



Sustainable Forest Management Plan

North Island Timberlands

Cascadia Forest Products Ltd.

2006 - 2010

May 17, 2006

Version 3.0

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INTRODUCTION

About the SFM Plan

The North Island Timberlands' Sustainable Forest Management (SFM) Plan is a "road map" to current and long-term SFM performance objectives and management strategies in the North Island operating area, referred to here as the [Defined Forest Area](#) or DFA. The DFA is situated on the east central coast of Vancouver Island west of Robert's Lake to the Eve River, encompassing the community of Sayward. Added to the DFA for the 2006 reporting period is Phillips Arm. It is the crown land identified as TFL 39, Blocks 2 and 5 (Phillips Arm).

It is an adaptation of planning processes that have been in place for more than 35 years on the DFA. These planning processes include strategic and operational plans, analyses, standards, monitoring and public review. Management of forest lands in the Campbell River/Sayward area has continued to evolve over time in response to learning and to changes in society's values. Revised management plans, submitted at approximately five-year intervals, include objectives, management strategies and analyses of management impacts. Standards and operating plans have been updated as changes occur. By the end of 2006 an approved Forest Stewardship Plan (FSP) will be in place in accordance with the Forest and Range Practices Act (FRPA). Monitoring has included divisional reporting as well as Tree Farm License (TFL) 39 and corporate annual reports and compliance audits.

The results of the public participation processes over the past years have contributed to the development of the objectives, indicators and targets. Since 1998, the North Island Woodlands Advisory Group (NIWAG) has helped to further develop the SFM performance framework for the DFA. Ongoing public review and input is provided by NIWAG, TFL Management Plan and operational plan reviews, and through other processes related to specific land use issues such as landscape unit planning and community water supply.

North Island managers and employees understand and follow the values, objectives, targets and management practices for achieving SFM on the DFA, as described in this document. The SFM Plan is an evolving document, which is reviewed with NIWAG on an ongoing basis and revised to reflect changes in the forest and local community.

The SFM Plan includes this introductory overview and two sections:

- [Section 1](#) North Island's Year 2006 SFM values, goals, indicators and objectives, with acceptable variances and management strategies. These are organized according to the Canadian Council of Forest Ministers' (CCFM) Criteria and Critical Elements for Sustainable Forest Management.
- [Section 2](#) Coast Forest Strategy.
- [Glossary](#) A glossary of acronyms and terms used in the plan.

The plan also includes two appendices:

- [Appendix 1](#) A summary and full report of North Island's 2005 performance.
- [Appendix 2](#) The DFA Data Set, including monitoring and reporting information for 2005, as well as historic trends for the indicators.

The Process for Developing the Set of Criteria and Indicators

The DFA's regulatory and management systems, and the values that they address, have been developed over several decades and are responsive to Canadian Standards Association (CSA) SFM system criteria, including the requirements for public involvement and the elements of a continual improvement process.

This SFM Plan Version 3.0 is the eighth revision to the plan. It reflects the results of a management review of the operation's 2005 performance and work done by NIWAG to address changes to the '02 version of the standard. It also reflects ongoing discussions with First Nations, NIWAG and other stakeholders.

The review process ensures that the SFM Plan is a product of continual improvement. This occurs through performance reviews, re-assignment of plan elements to more appropriate sections of the SFM organizational scheme, and new public input. Because of the dynamic nature of this process, the SFM Plan should be viewed as an illustrative snapshot, rather than as a final or static document.

The indicators in the plan are numbered from (1) to (46). The same numbering is retained throughout the document. This being a transitional report, there is a discrepancy with the indicator numbering between the 2006 Plan and the 2005 Report. Therefore, there is a 2006 indicator summary that identifies the relationship between the old and new indicators.

Progress toward some goals could not be measured by quantifiable indicators. In those cases, current performance is evaluated through qualitative assessments of, for example, stakeholder processes, management programs, communications initiatives, etc.

Links to Management Plans and Operational Plans

Figure 1 shows the links between operational planning and TFL Management Plans with the BC Forest Practices Code (FPC). [To be replaced by the BC Forest and Range Practices Act (FRPA) when the Forest Stewardship Plan (FSP) is approved.]

The SFM Plan is an umbrella plan that links higher level plans such as the Management Plan with operational plans. The SFM Plan reflects the objectives, management strategies and reporting structure of Management Plans. Likewise it is influenced by other higher level plans such as the Vancouver Island Land Use Plan and by legislation such as the FPC Act.

Currently a Cascadia Forest Stewardship Plan (FSP) is out for public review and is anticipated to be in place by year end. When this is approved, the SFM plan will be amended to address pertinent changes.

Figure 1 shows the flow of input and direction to operational plans, including Forest Development Plans and Site Plans. It does not show the feedback loops of monitoring and adaptive management that occur from operations to the management plans and other higher level plans.

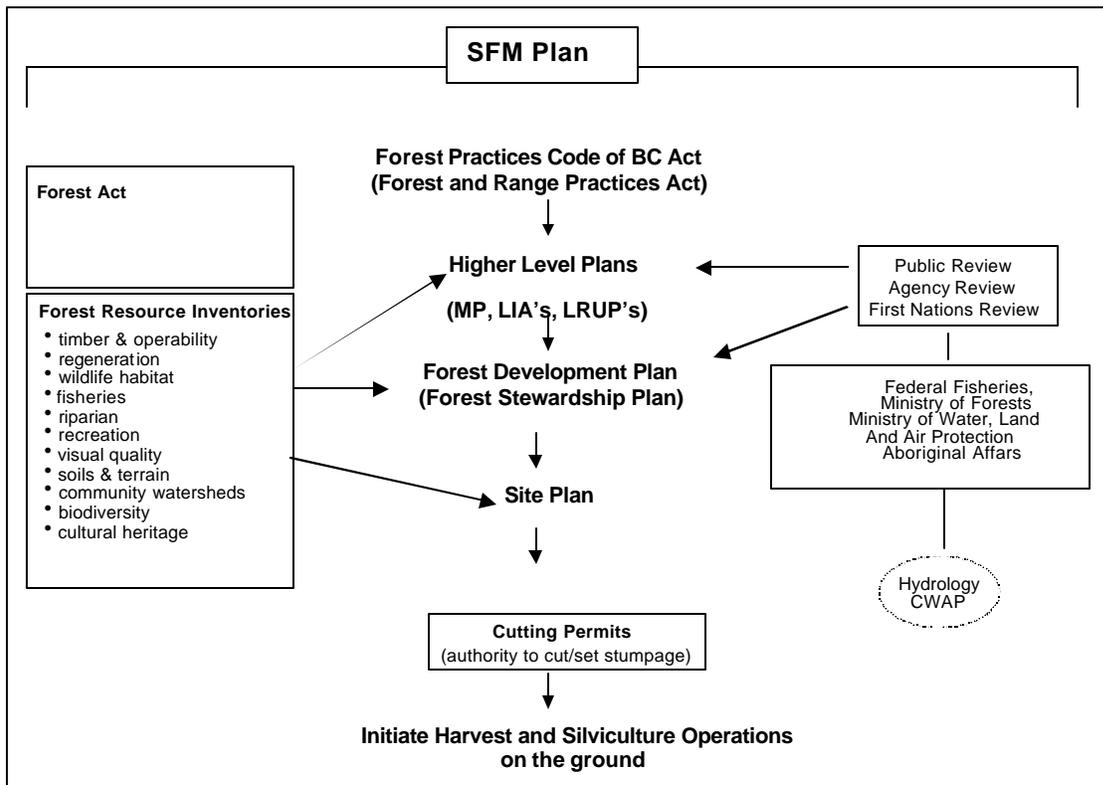


Figure 1: Links between Plans (TFL - with Forest Practices Code/Forest and Range Practices)

SECTION 1

Sustainable Forest Management Criteria and Indicators

This section of the SFM Plan describes North Island's SFM Values, Objectives, Indicators and Targets for the year 2006, as developed in conjunction with and approved by the North Island Woodlands Advisory Group (NIWAG). As appropriate, an acceptable variance is provided for each Target. The section is organized according to the Criteria for Sustainable Forest Management, which was developed by the Canadian Council of Forest Ministers and incorporated into the Canadian Standards Association Sustainable Forest Management standard (CAN/CSA-Z809-2002).

As further explanation of the organization of this section:

- The Criteria (e.g., below: [1.0: Criteria - Conservation of Biological Diversity](#)) and Critical Elements (e.g., [1.1: Critical Element - Ecosystem Diversity](#)) and their accompanying statements are derived from *Z809-02 Sustainable Forest Management: Requirements and Guidance* (Canadian Standards Association, Mississauga, 2002).
- The subsidiary Values (e.g., [1.11: Value – The representation of older forest \(>60 years\) in the DFA forest](#)), Goals, Indicators, Objectives and Acceptable Variances were developed for this plan during discussions among NIWAG members, North Island Timberlands staff and other BC Coastal Group staff.

As used in this plan:

- Values are DFA characteristics, components or qualities considered by an interested party to be important in relation to a CSA SFM element or other locally identified element.
- Objectives are a broad statement describing a desired future state or condition of a value.
- Indicators are a variable that measures or describes the state or condition of a value.
- Targets are a specific statement describing a desired future state or condition of an indicator. Targets should be clearly defined, time-limited and quantified, if possible.
- Acceptable Variances specify the range of performance results (+ or – relative to the Target) that is deemed to be an acceptable outcome. A result outside this range does not always indicate unacceptable performance. (For example, it could reflect: the impact of an uncontrollable event, such as a natural disaster; the fact that the objective was based on poor quality or inadequate data; the effects of a responsible choice between two competing objectives; or the progress toward a future level of performance.) A result outside the Acceptable Variance range does, however, require review, assessment and, possibly, a revision of either the objective or management practices.

North Island's performance against this plan is subjected to on-going monitoring and to annual review and assessment by North Island management and NIWAG.

1.0 Criteria – Conservation of Biological Diversity

Conserve biological diversity by maintaining integrity, function and diversity of living organisms and the complexes of which they are part.

1.1 Critical Element – Ecosystem Diversity

Conserve ecosystem diversity at the landscape level by maintaining the variety of communities and ecosystems that naturally occur in the DFA.

These indicators measure impacts on ecosystem diversity at the landscape level by examining changes in the forest's age class distribution and species composition, and at the harvest stand level by monitoring the quantity and distribution of retained forest areas.

1.11 Value – The representation of older forest (>60 years) in the DFA.

Objective: The representation of older forest (>60 years) in the DFA remains stable over time.

Indicator 1: The percentage of the DFA productive forest that is at least 60 years old.

Target: 36%.

Acceptable Variance: > 36%.

This indicator will be refined as the Forest Project proceeds. The intent is to measure forest areas that will contribute structural diversity (including snags, coarse woody debris and variation in size) to the forest landscape.

1.12 Value – The representation of Old Growth ecosystems at the landscape level.

Objective: At the landscape level, old growth representation of each Biogeoclimatic Ecosystem Classification (BEC) variant is retained.

Indicator 2: The percentage of each Biogeoclimate unit of the DFA that is classified as Old Growth (>250).

Target: Levels are such that they are within those identified by the MoF.

Acceptable Variance: Not applicable. Continual improvement to decrease deficit.

1.13 Value – Forest retention at the landscape level.

Objective: An amount of existing stand variety is retained in harvested areas.

Indicator 3: The annual percent of harvested blocks that are non-clearcuts.

Target: 100%.

Acceptable Variance: - 5%.

1.14 Value – The age class distribution of the DFA forest inventory.

Objective: Ensure the age class distribution minimizes any future fall down effects of the AAC.

Indicator 4: Forest Inventory by age class distribution with a LRSY run.

Target: Minimize fall down effects of the AAC.

Acceptable Variance: +/- 10%.

1.2 Critical Element – Species Diversity

Conserve species diversity by ensuring that habitats for the native species found in the DFA are maintained through time.

An accurate inventory of all species in the DFA is not possible. The indicator set measures changes in the prevalence of commercial tree species and in the number of identified species at risk. Free growing commitments include reforestation with site appropriate species. The indicator set is supplanted by management programs that are designed to maintain the ecosystem diversity required for species diversity; and by effective monitoring programs.

1.21 Value – Tree species representation in the new forest.

Objective: The representation of the existing native tree species in the regenerated forest remains stable over time.

Indicator 5: The average annual percentage representation of each tree species in the composition of second growth.

Target: +/- 20% of the 1997 inventory baseline.

Acceptable Variance: None.

1.22 Value – Tree species representation in the mature forest.

Objective: The species mix found in the mature forest is kept similar to the historic mix.

Indicator 6: The percentage of the mature inventory of the DFA by species.

Target: +/- 20% of the 1997 inventory baseline.

Acceptable Variance: None.

1.23 Value – Maintenance of variability in stand structure.

Objective: Existing stand structure is retained in the Timber Zone harvested areas.

Indicator 7: The annual average % of the total area of non-clearcut openings that is retained.

Target: 10%.

Acceptable Variance: >10%.

1.24 Value – To maintain forest influence.

Objective: Forest influence is maintained throughout harvested areas.

Indicator 8: The average annual % of the harvested area that is within forest influence.

Target: 50%.

Acceptable Variance: >50%.

1.25 Value – The risk status or forest-associated species on the DFA.

Objective: Forest Management practices do not pose a threat to the DFA forest-associated species.

Indicator 9: The annual listing of species at risk found on the DFA and their risk status rating.

Target: The annual listing of species at risk found on the DFA does not increase and their risk status rating does not rise year over year as a result of management activities on the DFA.

Acceptable Variance: None.

Programs:

- ✧ Cascadia has reviewed the habitat requirements of vertebrate species on its tenure and has used those as a guide for key ecological attributes in the implementation of variable retention. (See [Section 2](#)).
- ✧ Cascadia is involved in monitoring pilot projects aimed at developing a comprehensive adaptive management and monitoring program in support of variable retention.

1.3 Critical Element – Genetic Diversity

Conserve genetic diversity by maintaining the variation of genes within species.

1.31 Value – The genetic diversity of free-growing stands.

Objective: Free-growing stands contain a large proportion of naturally regenerated trees.

Indicator 10: The annual average percentage of the total number of trees at free growing that are from natural seed in.

Target: 50%.

Acceptable Variance: > 50%.

1.4 Critical Element – Protected Areas and Sites of Special Biological Significance

Respect protected areas identified through government processed. Identify sites of special biological significance within the DFA and implement management strategies appropriate to their long-term maintenance.

1.41 Value – The Identified High Conservation Value (HCV) areas of the DFA.

Objective: Identified High Conservation Value areas of the DFA are appropriately managed.

Indicator 11: The percent of identified HCV areas of the DFA that are under special management.

Target: 100%.

Acceptable Variance: None.

1.5 Critical Element – Management Strategy

1.51 Value – Landscape Level Planning

Concern for sustainability of ecosystems has led to increasing demand for landscape level planning to ensure that ecosystem functioning and plant and animal habitats are conserved.

Substantial areas consisting largely of old growth forests have been reserved on inoperable or sensitive soil sites, and as riparian, wildlife and recreation reserves. These areas are described in Timber Supply Analysis reports (e.g., in the TFL 39 Management Plan).

The Forest Practices Code (FPC) requirements for landscape and stand level biodiversity have been applied within TFL 39. The Biodiversity Guidebook was issued in 1995. Direction from the MoF and the MoWLAP has emphasized old seral stage representation at the landscape level and on variation in stand structure, primarily through Old Growth Management Areas (OGMAs) and Wildlife Tree Patches (WTPs).

The Vancouver Island Land Use Plan (VILUP) is a higher level plan established under a Higher Level Plan Order for Regional plans and came into effect on December 1, 2000. The Sayward Landscape Unit Plan (SLUP) was effective July 2003. The SLUP falls within Resource Management Zone #31 of the VILUP. Under VILUP, this area was described as a General Management Zone for which there would be no specific Higher Level Plan direction and it was anticipated that general Forest Practices Code provisions would apply to this area.

Cascadia is continuing to develop a capability for landscape reporting and spatial forecasting. This includes reporting by BEC (Biogeoclimatic Ecosystem Classification) variant on reserved areas, seral (age) classes, and interior old growth and patch sizes. These reports will be useful for describing the current situation and as a basis for developing strategies to achieve landscape objectives when they are available. The recently developed spatial forecasting tool has been used to project at a strategic level the implementation of variable retention over the DFA for the next 60 years. This is being linked to a spatial habitat supply model to allow the assessment of landscape planning options on the provision of future habitat.

1.52 Value – Biodiversity Conservation

In June 1998, BC Coastal Group (then MacMillan Bloedel) announced a new forest management strategy, formerly called the Forest Project, now the Coast Forest Strategy, which includes conservation of biodiversity as a primary objective. Key components include phasing out clearcutting in favor of 100% variable retention by the end of 2003 and an increase in conservation of old growth forests and wildlife habitat on BC lands managed by the company. Section 2 includes a fuller description of the Coast Forest Strategy.

Strategies include:

- Old-growth stewardship zones will include additional reserves of old-growth forest. Variable retention will ensure that a diversity of forest structure – including snags, wood debris and live trees of various sizes and in various patterns – is well distributed across the forest landscape.
- Variable retention and stewardship zones will provide additional means and flexibility for achieving and often exceeding government landscape objectives for old seral representation and Wildlife Tree Patches.
- The development and use of performance based procedures will be encouraged.
- Ecosystem mapping for most of TFL 39 is complete. This mapping has been funded by FIA (formerly known as FRBC) and is to the site series level at a scale of 1:20,000. The site series information will provide assistance in landscape unit planning and operational planning.

1.53 Value – Habitat Conservation

Objectives are to minimize the impact of activities on wildlife habitat and to not knowingly jeopardize rare, endangered or threatened species.

Identified wildlife are listed by Forest District in the Managing Identified Wildlife Guidebook (February, 1999). The BC Conservation Data Centre (MoSFM) maintains lists of rare vertebrates, vascular plants and plant communities by Forest District.

It is recognized that the old growth stewardship zones and reserves for other reasons (e.g. inoperable areas, riparian and wildlife areas and sensitive soils) will not address all wildlife needs. These approaches might be described as coarse filter approaches.

A fine filter approach is necessary for species where the coarse filter is inadequate. Such additional measures will be applied as they are identified. Examples include the “Identified Wildlife” discussed below.

Strategies include:

Develop and incorporate landscape level objectives for biodiversity including wildlife habitat. This will be achieved as part of the landscape unit planning process. MoWLAP will designate Wildlife Habitat Areas (WHA) that are approximately 200 hectares (total hectares not to exceed 2,400 – maximum 1% impact on the Timber Harvesting Land Base (THLB)).

May 2004, Buck Tanner (MSRM) and Erica McClaren proposed four WHAs for Goshawks within TFL 39, Block 2 (Tlatlos/Russel Creek WHA [1-092], Tsitika WHA [1-093], Gerald Creek WHA [1-087], and Consort Creek WHA [1-085]). These WHAs may also function as UWRs and Old Growth Management Areas (OGMAs).

May 3, 2004, the Minister of Water, Land and Air Protection established a category of species at risk – <http://www.env.gov.bc.ca/wld/serisk.htm> (species that may be affected by forest or range management on Crown Land).

During the appropriate season, wildlife features in cutblocks assessed for the presence of identified species have the appropriate conservation measures (i.e. nest tree/den reserves) prescribed.

Species which potentially occur within TFL 39, Blocks 2 and 5, and which require future consideration when planning timber-harvesting activities, include the following: Marbled Murrelet, Queen Charlotte Goshawk and the Keen’s Long-eared Myotis.

Keen’s Long-eared Myotis – Applying recommendations made in the Biodiversity Guidebook and the Riparian Management Area Guidebook will adequately manage and conserve this species.

Queen Charlotte Goshawk – A qualified registered professional (R.P.Bio) will investigate all observations of goshawks or possible nests early in the nesting season (March – June). Active goshawk nests identified by these surveys will be protected through the establishment of interim measures as outlined in Managing Identified Wildlife: Procedures and Measures – Volume 1 (Ministry of Forests, 1999), or with Wildlife Habitat Areas (WHAs). Observations will be reported to the Ministry of Water, Land and Air Protection (MoWLAP). Interim measures will be considered on an ongoing basis for the establishment of WHAs.

Marbled Murrelets – Within the Adam and Eve Landscape Units, Marbled Murrelets will be accommodated where possible by the delineation of Old Growth Management Areas (OGMAs) which target murrelet-nesting habitat.

Apply stand treatments in specific situations to enhance and improve habitat. These treatments will be based on an assessment of benefits (habitat and timber) and cost. They include restoration of riparian habitat and recruitment of old seral forest conditions. A recent example includes trials in restoration of riparian habitat in Block 2.

December 17, 2003, [7,109.2 ha] of Ungulate Winter Range (UWR) U1-004 (TFL 39, Block 2) for Black-tailed Deer and Roosevelt Elk were established.

Critical Spring Forage (CSF) assessments are prepared as per the Standard Operating Procedure (SOP) "For the Management of the CSF adjacent to Black-tailed Deer Winter Ranges (UWRs) in TFL 39, Block 2, to determine potential Forage Production Areas (FPA).

Scheduling the harvest of the FPA can provide early seral conditions conducive with physiological requirements for Black-tailed Deer over time.

Draft Old Growth Management Area (OGMAs) have been designed to maintain an ecological representation of old growth forests by biogeoclimatic variant across the landscape.

Constrained areas, (terrain, riparian, UWRs, etc.) were incorporated to lessen the impact on harvesting areas.

Where old growth is under represented, second growth stands, containing desirable ecological attributes are incorporated in a recruitment strategy.

2.0 Criteria – Maintenance and Enhancement of Forest Ecosystem Condition and Productivity

Conserve forest ecosystem condition and productivity by maintaining the health and vitality, and rates of biological production.

Goals:

- Minimize stress associated with harvesting activities.
- Track and minimize losses to fire, insects and disease.
- Recognize that natural levels of disturbance and stress may be beneficial.

Indicators:

The indicator set tracks the rates of naturally occurring disturbance and stress (biologic, geologic and climatic) to establish a background rate; in comparison, it tracks the rates of operationally related disturbance and stress; it tracks reforestation success as a measure of the forest ecosystem's response to harvest related disturbance.

2.1 Critical Element – Forest Ecosystem Resilience

Conserve ecosystem resilience by maintaining both ecosystem processes and ecosystem conditions.

2.11 Value – The timeliness of regeneration on the DFA

Objective: Harvested areas are reforested.

Indicator 12: The yearly percent of harvested area that is reforested within 3 years.

Target: 100%.

Acceptable Variance: 6%.

2.12 Value – The successful establishment of regeneration.

Objective: Harvest areas are successfully regenerated.

Indicator 13: The annual percent of regeneration established that fails.

Target: < 5%.

Acceptable Variance: + 5%.

2.2 Critical Element – Forest Ecosystem Productivity

Conserve forest ecosystem productivity and productive capacity by maintaining ecosystem conditions that are capable of supporting naturally occurring species.

2.21 Value – Area impacted by forest fires.

Objective: Area impacted by forest fires is minimized.

Indicator 14: Annual area of forest fires.

Target: Zero hectares affected by operationally caused fires.

Acceptable Variance: One hectare.

2.22 Value – The incidence of reportable spills.

Objective: To minimize the impacts on forests from reportable spills.

Indicator 15: The annual number of reportable spills.

Target: < 7.

Acceptable Variance: < 7.

2.23 Value – The extent of insect attack or disease in the DFA.

Objective: To minimize timber loss to insect and diseases.

Indicator 16: The number of areas greater than 5 ha (contiguous) in size that are at a high risk of mortality due to insects or disease.

Target: Zero.

Acceptable Variance: None.

2.24 Value – The extent of landslides in the DFA.

Objective: To minimize the impact of harvest operations on the stability of terrain.

Indicator 17: The annual area of ha that are affected by landslides.

Target: Zero.

Acceptable Variance: None.

Programs:

- ✧ Annual fire pre-organization plan for responding to emergency fire situations.
- ✧ Annual overview of insect and disease issues in the DFA.
- ✧ Coast Forest Strategy. (See Section 2).
- ✧ Cascadia compliance monitoring program (# slides/occurrences).

Critical Element – Management Strategy

Cascadia's goals are to protect the forest and to maintain a healthy forest condition.

- Regenerate all harvested land promptly with appropriate species considering both silviculture characteristics and economic values.
- Limit the losses from fire through a rigorous program of fire prevention and suppression.
- Minimize losses to insects and disease through monitoring and appropriate control measures.

2.31 Value – Fire prevention and suppression

The fire protection strategy is addressed in the Management Plan for TFL 39.

Prevention and control are governed by operating policies and procedures and a series of plans. Plans are prepared for MoF approval, and North Island Timberlands maintains and deploys its own fire suppression equipment.

Fire protection activities include hazard induced logging closures, aerial and ground patrols during periods of high risk and quick initial action using fixed wing aircraft, helicopters and ground crews.

Cascadia's primary objective is to prevent fires through good housekeeping, diligent equipment maintenance and strict control of operations as fire danger rises. Our goal is to contain all fires within 24 hours of detection.

Damage to established stands in TFL 39 has averaged less than 39 ha per year (less than 21 ha per year in mature stands) during the last 25 years.

