridors exist? At the stand level, is retention well-distributed and does it carry old growth attributes?

Adaptive Management Strategies

Under development.

Database & Reporting Parameters

Spatial maps of reserves that also show non-harvestable areas and late seral forest should be created every 5 years to assess any changes in connectivity. Visual inspection should be undertaken to assess if reserves link from high to low elevation and from coast to inland. FREP stand assessments have data that could be used to begin to assess if stand retention likely creates a permeable matrix for old forest species.

If connections appear low or questionable, then some direct species monitoring may be warranted. There are no high priority species on HG for which connectivity of old forest is a key habitat factor. Sometimes marten are suggested as needing connectivity and recommended for monitoring, but they are not present on Haida Gwaii. Current and future distribution of the old forest lichen *P rainerensis* could be assessed as an indicator of the adequacy of connectivity for a very old growth specific species with (probably) small dispersal distances. It may be too rare to assess and would only be recommended if connections appear low.

Indicator: Landscape Level Biodiversity - Ecosystem Representation

Element	Objective	Indicator	Target
FSC 6.4.1, FSC 9.4.1, 8.2.3 & 8.2.4: High Conservation Value Forests (HCVF) and attributes	Maintain HCVF values/ attributes through landscape level biodiversity	Evaluate whether ecosystems are represented across the landscape in time and space	Maintain representation levels as set by LUO

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Rationale for Indicator & Target

One of the key principals of conservation ecology is to keep all the pieces (Aldo Leopold). Representation of each ecosystem in an unmanaged state provides areas where natural processes can proceed, gives us areas to use as benchmarks to assess how managed areas compare, and provides habitat for the variety of plants and animals across the management area. Because of its fundamental role in conservation, the LUO sets targets for representation. Discussion is still ongoing as to what is the best ecological unit to use as a basis for representation – many plants and animals are found in several site series, so site series may be too small a unit. Groupings of site series may be better. The Land Use Order establishes ecosystem representation targets for each site series by Landscape Unit so this method was selected. Regardless of the representation unit chosen, the key concerns are:

- Are there enough reserves?
- Are reserves well distributed from high to low elevation?
- Do they encompass a variety of productivity classes; are most reserves large and functional?
- Are they well-distributed geographically throughout the area of interest?

In colloquial terms the questions follow a series: ok, if you have enough in reserves. Well then, where are they -- in the valley bottoms too, or all rock and ice? Are they large or are they small and dominated by edge effects? Are they well-distributed or are they isolated entities clustered in an unwanted LU?

The question of 'is enough set aside' is addressed by the LUO targets which sets goals of 30% of common ecosystems and 70% of rare ones. The LUO sets targets based on natural disturbance and some precautionary approaches to avoid high risk.

To assess the other questions, representation needs to be evaluated by elevation or landscape pattern, productivity and TEM/PEM classes.

Current Status/ Results

Ecosystem representation by site series

Under development.

Ecosystem representation by productivity class

Under development.

Ecosystem representation by elevation class (by LU)

Under development.

Summary of Management Strategies

The management objectives for landscape level biodiversity are a combination of the legal requirements under the Land Use Order (and related Forest Stewardship Plan-FSP), the *Forest and Range Practices Act* (FRPA), the FSC Management Plan, and Group Member Management Systems (e.g., planning procedures).

In particular, the Land Use Order (and related FSP) contains provisions for ecosystem representation targets for each Landscape Unit, relative to whether the ecosystem is considered common (30% representation targets) or rare (70% representation targets).

Group Members are required to complete analysis and tracking mechanisms in relation to ensuring these targets are met for each Landscape Unit.

Adaptive Management Strategies

Under development.

Database & Reporting Parameters

This indicator is analyzed using GIS information and builds on existing analysis work done for the LUO and the FSP related to the Ecosystem Representation targets under the LUO as well as previous work completed for the Environmental Risk Assessment. Additional work was required to generate some information on proportions of ecosystem representation by THLB and NCLB using the most current information from the recent Timber Supply Review (2012).