2.32 Value – Forest insect and disease control

An insects and disease pest management strategy is included in TFL 39, MP #8. Insect infestations, disease outbreaks and associated management activities are reported in the TFL 39 Annual Report.

The objective is to minimize losses due to insects and disease through a vigilant program of detection and appropriate control measures.

Forestlands will be assessed on an ongoing basis to identify potential pest problems. Any suspect areas will be examined and monitored by helicopter or ground surveys. Federal or provincial experts will be consulted on appropriate actions if beyond the expertise of our own registered professionals.

Losses due to insect or disease epidemics will be minimized by:

- Expedient salvage of trees and stands already dead, dying or threatened by pest infestations, subject to environmental and economic considerations.
- Maintaining tight inventory control to keep the volume of logs susceptible to ambrosia beetle attack as low as practical.
- Trapping insects such as ambrosia beetles, where appropriate.
- Carrying out harvesting and sanitation activities in areas identified as disease centers.

The Cascadia FDP has guidelines addressing the following issues:

- To reduce the risk of future losses to *Abies* species from the Balsam Woolly Adelgid (*Adelges piceae*). The adelgid is present in the eastern portion of the TFL.
- For restricting planting of Sitka spruce in medium and high hazard zones for the Sitka spruce weevil (*Pissodes strobi*).

A conifer sawfly infestation (*Neodiprion* spp.) occurred in Block 2 during the mid 1990's. By 1999, sawfly populations had collapsed in high-risk areas.

2.33 Value – Wind damage

Activities are in place to minimize losses from wind damage. These include assessment of susceptibility to windthrow, cutblock design and management practices (treatment of edges where appropriate), monitoring of damage and recovery of downed trees where practical.

Small cutblock sizes and reserves within cutblocks (e.g., wildlife tree patches and riparian management areas) expose more timber edge to potential damage from strong wind events.

Although variable retention may create more exposed edges, the retention pattern could modify wind forces against edges and reduce windthrow relative to clearcuts.

The strategy to minimize losses from windthrow involves further development of practices already in place:

- Assessment of windthrow hazard and risk. This has been taken further in a FIA funded project at North Island Timberlands where current windthrow hazard models have been applied to produce windthrow hazard maps. These maps facilitate better prescriptions and choice of retention levels.
- Cutblock and retention patch design based on knowledge of historic wind patterns and assessments.
- Management practices such as tree pruning and/or topping (applied according to the assessment results).
- Monitoring. The company has designed a windthrow monitoring program. This program will document the amount of windthrow occurring in variable retention areas and provide a baseline against which to measure future windthrow management.
- Recovery of downed trees where practical. The increased use of helicopter grapple yarding should allow retrieval of small patches of windthrow and individual trees that were uneconomic to salvage in the past. Large rotting logs play an important role in forest ecosystems. Hence a variety of size classes of woody debris and damaged or rotten logs will be left behind to maintain natural cycles and habitats.

Refer to “Company Guidelines for Variable Retention” for more details on prescription options for wind damage.

A catastrophic windthrow event occurred in December 2001 at select areas on the DFA. The intensity and magnitude of this unpredictable wind event resulted in approximately 600,000 cubic metres of windthrow. Salvage of recoverable timber was completed by mid 2003.

2.34 Value – Soil degradation

Roads, landings and other compacted areas remove area from the productive forest land base. These areas are measured in post harvest assessments. The data are compiled and reported annually for harvest areas.

Management practices are in place to ensure that impacts meet or exceed current standards, including site restoration where appropriate.

Also refer to TFL 39, MP #8.

2.35 Value – Reforestation

Restocking standards (included in TFL 39, MP #8) specify that depending on site, Not Sufficiently Restocked (NSR) area will be reforested within two to six years after completion of logging. A measure of success has been to manage the amount of NSR to be below three years of logging. These results have been reported in the TFL 39 Annual Report.

3.0 Criteria – Conservation of Soil and Water Resources

Conserve soil and water resources by maintaining their water quantity and quality in forest ecosystems.

3.1 Critical Element – Soil Quality and Quantity

Conserve soil resources by maintaining soil quality and quantity.

3.11 Value – The productivity of the forest soils.

Objective: To minimize soils degradation resulting from management activities.

Indicator 18: The annual percent of harvested openings in which soil disturbance exceeds plan.

Target: Zero.

Acceptable Variance: None.

3.2 Critical Element – Water Quality and Quantity

Conserve water resources by maintaining water quality and quantity.

3.21 Value – The natural water quality is maintained at levels to sustain natural populations of trout and salmonids.

Objective: Management activities do not diminish the natural quality of the water beyond survival limits of required trout and salmonids.

Indicator 19: The yearly 'flush', high and low water turbidity and temperature measurements for selected watersheds.

Target: Turbidity <5NTU; and Temperature <15 C.

Acceptable Variance: None.

** This indicator is still under development to determine a new area to sample. As of now a drainage has not been identified. Indicator is included in plan to signify importance to the public advisory group.*

Programs:

- ✧ Fisheries programs: stream identification.

3.3 Critical Element – Management Strategy

Forest management activities can increase rates of soil erosion and affect the flow of sediment into streams and the peak flow levels in streams.

Management practices are designed to minimize these impacts. They are based on regulatory guidelines and standard operating procedures. Operational staff receives training for these standards and procedures, and environmental audits of operations are conducted annually.

Strategies for protection of soil and water resources are described in the Management Plans.

Since helicopter yarding systems significantly reduce impacts on soils and water resources, they are increasingly being used to access timber in sensitive areas.

3.31 Value – Soil Conservation

Forest areas are mapped by either five-class terrain stability mapping or sensitive site (ES) mapping. This information is used to identify sensitive areas for operational planning. It is also used to estimate appropriate allowances in strategic analyses (e.g., refer to TFL 39, MP #8).

The overall objective is to sustain the productivity of the landbase.

Strategies include:

- Standard Operating Procedures have been developed and are maintained for road construction, maintenance and deactivation.
- Terrain stability field assessments (TSFAs) are conducted on steep and sensitive sites.
- Forest practices reflect the sensitivity of the soil.
- Internal and external audits on road building and harvesting practices.
- Minimize the amount of permanent site degradation due to roads.

Concern has been expressed that variable retention might increase road requirements. There will be situations with increased road requirements and others with reduced requirements. It is expected that in sum they will tend to offset one another. For example, there has been an increase in helicopter harvesting (and hence fewer roads) on steeper terrain. Significant increases in roads are not expected on flatter terrain because of gains in reduced adjacency constraints.

3.32 Value – Water Protection

Particular attention is focused on managing riparian areas. In the TFL, riparian reserve and management areas are implemented according to FPC requirements or better. Higher order streams (smaller streams with limited regulatory protection) are used as priority anchor points for the location of retention patches within settings.

The objective is to sustain water quality and quantity.

Strategies include:

- Work closely with regional and community water boards regarding practices and standards in community watersheds. The Oyster River Watershed (in MF 19) and Newcastle Creek (in TFL 39) are water supply areas for local communities. MacMillan Bloedel and Weyerhaeuser have participated in the Oyster River Watershed Management Committee for the last decade and Island Timberlands will maintain participation. At the request of the committee in 2000, Weyerhaeuser and TimberWest completed and reviewed with the committee a watershed assessment on the Oyster River watershed.
- Coastal Watershed Assessment Procedures have so far been applied to more than 40 watersheds and basins in TFL 39 according to a priority list developed by the MoWLAP. Updates are completed as required and additional CWAPs will be undertaken as requested by District Managers. Assessments for the Tsitika and Memekay drainages have just been completed.
- Ensure that road construction and road maintenance are to required standards.
- Aerial yarding systems (helicopter) have increasingly been used in sensitive areas to minimize road density.
- Develop and implement road deactivation plans, and further reduce erosion through dry seeding, or hydroseeding and planting. Utilize FIA funding for watershed restoration work.
- Develop a water sampling program to collect baseline data associated with herbicide use areas.

4.0 Criteria – Forest Ecosystem Contributions to Global Ecological Cycles

Maintain forest conditions and management activities that contribute to the health of global ecological cycles.

4.1 Critical Element – Carbon Uptake and Storage

Maintain the process that take carbon from the atmosphere and store it in forest ecosystems.

4.11 Value – The free growing status of regenerated stands in the DFA.

Objective: Regenerated stands meet their free growing commitments.

Indicator 20: The annual number of ha that are not compliant with their free growing commitments.

Target: Zero.

Acceptable Variance: None.

4.2 Critical Element – Forest Land Conversions

Protect forestlands from deforestation or conversion to non-forests.

4.21 Value – The conversion of forest lands to permanent access structures.

Objective: To minimize conversion of forest land into permanent access structures.

Indicator 21: The annual average percent of harvested openings that is occupied by permanent access structures.

Target: < 5%.

Acceptable Variance: 0.5 %.

4.3 Critical Element – Management Strategy

The uptake and storage of carbon by actively growing forests reduce global carbon dioxide levels.

North Island Timberland's forest management activities are focused on prompt reforestation of harvested areas with well stocked stands and on restricting the area that is removed from production by roads and landings ([See Section 2.34](#)).

Surface water area is a significant contributor to hydrological cycles. The current management strategy has had minimal adverse impact on the surface water area in the DFA.

5.0 Criteria – Multiple Benefits to Society

Sustain flows of forest benefits for current and future generations by providing multiple goods and services.

5.1 Critical Element – Timber and Non-Timber Benefits

5.11 Value – The rate of timber harvest.

Objective: Timber harvest is within the long term productive capacity of the resource base.

Indicator 22: The annual harvest levels.

Target: The annual harvest is within 50% of the AAC on an annual basis within the 5 year cut control period.

Acceptable Variance: Not applicable.

5.12 Value – The level of road access in the DFA.

Objective: To retain an active road network throughout the DFA.

Indicator 23: The total km of active roads within the DFA.

Target: The total km of active road within the DFA does not decrease from year to year.

Acceptable Variance: +/- 20%.

5.13 Value – Recreation opportunities within the DFA.

Objective: Recreation opportunities are maintained throughout the DFA.

Indicator 24: The number of maintained recreation sites.

Target: The number of maintained recreation sites does not decrease from year to year.

Acceptable Variance: Not applicable.

5.2 Critical Element – Communities and Sustainability

Contribute to the sustainability of communities by providing diverse opportunities to derive benefits from forests and to participate in their use and management.

5.21 Value – The safety of workers on the DFA.

Objective: The DFA workers operate at a high safety level with an Medical Incident Rate (MIR) of < 0.

Indicator 25: The annual MIR.

Target: The annual MIR is less than 2.3 in 2006.

Acceptable Variance: < 2.3.

5.3 Critical Element – Fair Distributions of Benefits and Costs

Promote the fair distribution of timber and non-timber benefits and costs.

Note

Previous to 2004, North Island Timberlands reported on two indicators with this element:

- North Island Timberlands' profit margin, and
- Distribution of revenues by percentage.

Given the state of corporate takeovers that has been constant with North Island Timberlands over the last two years, these indicators have not been reported on. Once the realignment with Western Forest Products Inc. is completed, we will revisit this element and develop sound indicators as appropriate.

5.4 Critical Element – Management strategy

5.41 Value – Recreation

North Island recognizes and supports the responsible use of forests for recreation activities. The DFA provides varied recreational opportunities for both local residents and visitors to the area. Recreation strategies are included in the TFL management plan. Several recreation sites are maintained by Cascadia, and harvesting activities are restricted in some areas because of recreation and visual landscape values. Due to removal of area from the DFA, three established recreation sites are no longer part of the SFM Plan (Junction Pool, Montague Creek and Lower Tsitika Crossing).

Public access is available throughout the DFA. Some restrictions are applied, especially in active logging areas, for safety reasons and protection of equipment. Access is limited during periods of high fire hazard.

North Island's strategy is to:

Continue to work with the MoF and local residents to develop appropriate strategies for public access to specific areas. Issues include road deactivation (environmental risk), road maintenance and safety.

Cooperate with commercial tour operators where access is required.

Develop and maintain recreation sites in concert with the MoF and subject to funding.

With the MoF, develop strategies for recreation sites and trails and define objectives for management of these features.

Continue to provide recreation maps showing recreation areas, roads and rules of access.

Continue to cooperate with MoF and local caving groups in managing and protecting sensitive caves and karst resources. This includes undertaking surface inventories in karst areas prior to development. North Island Timberlands in cooperation with the Campbell River District (MoF) and local caving groups have developed Standard Operating Procedures for karst management.

5.42 Value – Visual impact

North Island's objective is to reconcile where possible the harvesting of trees with the visual landscape.

The strategy is to:

Maintain visual landscape inventories.

Recognize visual landscape objectives in plans and operations.

Work with MoF specialists to manage for visual landscape objectives more efficiently. This includes improved visual landscape design (assisted by variable retention) and management practices to reduce the time for achieving visually effective green-up.

5.43 Value – Archaeological and Cultural Heritage Sites

North Island will respect known sites of historic and cultural significance and account for such sites in strategic analysis.

Strategies include:

Review operational plans with local people to identify areas in which cultural resources of potential interest may be affected by forest development.

Conduct assessments and implement management to protect cultural resources in accordance with the Forest Practices Code and the Heritage Conservation Act. This includes working with First Nations, the MoF and the Archaeology Branch (Ministry of Small Business, Tourism and Culture) to identify the appropriate assessment procedures.

5.44 Value – First Nations

Economic — The objective is to develop enduring business relationships with First Nations.

Strategies include:

A First Nations Partnership Agreement has been in place with a new agreement in development at North Island with the Tlowitsis Mumtagila, Campbell River, Cape Mudge, Comox and Kwiakah First Nations.

Consultation – The objective is to improve communications and understanding by all involved and hence identify and solve concerns well in advance of planned operations.

Strategies include:

Cascadia encourages review of operational plans.

First Nations representatives participate in NIWAG and in other public review and input initiatives.

Cultural Heritage – See Part 5.43 on archaeological and cultural heritage sites.

5.45 Value – Local economic benefits

Employment in the DFA is important to the economic health of the local communities, particularly Sayward and Campbell River.

Community economic and employment strategies include:

North Island managers are responsible for developing relationships with local communities, including First Nations.

North Island will move towards achieving a work force that broadly reflects the demographics of local communities.

Cascadia will continue the practice of managing TFL 39 on a Block basis in response to local economic concerns including economic opportunities. Block contributions are defined in MP #8 AAC.

North Island is committed to tracking total forest sector jobs on the DFA. This will be reported and discussed quarterly with the public advisory group.

A comprehensive review of management strategies and operations in 1997-98 led the company to reaffirm its commitment to the solid wood products industry in British Columbia. Cascadia's goal is to be the best forest products company in the world. This includes attaining high standards in safety, environmental responsibility and business success.

Strategies to achieve these goals include:

A dedicated effort to improve safety in the work place.

Restructuring of operations to reduce overhead costs.

The Coast Forest Strategy forest management strategy. Key components included phasing out of clearcutting over a five-year period to be replaced by variable retention, conservation of more old growth forest, and SFM certification. It is expected that a positive market response to the Coast Forest Strategy will help to stabilize short-term harvest and employment levels in local communities.

- Cascadia will continue the practice of managing TFL 39 on a block basis in response to local economic concerns including employment opportunities. The current AAC for TFL 39 is allocated by block (including Blocks 2 and 5).
- Economic benefits include employment, wages and payments to government, including stumpage fees and other taxes. Records for these are compiled monthly by North Island.
- The financial health of the North Island Timberlands operation relates directly to the economic health of the local community. A measure of financial health is the margin (revenue minus costs) that the operation achieves.
- The capacity for timber production is indicated by the AAC allocation to TFL 39, Blocks 2 and 5. Actual harvest can be compared to these numbers. Substantial variation can occur on an annual basis largely because of changes in market conditions.

6.0 Criteria – Accepting Society’s Responsibility for Sustainable Development

Society’s responsibility for sustainable forest management requires that fair, equitable and effective forest management decisions are made.

6.1 Critical Element – Aboriginal and Treaty Rights

Recognize and respect Aboriginal and treaty rights.

6.11 Value – Dialogue information sharing with First Nations.

Objective: An information sharing and referral program is maintained with First Nations with interests in the DFA.

Indicator 26: The frequency of information sharing meetings and reviews held with First Nation representatives.

Target: At least yearly.

Acceptable Variance: Not applicable.

6.12 Value – First Nations employment on the DFA.

Objective: 6% of employment on the DFA to be filled by local status First Nation people.

Indicator 27: To be developed.

Target: 6%.

Acceptable Variance: +/-5%.

* *Still under development in 2006. Reporting will depend on progress in developing a method of tracking.*

Programs:

- ✧ Hamatla Partnership Agreement.
- ✧ North Island Woodlands Advisory Group.
- ✧ Public education programs.
- ✧ Research programs including:
 - ∞ Coast Forest Strategy.

6.2 Critical Element – Respect for Aboriginal Forest Values, Knowledge and Users

Respect traditional Aboriginal forest values and uses identified through the aboriginal input process.

6.21 Value – First Nations involvement

Objective: Partnership agreement signed with First Nations with interest in the DFA.

Indicator 28: The number of signed First Nation partnership agreements in place.

Target: The number of signed First Nation partnership agreements in place from year to year is at least one.

Acceptable Variance: None.

6.22 Value – Old Growth Cedar

Objective: Old Growth cedar continues to be available to First Nations.

Indicator 29: The annual volume of old growth cedar made available to First Nation.

Target: The volume of old growth cedar made available to First Nation is as reasonably requested.

Acceptable Variance: None.

6.23 Value – The regeneration of Cedar

Objective: Cedar is regenerated in scale with its extraction and as ecologically suitable.

Indicator 30: The 10-year average % variance between the % of annual harvested volume that is cedar and the % of the annual planted seedlings that are cedar.

Target: Within 20% of the harvested percentage.

Acceptable Variance: None.

6.3 Critical Element – Public participation

Demonstrate that the SFM public participation process is designed and functioning to the satisfaction of the participants.

6.31 Value – The sector representation on the PAG

Objective: All relevant sectors are represented on the PAG.

Indicator 31: The percentage of PAG sector seats that have active representation.

Target: The percentage of PAG sector seats that have active representation is at least 90% from year to year.

Acceptable Variance: None

6.32 Value – Respectful communication between the company and NIWAG

Objective: Timely communication with NIWAG in regards to changes corporate policies, programs or initiatives.

Indicator 32: The number of cases when NIWAG communication does (#yes) and/or does not (#no) occur effectively.

Target: Ratio improvement over time.

Acceptable Variance: None.

6.33 Value – Public awareness

Objective: To support open communication and dialogue with the public.

Indicator 33: The annual total hits on the NIWAG website.

Target: Increases from year to year.

Acceptable Variance: None.

6.34 Value – Stakeholder/First Nations participation satisfaction

Objective: CSA public participation at this table is responsive, communicative and representative of the stakeholder and First Nations value.

Indicator 34: Stakeholder/First Nations participation satisfaction evaluation.

Target: Continual improvement.

Acceptable Variance: None.

6.4 Critical Element – Information for Decision-Making

Provide relevant information to interested parties to support their involvement in the public participation process, and increase knowledge of ecosystem processes and human interactions with forest ecosystems.

6.41 Value – Research in alternatives to herbicides currently used in the DFA

Objective: The Unit support research in and deployment of non-herbicide alternatives.

Indicator 35: Funding of applicable research projects by Cascadia.

Target: Funding of applicable research projects by Cascadia is allocated.

Acceptable Variance: None.

6.42 Value – The use of herbicide in the DFA

Objective: Vegetation Management in the DFA emphasizes non-herbicide methods.

Indicator 36: The cumulative percentage of brushing activities that is done using herbicides over the term of the PMP is limited to 20%.

Target: 20%.

Acceptable Variance: None.

6.43 Value – Public education and communication

Objective: A continuous public education and communication program exists.

Indicator 37: The annual percentage of the annual program elements that are fulfilled.

Target: The annual % of the annual program elements that are fulfilled is 100%.

Acceptable Variance: None.

6.44 Value – Research

Objective: There is ongoing research related to ecosystem management and operations.

Indicator 38: The number of active ecosystem management and operation related research projects.

Target: The number of active ecosystem management and operation related research projects is at least one in any given year.

Acceptable Variance: None.

6.5 Critical Element – Management Strategy

6.51 Value – Community, stakeholder and First Nations involvement

Public participation processes are central to achievement of SFM goals. The objective is to provide ready access for public input and stakeholder involvement in our management process.

The North Island Woodlands Advisory Group (NIWAG) currently includes 13 community representatives who provide input on an ongoing basis. NIWAG plays a central role in the development of this plan by identifying local values and goals, participating in indicator selection, and reviewing and commenting on performance results. Regular meetings provide both input for local management issues and opportunities for all to learn about forest management and how these activities relate to the communities.

There is a 25 year history of public involvement in the DFA. The process for developing management plans includes public review at different stages in preparation of the plan. Operational plans in TFL 39 are available for public review, and dialogue occurs with special interest groups such as cavers, other recreational users and the Oyster River Watershed Management Committee.

Representatives of local First Nations are participating in NIWAG. The TFL 39 MP #8 process includes sending invitations to First Nation groups to discuss management issues, and Forest Development Plans are referred to local groups for input. North Island has a partnership agreement with First Nations for carrying out silvicultural work, training forest technicians, and supplying forest products for cultural uses.

Operational planning to identify Cultural Heritage Resource sites and to develop appropriate management prescriptions occurs according to the FPC and the Heritage Conservation Act. The strategy is summarized in the Statement of Management Options, Objectives and Procedures for TFL 39, MP #8.

6.52 Value – Research

There are several monitoring and research projects underway, including:

Nine “VRAM” (Variable Retention Adaptive Management) study sites are now established, with ongoing G&Y and other studies testing percentage group retention levels, and group removal under short/long cycles.

Windthrow monitoring.

Summer bird survey transects.

Two bird studies looking at VR groups, types/levels of retention.

Beetles.

Amphibians.

SECTION 2

Coast Forest Strategy (Forest Project)

Key components of the Coast Forest Strategy (formerly the Forest Project) include phasing in variable retention over a five-year period (1999-2003) and increasing the conservation of old growth forests and wildlife habitat on the company's Crown tenures.

The variable retention approach to forest management is intended to address public concerns about sustainability, as expressed in international agreements, by retaining future options, sustaining healthy ecosystems (productivity), maintaining economic opportunities and sustaining biological diversity. Conserving more old growth and maintaining forest structural legacies important for habitat and ecological functioning of coastal forest ecosystems will enhance biodiversity and ecosystem values. Application of a range of variable retention silvicultural systems (depending on site characteristics and resource objectives) not only retains key biological legacies within harvested areas, but also provides flexibility for maintaining and dispersing forest structure across the landscape. These habitat elements include, for example, cavity sites, downed wood, shrubs, deciduous trees, riparian areas, and early and late seral stages.

In order to meet landscape objectives, the company divided its BC coastal forest lands into three distinct Stewardship Zones (old growth, habitat and timber), reflecting different management priorities. The requirements for each zone specify an appropriate minimum retention level and a range of silvicultural systems from selection to group retention. This strategy calls for a focused management approach that will deliver overall improved economic and environmental benefits.

Within harvest cutblocks (sometimes referred to as "openings"), the minimum retention levels are: 20% in the old growth zone; 15% in the habitat zone; 10% in the timber zone using group retention; and 5% in the timber zone using dispersed retention. At the landscape level, averaged across all zones, the overall retention within the productive forest area will be an estimated 36%.

The company's zoning approach builds on the zoning objectives developed in the Vancouver Island Land Use Plan. Final determination of the stewardship zone boundaries will be made in consultation with MoF and MoWLAP staff and other stakeholders.

Reporting procedures were implemented to show progress in the transition from clearcutting to variable retention and the amount of retention in harvest blocks.

A working group of specialists from the company, the MoF and the MoWLAP was formed to deal with the many issues that the Coast Forest Strategy raises and to ensure that the strategy is consistent with the Crown's objectives. The company is also working with both agencies in assigning and implementing an adaptive management and monitoring program to ensure that variable retention objectives are met and that the retained forest structures are effective in achieving desired outcomes. In addition, an expert panel of independent scientists was convened four times during the phase-in to review and comment on environmental aspects of the strategy's implementation. Summaries of the panel's comments are published and publicly available on request.

Adaptive Management and Monitoring

The Adaptive Management (AM) and Variable Retention (VR) Working Groups developed a framework that includes criteria and indicators and both extensive and intensive approaches to monitoring. The AM Framework document was completed by F. Bunnell, L. Kremsater, D. Huggard, and G. Dunsworth and was peer reviewed by five panel scientists. This will form the basis for future monitoring of the biodiversity consequences of implementing variable retention. The framework is built around three key indicators:

- **Indicator 1** - Representation (Coarse Filter)
Ecologically distinct habitat types are represented across the tenure to maintain *lesser known species and ecological functions*.
- **Indicator 2** - Structure (Medium Filter)
The amount, distribution, and heterogeneity of habitat and landscape elements are maintained over time.
- **Indicator 3** - Species (Fine Filter)
Productive populations of species are well distributed throughout the tenure.

Monitoring and research projects in collaboration with BC government agencies and universities are ongoing. During 2004 the following were conducted as part of the AM program:

VR Implementation Monitoring

Symmetree Consulting completed special evaluations for 6 Large Patch VR and 7 Standing Stem Harvesting cutblocks and communicated the results to operations planners. The company completed over 90% of its coastal BC harvest in 2004 using VR. Symmetree monitored a random sample of 17% of the area harvested from 1999-2003 and provided feedback to operations.

Variable Retention Adaptive Management (VRAM) Experimental Sites

Installation of VRAM experimental sites continued. These sites provide a scientifically sound basis for comparison of retention systems focused on key uncertainties. Pre-harvest monitoring was completed for three study sites; logging was completed on 3 sites in 2004, bringing the total harvested to 6.5 and the total layout to 9 of the 15 planned sites. Current sites will be completed in 2005.

VR Structural Monitoring

This study documents the structural attributes (i.e., habitat) provided by variable retention harvesting in relation to benchmark natural forests. Thirty-six sites established in 1999 were re-sampled in 2004 to assess post-harvest changes. A report was completed summarizing the results of 5 years of monitoring.

Variable Retention Windthrow Monitoring

Windthrow monitoring of VR cutblocks continued. The windthrow database now consists of total of 2994 plots distributed throughout BC Coastal operations. A total of 98 harvested blocks are included in the sample, representing nearly 191 km of external setting boundaries, 27 km of larger patch edges, 112 ha of smaller retention patches and 352 km of riparian and other strip edges.

VRAM Group Size Comparison Bird Study

This study is a detailed examination of bird use of retention patches. Species presence, abundance and habitat use was documented using point-count stations.

Summer Bird Surveys

A fifth season of monitoring was completed on summer bird transects--51 routes and approximately 2500 stations throughout coastal BC. This study documents landscape-level trends in bird populations in forested landscapes.

VRAM & Operational Bird Studies

No additional field work was done in 2004 to compare bird use of different approaches to variable retention; however, a 5-year analysis and summary of previous work was prepared.

Terrestrial Gastropod Study

A five-year summary of pre-harvest and pilot study projects to monitor slugs and snails was completed.

Aquatic Breeding Amphibians

Pre-harvest monitoring of 3 sites was completed. Different buffers widths will be assigned to wetlands to test the efficacy of retention patches for maintaining breeding populations.

Carabid Beetles

A study of post-harvest beetle populations compared group and dispersed retention. Transects across different habitat conditions were monitored at intervals throughout the season.

Ectomycorrhizal Fungi

A study was established to examine the abundance of ectomycorrhizal fungi on tree seedlings in relation to dispersed trees and cutblock edges.

Variable Retention and Small Streams

Pre- and post-harvest monitoring of water flow and temperature continued. The two study areas were logged June-Nov 2004, and April 2003-April 2004. Data were downloaded from stream probes and weather stations, and litter samples were collected.

Growth and Yield — Edge Study

This study examines the influence of forest edges (either adjacent stands or retention patches) on seedling growth.

Growth and Yield — VRAM Experimental Plots

Permanent plots were established in experimental comparison areas to measure the impact of the amount and spatial distribution of retention on tree growth.

The growth and yield, windthrow monitoring, forest structure monitoring and summer bird surveys are funded through the Forest Investment Account (FIA), land-based investment program. Funding was received by the BC Forest Science Program (FSP) for 2005 and beyond for the beetle, amphibian, mycorrhizal fungi, gastropod and small streams projects.

Glossary

Acronyms used in this document

AAC	Allowable Annual Cut
BCCG	British Columbia Coastal Group
BCTS	British Columbia Timber Sales
BEC	Biogeoclimatic Ecosystem Classification
CCFM	Canadian Council of Forest Ministers
CSA	Canadian Standards Association
CWAP	Coastal Watershed Assessment Procedure
DFA	Defined Forest Area
EMS	Environmental Management System
FDP	Forest Development Plan
FIA	Forest Investment Account
FPC	Forest Practices Code
FRBC	Forest Renewal British Columbia
FRPA	Forest and Range Practices Act
FSP	Forest Stewardship Plan
GIS	Geographic Information System
HCV	High Conservation Value
ISO	International Organization for Standardization
MoWLAP	BC Ministry of Water, Land and Air Protection
MF	Managed Forest
MIR	Medical Incident Rate
MoF	BC Ministry of Forests
MP	Management Plan
NIWAG	North Island Woodlands Advisory Group
NSR	Not Satisfactorily Restocked
NTFP	Non-Timber Forest Product
NTU	Nephelometric Turbidity Unit
PSP	Permanent Sample Plot
RIR	Recordable Incident Rate
SFM	Sustainable Forest Management
SP	Silviculture Prescription / Site Plan
TFL	Tree Farm License
VR	Variable Retention
WTP	Wildlife Tree Patch

Allowable Annual Cut (AAC): The allowable rate of timber harvest from a specified area of land. The Chief Forester of British Columbia sets the AAC for timber supply areas (TSAs) and tree farm licenses (TFLs) in accordance with Section 8 of the Forest Act.

Area Awaiting Restocking (AAR): See Not Satisfactorily Restocked.

At-risk species: See Species at-risk.

Biodiversity Emphasis Option (BEO): The provincial government assigns low, intermediate or high BEOs to landscape units depending on a range of management priorities (i.e. timber production, wildlife habitat and biodiversity conservation). The main result is a designation of the area of old growth forest that should be maintained in the landscape unit.

Biogeoclimatic Ecosystem Classification (BEC): Developed in BC in 1965, the BEC System classifies areas of similar regional climate, expected climax plant communities and site factors such as soil moisture and soil nutrients. The subzone is the basic unit of this classification system. Within subzones, variants further identify more local climatic factors.

Biogeoclimatic zone: A geographic area having similar patterns of energy flow, vegetation and soils as a result of a broadly homogenous macroclimate.

Biogeoclimatic variant: See Biogeoclimatic Ecosystem Classification.

Biological diversity: The diversity of plants, animals, and other living organisms in all their forms and levels of organization, including genes, species, ecosystems, and the evolutionary and functional processes that link them.

Blue listed: Refers to plants, animals, and plant communities assessed by the BC Conservation Data Centre to be vulnerable.

British Columbia Coastal Group (BCCG): Name for the group of timberland units: Queen Charlotte Islands, Stillwater, North Island, Port McNeill, and West Island.

British Columbia Timber Sales (BCTS): Is an independent organization within the Ministry of Forests and Range created to develop Crown timber for auction in order to establish market price and cost benchmarks and capture the value of the asset for the public.

Clearcut: An area of forest land from which all merchantable trees have recently been harvested.

Canadian Standards Association (CSA) standard: Refers to CSA Z809, a National Standard for Canada for a SFM System. It describes the components and performance objectives of a SFM system that when applied to a DFA will ensure that forest management objectives are set for the critical elements of the CCFM SFM criteria.

Coastal Watershed Assessment Procedure (CWAP): Assesses the impacts of forest practices on the hydrologic regime of a watershed. In particular, the potential for changes to peak stream flows, accelerated landslide activity, accelerated surface erosion, channel bank erosion and changes to channel morphology as a result of logging the riparian vegetation, and changes to the stream channel interaction from all these processes are assessed.

Cutblock: Defined in the Forest Practices Code of British Columbia Act as a specific area of land identified on a forest development plan, or in a license to cut, road permit, or Christmas tree permit, within which timber is to be or has been harvested. (Also see opening.)

Cultural Heritage Resource (CHR): An object, a site or the location of a traditional societal practice that is of historical, cultural or archaeological significance to the province, a community or an aboriginal people. Cultural heritage resources include archaeological sites, structural features, heritage landscape features and traditional use sites.

Defined Forest Area (DFA): A specific area of forest, land, and water delineated for the purposes of registration of a Sustainable Forest Management system.

Ecological cycles: Refers to the major nutrient cycles (i.e. carbon and nitrogen) and the hydrological cycle.

Ecosystem: A functional unit consisting of all the living organisms (plants, animals and microbes) in a given area, and all the non-living physical and chemical factors of their environment, linked together through nutrient cycling and energy flow. An ecosystem can be of any size – a log, pond, field, forest, or the earth's biosphere – but it always functions as a whole unit.

Environmentally sensitive area (ESA): Area requiring special management attention to protect important scenic values, fish and wildlife resources, historical and cultural values, or other natural systems or processes. ESAs include unstable soils that may deteriorate unacceptably after harvesting, and areas of high value to non-timber resources such as fisheries, wildlife, water and recreation.

Environmental Management System (EMS): A structured system for identifying and ranking the environmental risk associated with management activities; creating and implementing control methods to manage that risk; monitoring and assessing performance; and taking corrective action to address deficiencies under a continual improvement program.

Forest and Range Practices Act (FRPA): Forest and Range Practices Act is the province's new results based legislation governing forest and range practices. Over time, it will replace the Forest Practices Code of BC Act (FPC). Like the FPC, FRPA consists of an Act of the Legislature and Several Regulations made by Cabinet.

Forest Development Plan (FDP): These plans explain resource values present in a specified area, how the values will be protected or maintained, where roads will be built and what areas are proposed for harvest. They are revised annually, advertised and presented for public review and comment before presentation to the Ministry of Forests for approval.

Forest influence area: The area within an opening that is within one tree height of a patch of retention or retained single tree.

Forest Practices Code (FPC): The Forest Practices Code of British Columbia Act, the regulations made by Cabinet under the act, and the standards established by the BC Chief Forester. The term is sometimes used to include guidebooks associated with the Code.

Forest Stewardship Plan (FSP): Forest Stewardship Plan is the key operational plan under FRPA, replacing the Forest Development Plan (FDP) under the Forest Practices Code. Like FDPs, FSPs provide limits on where primary forestry activities such as timber harvesting and road construction may occur, are subject to public review and comment and must be approved by government before they take effect.

Free growing: A stand of healthy trees of commercially valuable species, the growth of which is not impeded by competition from plants, shrubs or other trees. Silviculture regulations further define the exact parameters (e.g., species, density and size) that a stand of trees must meet to be considered free growing.

Green-up: A reforested cutblock with a stand of trees that has attained the height specified in a higher level plan for the area or that, in the absence of a higher level plan, has attained a height of at least three meters is said to have achieved green-up (1.3 metres in the enhanced zone of the VILUP).

Guidebook: Guidebooks consist of guidelines and recommendations on how to best achieve the requirements of the Forest Practices Code. They are not legally enforceable. However, specifications and procedures recommended by the guidebooks may be incorporated into plans, prescriptions and contracts in which case those specifications and procedures may become legally enforceable.

High Conservation Value (HCV) area: An area in which the conservation of any of numerous social or ecological values is deemed to have an especially high priority. Harvesting in HCV areas is typically very restricted and depending on the nature of the identified value(s) may be precluded entirely. Identification of HCV areas may result from information supplied by First Nations, government agencies, company personnel or other stakeholders. (See Environmentally sensitive area.)

Inoperable lands: Lands that are unsuited for timber production by virtue of their: elevation; topography; inaccessible location; low value of timber; small size of timber stands; steep or unstable soils that cannot be harvested without serious and irreversible damage to soil or water resources; or designation as parks, wilderness areas, or other uses incompatible with timber harvest.

ISO standard: Refers to ISO 14001, a generic international standard approved by the International Organization for Standardization to provide any organization with the elements of an effective Environmental Management System to support environmental protection and prevention of pollution.

Landing: An area modified as a place to accumulate logs before they are transported.

Landscape level: A watershed, or series of interacting watersheds or other natural ecological units. This term is used for conservation planning and is not associated with visual landscape management.

Landscape unit: For the purpose of the forest practices code, landscape units are planning areas delineated on the basis of topographic or geographic features. Typically they cover a watershed or series of watersheds, and range in size from 5000 to 100 000 ha.

Managed Forest (MF): Forest land that is being managed under a forest management plan. North Island's MF 19 is an area of privately owned land designated for commercial forestry.

Mature forest: Generally, stands of timber where the age of the leading species is greater than the specified cutting age. Cutting ages are established to meet forest management objectives. In the North Island SFM Plan, mature is defined as forest areas established before 1864 and includes old growth.

Medical Incident Rate (MIR also known as RIR): Number of incidents per 100 workers that require a doctor's medical attention or result in lost work time.
$$\frac{20,0000 \times \# \text{ Medical Incidents}}{\text{Exposure Hours}}$$

Nephelometric turbidity unit (NTU): Unit of measure for the turbidity of water. Essentially, a measure of the cloudiness of water as measured by a nephelometer. Turbidity is based on the amount of light that is reflected off particles in the water.

Non-Timber Forest Products (NTFPs): All forest products except timber, including other materials obtained from trees such as resins and leaves, as well as any other plant and animal products.

Not Satisfactorily Restocked (NSR): Productive forest land that has been denuded and has not yet been regenerated to the specified stocking standards for the site.

Old growth: Old growth is a forest that contains live and dead trees of various sizes, species, composition and age class structure. Old-growth forests, as part of a slowly changing but dynamic ecosystem, include climax forests but not sub-climax or mid-seral forests. The age and structure of old growth varies significantly by forest type and from one biogeoclimatic zone to another. As a rough measure, forests on the BC Coast that are aged 250 years or older and exhibit few or no signs of human intervention are generally termed old growth. (See also second growth and mature.)

Opening: Usually used synonymously with cutblock (see above) to include all of an area that has been harvested or is designated for harvesting, including the trees retained singly or in groups within the area. Less often, used to describe the actual cleared area(s) within a cutblock.

Permanent access structure: A built structure, including a road, bridge, landing, gravel pit, etc. It is shown expressly or by necessary implication on a forest development plan, access management plan, road permit or silviculture prescription as remaining operational after timber harvesting activities on the area are complete.

Productive forest: Forest land that is capable of producing a merchantable stand of timber within a defined period of time.

Recordable Incident Rate (RIR): Comparable to Medical Incident Rate, above. The former MacMillan Bloedel used MIR to measure safety performance; Weyerhaeuser Company used RIR. Cascadia uses MIR.

Red-listed: Refers to plants, animals and plant communities assessed by the BC Conservation Data Centre to be extirpated, endangered or threatened.

Reforestation: Establishment of a new stand of trees after harvesting or natural disturbance by either planting or natural regeneration. Before receiving approval to harvest on crown lands, a forester must prepare a Silviculture Prescription describing, among other things, the manner and time frame within which reforestation will be conducted.

Reserve zones: Zones where timber harvesting is not permitted.

Riparian: An area of land adjacent to a stream, river, lake or wetland that contains vegetation that, due to the presence of water, is distinctly different from the vegetation of adjacent upland areas.

S1-6 stream: Stream classification system for riparian management. S1 to S4 streams are fish streams or streams in a community watershed. S5 and S6 streams are not fish streams and are not in a community watershed. Each class also denotes a range of stream width: S1 is >20m, S2 is >5-20m, S3 is 1.5-5m, and S4 is <1.5m; for streams that are non-fish bearing or not within a community watershed, S5 is >3m and S6 is <3m. Smaller streams are described as "higher order" streams.

Second growth: Typically younger (i.e., less than 120 years on the BC Coast) forests that have been established by planting and/or natural regeneration after removal of a previous stand by fire, harvesting, insect attack or other cause. (See mature and old growth.)

Sensitive soils: Forest land areas that have a moderate to very high hazard for soil compaction, erosion, displacement, landslides or forest floor displacement.

Silviculture: The art and science of controlling the establishment, growth, composition, health and quality of forests and woodlands. Silviculture entails the manipulation of forest and woodland vegetation in stands and on landscapes to meet the diverse needs and values of landowners and society on a sustainable basis.

Silviculture Prescription / Site Plan: A site-specific integrated operational plan to carry out one or a series of silviculture treatments.

Silvicultural System: A planned program of treatments throughout the life of the stand to achieve defined objectives. A silvicultural system includes harvesting, regeneration and stand-tending. It covers all activities for the entire length of a rotation or cutting cycle. In BC this includes seven major categories: clearcut, patch-cut, coppice, seed tree, shelterwood, retention and selection.

Snag: A large, standing dead tree.

Species at-risk: Species identified by the BC Conservation Data Centre as red or blue listed.

Stand level: Level of forest management at which a relatively homogenous (usually small) land unit can be managed under a single prescription, or a set of treatments, to meet well-defined objectives.

Stewardship Zones: Under the BC Coastal Group's Forest Project, all public and private forest lands have been (or will be) designated as a Timber, Habitat or Old Growth zone. Each zone has a distinct set of management priorities, targets for forest retention and allowable silvicultural systems. Management practices in each zone meet or exceed legal requirements.

Sustainable Forest Management (SFM): Management to maintain and enhance the long-term health of forest ecosystems, while providing ecological, economic, social, and cultural opportunities for the benefit of present and future generations.

Timber Supply Analysis: An assessment of future timber supplies over long planning horizons (more than 200 years) by using timber supply models for different scenarios identified in the planning process.

Variable Retention (VR): A relatively new approach to harvesting and silvicultural systems that follows nature's model by always retaining part of the forest after harvesting. Standing trees are left in dispersed and/or grouped patterns to meet objectives such as retaining old growth structure, habitat protection and visual quality. Variable retention retains structural features (snags, large woody debris, live trees of varying sizes and canopy levels) as habitat for a host of forest organisms and maintains forest and residual tree influences. There are two main types of variable retention: dispersed retention, which retains individual trees scattered throughout a cutblock, and aggregate (or group) retention, which retains trees in patches of intact forest.

Visual Quality Objective (VQO): An approved resource management objective that reflects a desired level of visual quality based on the physical and sociological characteristics of the area; refers to the degree of acceptable human alteration to the characteristic landscape.

Wildlife tree: A standing live or dead tree with special characteristics that provide valuable habitat for the conservation or enhancement of wildlife.

Windthrow: Trees uprooted as a result of wind events.

Yarding: In logging, the hauling of felled timber to the landing or temporary storage site from where trucks (usually) transport it to the mill site. Yarding methods include cable yarding, ground skidding, and aerial methods such as helicopter yarding.

Appendix 1

NORTH ISLAND TIMBERLANDS

2005 SFM Performance Summaries



NORTH ISLAND TIMBERLANDS Sustainable Forest Management Plan

2005 Summary Report

NORTH ISLAND TIMBERLANDS

Sustainable Forest Management Plan

2005 Summary Report

In May 1999, North Island Timberlands became the first operation in Canada to be independently certified under the Canadian Standards Association's sustainable forest management standard. The certified area included 225,000 hectares of public and private forest lands near the communities of Campbell River and Sayward on Vancouver Island, British Columbia. North Island was re-certified to the CSA Z809 standard in May 2002 and again in May of 2003 to the '96 standard.

January 2005 marked the first large change in the Defined Forest Area (DFA). The area known as Eve River was 'taken back' and is now managed by British Columbia Timber Sales (BCTS). BCTS is pursuing certification on that area and other lands they manage adjacent to it.

In June of 2005, Weyerhaeuser sold the British Columbia Coastal Group (BCCG), which North Island Timberlands (NIT) is part of, to Brascan. Brascan formed two companies. Island Timberlands to manage the private forest land and Cascadia Forest Products to manage the public (crown) forest land. North Island Timberlands managed a DFA of 180,255 hectares of public forest lands in 2005 and is now part of Cascadia Forest Products.

As part of the certification program, North Island prepared a Sustainable Forest Management (SFM) Plan with input from a community advisory group. The SFM Plan includes goals related to North Island's social, economic and environmental performance. Progress toward the goals is measured by means of indicators and is reviewed annually with the objective of continually improving the operation's performance.

The North Island Woodlands Advisory Group (NIWAG) continues to play a key role in North Island's SFM program. In 2005, the group included members from: Campbell River Chamber of Commerce, Campbell River Environmental Committee, City of Campbell River, United Steelworkers Local 1-363, Hamatla Treaty Society, Regional District of Comox-Strathcona, Sayward Fish and Game Club, seniors' representative, Timberline Secondary School, and the Village of Sayward, and a supplier representative. In addition, the BC Ministry of Forests participated as a contributing observer.

Economic Performance

North Island Timberlands was a significant contributor to the regional economy in 2005. NIT employed an equivalent of 451 full time employees. This number includes staff, hourly and contract employees on the DFA.

At this time Western Forest Products is in negotiations with Cascadia Forest Products to acquire these crown forest lands. There will be no release of financial or economic information at this time.

The annual harvest volume is a general indicator of the level of economic activity. In 2005, North Island harvested 1.56 million m³. This is the last year of the 5 year cut control period, and puts NIT at approximate 105% of the AAC for Block 2. As a company, Cascadia is at 89% of the AAC for TFL 39 cut control period from 2001 to 2005.

Social Performance

Safety is a core value for all Cascadia operations. North Island aimed to achieve a Medical Incident Rate (MIR) of 2.3 or less in 2005. (MIR measures the number of incidents per 100 workers that require a doctor's medical attention or result in lost work time.) North Island's actual 2005 rate was 5.1.

The number of recreation sites maintained by North Island is three; down from past years due to the aforementioned transitions.

Environmental Performance

The advisory group identified numerous environmental goals related to maintenance of biodiversity; protection of endangered species; sustaining soil and water qualities; regeneration of harvested areas, etc.

Two key indicators gauge the adequacy of reforestation:

- (1) Promptness of reforestation is measured by comparing the area in which reforestation is pending beyond three years from harvest. The 2005 result was areas awaiting reforestation beyond three years from harvest was 4.2% of the total areas awaiting reforestation.
- (2) The "area that fails to meet agreed reforestation targets" is a measure of reforestation success in the longer term. It is the area that fails to meet targets for stocking density or species mix at the time of the Free Growing declaration, which typically occur 11-14 years after harvest. In 2005, all blocks met the free growing obligation within the reporting year.

Trends in the age class distribution and relative percentages of dominant tree species offer measurable indicators of biodiversity attributes. About 36.6% of the North Island forest is mature (pre-1864). For the past three decades, timber harvesting has proceeded at an average rate of just under one percent per year of the productive forest area. Data for annual volume harvested by species, number of seedlings planted by species, and dominant second growth species by area indicate a balanced approach to harvesting and reforestation by species. In second growth forests, the trend since 1981 has been towards increases in the percentage of Western Red Cedar (5.7 to 7.6 %), and Douglas fir (14.0 to 15.9%), offset by a decrease in the percentage of less commercially valuable hemlock (56.5 to 50.3%).

Permanent access structures (which include roads, landings, etc.) are the primary source of increased risk for sedimentation of streams. Reflecting the Forest Practices Code Soil Conservation Guidebook standards, North Island set an objective that less than 5% of the area in 2005 openings would be in permanent access structures. The result was 5.4%, consistent with a downward trend from the level of 5.8% in 1987.

The provincial Ministry of Sustainable Forest Management has responsibility for identifying and monitoring species at risk, and through the Conservation Data Centre it publishes an annually updated list of rare plant and animal species. The operation's objective is to place no species at risk as a result of management activities. The latest CDC list was reviewed by R.T. McLaughlin R.P.Bio. There have been no additions to the blue listed species found on the DFA.

Review and Improvement

North Island's performance is subjected to quarterly management reviews. This includes re-assessment and revision of the risk profile considering new equipment or procedures, and internal and external audit results. (The "risk profile" is a measure of the relative possibility of an accidental environmental incident for each aspect of the operation). The review looks for opportunities to improve the environmental management system and performance on the ground.

2005 performance results were also reviewed and discussed with the North Island Woodlands Advisory Group. The advisory group had two indicator workshops to address the transition to the CSA Z809 2002 standard, development of a First Nations employment indicator, a communication indicator, a second safety indicator, and others. NIWAG members emphasized the importance of sustaining local economic benefits.

An independent surveillance audit of North Island's environmental management system was done by Quality Management Institute in May 2005.

This document is a summary of North Island's performance against its 2005 Sustainable Forest Management Plan. For further information, please contact the Division Forester, North Island Timberlands, 250-287-5000, or write to P.O. Box 6000, Campbell River, BC V9W 5E1.



Summary Reports on Performance

2005 Indicators and Objectives - Results

CAN/CSA-Z809-96

&

ISO-14001

North Island Timberlands

As of December 31, 2005
Reported March 2006

CAN/CSA-Z809-96 Indicators Summary – 2005

#	Indicator	2005 Objective	Acceptable Variance	2005 Result	Comments
1.	Percent of primary, secondary and tertiary species weighted by hectare (for 2nd growth)	Maintain percentage of second growth species	± 20% 1997 inventory baseline	Objective met.	All species within range of variance except for cedar which is above the upper variance.
2.	Gross volume by species of mature forest	Maintain percentage of mature species	± 20% 1997 inventory baseline	Objective met.	
3.	Percent of forest > 60 years old	36%	> 36%	Objective met.	
4.	Number of identified species at risk	Zero annual increase as a result of mgmt activities	None	Objective met.	
5.	Pct of seed used that is registered or certified			-----	Dropped in 2004.
6.	Pct of harvested area that is reforested	100% reforestation within 3 years	6% above 3 years old as a % of total NSR	Objective met.	4.2 % of NSR is greater than 3 yrs old
7.	Pct of openings' area occupied by permanent access structures	Less than 5%	+ 0.5%	Objective met. 5.4 %	
8.	Area that does not meet free growing (FG) commitments	Zero hectares of FG non-compliance	0	Objective met. 0	
9.	The number of forest fires caused accidentally by industrial activity	0	1 per year	Objective met. 0	
10.	Area of regeneration failures	Current regen failure is less than 5% of current area established	+ 5%	Objective not met. 12.9 %	
11.	Forest inventory by percent of age class distribution	Historically implicit in AAC; to be redefined in Forest Project	Not applicable	Tracking only. See data set.	
12.	The area of water bodies	No change in area of water bodies	None	Objective met. 0	
13.	Hectares sold out of DFA (MF19)	0	0		Not applicable to crown land.