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Indicator: HCVF Large Landscape Level Forests (LLLF)

Element	Objective	Indicator	Target
FSC 9.4.1, 8.2.3 & 8.2.4: High Conservation Value Forests (HCVF) and attributes	Maintain HCVF values of large landscape level intact forests; ensure viable populations of most or all naturally occurring species exist in natural patterns of disturbance and abundance	% disturbance within LLLF Forest Polygons	≤ 5% (interim, precautionary threshold)

Rationale for Indicator & Target

The indicator is based on the FSC requirements to identify large landscape level intact forests within the Management Unit as part of the HCVF Assessment and then establish management strategies consistent with the precautionary approach to ensure maintenance of the values. The target is based on the research done by the Group Members (refer to the FSC Management Plan) and the resulting 5% threshold set under the management strategies. It is anticipated that this indicator and target will change over time as results of monitoring and adaptive management are reviewed (continual improvement and adaptive management loop).

The FSC Management Plan describes the three large landscape level forests in more detail, but a summary is provided as follows:

LLL Forest Patches on the Haida Gwaii		LLL Forest within Protected Areas & Conservancies		LLL Forest within the MU (ha)		LLL Forest within other tenures	
ID	(ha)	(ha)	%	(ha)	%	(ha)	%
1	114,440	112,367	99	1,054	1	-	0
2	62,381	1,988	3	22,069	35	42,300	62
3	71,083	53,638	75	17,399	24	46	1

Moreover, the intact forest #1 is not of concern for forest management as 99% of the area is located within protected areas. Intact forest #3 is also largely comprised of protected areas (75%). The third intact forest polygon is of the most concern to be impacted by forest management activities as a very small portion is located within protected areas (3%). Therefore, in terms of monitoring, intact forest #3 is of the most concern.

Current Status/ Results

Harvesting

Year	Group Member	Harvest Area within Intact Forest Polygons			Target Met (Y/N)
		1	2	3	
		5% = 5,721 ha	5% = 3,119 ha	5% = 3,554 ha	
2011	Taan	0.0	N/A	N/A	Y
	BCTS	0.0	0.0	0.0	
	Other Licensees	N/A	0.0	N/A	
	Total Harvested	0.0	0.0	0.0	

A review of plans for 2012 and 2013 was also completed. Taan currently has no harvesting planned within the small narrow section of intact forest located in the north-west section of TFL 60.

BCTS and Husby both have harvesting occurring in the intact forest areas in 2012 and planned for 2013-2014. The total area harvested/ planned for Intact Forest #2 in 2012 for Husby is 99.8 ha and for 2013 is 111.4 ha. BCTS has a total area of 224.2 ha planned within Intact Forest #2 for 2013-2014 and 311.1 ha planned for Intact forest #3 from 2012-2014. Although harvesting plans are quite extensive, these planned areas are well below the permitted threshold. However, this indicator will need to be monitored very closely over the next year to ensure conformance with the targets and monitor ecosystem representation targets in relation to planned harvesting (i.e., to ensure that ecosystems being harvested within the intact forest polygons are well represented elsewhere in the Management Unit).

Teal has not harvested in the intact forest polygons and does not have any harvesting plans for 2012 in the intact forest.

Connections

Under development.

Forest Interior

Under development.

Summary of Management Strategies

The management objectives for intact forest polygons are a combination of the legal requirements under the Land Use Order (and related Forest Stewardship Plan-FSP), the *Forest and Range Practices Act* (FRPA), and the FSC Management Plan. The HCVF Assessment determined that special measures are required beyond the legal requirements in order to adhere to the FSC requirements and ensure a precautionary management approach is implemented for large landscape level intact forests.

The FSC Management Plan includes a description of the analysis, methods and research on potential disturbance thresholds for ensuring intactness is maintained. Group Members are required to ensure tracking mechanisms are in place and periodically updated in relation to ensuring these targets are met for each polygon.