#	Indicator	2005 Objective	Acceptable Variance	2005 Result	Comments
14.	Harvest Levels	TFL: 1,229,411 m ³ MF: 300,000 m ³ Tot: 1,529,411m ³	TFL: ± 50% MF: ± 20%	Objective met.	1,567,965 m ³
15.	North Island division margin	Not set			
16.	Medical Incident Rate	2.3	Less than 2.3	Objective not met. 5.1	
17.	Number of recreational sites maintained	Continue the maintenance of existing sites.	None	Objective met.	Sgt. Randally, rustic campsites at Stewart & Tlowlis Lake.
18.	Km of active road	Retain the active network	± 20%	Objective met.	
19.	Number of FPC contraventions related to road, soil and water management	0	None	Objective met.	
20.	Advisory group active membership	All sectors are represented	None	Objective not met.	2 vacancies: Contractor and Member at Large.
21.	Planting by species compared to harvest	Plant cedar in proportion to harvest (10 year average)	± 20%	Objective met.	
22.	Stand level retention in openings as pct of total opening area	≥ 10%	Greater than 10%	Objective met. 20 %	
23.	Percent of total opening area harvested with non-clearcut systems	100% of total opening area harvested	+ 5%	Objective met. 100 %	
24.	Percent of annual harvest area within forest influence	50% for non-clearcut blocks	> 50%	Objective met. 62%	
25.	Percent of identified High Conservation Value areas under special management	100% of HCV areas identified are under special management	None	Objective met. 100%	SMZ 11 and Sgt. Randally remain in the DFA.
26.	Old growth representation by BEC variant	Meet MoF biodiversity guidebook targets	0	Objective met.	
27.	Total number of trees at 'free growing' vs. planted total	Trees at FG > planted total	None	Objective met.	
28.	Number of reportable oil spills	≤ 7 spills	+ 1 (i.e., 8)	Objective met. 4	

#	Indicator	2005 Objective	Acceptable Variance	2005 Result	Comments
29.	Natural wildfires by number and area	< 50 hectares	Fires exceeding 50 ha are actively managed	Objective met. 0	
30.	Areas > 500 hectares at high risk of mortality due to insects or disease	0	N/A	Objective met. 0	
31.	Area of naturally induced slides	Track for baseline	N/A	7.5 hectares	Cumulative baseline number 205.7 ha.
32.	Percent of openings in which soil disturbance exceeds plan	0	None	Objective not met. 1.9 %	A 3 ha. SU with 0.3 ha. of compaction that has been dealt with and will be planted in Spring 2006.
33.	Water quality measurements for selected watersheds	Turbidity < 5 NTU Temperature < 15° C	+ 10%	N/A	Will be reported on by SIT.
34.	Area and percent of total slides from harvested areas or roads	Zero as result of post-1995 activities	None	0.02 ha slide	Heavy rain on snow event resulting in a small slide.
35.	Distribution of revenues by percentage	Track distribution and report	None		
36.	Compliance with required public consultation processes	100%	None	Objective met.	
37.	Days haul wood			-----	Dropped in 2003.
38.	Maintenance of certified SFM system	Maintain SFM certification	None	Objective met.	
39.	Compliance with treaty settlements and IMAs	100%	None	Objective met.	There are no settlements or interim measure agreements in place.
40.	First Nations information sharing and referrals program	Annually review FDP with First Nations	None	Objective met.	
41.	First Nations partnership agreement	Partnership agreement in place	None	Objective met.	
42.	Public education, communications and consultation program	100% compliance to plan	None	Objective met.	

#	Indicator	2005 Objective	Acceptable Variance	2005 Result	Comments
43.	Corporate and operational research program	Programs linked to strategic ecosystem management and operational issues	N/A	Objective met.	
44.	Hectares of brush treatments by method	Minimize the use of herbicides to less than 20% of the total brushing program	None	Objective not met. 40 % of program was chemical on Cascadia DFA.	Backlog of areas requiring chemical treatment.
45.	Allocation of resources from BCCT to the development and implementation of non-herbicide alternatives specific to current herbicide uses as reported to NIWAG quarterly	Research and implementation of options that reduce the need to use herbicide within the DFA	None	Objective met.	
46.	Aboriginal employment on the DFA	6 % of employment on the Defined Forest Area to be filled by local (Hamatla) Status First Nations people.			

2006 Indicators and Objectives – Cross Reference

CAN/CSA-Z809-02 Indicators – 2006

2006 #	2005 #	2006 Indicator	2006 Objective	2006 Target	Acceptable Variance	Comments
1.	3	The percentage of the DFA productive forest that is a least 60 years old.	The representation of older forest (>60 years) remains stable over time.	36%	> 36%	
2.	26	The percentage of each Biogeoclimate unit of the DFA that is classified as Old Growth (>250 yrs).	At the landscape level, old growth representation of each BEC variant is retained.	Levels within those identified by the MoF.	Not applicable	
3.	23	The annual percent of harvested blocks that are non-clearcut.	An amount of existing stand variety is retained in harvested areas.	100%	- 5%	
4.	11	Forest inventory by age class distribution with a LRSY run.	Ensure the age class distribution minimizes any future fall down effects of the AAC.	Minimize fall down effects of the AAC.	± 5%	
5.	1	The average annual percentage representation of each tree species in the composition of second growth.	The representation of the existing native tree species in the regenerated forest remains stable over time.	± 20% of the 1997 inventory baseline.	None	
6.	2	The percentage of the mature inventory of the DFA by species.	The species mix found in the mature forest is kept similar to the historic mix.	± 20% of the 1997 inventory baseline.	None	
7.	22	The annual average % of the total area of non-clearcut openings that is retained.	Existing stand structure is retained in the Timber Zone harvested areas.	10%	> 10%	
8.	24	The average annual % of the harvested area that is within forest influence.	Forest influence is maintained throughout harvested areas.	50%	> 50%	

2006 #	2005 #	2006 Indicator	2006 Objective	2006 Target	Acceptable Variance	Comments
9.	4	The annual listing of species at risk found on the DFA and their risk status rating.	Forest Management practices do not pose a threat to the DFA forest-associated species.	The annual listing of species at risk found on the DFA does not increase and their risk status rating does not rise year over year as a result of management activities on the DFA.	None	
10.	27	The annual average percentage of the total number of trees at free growing that are from natural seed in.	Free-growing stands contain a large proportion of naturally regenerated trees.	50%	> 50%	
11.	25	The percent of identified HCV areas of the DFA that are under special management.	Identified High Conservation Value areas of the DFA are appropriately managed.	100%	None	
12.	6	The yearly percent of harvested area that is reforested within 3 years.	Harvested areas are reforested.	100%	6%	
13.	10	The annual percent of regeneration established that fails.	Harvest areas are successfully regenerated.	< 5%	+ 5%	
14.	9 & 29	Annual area of forest fires.	Area impacted by forest fires is minimized.	Zero hectares affected by operationally caused fires.	One hectare	
15.	28	The annual number of reportable spills.	To minimize the impacts on forests from reportable spills.	< 7	< 7	
16.	30	The number of areas greater than 5 ha (contiguous) in size that are at a high risk of mortality due to insects or disease.	To minimize timber loss to insect and diseases.	Zero	None	
17.	31 & 34	The annual area of ha that are affected by landslides.	To minimize the impact of harvest operations on the stability of terrain.	Zero	None	

2006 #	2005 #	2006 Indicator	2006 Objective	2006 Target	Acceptable Variance	Comments
18.	32	The annual percent of harvested openings in which soil disturbance exceeds plan.	To minimize soils degradation resulting from management activities.	Zero	None	
19.	33	The yearly 'flush', high and low water turbidity and temperature measurements for selected watersheds.	Management activities do not diminish the natural quality of the water beyond survival limits of required trout and salmonids.	Turbidity <5NTU; and Temperature <15 C.	None	
20.	8	The annual number of ha that are not compliant with their free growing commitments.	Regenerated stands meet their free growing commitments.	Zero	None	
21.	7	The annual average percent of harvested openings that is occupied by permanent access structures.	To minimize conversion of forest land into permanent access structures.	< 5%	0.5 %	
22.	14	The annual harvest levels.	Timber harvest is within the long term productive capacity of the resource base.	The annual harvest is within 50% of the AAC on an annual basis within the 5 year cut control period.	Not applicable	
23.	18	The total km of active roads within the DFA.	To retain an active road network throughout the DFA.	The total km of active road within the DFA does not decrease from year to year.	+/- 20%	
24.	17	The number of maintained recreation sites.	Recreation opportunities are maintained throughout the DFA.	The number of maintained recreation sites does not decrease from year to year.	Not applicable	
25.	16	The annual MIR.	The DFA workers operate at a high safety level with an Medical Incident Rate (MIR) of < 0.	The annual MIR is less than 2.3 in 2006.	< 2.3	

2006 #	2005 #	2006 Indicator	2006 Objective	2006 Target	Acceptable Variance	Comments
26.	40	The frequency of information sharing meetings and reviews held with First Nation representatives.	An information sharing and referral program in maintained with First Nations with interests in the DFA.	At least yearly.	Not applicable	
27.	46	To be developed.	6% of employment on the DFA to be filled by local status First Nation people.	6%	+/-5%	
28.	36	The number of signed First Nation partnership agreements in place.	Partnership agreement signed with First Nations with interest in the DFA.	The number of signed First Nation partnership agreements in place from year to year is at least one.	None	
29.	New	The annual volume of old growth cedar made available to First Nation.	Old Growth cedar continues to be available to First Nations.	The volume of old growth cedar made available to First Nation is as reasonably requested.	None	
30.	21	The 10-year average % variance between the % of annual harvested volume that is cedar and the % of the annual planted seedlings that are cedar.	Cedar is regenerated in scale with its extraction and as ecologically suitable.	Within 20% of the harvested percentage.	None	
31.	20	The percentage of PAG sector seats that have active representation.	All relevant sectors are represented on the PAG.	The percentage of PAG sector seats that have active representation is at least 90% from year to year.	None	
32.	New	The number of cases when NIWAG communication does (#yes) and/or does not (#no) occur effectively	Timely communication with NIWAG in regards to changes corporate policies, programs or initiatives.	Ratio improvement over time.	None	

2006 #	2005 #	2006 Indicator	2006 Objective	2006 Target	Acceptable Variance	Comments
33.	New	The annual total hits on the NIWAG website.	To support open communication and dialogue with the public.	Increases from year to year.	None	
34.	New	Stakeholder/First Nations participation satisfaction evaluation.	CSA public participation at this table is responsive, communicative and representative of the stakeholder and First Nations value.	Continual improvement.	None	
35.	45	Funding of applicable research projects by Cascadia.	The Unit support research in and deployment of non-herbicide alternatives.	Funding of applicable research projects by Cascadia is allocated.	None	
36.	44	The cumulative percentage of brushing activities that is done using herbicides over the term of the PMP is limited to 20%.	Vegetation Management in the DFA emphasizes non-herbicide methods.	20%	None	
37.	42	The annual percentage of the annual program elements that are fulfilled.	A continuous public education and communication program exists.	The annual % of the annual program elements that are fulfilled is 100%.	None	
38.	43	The number of active ecosystem management and operation related research projects.	There is ongoing research related to ecosystem management and operations.	The number of active ecosystem management and operation related research projects is at least one in any given year.	None	

Appendix 2

NORTH ISLAND TIMBERLANDS

2005 SFM Indicators Data Set Report – Cascadia Forest Products Ltd.

March 2006

Defined Forest Area Data Set – March 30, 2006
Indicators

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Indicator 1: Percent of primary, secondary and tertiary species (2nd growth)

This indicator measures the diversity of commercial tree species, which may be an indicator of broader biodiversity attributes.

History: This indicator was developed in 1999.

Objective: Maintain percentages of second growth species that are comparable to those in the historic baseline inventory.

Acceptable Variance: - 20%.

The 20% variance is against the inventory average derived from the DFA's 16-year database (1981-97). For example, the cumulative average percentage of Douglas fir within this time period is 14% of total second growth hectares. Thus, the cumulative total for Douglas Fir in future calculations should be between 11% and 16.8%.

Forecast: Harvest percentages are forecast in the Timber Supply Analysis and the 20 Year Plan for the TFL; and in the Strategic Timber Supply Analysis for MF 19.

Data:

Since the 1980s, the DFA forest inventory has described each second growth stand according to the area occupied by its three most prevalent commercial species. This data includes only second growth areas that have been established since 1981.

Total species percentages for these second growth stands within the DFA are calculated by multiplying species percentages by hectare for each contributing stand, summing the hectares so derived for each species, and expressing them as percentages of the total area in the data set.

In describing only the three dominant species within each stand, this data is in most cases an understatement of actual species diversity within any given stand.

Inventory: Forest inventories have been maintained for 30 to 40 years for the DFA, Block 2 of TFL 39 and Blocks 8 and 9 of MF 19. The inventory is maintained by North Island Timberlands.

Reporting: The GIS analyst compiles the data annually and reports on the indicator performance in the annual SFM Report.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

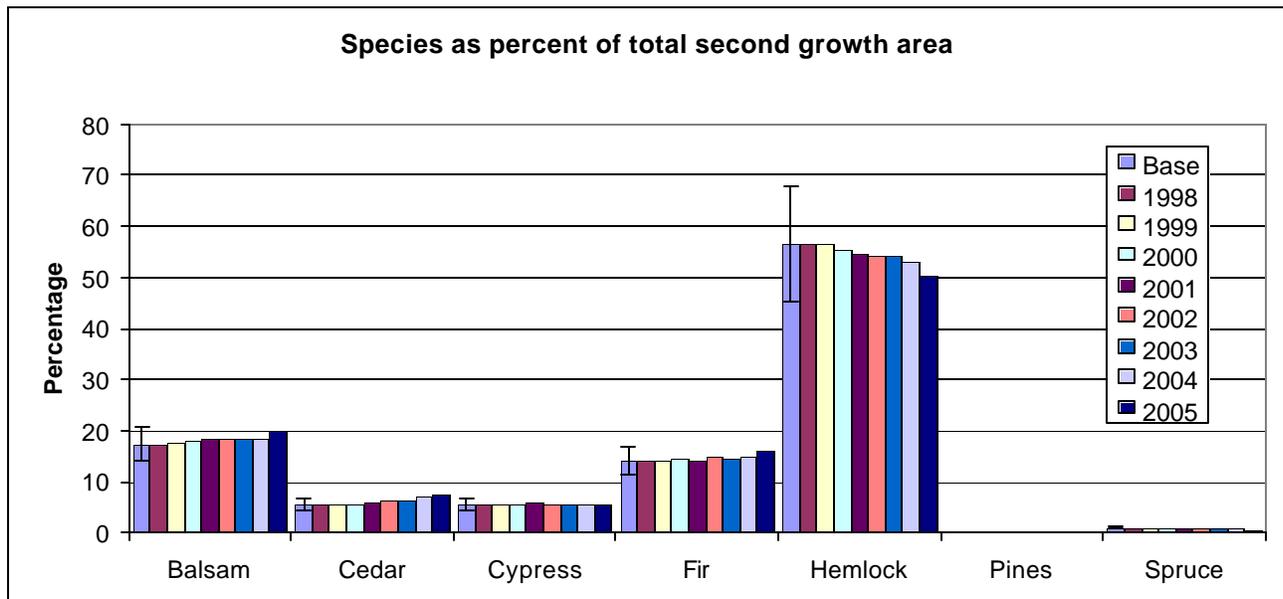
Performance:

The table below shows second growth species by area (in hectares) and the percent of total area represented by each species. The error bars on the graph following represent the $\pm 20\%$ acceptable variance.

Cumulative Years	Second growth species area and percent by the three dominant species								
	Balsam	Cedar	Cypress	Fir	Hemlock	Pine	Spruce	Total	
B A S E	1981-97	4,571	1,492	1,453	3,675	14,854	26	240	26,309
	Percent	17.4	5.7	5.5	14.0	56.5	0.1	0.9	100.0
	Variance: + 20% is	20.8	6.8	6.6	16.8	67.8	0.1	1.1	N/A
	- 20% is	13.9	4.5	4.4	11.1	45.1	0.1	0.7	
1998	4,772	1,493	1,535	3,835	15,584	15	235	27,472	
Percent	17.4	5.4	5.6	14.0	56.7	0.1	0.9	100.0	
1999	5,080	1,562	1,579	4,046	16,247	16	238	28,766	
Percent	17.7	5.4	5.5	14.1	56.5	0.1	0.8	100.0	
2000	5,509	1,717	1,698	4,509	17,115	16	256	30,821	
Percent	17.9	5.6	5.5	14.6	55.5	0.1	0.8	100.0	
2001	5,822	1,869	1,859	4,463	17,291	16	253	31,573	
Percent	18.4	5.9	5.9	14.1	54.8	0.1	0.8	100.0	
2002	6,046	2,060	1,891	4,924	18,052	18	271	33,262	
Percent	18.2	6.2	5.7	14.8	54.3	0.1	0.8	100.0	
2003	6,592	2,312	2,005	5,199	19,430	19	299	35,856	
Percent	18.4	6.4	5.6	14.5	54.2	0.1	0.8	100.0	
2004	7,021	2,629	2,121	5,693	20,065	20	295	37,845	
Percent	18.6	7.0	5.6	15.0	53.0	0.1	0.8	100.0	
2005	6,655	2,532	1,866	5,314	16,837	24	222	33,450	
Percent	19.9	7.6	5.6	15.9	50.3	0.1	0.7	100.0	

This indicator has been recompiled using NAD83 base map data.

Areas without species data have been calculated using the species percentage pre-harvesting by year, except areas which have been planted in which case percent of species planted were used.



Indicator 2: Gross volume by species of mature forest

Diversity of tree species may be an indicator of broader biodiversity attributes.

History: This indicator was developed in 1999.

Objective: Maintain percentages of mature species that are comparable to those in the historic baseline inventory.

Acceptable Variance: - 20% within a species.

The 20% variance is against the percentages of total volume by species as set forth in inventory data at December 31, 1997.

Forecast: Harvest percentages are forecast in the Timber Supply Analysis and the 20 Year Plan for the TFL; and in the Strategic Timber Supply Analysis for MF 19.

Data:

“Mature” is defined here as forest areas established before 1864. In this instance it also includes “old growth,” which is described in most MoF publications as older than 250 years for coastal forests. Gross volumes (which include a volume reduction for estimated decay) for the seven coniferous species within this category are established by timber cruises.

Inventory: There are 30 to 40 years of historic data maintained by the GIS analyst in Nanaimo. Volumes are updated with each inventory revision, usually on an annual basis.

Reporting: The GIS analyst compiles the data annually and reports on the indicator performance in the annual SFM Report.

Note: In reference to the Pine and Spruce, the percentages are insignificant and not visible on the ground and will not be a concern for compliance.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

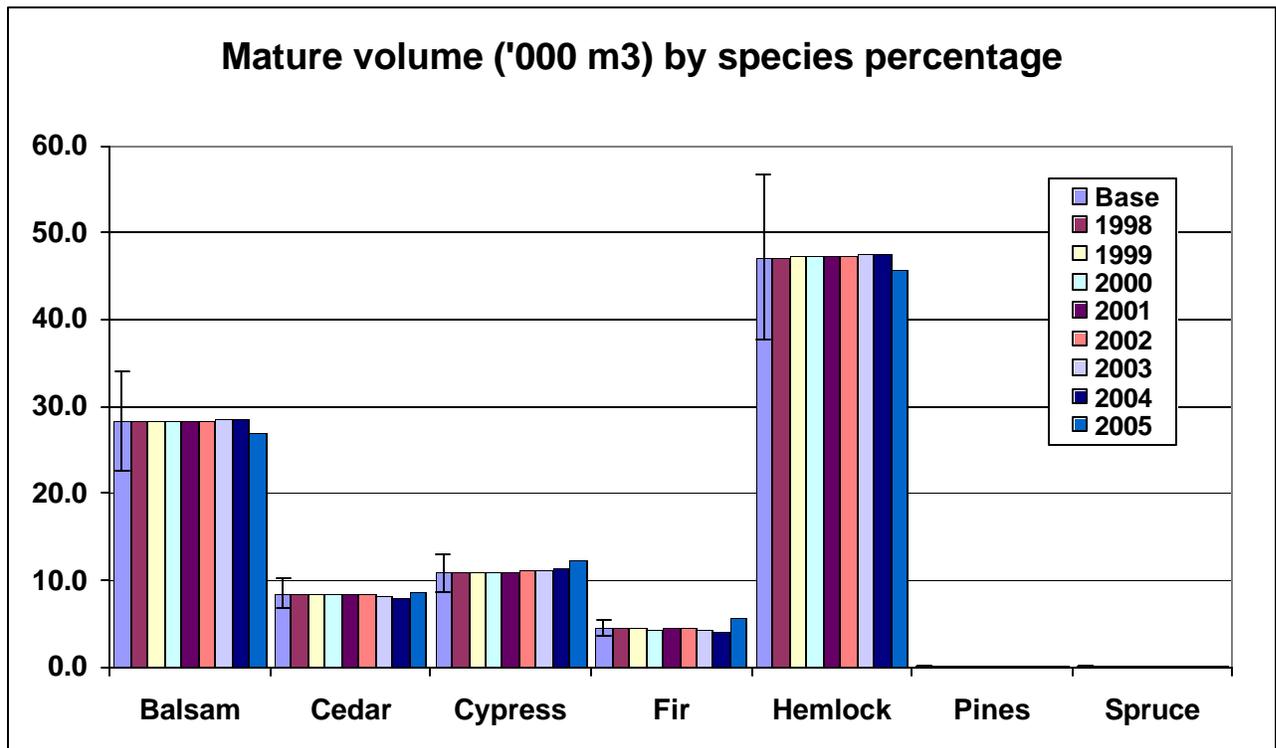
Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

The table below shows mature volume (in m³) by species and the percent of total mature volume that figure represents. All species are being retained within the ± 20% variance from 1997 base. The error bars on the graph following represent the ± 20% acceptable variance.

Mature Volume (000m³) by Species

Cumulative Years	Species								
	Balsam	Cedar	Cypress	Fir	Hemlock	Pines	Spruce	Total	
B A S E	1997	20,313	6,117	7,788	3,265	33,839	112	176	71,647
	Percent	28.4	8.5	10.9	4.6	47.2	0.2	0.2	100
	Variance								
	+ 20%	34.1	10.2	13.1	5.5	56.6	0.2	0.2	N/A
-20%	22.7	6.8	8.6	3.7	37.8	0.2	0.2		
1998	20,113	6,060	7,733	3,218	33,507	108	176	70,953	
Percent	28.3	8.5	10.9	4.5	47.2	0.2	0.2	100	
1999	19,850	5,940	7,632	3,118	33,077	106	172	69,934	
Percent	28.4	8.5	10.9	4.5	47.3	0.2	0.2	100.0	
2000	19,447	5,799	7,518	3,037	32,452	105	173	68,568	
Percent	28.4	8.5	11.0	4.4	47.3	0.2	0.2	100	
2001	18,922	5,636	7,381	2,982	31,688	103	173	66,922	
Percent	28.3	8.4	11.0	4.5	47.4	0.2	0.2	100	
2002	18,790	5,568	7,361	2,959	31,406	103	168	66,389	
Percent	28.3	8.4	11.1	4.5	47.3	0.2	0.2	100	
2003	18,283	5,289	7,209	2,729	30,471	72	152	64,206	
Percent	28.5	8.2	11.2	4.3	47.5	0.1	0.2	100	
2004	17,629	5,006	7,062	2,565	29,409	69	151	61,891	
Percent	28.5	8.1	11.4	4.1	47.5	0.1	0.2	100	
2005	11,707	3,794	5,332	2,430	19,721	68	79	43,131	
Percent	27.1	8.8	12.4	5.6	45.7	0.2	0.2	100	



Indicator 3: Percent of productive forest area more than 60 years old

Forest age may be an indicator of broader biodiversity attributes. The 60-year age category is selected as a significant indicator because it is the minimum age at which management treatments can begin to create the structural elements that support old growth biodiversity.

History: This indicator was developed in 1999.

Objective: Maintain a minimum of 36% forest area greater than 60 years of age.

Acceptable Variance: 36% or greater.

The 36% minimum percentage is a reference to the productive forest area and does not include forests outside that area. Those so-called "non-productive" forests constitute some 14% of the DFA's total forest area and are typically more than 150 years of age.

Forecasts: Age class distributions are forecast through the Timber Supply Analysis. Future forecast methodology for MP 8 will incorporate Forest Project targets for stand level retention.

Data:

Inventory: Forest inventories for TFL 39, Block 2, MF 19, Blocks 8 and 9 and MF 21 are maintained on an ongoing basis by North Island Timberlands.

Reporting: North Island Timberlands reports on this indicator annually. Data will also be reported in inventory update summaries, Management Plan summaries and the Forest Project Analysis. The GIS analyst compiles the data annually and reports on the indicator performance in the annual SFM Report.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

The DFA's forests remain well within the objective.

Year	Age (by pct of productive forest area)	
	> 60 Years	> 150 Years
1997	58.7	51.8
1999	55.3	50.2
2000	55.3	50.0
2001	54.8	49.4
2002	53.1	47.7
2003	52.5	47.3
2004	51.1	45.8
2005	46.7	40.6

Indicator 4: Number of identified species at risk

Sustaining viable populations of extant species is a key requirement of sustainability.

History: This indicator was developed in 1999.

Objective: Zero annual increase in number of species at risk and not increase the level of threat as a result of management activities in the DFA.

Acceptable Variance: None.

Forecast: MoWLAP is responsible for forecasting.

Data:

The provincial Conservation Data Centre (<http://srmwww.gov.bc.ca/cdc>) is responsible for identifying red and blue listed species extant within specific ecosections of each Forest District. Procedures and measures for protecting red listed species, in particular, are set out in the Identified Wildlife requirements of the Forest Practices Code.

Reporting: The Division Forester reports on the indicator performance in the annual SFM Report, based on review by R.P. Bio.

Note:

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Year	Latest CDC list reviewed	Date reviewed	New species listed		MoWLAP requests
			Number	Listing linked to DFA management	
1999	Aug 17, 1999	June 4, 2000	0	N/A	No
2000	June 2000	Feb. 28, 2001	2	No	No
2001	April 2001	Feb. 2002	5	No	No
2002	R.T. McLaughlin, R.P. Bio.	Nov. 25, 2002	0	N/A	No
2003	R.T. McLaughlin, R.P. Bio.	Dec. 16, 2003	1	No	No
2004	R.T. McLaughlin, R.P. Bio.	Mar. 15, 2005	0	N/A	No
2005	R.T. McLaughlin, R.P. Bio.	Mar. 17, 2006	0	N/A	No

See binder in NIWAG Library.

Indicator 5: Percent of seed that is registered or certified

The origin of seed from which planted seedlings are grown is an indicator that individuals that may not be adaptable to the local provenance are not compromising the genetic diversity of new forests.

The MoF maintains the provincial seed registry and produces an annual report. The registration process ensures that seed zone guidelines are met and that each seed lot includes a minimum requirement for population diversity.

Certification applies to seed produced from a seed orchard. It documents the management of the seed orchard including the design and layout of the clones and parents that have contributed to the seed lot.

History: This indicator was developed in 1999, dropped in 2004.

Objective: 100% of seed used in reforestation is registered or certified.

The MoF requires that all seed used on Crown land is registered. North Island also follows this practice for seed destined for reforestation of private land. Some seed used on private land is registered from Weyerhaeuser's seed orchard.

Acceptable Variance: None.

Forecast: N/A

Data:

The DFA Data Set includes examples from the seed registry and the Weyerhaeuser seed inventory (by seed lot number) in May of 1998.

The stock inventory summary shows all the seedling (stock) requests for planting in the late summer/fall (SU for summer under the heading of Seas) and in the spring of 1999 (SP for spring under the heading of Seas).

The Seedlot/Elev column shows the seedlot registration number and the elevation level (the seedlings may be planted in an elevation band about this height – the width of the elevation band varies with species).

The other columns include:

Nur:	Nursery
SPP:	Species – e.g. BA is Abies amabilis, CW is red cedar, FDC is Douglas fir, HM is mountain hemlock, HW is western hemlock and YC is yellow cypress.
Age:	The number indicates the age of the seedling (most are one year old in this summary) and whether it has been transplanted.
Type:	E.g. PSB – plug styro block.
Size:	Container cavity size.
Trees:	Numbers in thousands.

The reforestation records for each planted area include the seedlot registration number(s).

Inventory: The province maintains the provincial seed registry. The seed inventory for the DFA is also maintained by Nanaimo Woodlands and reported to MoF. The Silviculture Forester maintains a copy of the stock inventory.

Reporting: The Seed Planning and Registry System is maintained by the MoF, and an annual report is produced. Weyerhaeuser keeps a register of their seed orchard seed.

Performance:

Year	Percent of seed that is registered or certified
1999	100
2000	100
2001	100
2002	100
2003	100
2004	100*

* Indicator will not be reported on going forward from 2004.

Indicator 6: Percent of harvested area that is reforested

Prompt reforestation is required on all harvested land. This indicator examines the promptness of reforestation, as described below. It indicates utilization of the productive forest area of the DFA.

History: This indicator was developed in 1999.

Objective: Reforest 100% of the harvested area within 3 years from harvest.

Acceptable Variance: 6 %

Forecast: The Timber Supply Analysis incorporates the 3-year target.

Data:

Recent timber supply analyses have included an assumption of a three-year regeneration delay. The reduction in average regeneration delay during recent years is largely because of more prompt planting after harvest.

The objective is expressed as the number of hectares of NSR greater than three years old and the percentage of this area of total NSR.

Inventory: The Silviculture Forester tracks unstocked areas in the Genus database.

Reporting: The Silviculture Forester compiles the data from the Genus database and reports on the indicator performance in the annual SFM Report.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Year	Area of NSR > 3 years from harvest	Total NSR	% of area > 3 years as a % of total NSR
2000	129 hectares	2,180 hectares	6%
2001	131 hectares	3,172 hectares	4%
2002	434 hectares	3,880 hectares	11%
2003	274 hectares	3,893 hectares	7%
2004	156 hectares	3,948 hectares	4%
2005	114 hectares	2,703 hectares	4%

Indicator 7: Percent of opening area occupied by permanent access structures

This indicator measures the proportion of harvest areas that is removed from the productive forest area because of permanent access structures (roads, landings, etc.). It indicates the reduction in the potential productive area and the increased risk or potential for environmental impact, particularly sedimentation of streams.

History: This indicator was developed in 1999.

Objective: Less than 5% of the area in openings to be in permanent access structures (annual average).
 This objective reflects the Forest Practices Code – Soil Conservation Guidebook standards.

Acceptable Variance: + 0.5% (i.e. less than 5.5% of the area in openings).

Forecast: The forecast is the objective.

Data:

Inventory: The Genus database produces a site degradation report for blocks where logging has been completed.

Reporting: The Division Forester tracks and reports on the indicator performance in the annual SFM Report.

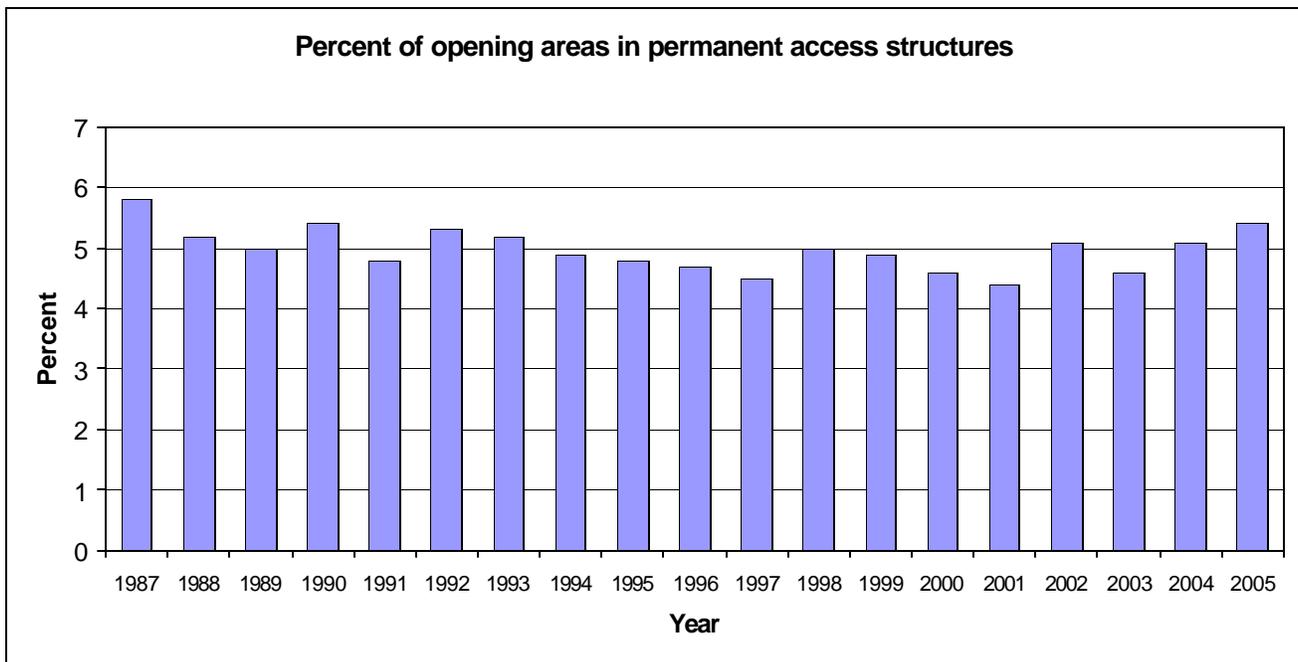
Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

5.4 %. Objective achieved.



Indicator 8: Area that does not meet 'free growing' commitments

This indicator measures the success at achieving free growing targets defined in Silviculture Prescriptions and Site Plans. It provides indications of regeneration success, of utilization of the productive area and of maintaining forest ecosystems on the DFA.

History: This indicator was developed in 1999.

Objective: Zero hectares of free growing non-compliance.

This objective reflects requirements of the Forest Practices Code of BC.

Acceptable Variance: 0 %

Forecast: The Timber Supply Analysis assumes the objective level is met.

Data:

Inventory: The Genus database lists free growing commitments by standard unit within an opening.

Reporting : The Division Forester tracks and reports compliance with FG obligations in the annual SFM Report.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Free Growing Non-Compliance				
Year	Openings/SUs	Hectares	Total hectares due	Non-compliant
1998	0	0.0	0.0	0.0 %
1999	2	17.6	236.8	7.4 %
2000	5	59.0	281.5	20.9 %
2001	12	62.0	735.2	8.4 %
2002	13	51.2	1,815.0	2.8 %
2003	1	46.2	2,054.0	2.0 %
2004	2 (SUs)	16.0	1,123.0	1.4 %
2005	0	0.0	1,404.9	0.0 %

Indicator 9: Number and area of accidental operationally caused fires

This indicator provides a measure of success at protecting the forest from damage by fire. Operationally caused fires are those that are initiated by management activities (e.g. operational or escaped slash fires).

History: This indicator was developed in 1999.

Objective: Zero accidental operationally caused fires.

Acceptable Variance: One per year. This variance is based on historical data.

Forecast: The objective is the forecast. This is assumed to be zero in the Management Plan forecasts. A small allowance for non-recovered timber from fire has been included in recent timber supply analyses.

Data:

The Division Forester reports annually on the incidence and cause of fires and on the area burned. This includes fires resulting from operational activities. A historical record is available for TFL 39 areas. For MF 19 areas, tracking and reporting commenced in 1997.

Inventory: Fires are reported for entry into the Incident Tracking System (ITS).

Reporting: The Division Forester compiles the data from the ITS and reports on the indicator performance in the annual SFM.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Accidental Operational Fires

Year	Number	Total area burned (ha)
1983	1	
1984	2	
1985	2	
1986	1	
1987	4	
1988	3	
1989	0	
1990	1	
1991	1	
1992	1	
1993	3	
1994	7	
1995	8	
1996	1	
1997	2	
1998	1	2
1999	1	22
2000	1	0.01
2001	2	0.02
	1	0.01 public
2002	1	0.1
2003	0	
2004	0	
2005	0	

Indicator 10: Area of regeneration failures

This indicator measures the area of regeneration failure as a percentage of areas established (both by planting and naturally) each year. It is an indication of regeneration success and of utilization of the DFA's productive area.

History: This indicator was developed in 1999.

Objective: Current regeneration failure is less than 5% of the current area established.

Acceptable Variance: 5 %

Forecast: Assumed to be zero in the planting forecast prepared by the division and the Management Plan forecast.

Data:

Regeneration failures may also result in changes in the inventory update, a change in a polygon description from stocked to NSR.

Inventory: The area reforested and the area that fails a survival or regeneration performance assessment is tracked in the Genus database.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Year	Area established - ha (planted and natural)	Area of regen failures (ha)	Failed area as percent of established area	Comment
1980	1,691	208	11.0	
1981	2,617	204	7.8	
1982	2,061	0	0	
1983	1,352	152	11.2	
1984	1,301	416	32.0	
1985	1,257	96	7.6	
1986	1,462	140	9.6	
1987	2,278	61	2.7	
1988	2,278	134	5.9	
1989	2,188	68	3.1	
1990	1,704	28	1.6	
1991	2,105	287	13.6	
1992	2,544	96	3.8	
1993	1,687	51	3.0	
1994	2,345	56	2.4	
1995	1,852	221	11.9	
1996	1,875	94	5.0	
1997	1,554	93	6.0	
1998	1,448	18	1.2	
1999	1,195	130	10.9	
2000	1,500	133	8.9	
2001	1,639	48	2.9	
2002	1,640	214	13.0	
2003	1,525	44	2.9	
2004	2,172	136	6.3	Browse/Brush/Drought
2005	1,639	210	12.9	51% stock failure 49% browse

Indicator 11: Forest age class distribution

Age class distribution is an indicator of sustainability for ecological, social and economic considerations.

History: This indicator was developed in 1999.

Objective: Historically implicit in AAC and being redefined as part of BC Coastal Group Forest Project.

Acceptable Variance: N/A.

Forecast: Age class distributions are forecast as part of the Timber Supply Analysis.

Data:

Forest management in BC has proceeded in recent decades with the objective of converting the public forest from predominantly old growth to one with a large component of protected old growth and a commercially-accessible remainder distributed primarily among age classes up to the age of rotation.

The primary instrument of this conversion has been the Annual Allowable Cut allocations established by the province's Chief Forester with consideration for various objectives.

In June 1998, the BC Coastal Group (then MacMillan Bloedel) announced its intention to pursue a new direction with respect to forest management practices on its public and private lands. Many aspects of this new approach on crown land are subject to discussions with and approval of the provincial government. The outcome of those discussions may result in significant revisions to the objectives driving future AAC determinations.

Inventory: Nanaimo Woodlands Inventory Section maintains 30 to 40 years of historic data on age class distribution by area for total productive forest lands. This is updated generally on an annual basis. This data is located in Forest Inventory for TFL Block 2 and Forest Inventory for MF Blocks 8 and 9.

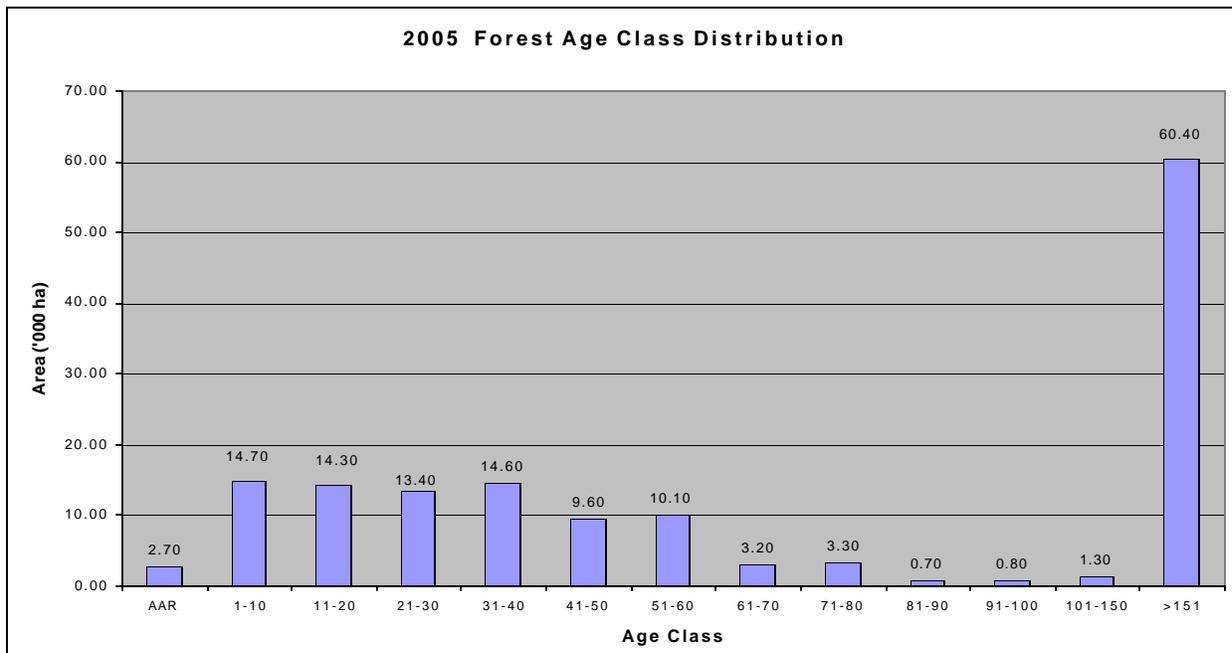
Reporting: The GIS analyst compiles the data annually and reports on the indicator performance in the annual SFM Report.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:



Indicator 12: Area of water bodies

This indicator measures the area of lakes, wetlands and large streams in the DFA. It provides an indication of the impact of forest management on water resources.

History:	This indicator was developed in 1999.
Objective:	No change in area of water bodies.
Acceptable Variance:	None.
Forecast:	No change in area is projected.

Data:

Changes in mapping standards and in boundaries make historical comparisons difficult. Reporting was standardized in 1999 for future inventory updates.

Inventory: The Inventory Section reports (at the 1:20,000 scale) on the area of lakes, wetlands and large streams at each inventory update. This includes the inventory summaries in the TFL and MF Management Plans.

Reporting: The data is reported annually in the Forestry Inventory Revisions Report, the Management Plan and the DFA Data Set. The GIS Analyst compiles the data annually and reports on the indicator performance in the annual SFM Report.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

- 2002 – 3,177 hectares.
- 2003 – 3,177 hectares.
- 2004 – 3,177 hectares.
- 2005 – 2,794 hectares.

Indicator 13: Area sold out of the DFA – not applicable to Crown Land.

This indicator measures the privately owned forest land that may be transferred to another use.

History: This indicator was developed in 1999.

Objective: Zero sales of land from MF 19.

The North Island objective is to retain forest land in forest production.

Acceptable Variance: Zero forest land removed from production.

Forecast: Timberlands and Properties department and Nanaimo Woodlands are responsible for future projections. The Timber Supply Analysis assumes that no land will be sold.

Data:

Inventory: The Timberlands and Properties department tracks all land transfers. The Nanaimo Woodlands Inventory Section is responsible for updating the forest inventory, usually on an annual basis.

Reporting: The data is reported annually in the Forestry Inventory Revisions Report, the Management Plan and the DFA Data Set. The Division Forester will monitor and report on sales within the DFA.

Note:

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Year	Ha Sold	Comment
1998	78.9	District Lot 38 [78.9 ha] in Discovery Passage was removed and sold in 1998. This is waterfront property and was part of a small block that was isolated from the rest of the DFA.
1999	4.5	A small area [4.5 ha] of industrial land [the Campbell River Marine lease] was removed from MF 19 in 1999.
2000	0	In 1998, CEO Tom Stephens approved a land sales program that included a 169-hectare parcel in the Oyster Bay area. This area is currently for sale.
2001	0	In 1998, CEO Tom Stephens approved a land sales program that included a 169-hectare parcel in the Oyster Bay area. This area is currently for sale.
2002	0	In 1998, CEO Tom Stephens approved a land sales program that included a 169-hectare parcel in the Oyster Bay area. This area is currently for sale. Currently the Kelsey Bay Dryland Sort and Shop Yard are for sale.
2003	169	Sold parcel in Oyster Bay area.
2004	0	

Indicator 14: Annual harvest level

This indicator compares actual timber harvest with harvest targets. It provides an indication of sustainability and of contribution to the local and provincial economies. The area harvested also impacts the availability of other commercial and non-commercial forest products.

History:	This indicator was developed in 1999.
Objective:	For the TFL: Harvest the Allowable Annual Cut (AAC) allocation over the 5 year cut control period. For MF 19: Achieve the annual plan (318,544 m ³ for 2004).
Acceptable Variance:	For the TFL: $\pm 50\%$ of AAC on annual basis, and $\pm 10\%$ over the five year cut control period. For MF 19: $\pm 20\%$ on the annual plan.
Forecast:	The Timber Supply Analysis for the TFL and Strategic Timber Supply analysis for MF Blocks 8 and 9 forecast the harvest level.

Data:

The TFL AAC is determined every five years by the BC Chief Forester. The Vice President of BCCT determines the MF 19 plan harvest.

Inventory: Over 20 years of historic data for the DFA is maintained by the Solid Wood Inventory Section, located in the MoF Harvest database.

Reporting: Harvest volumes are reported annually in "Official MoF Scale Report and Weyerhaeuser Timberlands Units Production". The TFL 39, Block 2 harvest is also reported in the TFL 39 Annual Report and MF 19 harvest is reported in the Annual BCAA Report.

Harvest estimates for both the TFL and MF are from official MoF scale reports.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

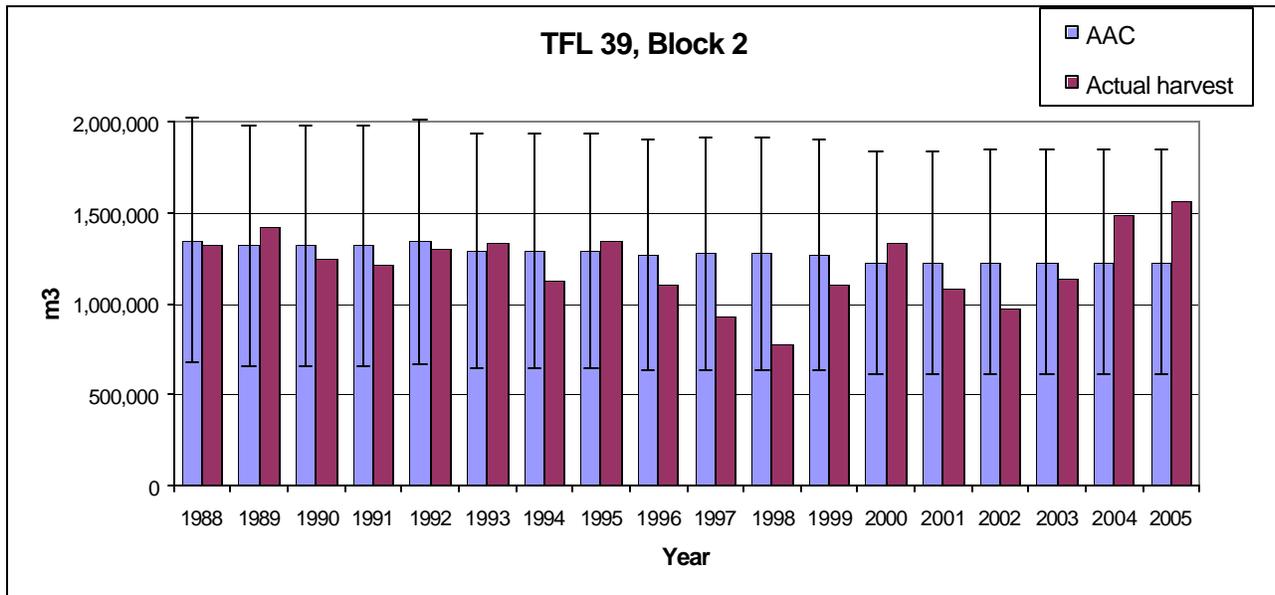
TFL 39, Block 2:

The AAC and harvest numbers exclude the SBFEP and the one mile reserve (from 1988 to 1991) allocations and cut. They include residue. The error bars on the graph below represent the $\pm 50\%$ acceptable variance.

Year	MF 19			TFL 39 Block 2			Total (includes residue)		
	Forecast	Actual	%	AAC	Cut	%	Plan	Cut	%
1996	115,000	110,000	95	1,271,900	1,110,190	87	1,386,900	1,220,190	88
1997	114,000	158,856	139	1,276,346	932,125	73	1,390,346	1,090,981	78
1998	200,000	218,220	109	1,276,346	770,941	60	1,476,346	989,161	67
1999	200,000	238,671	119	1,269,162	1,102,437	87	1,467,605	1,341,108	91
2000	153,200	181,601	118	1,223,902	1,337,240	109	1,377,102	1,518,841	110
2001	200,000	214,752	107	1,223,902	1,089,045	89	1,423,902	1,303,797	92
2002	200,000	212,235	107	1,229,411	977,354	79	1,429,411	1,189,589	83
2003	196,168	216,948	110	1,229,411	1,133,882*	92	1,425,575	1,350,830	95
2004	318,544	306,756	96	1,229,411	1,487,346*	121	1,547,955	1,794,102	116
2005				1,229,411	1,564,965	127			

The five year cut control period (1996-2000) for Block 2 resulted in 83% of the AAC being cut (includes residue).