Adaptive Management Strategies

Under development.

Some items to consider regarding adaptation of the management strategies for the large landscape level forests is exploring the potential to utilize helicopter logging to reduce impacts from roads in the intact forest areas (may be uneconomical due to poorer timber types or may not be feasible due to other constraints such as equipment, fuel, etc.). Also need to re-consider setting some thresholds or targets and management strategies in relation to roads such as minimizing the amount of roads, widths, etc. and deactivation/ rehabilitation of roads no longer required for use. Evaluate the potential for comparing bird surveys from the two types of Large Landscape Forests – intact and less intact as part of effectiveness monitoring.

Further work is needed to evaluate the portion of the intact forest polygons that are located within the non-contributing land-base and not likely to be harvested. Additional work will also be required to evaluate the ecosystem representation within the intact forest areas that are being targeted for harvest in comparison to representation in the rest of the Management Unit.

Database & Reporting Parameters

Group Members Planning Leaders provide interim reporting on this indicator using the GIS analysis work and forward planning of harvesting areas. Specific parameters are recorded within the FSC Management Plan – HCVF Large Landscape Level Forests. An action item has been developed within the Corporate Tracker to ensure that a system for periodic review/ communication is developed and implemented.

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Indicator: Invasive Species

Element	Objective	Indicator	Target
FSC 8.2.6 & 9.4: High Conservation Value Forests (HCVF) and attributes	Maintain HCVF values/ attributes	# of invasive plant occurrences reported; # of assessments completed on new occurrence areas	Ensure monitoring and reporting of invasive plants is occurring

Rationale for Indicator & Target

The indicator was developed based on recommendations made from the peer review of the High Conservation Value Forest Assessment to monitor new introductions, eradications and spread of existing invasive species.

A symposium was held in 2002 to discuss introduced species to Haida Gwaii and in particular, focussed on the Sitka mule deer in relation to ecosystem impacts. Recent studies by RGIS also indicate that deer browse have significantly impacted song bird populations on Haida Gwaii. The Land Use Order Background Report (2003) describes introduced species of key relevance to the Land Use Planning process and includes beaver, rats, racoon, Sitka deer, Japanese knotweed, scotch broom, gorse, Canada thistle, marsh thistle, wall lettuce and English ivy.

Invasive plants are only part of invasive species concerns, but are the most directly related to, and can be impacted by, forest management activities. Therefore, this indicator has been developed to focus on invasive plants. The target does not contain a specific threshold, but is designed to encourage active monitoring and reporting of new sightings.

Current Status/ Results

Year	Group Member	# of Invasive Plant New Sightings	# of Invasive Plant New Occurrences Reported	# of Assessment Completed on New Occurrence Sites	Target Met (Y/N)
2011	Taan	0	0	0	Y
	BCTS	6	6	Planned for 2012	Y

Follow up is required in 2012 to request reports from the Invasive Plants database for use to complement the monitoring report. The database can provide reports on reported new sightings as well as species reported and locations/ GPS points.

Summary of Management Strategies

The following invasive plants have been identified as high priority species: gorse, scotch boom, Japanese knotweed, Himalayan knotweed, yellow flag iris, common tansy, meadow hawkweed, orange hawkweed, spotted hawkweed, marsh plume thistle and tansy ragwort.

Forest managers in BC are required under the *Forest and Range Practices Act* (FRPA) to include measures to prevent the introduction and spread of invasive plants through their Forest Stewardship Plans (FSP). The Haida Gwaii FSP (approved November 2011) includes measures for a list of identified high priority invasive species, and includes training in identification, monitoring and reporting to the provincial database (IAPP), grass seeding and roadside brushing as well as considerations for recommending for sanitation and disposal activities (e.g., machine washing).

The presence of invasive plants are first assessed at the development/ planning stage of the cutblock through the Site Plan process (field work and documentation to address all FSP requirements, including invasive plants). New sightings are reported to MFLNRO via the IAPP database/ Report a Weed process. If any special instructions are required to work crews regarding prevention of spread, etc. they are reviewed during the pre-work meetings.