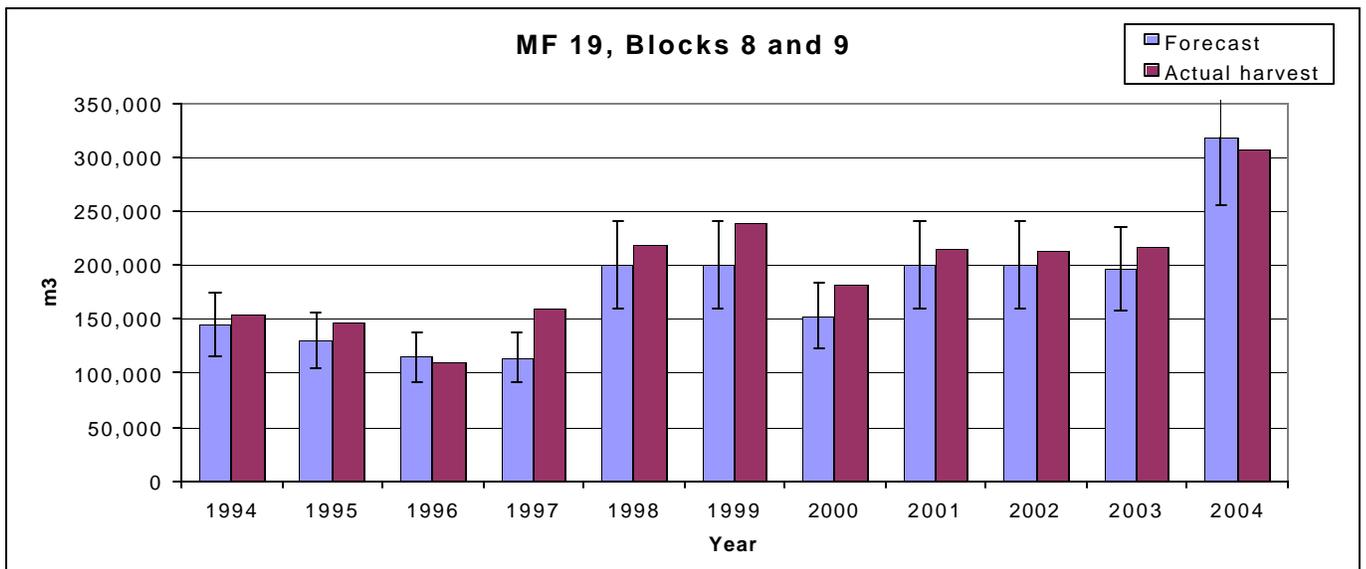
* Difficulties with the MoF system did not account for all volume that was billed in the official cut control report. This volume (> 100,000 m³ – predominately volume from road permits) will be included in the 2005 cut control report. Residue samples completed late in 2004 will also be included in the 2005 report.



MF 19, Blocks 8 and 9:

The MF 19 plan and harvest numbers exclude residue (water scale).

The intent is to harvest the DFA for long term sustainability, allowing year to year variations in harvest rates. Plan estimates for MF 19, Blocks 8 and 9, originally totaled 150,000 m³ for 1998 but were increased to 200,000 m³ because of poor market conditions and high costs on crown lands (TFL). The error bars on the graph below represent the ± 20% acceptable variance.



Indicator 15: North Island Timberlands margin

This indicator measures the difference between the average selling price and average costs for North Island Timberlands, including activities on both public and private lands. It provides an indication of the profitability of the operation and, implicitly, its economic contributions to the local and provincial economies.

History: This indicator was developed in 1999.

Objective: There was no objective set for 2004.

This indicator was not reported on due to Brascan takeover. It may be appended post-takeover.

Acceptable Variance: At least 100% of the previous year.

Forecast: The Vice President of Timberlands sets the annual target for each operation.

Data:

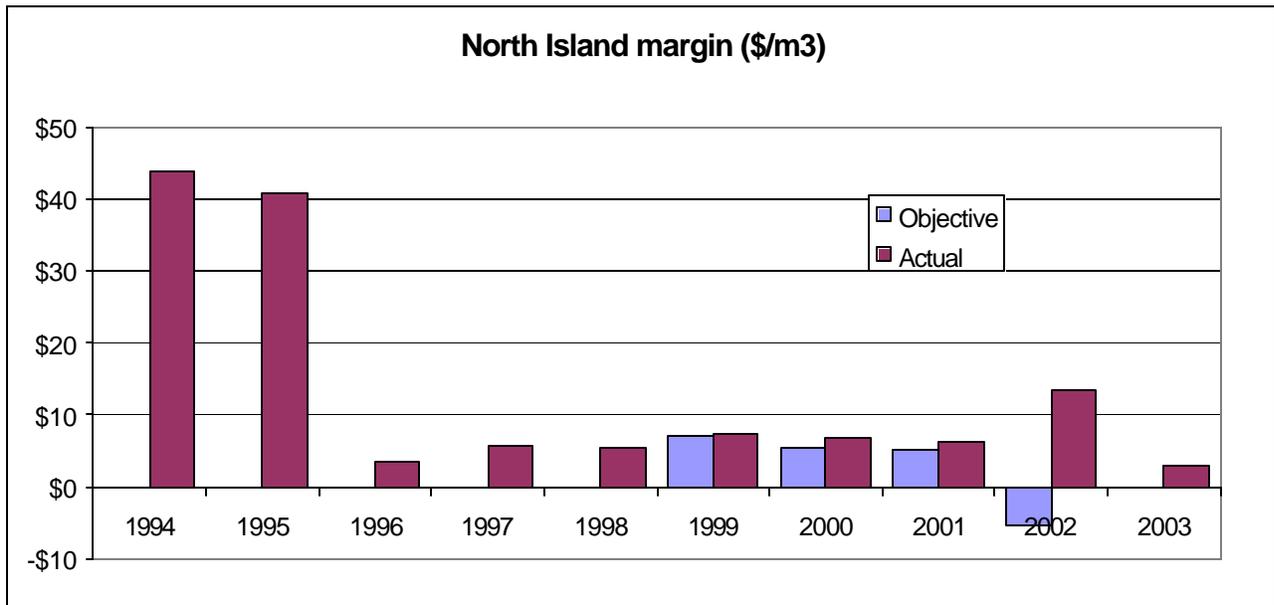
From 2003 forward, margin will be calculated using the production profit for crown land plus earnings for private land prorated $\$/m^3$.

Inventory: The Decision Support Analyst tracks and reports this indicator.

Reporting: Data on this indicator is reported in the Division Financial Statement.

Performance:

North Island actual margin was $\$2.83$ per m^3 for 2003 (used production profit for crown and earnings for private land).



Indicator 16: Medical Incident Rate (MIR)

This indicator measures the number of incidents per 100 workers that require a doctor’s medical attention or result in lost work time. It provides an indication of the level of North Island Timberlands’ commitment to safe working conditions for employees.

History: This indicator was developed in 1999.

Objective: 2.3 MIR for combined Weyerhaeuser/Cascadia company crews and contractors.crews.

The objective is based on continual improvement and takes into consideration the historic performance of the Division and Weyerhaeuser/Cascadia corporate commitments.

Acceptable Variance: Less than or equal to the objective.

Forecast: The corporate objective is to improve the safety performance over time to have an MIR of zero.

Data:

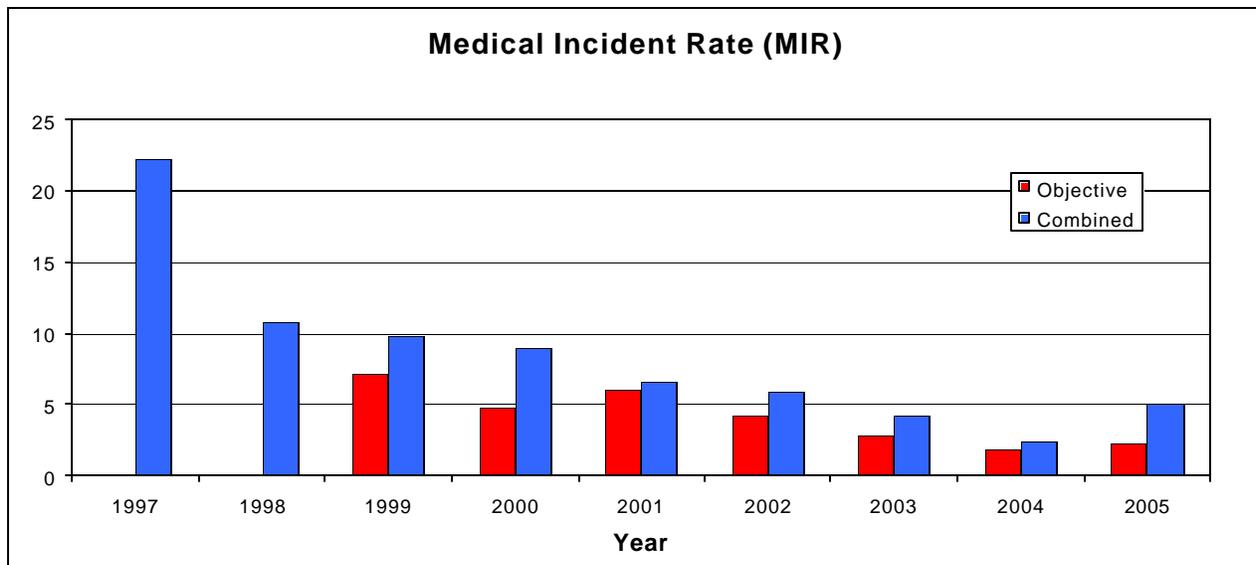
Inventory: North Island Timberlands collects information on all recordable incidents.

Reporting: The Financial Manager reports the indicator as part of the monthly financial statement.

Performance:

2005:

- 5.1 MIR – Cascadia company crews and contractor crews.



Indicator 17: Number of recreation sites maintained

This indicator tracks the number of recreation sites (trails, campgrounds) maintained by North Island Timberlands. The indicator provides a measure of North Island's continued commitment to supporting some of the non-timber values on the DFA.

History: This indicator was developed in 1999.

Objective: Continue the maintenance of existing sites.

The objective is to ensure that existing recreation sites continue to be maintained going forward.

Acceptable Variance: None.

Forecast: Assumes same number of sites.

Data:

Inventory: The Division Forester is responsible for maintaining recreation sites in the DFA. This includes tracking and reporting on the sites.

Reporting: The Division Forester reports on the indicator performance in the annual SFM Report.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Year	Sites	Sites Maintained	Sites
1996	2	2	
1997	4	4	
1998	4	4	
1999	4	4	
2000	5	5	Montague Creek, Lower Tsitika Crossing, Junction Pool, Dalrymple Creek, Wowo Lake
2001	5	5	Montague Creek, Lower Tsitika Crossing, Junction Pool, Dalrymple Creek, Wowo Lake
2002	5	5	Montague Creek, Lower Tsitika Crossing, Junction Pool, Dalrymple Creek, Wowo Lake
2003	6	6	Montague Creek, Lower Tsitika Crossing, Junction Pool, Dalrymple Creek, Sgt. Randally, Wowo Lake
2004	6	6	Montague Creek, Lower Tsitika Crossing, Junction Pool, Dalrymple Creek, Sgt. Randally, Wowo Lake
2005	3	3	Sgt. Randally and rustic sites at Stewart and Tlowlis Lake. Previous year's sites are part of BCTS and Island Timberlands.

Indicator 18: Kilometers of active road

This indicator estimates the length of roads in the DFA, including both maintained and non-maintained roads. Retaining a “balance” of roads is important for access for forest management, recreation and other resource uses while maintaining as much land in productive use as possible. Roads are added as new areas are developed and in some areas roads are removed through debuilding. Other roads that are not required for a period, are deactivated to minimize the risk of environmental damage.

History: This indicator was developed in 1999.

Objective: Retain the active road network.

The objective is to effectively manage the active road network resulting in little change in its size.

Acceptable Variance: $\pm 20\%$

Forecast: This indicator is forecast in the Management Plan.

Data:

Inventory: Data on the active road network (maintained and non-maintained roads) is maintained at a 1:20,000 scale at North Island in the Geographic Information System (GIS).

Reporting: The GIS Technician compiles the data from the GENUS System and reports on the indicator performance in the annual SFM Report. North Island also prepares an annual report on road development, summarized by the Inventory Section in the TFL 39 Annual Report.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Year	Kilometers			Comment
	Maintained	Non-maintained	Total	
1997	1,566	1,718	3,284	NAD 27 map projection
2000	1,623	2,240	3,863	NAD 83 map projection
2001	1,751	2,396	4,147	NAD 83 map projection
2002	1,843	2,313	4,156	NAD 83 map projection
2003	1,950	2,304	4,254	46% maintained
2004	2,105	2,304	4,384	48% maintained
2005	1,879	1,887	3,766	50% maintained

Indicator 19: FPC contraventions related to road, soil and water management

This indicator tracks the number of legislative non-compliance incidents on the DFA relating to road construction, soil and water. It provides a measurement, in particular, of the extent to which North Island Timberlands is effectively managing its road building practices and mitigating the potential effect of its operations on soil and water.

History: This indicator was developed in 1999.

Objective: Zero

The North Island objective is to be in legislative compliance and, therefore, to have no contraventions.

Acceptable Variance: None

Forecast: The forecast is the objective.

Data:

Contraventions are reported in ITS and MoF Compliance Reports. Contraventions are entered and tracked in ITS at the division level.

Performance:

Year	Number of FPC contraventions	# of FPC determinations
1999	2	1 (1997)
2000	0	1 (1999)
2001	0	0
2002	1	1
2003	0	0
2004	0	0
2005	0	0

Indicator 20: Advisory group active membership

This indicator tracks the active functioning of the North Island Woodlands Advisory Group (NIWAG). It provides one indication of the relative success of an ongoing mechanism to allow for meaningful input from all sectors of the local community into SFM planning on the DFA.

History: This indicator was developed in 1999.

Objective: All sectors are represented.

Acceptable Variance: None

Any change in membership numbers must be assessed and remedied if it creates an effective gap in the adequacy of representation of the various interests on the DFA.

Forecast: Terms of Reference for the advisory group.

Data:

Inventory: The Division Forester is responsible for supporting and monitoring participation in the advisory group. There is a membership list and Terms of Reference for the advisory group.

Reporting: Minutes are recorded for each meeting that include attendance. The NIWAG membership list is maintained by the NIWAG facilitator and posted on North Island Timberlands intranet site.

Performance:

Sector	NIWAG Membership at end of							
	1998	1999	2000	2001	2002	2003	2004	2005
Fish and Game Club	1	1	1	1	1	1	1	1
First Nations	2	1	1	1	1	1	1	1
Ministry of Forests	1	1	1	1	1	1	1	1
District of Campbell River	1	1	1	1	1	1	1	1
Education/Youth	0	0	1	0	1	1	1	1
Contractor	1	1	1	1	1	1	0	0
Supplier	1	1	1	1	1	1	0	1
Village of Sayward	1	1	1	1	1	1	1	1
Regional District	1	1	1	1	0	1	1	1
Environmental Council	1	1	1	1	1	1	1	1
Member at Large	0	0	1	1	1	1	1	0
Labour	1	1	1	1	1	1	1	1
Chamber of Commerce	1	1	1	1	1	1	1	1
Senior	0	0	0	0	1	1	1	1
Total Sectors	12	11	13	12	13	14	12	12

Indicator 21: Planting by species (compared to harvest)

This indicator tracks the planting of species (specifically Western Redcedar) relative to the proportions removed in harvest. The objective is to ensure a sustained supply of WRC over time. Old growth cedar has traditional, cultural and ceremonial uses for First Nations.

History: This indicator was developed in 1999.

Objective: Plant cedar in proportion to cedar harvest (average over a 10-year period).

Acceptable Variance: $\pm 20\%$ of harvested cedar.

Forecast: Silviculture Plans and Harvest Plans forecast the planting and harvest.

Data:

Planting of cedar is compared to harvest of cedar over an 10-year period to avoid year to year fluctuations that can occur and to average the delay that occurs between harvest and stocking.

Number of stems planted vs. harvested volume does not yield strictly comparable data. For example, the data does not include natural regeneration; which is a significant component of cedar reforestation in many areas; further, the average size (m^3 per tree) of harvested cedar trees is generally larger than that of other species. In association with other indicators, however, this data can be meaningful.

Inventory: The Division Forester is responsible for development of silviculture prescriptions and site plans and for tracking all silvicultural treatments including planting by species. The number of trees planted is entered into the Genus database. Nanaimo Woodlands Inventory Section collects data annually on planting by species. Harvest by species is available in the MoF harvest database.

Reporting: The TFL 39 and MF 19 results are reported by management unit in the annual "Summary of Silvicultural Activities". The TFL 39 results are reported by block in the TFL 39 Annual Report. Scaled harvest volumes are reported by Solid Wood Inventory Section in Weyerhaeuser's official MoF Scale Report and in the TFL 39 Annual Report. Often this information has been aggregated by management unit in Weyerhaeuser's official MoF Scale Report.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Performance:

The average variance for cedar 1995-2005 is within the acceptable variance. Indicator 1, however, suggests that the percentage of cedar is increasing slightly in the DFA's second growth forests.

Year	DFA Harvested (m^3)			DFA Planted ('000 trees)			% variance (\pm) between planting & harvest
	Total	Cedar	% Cedar	Total	Cedar	% Cedar	
1995	1,409,766	187,189	13.3	1,568.2	108.5	6.9	-48.1
1996	1,177,515	143,340	12.2	1,650.5	86.5	5.2	-57.4
1997	1,051,199	130,104	12.4	1,351.0	106.4	7.9	-36.3
1998	964,851	100,711	10.4	1,444.4	162.1	11.2	7.7
1999	1,428,932	189,113	13.2	1,208.3	160.2	13.3	0.1
2000	1,518,840	213,705	14.7	1,567.9	170.5	10.9	-25.9
2001	1,209,212	162,597	13.4	1,858.0	281.4	15.1	12.7
2002	1,130,375	170,862	15.1	1,999.2	368.8	18.4	21.9
2003	1,350,830	248,476	18.4	2,132.8	345.6	16.0	-13.1
2004	1,794,102*	232,042	12.9	1,897.6	393.5	20.7	60.0
2005	1,567,965*	245,822	15.6	1,354.5	201.2	14.8	-5.1
Avg.	1,327,599	183,996	13.7	1,639.3	216.8	12.8	-7.2

* See Indicator 14 for explanation of volume harvested in 2004.

Indicator 22: Stand level retention in openings as a percent of total opening area (annual average for non-clearcut openings)

Stand level retention provides for diversity by increasing the range of habitat and stand structure retained. Retention also contributes to genetic diversity by increasing the range of parental genes.

History: This indicator was developed in 2000.

Objective: $\geq 10\%$.

Acceptable Variance: Greater than 10%.

Forecast: The objective describes the required minimum level of group retention in the Timber Zone only. The Forest Project forecast the following levels of retention for each of the three stewardship zones:

- Old Growth Zone 20% minimum
- Habitat Zone 15% minimum
- Timber Zone 10% minimum (group)
5% minimum (dispersed)

Data:

Openings are defined as non-clearcut if they meet or exceed the minimum standards for variable retention. Variable retention is achieved when more than half the total area of the opening is within one tree height from the base of a tree or group of trees, whether or not the tree or group of trees is inside the opening.

Stand level retention may include patches of trees (determined by estimating the area of the patches) and individual trees (area contribution is estimated by comparing the basal area of the trees to the average basal area of the initial stand).

Inventory: Stand level retention objectives are written into the Silviculture Prescription by the Area Forester during opening planning. The actual level of retention is then verified during the Post-Harvest Assessment by the Area Forester and entered into the Genus database.

Reporting: The Division Forester compiles the data from the Genus database and reports on the indicator performance in the annual SFM Report.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Year	Total non-clearcut harvest area (ha)	Stand level retention	
		Hectares	% of total
2000	891.1	216.8	24.3
2001	1,032.5	258.0	25.0
2002	1,411.4	322.2	23.0
2003	2,819.3	774.9	27.5
2004	1,783.7	340.1	19.0
2005	3,156.7	638.7	20.0

The total non-clearcut harvest area differs in Indicators 22, 23 and 24 due to indicator 22 only being concerned with the timber zone.

Indicator 23: Percent of total opening area harvested with non-clearcut systems

This indicator measures the proportion of opening area harvested annually that is not clearcut. Non-clearcut silviculture systems provide for diversity by increasing the range of habitat and stand structure that is retained.

History: This indicator was developed in 2000.
 Objective: 100% of opening area harvested.
 Acceptable Variance: + 5%
 Forecast: The forecast is an objective of the Forestry Project. In the year 2004, 100% of the openings harvested will be done with a non-clearcut silviculture system.

Data:

Openings are defined as non clear-cut if they meet or exceed the minimum standards for variable retention. Variable retention is achieved when more than half the total area of the opening is within one tree height from the base of a tree or group of trees, whether or not the tree or group of trees is inside the opening.

The total opening area includes areas (patches and individual trees) of retention that are within the opening.

Inventory: The silviculture system to be used is written into the Silviculture Prescription by the Area Forester during opening planning. The silviculture system of each opening is tracked in the Genus database. Compliance with the SP is verified during the Post Harvest Assessment by the Area Forester.

Reporting: The Division Forester compiles the data from the Genus database and reports on the indicator performance in the annual SFM Report.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Year	Total harvest area (ha)	Non-clearcut harvest area		Objective (%)
		(ha)	% of total	
1999	1,781.0	528.0	30.0	30
2000	1,953.7	977.9	50.1	50
2001	1,653.3	1,219.9	74.0	70
2002	1,527.9	718.2	65.0	80
2003	1,705.1	1,604.0	94.0	100
2004	2,314.4	2,290.8	99.0	100
2005	2,080.3	2,080.3	100.0	100

Indicator 24: Percent of annual harvest area within forest influence

Areas within forest influence experience different growing conditions, including reduced light and wind and hence provide different microclimate and habitat types.

History: This indicator was developed in 2000.

Objective: 50%, non-clearcut blocks, annual average.

Acceptable Variance: Greater than 50%.

Forecast: The forecast is an objective of the Forestry Project. When the target of 100% variable retention is achieved in late 2004, more than half of the then current harvest area will then be within forest influence.

Data:

Forest influence is defined as the area within an opening that is within one tree length of a patch of retention or within one tree length of a single tree retained within the opening. By definition, at least half of the area harvested in non-clearcut openings must be within forest influence

The current approach is to estimate the area of forest influence by ocular examination of opening maps. Future estimates may be determined by applying buffers of appropriate width in the GIS.

Inventory: Forest influence objectives are written into the Silviculture Prescription by the Area Forester during opening planning. The actual level of forest influence is then verified during the Post-Harvest Assessment by the Area Forester and entered into the Genus database.

Reporting: The Division Forester compiles the data from the Genus database and reports on the indicator performance in the annual SFM Report.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Year	Total non-clearcut harvest area (ha)	Forest influence (%)	Objective (%)
2000	951.7	72.5	> 50
2001	1,219.9	74.0	> 50
2002	718.2	74.0	> 50
2003	1,604.0	66.0	> 50
2004	2,290.8	62.0	> 50
2005	3,326.2	62.0	> 50

Note: The total non-clearcut harvest area differs in Indicators 22, 23 and 24 due to calculations of basal area equivalent for two single stem blocks and a dispersed retention block.

Indicator 25: Percent of identified High Conservation Value (HCV) areas under special management

This indicator identifies areas of special value and describes the management for protecting these values.

History:	This indicator was developed in 2000.
Objective:	100% of HCV areas identified are under special management.
Acceptable Variance:	None.
Forecast:	The forecast is the objective.

Data:

HCV areas include areas in which conservation of any of numerous social or ecological values is deemed to have an especially high priority. Identification of HCV areas may result from information supplied by First Nations, government agencies, company personnel or other stakeholders.

Inventory: A list of HCV areas is maintained by the Division Forester. Any special management practices required for these areas will be noted or referenced. During the FDP review process this list will be reviewed to ensure forest management activities will not infringe upon or impact the value to be conserved.

Reporting: The Division Forester will annually review the compliance with each special management plan and report on the indicator performance in the annual SFM Report.

HCV areas include:

- Special Management Zone 11 – Schoen – Strathcona.
- Sgt. Randally (Sayward Cypress Management Society)

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Year	HCV areas		
	Number of HCV areas	Number under special management	Percent under special management
2000	5	5	100
2001	6	6	100
2002	6	6	100
2003	6	6	100
2004	6	6	100
2005	2	2	100

Special Management Zone (SMZ) 11

Measures to address higher level plan objectives for the SMZ are outlined in the currently approved Forest Development Plan (FDP). The objectives are incorporated into block by block silviculture prescriptions and logging plans.

SMZ 11 - Schoen-Strathcona

The area identified as SMZ 11 Schoen-Strathcona extends along the height of land between Schoen Lake and Strathcona Park.

The primary values identified are:

- Old growth biodiversity and connectivity functions (particularly in Schoen Creek drainage).
- Wildlife and fish habitats and populations (upper White River, Consort Creek, Gold River).
- Visual qualities associated with Victoria and Warden peaks.

The primary special management objectives outlined are:

- Provide suitable habitat for wildlife species associated with the ungulate winter ranges, wetland habitats.
- Maintain late-successional habitat elements and attributes of biodiversity in forested ecosystems with emphasis on regionally rare and under represented ecosystems, by retaining old seral forest at the site series/surrogate level of representation (late-successional elements and attributes of biodiversity should be retained in patches of variable size).
- Maintain the visual quality of the sensitive viewshed associated with Victoria and Warden peaks.

The area presently identified as SMZ 11 began development in 1973 under a special use plan called the White River Plan (WRP). The plan no longer has status in legislation. The FPC; VILUP and landscape unit planning now provides the framework for integrated resource planning in the White River's Schoen Strathcona SMZ. Many of the results of the plan including the maintenance of recreation, water quality, fish and wildlife habitat are still in effect and will contribute towards plans for the Schoen Strathcona SMZ and the White River Landscape Unit.

The current values of biodiversity and connectivity, wildlife and fish habitat and populations are being maintained. Old growth biodiversity and connectivity is being maintained through a vast area of naturally occurring mature forest.

At the stand level, biodiversity will be maintained through the retention of Riparian Reserve Zones, Wildlife Tree Patches and Variable Retention areas. A minimum of 15% of aggregated or dispersed retention will be retained in each harvest area through to rotation (or longer). This will contribute to the protection of existing habitat by ensuring that there will be vertical and horizontal structural diversity, future course woody debris and mature forest attributes maintained for the future stands.

Presently connectivity exists between the valley floor and the alpine in many areas using various routes. Some of these routes incorporate Deer Winter Ranges and leave blocks between existing harvested areas. Cascadia will continue to work with the various agencies to develop strategies that will maintain this connectivity.

A Standard Operating Procedure (SOP) was developed in conjunction with MoWLAP staff addressing the management of Critical Spring Forage (CSF) adjacent to all Black-tailed Deer Winter Ranges (DWRs) within the forest lands managed by Cascadia's North Island Timberlands. This strategy involves the assessment of currently available CSF, followed by intervention using any one of a number of potential forage production techniques, when required to maintain desired levels. This approach is detailed in the SOP.

Past development under the WRP has helped maintain the visual quality of SMZ 11 by dispersing the pattern of harvest across the area of SMZ 11. Harvesting has occurred in harvest areas of less than 50 hectares since development began 26 years ago. Visual quality will be maintained through designing a landscape in which harvest areas and retention areas have a range in sizes and shapes. Visual quality assessments in visually sensitive units will be conducted at the Silviculture Prescription stage prior to being submitted for approval. Cascadia will continue its variable retention silviculture program and further explore partial cut and single tree methods of harvesting.

Sgt. RandAlly (Sayward Cypress Management Society)

The Sgt. RandAlly will be managed by the Sayward Cypress Management Society (SCMS) in conjunction with Cascadia for the preservation of this tree and the surrounding area. There is a three-way agreement between the Ministry of Forests, SCMS, and Cascadia with regard to the recreation site and trail. However, the SCMS is responsible for the care, maintenance, and repair of the Sgt. RandAlly forest recreation site.

Indicator 26: Old growth (>250 years) representation by BEC variant (Crown Land only)

This indicator measures the amount of old growth forest in the DFA (Crown portion only) by broad ecological classification. Some species are specifically adapted to habitats found in old growth forest.

History:	This indicator was developed in 2000.
Objective:	Meet Ministry of Forests biodiversity guidebook targets as defined by BEC variant and landscape unit.
Acceptable Variance:	Zero.
Forecast:	The forecast is an objective set by the FPC Biodiversity Guidebook.
Note:	An interim old growth deficit exists in some landscape units, as illustrated in the 1997 forest inventory, due to historic harvest profile.

Data:

Old growth or old seral is defined by the MoF in the Biodiversity Guidebook as forests 250 years of age and older. Forest ages are determined from the forest inventory. For productive second-growth forest areas, age is determined by considering the difference between the current (or reference) year and the establishment year. For mature stands (established prior to 1864), age is determined by considering the current year, the year of cruise and the age class assigned at the time of cruise.

The map of BEC (Biogeoclimatic Ecosystem Classification) variants is obtained from the MoF and combined with the current forest inventory to generate the summary of old growth by variant within the DFA.

The FPC Biodiversity Guidebook defines the natural disturbance type and sets targets for retention of old seral stage forest by biogeoclimatic unit. Landscape units and biodiversity emphasis is set by Ministry of Forests Campbell River District through land use planning processes.

Inventory: The baseline data is compiled from the 1997 forest inventory. This report will be re-compiled when on an annual basis following the update of the forest inventory.

Reporting: The GIS analyst compiles the data from the GIS database and reports on the indicator performance in the annual SFM Report.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

As a result of past harvest history, BEC variants in three landscape units are short of the old growth targets. The Forest Development Plan has strategies for variant shortfalls.

LSU_NAME	BECLABEL	TARGET %	OG AGE	OG AREA	BEC AREA	AVAILABLE OG
Adam-Eve	AT unp	85%	250+	105.9	122.3	86.6%
Adam-Eve	CWH vm 1	13%	250+	5204.0	21605.3	24.1%
Adam-Eve	CWH vm 2	13%	250+	8479.8	13632.8	62.2%
Adam-Eve	CWH xm 2	9%	250+	2.8	5.6	50.0%
Adam-Eve	MH mm 1	19%	250+	4852.8	5637.6	86.1%
				18645.3	41003.6	45.5%
Salmon	AT unp	85%	250+	15.4	15.4	100.0%
Salmon	CWH mm 1	9%	250+	4995.9	23478.3	21.3%
Salmon	CWH mm 2	9%	250+	3484.3	8353.0	41.7%
Salmon	CWH vm 1	13%	250+	512.1	1146.0	44.7%
Salmon	CWH vm 2	13%	250+	312.9	461.6	67.8%
Salmon	CWH xm 2	9%	250+	961.2	16098.0	6.0%
Salmon	MH mm 1	19%	250+	2810.4	3532.7	79.6%
				13092.2	53085.0	24.7%
Sayward	CWH mm 1	9%	250+	152.0	527.1	28.8%
Sayward	CWH mm 2	9%	250+	179.4	249.8	71.8%
Sayward	CWH xm 1	9%	250+	15.2	929.3	1.6%
Sayward	CWH xm 2	9%	250+	377.1	5548.7	6.8%
Sayward	MH mm 1	19%	250+	23.6	25.0	94.4%
				747.3	7279.9	10.3%
White	AT unp	85%	250+	93.2	93.2	100.0%
White	CWH mm 1	13%	250+	268.0	776.2	34.5%
White	CWH mm 2	13%	250+	362.8	496.4	73.1%
White	CWH vm 1	19%	250+	5408.6	15306.1	35.3%
White	CWH vm 2	19%	250+	5744.3	8638.3	66.5%
White	CWH xm 2	13%	250+	215.0	1571.0	13.7%
White	MH mm 1	28%	250+	4092.6	4708.1	86.9%
				16184.5	31589.3	51.2%
				48669.3	132957.8	36.6%

Areas may differ from previous year due to changes in BioGeoClimatic coverage and harvesting.

* OG age has been adjusted from 225+ to 250+. This is consistent with the Government's definition of OG and the indicator.

Indicator 27: Total number of trees at 'free growing' compared to planted total

This indicator provides a broad measure of the genetic diversity of the regenerating forest by estimating contributions from both planted seedlings and natural regeneration.

History:	This indicator was developed in 2000.
Objective:	Number of crop and competing trees is greater than number of trees planted (annual average).
Acceptable Variance:	None.
Forecast:	The number of crop and competing trees is modeled based on growth and yield data. This information is a key part of the Timber Supply Analysis.

Data:

A free growing stand is defined in the Forest Practices Code of BC Act as "a stand of healthy trees of commercially valuable species, the growth of which is not impeded by competition from plants, shrubs or other trees." A crop tree is defined as a species ecologically suited to the site, free from damage or disease, at least the minimum required spacing from another crop tree and judged capable of surviving to free growing. A competing tree is defined as a coniferous or deciduous tree that will continue to compete with crop trees until the standard unit is free growing.

The free-growing assessment (to determine whether free-growing status has been achieved) includes a tally of total trees per hectare. This total includes both planted and naturally regenerated trees and is compared to the number of trees planted per hectare (obtained from stand records). Total number of trees are determined by multiplying trees per ha by ha for each opening that has achieved free growing and summing across these areas.

Inventory: The Silviculture Forester carries out free growing surveys as per the SOP. Data collected during the assessment is entered into the Genus database.

Reporting: The Division Forester compiles the data from the Genus database and reports on the indicator performance in the annual SFM Report.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Year	FG Openings Due (late)	Stems per hectare		Percent Difference
		Planted	At free growing	
2000	13	306	15,697	+ 5,130 %
2001	27	971	3,780	+ 389 %
2002	50	472	3,565	+ 755 %
2003	62	626	3,761	+ 601 %
2004	66 (SUs)	700	4,144	+ 592 %
2005	72 (SUs)	613	3,729	+ 608 %

Indicator 28: Number of reportable spills

This indicator provides a measure of pollution from oil spills.

History: This indicator was developed in 2000.

Objective: 7 or less

Acceptable Variance: +1 (i.e., 8)

Forecast: This indicator can't be forecast.

Data:

The operation is legally required to immediately report to the Provincial Emergency Program (PEP) any hydrocarbon spill into water or in excess of 100 liters. North Island Timberlands' Spill Contingency Plan requires that all spills are reported to Division Spill Coordinator, who in turn reports the spill to PEP.

Inventory: The Engineering Administrative Technician maintains a record of all spills in the file system.

Reporting: The Division Forester compiles the data and reports on the indicator performance in the annual SFM Report.

Note:

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Reportable spills include fuel or lubricant spills that are over 100 litres or anything that enters a water body.

Year	Number of Reportable Spills			
	Objective	Actual	Volume (litres)	#/vol to water
1995	N/A	8		
1996	N/A	10		
1997	N/A	8		
1998	N/A	9		
1999	N/A	6	940.0	
2000	7	6	1,181.5*	
2001	7	10	1,233.0	
2002	7	2	2,232	
2003	7	3	1,208	
2004	7	4	300	2 / 21 litres
2005	7	4	700	1 / 20 litres

* Note – 600 litres attributable to one contract operation spill.

Indicator 29: Natural wildfires by number and area.

This indicator provides a measure of success at protecting the forest from damage by fire. Natural wildfires are those that are initiated by lightning strikes. Refer to Indicator 9 for a similar measure on fires initiated by management activities.

History: This indicator was developed in 2000.
 Objective: Less than 50 hectares.
 Acceptable Variance: Fires exceeding 50 hectares are actively managed.
 Forecast: This indicator can't be forecast.

Data:

The Division Forester reports annually on the incidence and cause of fires and on the area burned. This includes fires resulting from lightning strikes and other causes not related to forest management activities.

A historical record is available for TFL 39 areas. For MF 19 areas, tracking and reporting commenced in 1997.

Inventory: Fires are reported for entry into the Incident Tracking System (ITS).

Reporting: The Division Forester compiles the data from the ITS and reports on the indicator performance in the annual SFM Report.

Note:

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Year	Number	Total area burned (ha)
1983	0	
1984	1	Spot
1985	2	Spot
1986	0	
1987	0	
1988	0	
1989	2	Spot
1990	7	2.0
1991	0	
1992	1	Spot
1993	0	
1994	6	1
1995	1	Spot
1996	0	
1997	0	
1998	0	
1999	0	
2000	2	0.02
2001	0	
2002	7	0.2 (lightning)
2003	1	<0.01 (lightning)
2004	2	<0.2 (lightning)
2005	0	

Indicator 30: Number of areas greater than 500 hectares at high risk of mortality due to insects or disease

This indicator measures the success of management strategies to limit the size (impact) of insect infestations and disease epidemics.

History:	This indicator was developed in 2000.
Objective:	Zero
Acceptable Variance:	Operation has previously identified high risk areas and implemented a strategy to manage risk prior to area exceeding 500 hectares.
Forecast:	This indicator can't be forecast.

Data:

Forests are assessed continuously, both on the ground and from the air, to identify potential insect infestations or disease epidemics. Suspect areas are further examined by helicopter or ground survey. Federal, provincial or independent experts are consulted on the need for preventative measures. Salvage occurs if there is significant mortality.

Inventory: Annually the Division Forester, or designate, will carryout a Forest Health Overview assessment and report on forest health concerns. The Division Forester, or designate, will implement a strategy to manage the risk prior to the area exceeding 500 hectares. The report is filed in the Forestry File system.

Reporting: The Division Forester compiles the data and reports on the indicator performance in the annual SFM Report.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Year	Forest threatened by insects or disease		Insects and disease observed in DFA during Forest Health Overview Assessment
	Number of areas greater than 500 hectares	Total area	
2000	0	0	Balsam wooly adelgid Sawfly
2001	0	0	Balsam wooly adelgid Sawfly (not aerial)
2002	0	0	Overall no new disease or insect outbreaks were detected.
2003	0	0	Overall no new disease or insect outbreaks were detected.
2004	0	0	Overall no new disease or insect outbreaks were detected.
2005	0	0	Overall no new disease or insect outbreaks were detected.

Indicator 31: Area of naturally induced slides

This indicator provides a baseline measure of disturbance from naturally-induced slides.

History: This indicator was developed in 2000.
 Objective: Track area of natural slides.
 Acceptable Variance: Not applicable.
 Forecast: This indicator can't be forecast.

Data:

Naturally-induced slides are slides that are not initiated by roads or other harvest activities and occur in areas of forest that are greater than 15 years of age. The documentation of any new slides is based on the frequent air and ground travel that occurs throughout the forest.

Inventory: Slides are reported to the Division Forester. Slides larger than 2 hectares are entered into the forest cover GIS.

Reporting: The Division Forester compiles the data from the file system and reports on the indicator performance in the annual SFM Report.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

The current known area of historic, naturally induced and non-reforested slides larger than two hectares.

Year	Natural slides (ha)	Current Year
2000	194.0	This is the baseline number.
2001	196.1	2.1
2002	196.1	0
2003	196.1	0
2004	198.6	2.5
2005	205.7	7.1

Indicator 32: Percent of openings in which soil disturbance exceeds plan

This indicator measures the amount of soil disturbance that exceeds planned levels. Higher disturbance levels both reduce the productive area and increase the risk of environmental impact, particularly sedimentation of streams.

History: This indicator was developed in 2000.

Objective: Zero.

Acceptable Variance: None.

Forecast: The forecast is the objective.

Data:

Maximum allowable soil disturbance levels (soil disturbed within the net area to be reforested) are specified in the silvicultural prescription for each opening. During the post harvest assessment a determination is made as to whether soil disturbance exceeds the level specified on the plan. This indicator reports the proportion of openings in which the actual soil disturbance exceeds that specified in the silvicultural prescription.

Inventory: Soil disturbance limits are written into the Silviculture Prescription/Site Plan by the Area Forester during opening planning. The actual level of soil disturbance is then verified during the Post Harvest Assessment by the Area Forester and entered into the Genus database.

Reporting: The Division Forester compiles the data from the Genus database and reports on the indicator performance in the annual SFM Report.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Year	Blocks reported on			
	Total		Blocks with soil disturbance exceeding plan	
	Blocks	Hectares	Number	Percent
2000	72	1,998.4	0	0
2001	80	2,177.0	0	0
2002	64	2,068.8	7	11
2003	82	2,209.0	0	0
2004	73	2,648.3	0	0
2005	54	2,270.3	1	1.9

Indicator 33: Water quality measurements for selected watersheds

Sediment and water temperature can impact fish and domestic water supply.

History: This indicator was developed in 2000.

Objective: Turbidity less than 5 Nephelometric Turbidity Units (NTU); temperature less than 15° C.

Acceptable Variance: Plus 10%.

Forecast: This indicator can't be forecast.

Data:

The Oyster River is designated as a water supply area. It is a source of domestic water and has a fish hatchery. Forest management can directly impact stream temperature and input sediment. Turbidity and temperature will be measured in the upper watershed, where the Oyster River leaves the DFA and near where it enters Georgia Strait. Samples will be collected during the spring flush in May, during low flow in late September and during high flow in late November.

Inventory: The Division Forester will have the samples collected and analyzed as per schedule.

Reporting: The Division Forester compiles the data and reports on the indicator performance in the annual SFM Report.

Performance:

Turbidity (NTU)	Flush							Low							High						
	98	99	00	01	02	03	04	98	99	00	01	02	03 ¹	04	98	99	00	01	02	03 ¹	04
Upper	N/A	N/A	N/A	0.13	0.26	0.26	<0.5	N/A	N/A	0.20	0.24	0.2*	N/A	<0.5	N/A	N/A	N/A	N/A	0.25	N/A	<0.5
Mid	0.52	0.95	0.67	0.20	0.89	N/A	3.0	1.59	0.16	0.30	0.09	0.76	0.73	1.0	0.87	0.80	0.56	3.9	0.99	N/A	0.8
Lower	0.70	1.35	0.74	0.31	1.0	0.6	0.8	2.2	0.34	0.39	0.26	0.38	0.4	1.7	1.68	1.22	1.15	5.9	1.61	N/A	0.8

¹ Grader just completed grading road.

Temperature (°C)	Flush							Low							High						
	98	99	00	01	02	03	04	98	99	00	01	02	03 ²	04	98	99	00	01	02	03 ²	04
Upper	N/A	N/A	N/A	7.4	8.0	5.0	7.0	N/A	N/A	8.0	9.0	9.0	N/A	9.0	N/A	N/A	N/A	N/A	5.0	N/A	5.0
Mid	12.5	4.5	7.0	8.9	8.0	N/A	10.0	9.0	9.5	9.0	6.7	13.0	13.0	10.0	3.5	3.0	1.0	5.9	5.0	N/A	5.0
Lower	18.0	6.5	10.0	10.0	10.0	9.4	N/A	10.0	11.0	12.0	13.1	13.3	13.4	N/A	4.0	3.5	1.0	5.5	4.8	N/A	N/A

² 2003 Note: The contractor that collects the water samples missed the late November (high) and fall (low).

2004 Note: NI labs collects the lower samples and did not collect the temperatures.

Indicator 34: Area and percent of total slides from harvested areas or roads

This indicator provides a measure of soil disturbance by slides caused by harvest activity. Such soil disturbance may reduce the productive area and increases the risk of environmental impact, particularly sedimentation of streams.

History: This indicator was developed in 2000.

Objective: Zero as result of post-1995 activities.

Acceptable Variance: None

Forecast: The forecast is the objective.

Data:

New slides are documented through the frequent forest assessments that occur both on the ground and from the air. Slides are classified as to whether they originated from harvest activity in areas harvested since the inception of the forest practices code.

Inventory: Slides are reported to the Division Engineer. Slides larger than two hectares are entered into the forest cover GIS.

Reporting: The Division Forester compiles the data from the Incident Tracking System (ITS) and reports on the indicator performance in the annual SFM Report.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Year	Total slides (ha)	Historic natural slides (ha) <i>(from Ind. 31)</i>	Slides from harvested areas or roads		
			Number	Hectare	% by area
2000	194.8	194.0	3	0.8	0.4
2001	197.7	196.1	1	0.8	0.4
2002	199.6	196.1	5	1.9	1.0
2003	204.8	196.1	11	5.2	2.5
2004	209.5	198.6	8	2.2	1.0
2005	216.6	205.7	1	0.02	< 0.1

Indicator 35: Distribution of revenues by percentage

The distribution of North Island revenues provides a measure of the operation's overall contribution to local, regional, provincial and national economies, and of the operation's financial viability.

History: This indicator was developed in 2000.

Objective: Track distribution.

This indicator was not reported on due to Brascan takeover. It may be appended post-takeover.

Acceptable Variance: Not applicable.

Forecast: This indicator can't be forecast.

Data:

The Cost Accountant began tracking the distribution of North Island revenues by wages (within company and contracted), government stumpage and fees, purchases (local and non-local) and corporate profit in 1999. This core information is collected and reported on during each financial month end and reported on in the North Island financial statement.

Inventory: The Decision Support Analyst collects and tracks financial information including wages (within company and contracted), government stumpage and fees, purchases (local and non-local) and corporate profit.

Reporting: This core information is reported on during each financial month end and reported on in the North Island financial statement. The information as presented here is expressed as a percentage of North Island total log sales revenues in order to address the question of equity with respect to economic benefits. Other expressions of the data are presented to NIWAG to establish absolute levels of benefits and to facilitate discussion regarding the impacts of such variables as annual harvest levels.

Guidelines for Compiling Indicator 35:

Contract Services covers payments to full phase (stump to dump) logging contractors, single phase contractors, general service contractors such as janitorial, electrical, and carpenters, etc. as well as consultants and professional services. These costs include the supply of equipment and materials costs required to execute the contract work and invoiced as one "job".

Own crew labour includes the gross payment of wages paid to both salary and hourly employees without deduction for statutory or contractual deductions. It includes all benefits costs paid by the employer for statutory and contractual benefits including Workers Compensation Assessments. Profit share and bonus payments are included. Payments made to cover employees under the Employee and Family Assistance Program (EFAP) and costs related to EFAP programs are not included. Includes only those people listed on the division payroll systems and not contract personnel hired to perform work at the division that would or would not regularly be performed by an employee.

Payments to Government includes only direct payments for stumpage and royalty fees, logging waste residue payments, fee in lieu charges for log exports, timber taxes and fees allocated by Head Office properties department (municipal and regional district property taxes, foreshore leases, etc), and amounts charged to licenses (e.g., subcode 920 radio licenses, highway crossing permits, etc.). No attempt has been made to estimate payments made for Goods and Services Taxes, provincial sales taxes, provincial motor fuel taxes, federal excise taxes, payroll related taxes (employee income tax with holdings) and assessments for EI or CPP, corporate income taxes, or corporate capital taxes, etc.

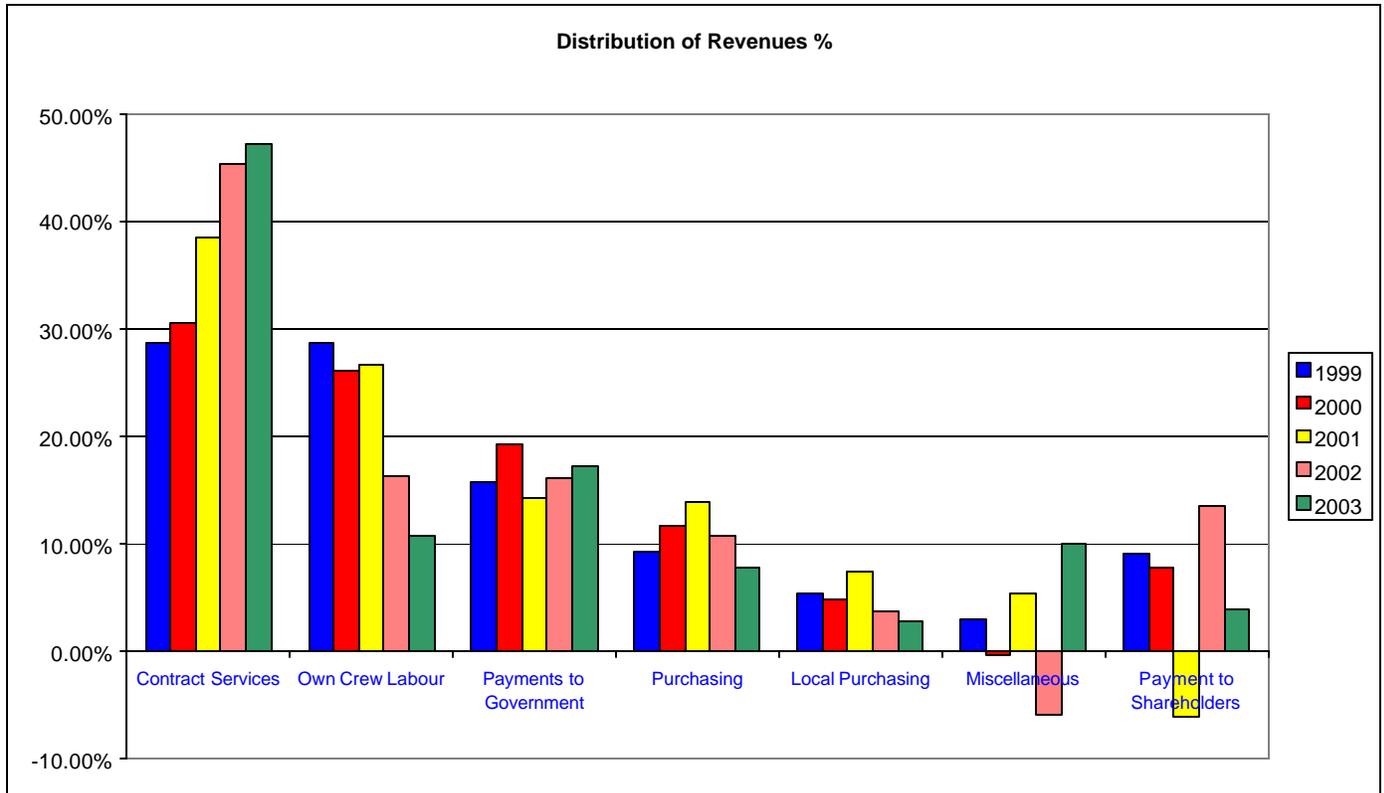
Purchasing includes all supplies, materials and services purchased that don't fit into a category listed above. Some of the services in this category would include Insurance coverage, road use charges, association dues, donations and repair supplies and services.