Routine inspections and survey such as regeneration surveys, planting inspections, road maintenance, etc. are all potential avenues to identify and report new sightings.

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Adaptive Management Strategies

Follow up with communications with MFLNRO representatives and Invasive Plants Council regarding access to reports from the IAPP database. A report was received in July 2012 listing the invasive plants added/ surveyed in 2011 and 2012 for all of Haida Gwaii. Review GPS points in relation to the Management Unit.

Database & Reporting Parameters

The Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) Invasive Alien Plants Program and Invasive plants database (IAPP Application) has the capability to generate exports of data. Group Members can obtain access to the database or can request reports periodically from the IAPP contacts (listed on the website.). New sightings, including species details and reporting 'agency'/ licensee are available. Reported of treated areas are also available (web link is provided below).

Under the FSP, Group Members are required to report new sightings of invasive plants to the IAPP Application, 'Report A Weed' process: http://www.for.gov.bc.ca/hra/plants/index.htm or directly to the Northwest Invasive Plants Council: http://www.nwipc.org/.

The Research Group on Introduced Species (RGIS) was founded in 1996 to conduct research and publicize information on the effects of introduced species on natural ecosystems within Haida Gwaii. It works in collaboration with several other groups such as federal and provincial governments and environmental groups. Several reports and publications are available on their website.

The Council of the Haida Nation may also maintain a database and management plan for introduced species (this was referenced in the 2002 Introduced Species Symposium but has not yet been confirmed).

Indicator: LUO/ FSP Annual Reporting

Element	Objective	Indicator	Target
FSC 8.2.6 & 9.4: High Conservation Value Forests (HCVF) and attributes	Maintain HCVF values/ attributes	Land Use Order/ FSP annual reporting	Provide a summary of the results of the LUO/ FSP annual reporting

Rationale for Indicator & Target

The indicator is intended to provide a summary of annual report data under the LUO/ FSP in order to demonstrate stand level implementation of the LUO that are for the most part, absent from the initial landscape level data analysis for the FSC Assessments and FSC Management Plan. The intent is that the data will build onto the landscape level mapping over time to allow for more complete and accurate data analysis. The target is a general target to gather information/ data at this time. Future work may involve establishing performance targets based on some numerical targets, if applicable.

Current Status/ Results

Year	Group Member	Feature Description	Hectares Constrained	Target Met (Y/N)
2011	Taan	N/A	N/A	N/A
	BCTS	N/A	N/A	N/A

Annual reporting was not required for 2011, as the FSP was not approved until November 2011. Interim information was provided above based on planning information for 2011 during partial implementation of the LUO.

Summary of Management Strategies

Under the Land Use Order (LUO) and related Forest Stewardship Plan (FSP), Group Members are required to annually report to the Province of BC and the Council of the Haida Nation the following items (information related to the feature as well as established no harvest zones and management zones):

- Haida Traditional Heritage Features and Forest Features
- Cedar Retention
- Western Yew Retention
- Cultural Cedar Stands, CMTs and Monumental Cedar
- Type I and II Fish Habitat
- Active Fluvial Units
- Forested Swamps
- Ecological Representation
- Red & Blue Listed Plant Communities
- Black Bear Dens
- Forest Reserves

Under the LUO, reporting is also required concurrent with the identification of any potential nests of Northern Goshawk, Great Blue Heron and Northern Saw-whet Owl.

Adaptive Management Strategies

Not applicable at this time.

Database & Reporting Parameters

Data is maintained within Group Member GIS database systems and reporting is compiled and submitted annually by each Group Member as required. Summaries are provided to the Taan CMS Administrator for inclusion in the FSC Monitoring Report.

Presumably, the Provincial Government and the Council of the Haida Nation will be compiling the annual data within a database. It is not known whether this database will be made available to the licensees.

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