Local purchasing is derived by subtracting from total purchasing those amounts paid by local cheque and Central Accounts Payable to vendors north of Royston on Vancouver Island and the Northern Gulf Islands.

Miscellaneous is a forced number representing the difference between total log sales and those costs identified above and total division profit. It includes, but is not limited to nor reconciles to the following: depletion on private timber, road amortization, silviculture liability change, inventory change/allocations, depreciation, and machine cost allocations.

Payments to Shareholders (profit) is the total division profit including non-operating profit (includes gains on sale of land, timber and equipment).

Performance:



Notes to % Bar chart to be used in Certification report.

Increase in contractor % as c.f. 1999

In 2002 Ted Leroy Trucking was introduced to North Island Timberlands to fulfill his TFL 39 bill 13 cut obligations. This factor and continuous shift operation by stump to dump contractors pushed 2003 harvest to the highest level since the indicator began in 1999, surpassing the previous high in 2000.

The parent company crew production was 60,000 m3 over 2002 production and 38% above plan levels.

In September of 2003 the company concluded the sale of the falling business to KLM Industries and the company employees transferred to the new company, increasing the payments in this category.

Ted Leroy Trucking began operation of a contract sort yard at Menzies Bay.

Own Crew Labour

The percentage of own crew labour was lower than previous years due in part to;

- Market related downtime
- Strike closures in November until year end
- Reduction of three salary positions and reduction of hourly crew.
- Transfer of high wage earning fallers to successor company

Payments to Government

Stumpage rates have increased since 1999 but a large volume of private land production have kept the total cost per cubic meter and the cost as a percentage of sales much lower than would otherwise be indicated.

Purchasing and Local Purchasing

The total dollar value of local purchases has increased slightly from 2002 and the new procedure is yielding more defensible numbers than was the case in the base line year. The large sales volume and low value in 2003 has created a slightly lower percentage than 2002 when the volume was much lower but the value significantly higher.

Miscellaneous

Logs in Water inventories have decreased significantly from 2002 levels, drawing more dollars into cost of sales.

Payments to Shareholders

North Island Timberlands posted a profit before, interest, taxes, and corporate fees. The private land generated a profit significantly larger than the distribution to shareholders shown here and covered a substantial loss on the crown side of the business. 2002 was the only year in the last six to show a breakeven or better performance since North Island Timberlands was formed in early 1998. On a cost of sales basis this unit has made significant in roads to improve profitability, however the decline in market share and value have out paced our efforts to date.

Indicator 36: Compliance with required public consultation processes

This indicator documents compliance with required public consultation processes. These public reviews are important for communication, including input into operational and strategic plans.

History: This indicator was developed in 2000.

Objective: 100% compliance

Acceptable Variance: None

Forecast: The forecast is the objective.

Data:

The Division Forester tracks required public consultation processes, documenting requirements and achievements. The results are summarized and reported annually. The required public consultation processes include public review of Management Plans, Forest Development Plans, Pesticide Use Permits, First Nations Consultations and other reviews as required.

Inventory: A record of public participation is maintained with each process. A summary of public consultation is maintained in the Engineering Database.

Reporting: The Division Forester compiles the data from the Engineering Database and reports on the indicator performance in the annual SFM Report.

Note:

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Public Consultation Process	Date of Review
Management Plan (MP)	Nov. 21 – 22, 2000
First Nations – FDP	Dec. 22, 2000
First Nations – MP	Oct. 30, 2000
Forest Development Plan (FDP)	Dec. 28, 2000 – Jan. 2, 2001
Pest Management Plan (PMP)	Nov. 15, 2002
Pest Management Plan (PMP)	Feb. 5, 2003
First Nations – FDP/Cedar	Feb. 14, 2003
Pest Management Plan (PMP)	Feb 27, 2003
First Nations – FDP/Cedar	Mar. 10, 2003
Pest Management Plan (PMP)	Mar. 19-28, 2003
First Nations – Cedar	Nov. 14, 2003
First Nations – Cedar	Nov. 28, 2003
Pest Management Plan (PMP)	May 3, 2003
Pest Management Plan (PMP)	May 21, 2003
Pest Management Plan (PMP)	May 28, 2003
Pest Management Plan (PMP)	June 19, 2003
Pest Management Plan (PMP)	June 26, 2003
Forest Development Plan (FDP)	Jan. 30, 2004 – Mar. 30, 2004
Forest Development Plan (FDP)	May 7, 2004 – July 7, 2004
Forest Development Plan (FDP)	July 26, 2004 – Sept. 24, 2004
Forest Development Plan (FDP)	March 4 – May 3, 2005
Forest Development Plan (FDP)	March 4 – Nov.9, 2005
Forest Development Plan (FDP)	May 5 – July 13, 2005
Forest Development Plan (FDP)	Sept. 6 – Nov. 9, 2005
Pest Management Plan (PMP)	Campbell River– June 29, 2005
Pest Management Plan (PMP)	Campbell River– July 6, 2005
Pest Management Plan (PMP)	Sayward – July 7, 2005
Forest Development Plan (FDP)	December 14, 2005

Indicator 37: Days haul wood – dropped in 2003

This indicator measures the extent of the work year for employees. A day in which wood is hauled usually indicates that all harvest phases are working. The attainment of maximum capacity may be effected by weather, market conditions or other constraints.

History: This indicator was developed in 2000, dropped in 2003.

Objective:

Acceptable Variance: Includes shutdown due to issues outside the control of the operation (including strike, lockout, weather, markets, etc.).

Forecast: The forecast is the objective.

Data:

Inventory: The number of days when wood is watered is reported on during each financial month end and reported on in the Division financial statement by accounting.

Reporting: The Division Forester compiles the data from the financial statement and reports on the indicator performance in the annual SFM Report.

Performance:

Year	Days Haul Wood		Comment
	Objective	Actual	
1995	N/A	178	
1996	N/A	166	
1997	N/A	172	
1998	N/A	203	
1999	N/A	229	
2000	233	230	8 days lost to labour dispute
2001	214	211	2 days lost to labour dispute
2002	221	221	
2003			Indicator dropped because it is not relevant.

Indicator 38: Maintenance of a certified SFM system

This indicator describes whether management in the DFA continues to meet the standards of defined forest certification systems.

History: This indicator was developed in 2000.

Objective: Maintain SFM certification.

Acceptable Variance: None.

Forecast: The forecast is the objective.

Data:

North Island Timberlands is audited to ISO 14001, CSA Z809 and CSA Plus 1163 standards annually. An external accredited auditor conducts the audit, and the results determine the status of the CSA certification. The results of the audits are reported to the Community Advisory Group and are entered into the DFA data set.

Inventory: The Division Forester ensures that a copy of audit reports is filed in the centralized file at North Island.

Reporting: The Division Forester reports on the indicator performance in the annual SFM Report.

Performance:

Audit	Date	Result
Application for ISO 14001 and CSA Z809 certification	April 6, 1999	Forest certification approved.
Surveillance audit for ISO 14001 and CSA Z809	October 18, 1999	Retained certification status.
Application for Chain of Custody CSA Plus 1163 certification	January 11, 2000	Chain of custody certification approved.
Surveillance audit for ISO 14001 and CSA Z809	August 2, 2000	Retained certification status.
Surveillance audit for ISO 14001 and CSA Z809	May 31, 2001	Retained certification status.
Chain of Custody certification	August 24, 2001	CSA COC certification approved.
Re-registration for ISO 14001 and CSA Z809 certification	April 15, 2002	Forest certification approved.
Surveillance audit for Chain of Custody CSA Plus 1163	December 11, 2002	Retained certification status.
Re-registration for ISO 14001 and CSA Z809 certification	May 23, 2003	Forest certification approved.
Surveillance audit for Chain of Custody CSA Plus 1163	Nov. 4, 2003	Retained certification status.
Surveillance audit for ISO 14001 and CSA Z809	April 26, 2004	Retained certification status.
Re-verification audit Chain of Custody CSA Plus 1163	April 30, 2004	Retained certification status.
Surveillance audit for Chain of Custody CSA Plus 1163	May 17, 2005	Retained certification status.
Surveillance audit for ISO 14001 and CSA Z809	May 20, 2005	Retained certification status.

Indicator 39: Compliance with treaty settlements and interim measures agreements

This indicator measures compliance with treaty rights and legal requirements regarding First Nations communities.

History: This indicator was developed in 2000.

Objective: 100% compliance.

Acceptable Variance: None

Forecast: The forecast is the objective.

Data:

North Island Timberlands will implement measures to comply with treaty settlements or interim measures agreements that are imposed on the DFA.

Inventory: The Division Forester will ensure that treaty rights and legal requirements are incorporated into the Environmental Management System (EMS). A summary of First Nations interactions is maintained by Ken Mackenzie.

Reporting: The Division Forester reports on the indicator performance in the annual SFM Report.

Note:

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Year	Compliance	Comment
2000	N/A	There are no settlements or interim measures agreements in place. North Island Timberlands continues to monitor treaty negotiations and work with First Nations through the Kwakuitl Laich-Kwil-Tach Nations Treaty Society.
2001	N/A	There are no settlements or interim measures agreements in place. North Island Timberlands continues to monitor treaty negotiations and work with First Nations through the Kwakuitl Laich-Kwil-Tach Nations Treaty Society.
2002	N/A	There are no settlements or interim measures agreements in place. North Island Timberlands continues to monitor treaty negotiations and work with First Nations through the Kwakuitl Laich-Kwil-Tach Nations Treaty Society.
2003	N/A	There are no settlements or interim measures agreements in place. North Island Timberlands continues to monitor treaty negotiations and work with First Nations through the Hamatla Treaty Society.
2004	N/A	There are no settlements or interim measures agreements in place. North Island Timberlands continues to monitor treaty negotiations and work with First Nations through the Hamatla Treaty Society.
2005	N/A	There are no settlements or interim measures agreements in place. North Island Timberlands continues to monitor treaty negotiations and work with First Nations through the Hamatla Treaty Society.

Indicator 40: First Nations information sharing and referrals program

This indicator documents opportunities for First Nations to review Forest Development Plans. These reviews are important for communication, including input into operational plans.

History: This indicator was developed in 2000.
 Objective: Annually review forest development plan with First Nations.
 Acceptable Variance: None
 Forecast: The forecast is the objective.

Data:

Inventory: The Division Forester documents Forest Development Plan reviews that occur with First Nations. A summary of First Nations information sharing and reviews is maintained in the Engineering Database.

Reporting: The Division Forester reports on the indicator performance in the annual SFM Report.

Note:

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Year	Review	
	Date	Comment
2000	November 3, 1999	Reviewed by Kwakwaka'wakw Laich-Kwil-Tach Nations Treaty Society.
2001	December 22, 2000	Reviewed by Kwakwaka'wakw Laich-Kwil-Tach Nations Treaty Society.
2002	July 3, 2002	Reviewed by Hamatla.
	July 5, 2002	Further discussion with Rodney Arnold regarding FDP.
2003	Feb. 14, 2003	Referral subcommittee met to work on cedar needs and FDP process.
	Mar. 10, 2003	Referral subcommittee met to work on cedar needs and FDP process.
	Nov. 14, 2003	Cedar access issue for FDP amended blocks.
	Nov. 28, 2003	First Nations Cedar strategy review.
2004	Aug. 19, 2004	Reviewed by Hamatla Treaty Society.
2005	Between Mar. 4 and Nov. 9, 2005	Three major amendments to the Forest Development Plan were submitted to First Nations for review and comment. No request for a meeting and consequently no meetings were held.
	Dec. 14, 2005	Met with Ken Smith, Tlowitsis.

Indicator 41: First Nations partnership agreement

This indicator provides a measure of participation by local First Nations in the SFM.

History: This indicator was developed in 2000.
 Objective: A signed partnership agreement is in place.
 Acceptable Variance: None
 Forecast: The forecast is the objective.

Data:

The goal of the partnership agreement is to assist First Nation in creating economically self sufficient forest enterprises. This is done through training and support of a silviculture crew, support of students enrolled in technical or professional forestry programs, supporting feasible joint ventures, donations and communication.

Inventory: The Division Forester will track participation, donations and partnership activities.

Reporting: The Division Forester reports on the indicator performance in the annual SFM Report.

Note:

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

Partnership Activities	Year							
	1998	1999	2000	2001	2002	2003	2004	2005
Partnership Agreement signed	Yes	Yes	Yes	Yes	No (draft)	No (draft)	Yes	Yes
<u>Partnership Crew</u>								
MIR	N/A	39.7	0	0	0	0	0	0
Person days	305.0	1,008.0	1,354.1	1,385.0	1,395.0	1,330.0	859	1,039
<u>Mentorship Program</u>								
Sponsored students	0	2	2	3	2	1	2	1
Summer students	0	3	4	3	2	1	0	1
<u>Participation</u>								
Review meetings	N/A	N/A	17	24	29	23	8	1
Joint venture projects supported	0	1	1	1	1	1	1	1
Donations program	yes	yes	yes	yes	yes	yes	yes	yes
NIWAG participation	yes	yes	yes	yes	yes	yes	yes	yes
Other support (programs)	N/A	N/A	4	N/A	N/A	N/A	N/A	Yes

Indicator 42: Public education, communications and consultation program

This indicator measures success at meeting commitments for public education, communications and consultation.

History: This indicator was developed in 2000.

Objective: 100% compliance to Plan.

Acceptable Variance: None.

Forecast: The forecast is the objective.

Data:

During the annual planning process that begins in October a public education program is developed and a budget put in place. The program may consist of tours, open houses, displays, appearances, sponsorships or communication. The objective is to complete all the activities listed in the program.

Inventory: It is the responsibility of the Division Forester to develop the program and report on the completion of activities in the Indicator Data set.

Reporting: The Division Forester reports on the indicator performance in the annual SFM Report.

Performance:

		2000		2001		2002		2003		2004		2005	
		Plan	Achieved	Plan	Achieved	Plan	Achieved	Plan	Achieved	Plan	Achieved	Plan	Achieved
Tours	Programs	1	2	2	1	0	0	1	0			0	0
	Stakeholder	1	5	1	2	3	3	2	3	2	2	2	3
	Other	As requested	20	As requested	2	2	2	1	0	37	37	As requested	17
Public Education	Open houses	2	5	0	0	As requested	As requested	As requested	As requested			1	1
	School visits	0	0	4 classes	2 Children's Festival & Brownies	1	1	0	Brownies	Brownies	Brownies	As requested	2
	Presentations	N/A	4	1	1	1	1	1	0	1	1	As requested	
Communication	Talks	As requested	0	As requested	As requested	As requested	As requested	As requested	As requested	1	1	As requested	2
	Stakeholder / First Nations	10	26	17	26	18	18	14	17	18	18	12	12
Support	Programs	0	4	0	0	0	0	0	0	0	0	0	1
	Organizations	0	1	0	0	0	0	0	0	0	0	0	21
	Students	14	14	7	7	1	1	3	3	2	2	3	3

Indicator 43: Corporate and Operational Research Program

This indicator provides a measure of how responsive research programs are to contributing to better quality decisions for Sustainable Forest Management.

History:	This indicator was developed in 2000.
Objective:	Research programs linked to strategic ecosystem management and operational issues.
Acceptable Variance:	Not applicable.
Forecast:	The forecast is the objective.

Data:

Research programs are summarized in individual reports and the "Reporting to Revenue Canada" document.

Inventory: Nanaimo Woodlands maintains the up to date documentation of Weyerhaeuser BC Coastal Group research activities. This documentation includes project plans, budgets, research activity progress, and actual dollars spent.

Nanaimo Woodlands also facilitates the transfer of "Best Practices" from Weyerhaeuser Corporate Research to the BC Coastal Group.

Reporting: The Manager of Nanaimo Woodlands is responsible for the overall program and reporting annually on this indicator.

Performance:

Year	Comment
1999	Current research programs are summarized in the "1999 Reporting to Revenue Canada", the "Forest Project Annual Report 1999 – 2000", Forest Renewal B.C. Summaries and the actual application of "Best Practices" on the ground.
2000	Current research programs are summarized in the "Reporting to Canada Customs and Revenue Agency," and in the "Forest Project Annual Report."
2001	Current research programs are summarized in the "Reporting to Canada Customs and Revenue Agency," and in the "Forest Project Annual Report."
2002	Current research programs are summarized in the "Reporting to Canada Customs and Revenue Agency," and in the "Forest Project Annual Report."
2003	Current research programs are summarized in the "Reporting to Canada Customs and Revenue Agency," and in the "Forest Project Annual Report."
2004	Current research programs are summarized in the "Reporting to Canada Customs and Revenue Agency," and in the "Forest Project Annual Report."
2005	Current research programs are summarized in the 2005 Monitoring and Research Projects report.

2005 Monitoring and Research Projects Cascadia Forest Products Ltd.

Coast Forest Strategy — Variable Retention Implementation Monitoring (AM¹)

We continued to monitor the amount, type and retention levels used with VR implementation throughout the company, which now consists of approximately 800k hectares of Crown forest tenure in coastal BC. Private lands formerly owned by Weyerhaeuser are now under the management of Island Timberlands. Independent assessments of VR cutblocks were completed by Symmetree Consulting on a random sample of 17% of the area logged from 1999 through 2003. Symmetree completed special evaluations for Large Patch VR and Standing Stem Harvesting cutblocks in 2004. No additional blocks were evaluated in 2005. The company completed the 5-year phase-in of VR in 2003, with over 90% of its harvested area logged using the VR approach. This level was maintained in 2004; data from 2005 are not yet compiled. Over the phase-in period, most VR was group retention (60%) or mixed retention (33%) with minor amounts of dispersed retention (5%) or shelterwood and selection systems (2%). Average long term retention was 21%.

Variable Retention Adaptive Management (VRAM) Experimental Sites (AM) Installation of VRAM experimental sites continued. These sites provide a scientifically sound basis for comparison of VR systems focused on key uncertainties. Logging was completed on 2.5 sites in 2005 (Group size – WIT Klanawa, Group percent – QCT Hoodoo, Riparian retention – NIT Moakwa, heli-yarding portion), bringing the total harvested to 9 of the 15 sites originally planned. Planting treatments were coordinated with operations and permanent growth and yield “sector plots” were established. Several post-harvest studies are ongoing at each VRAM site.

VR Structural Monitoring (AM, FIA) This study documents the structural attributes (i.e., habitat) provided by variable retention harvesting in relation to benchmark natural forests. From 1999 to 2004, transects were established to monitor retained habitat structure in 193 VR blocks, 98 benchmark unharvested sites (including pre-harvest VRAM sites), 19 blocks with old remnant patches, 19 blocks with riparian reserves, 8 older clearcuts and 6 scrub sites. Measured habitat attributes included live trees (species, DBH, height), snags (species, DBH, height, decay class), coarse woody debris (CWD; species, diameter, decay class, height above ground), cover layers (canopy, small tree, shrub, herb, moss, litter, mineral soil), dominant shrub and herb species, and site series. Summaries were compiled for major types of these attributes and for some important specific structures (e.g., large cedar snags, large well-decayed CWD, etc.). The monitoring design allows several types of comparisons such as changes over time, type of VR and differences in ecological units.

In 2004 and 2005, 72 cutblocks were re-sampled to assess 5-year post-harvest changes. This sample includes 18 dispersed, 46 group and 8 mixed retention types across 7 biogeoclimatic subzones. Detailed results are summarized in a lengthy report. Examples of the findings are: overall tree density in retention declined about 20% over 5 years; snag density increased in dispersed and mixed retention for the three driest subzones; most edge effects for structural attributes were either negligible or occurred over short distances.

Response of Birds to Group Retention (AM, FIA) This study is a detailed examination of bird use of retention patches by Mike Preston, who will complete his MSc thesis at Simon Fraser University in early 2006. Species presence, abundance and habitat use was documented using point-count stations. Results show that the frequency of occurrence of common species from uncut stands is more similar after harvesting with group retention than with clearcutting – showing value in leaving patches. Data are from bird surveys over two seasons in 12 group retention stands, 12 clearcuts, and 12 uncut control stands, each containing five monitoring stations, and each surveyed three times each year. In total 1,065 surveys were completed, yielding 3,259 songbird observations. Preliminary results showed that all of the 18 most frequently detected species occurring in uncut stands were represented in group retention stands, but most (66%) occurred in lower abundance. Compared to clearcuts, group retention sites supported more species and, unlike clearcuts, were not dominated by Dark-eyed Junco and Winter Wren. The response of most forest-dependent species to percent retention appears relatively linear (i.e., greater abundance as retention increases).

Summer Bird Surveys (AM, FIA) A sixth season of monitoring was completed on summer bird transects-- 51 routes and approximately 2500 stations throughout coastal BC (28 on Vancouver Island, 16 on the Sunshine Coast and 6 on Haida Gwaii/QCI). This study documents landscape-level trends in bird populations in forested landscapes. Analysis of 2005 results are underway. During the first 5 seasons, 25 to 47 bird species were observed on each survey route. The most frequently observed species were winter

wren, American robin, Swainson's thrush, Townsend's warbler, varied thrush, Pacific slope flycatcher and Hammond's flycatcher. It will likely take 10 years of monitoring to determine significant trends.

VRAM & Operational Bird Studies (AM, UBC) Breeding season surveys were done in 2005 to compare bird use of different approaches to variable retention. The study evaluated the Memekay (NIT), Klanawa (WIT), Goat Island and Lewis Lake (SWT) VRAM sites. Results to date show that about one-third of individual bird species and all "guilds" (groups with similar habitat preference) were affected by retention level. Removal of 31% of the original forest in various sizes of groups (69% retention) had little impact on forest bird communities. Retention levels of 5% to 10% showed no significant overall difference in bird abundance from clearcuts, which favored shrub nesters and "open" habitat species. Group size appeared to have an impact on some species, with large groups (1 ha) preferred over small to medium-sized groups (0.25 to 0.5 ha), although results with retention type and level were highly variable.

Terrestrial Gastropod Study (AM, FSP) Intensive pre-disturbance surveys of slugs and snails using litter sampling and artificial cover objects were completed for 6 VRAM sites from 2001 to 2003. Twelve to 16 species of gastropods were found on each site, comprised of small litter snails, large snails, carnivorous snails and slugs. Small litter snails accounted for the most species on all sites. Two sites were re-surveyed in 2005, 4 years after logging: Tsitika (NIT) & Horseshoe Lake (SWT). At the Tsitika site (% group retention), most species showed no treatment effects; however, two species of snails were most abundant in the uncut forest and decreased with retention level. At the Horseshoe Lake site (% dispersed retention), small litter snails had the highest density by far of any VRAM site and were most abundant in the uncut forest and 30% retention treatment (compared to clearcut, 5% and 10% dispersed). Some species showed no apparent treatment impact while others appeared to be reduced after logging. Post-harvest monitoring will be done on 4 more VRAM sites over the next two years.

Variable Retention Windthrow Monitoring (AM, FIA) Windthrow monitoring of VR cutblocks continued in 2005. The windthrow database now consists of total of 3355 plots distributed throughout the company's BC coastal operations. A total of 112 harvested blocks are included in the sample, representing nearly 220 km of external setting boundaries, 29 km of larger patch edges, 134 ha of smaller retention patches and 56 km of riparian and other strip edges. Monitoring found that wind damage increases with increasing boundary exposure, fetch distance, elevation (topographic exposure), and as tree height and rooting depths increase. Results show that strips and small patches have higher rates of windthrow (25% to 36%) than external edges and large patch edges (15% to 21%), although a greater proportion of total windthrow is due to cutblock edges because of the greater length of edge. Windthrow also varies with boundary and patch geometry (e.g. symmetrical patches tend to have less damage than irregular patches). Edge treatments appear to be effective for reducing windthrow if topping or pruning penetrates 10 to 15 metres into an edge. Windthrow along gullies and stream escarpments can be reduced when windward edges are set back 10 to 20 metres.

Aquatic Breeding Amphibians (AM, FSP) This study occurs on three cutblocks within the private lands of Island Timberlands. Different buffers widths were assigned to small wetlands to test the efficacy of retention patches for maintaining breeding populations of amphibians. In 2005, post-harvest monitoring was completed on one site, and pre-harvest monitoring continued for a second year on the other two sites. Unfortunately, loss of buffer replication occurred on two sites during logging operations; however, these sites can be monitored for harvesting impacts. Additional work is planned for 2006 on Crown land with funding through the BC FSP. Four amphibian species were found breeding in small ponds: long-toed salamander, rough-skinned newt, Pacific chorus frog and red-legged frog. Water levels increased significantly at ponds in the harvested site, especially at ponds with no retention or in-pond vegetation. There was continued use of ponds after harvesting at the logged site where the occurrence of Pacific chorus frogs increased at ponds and in ditches along roads. Additional monitoring is needed before conclusions can be reached on logging impacts for these amphibians.

Carabid Beetles (AM, FSP) A study of post-harvest beetle populations compared group size at the Klanawa VRAM site and several operational cutblocks at WIT. Transects across timber edges were monitored at intervals throughout the season. Carabid beetles showed a response to patch size in group retention sites, with higher catches per trap of "forest specialists" in larger patches than in smaller patches. This response was seen in both old growth and 2nd growth sites. Three years post-harvest, the patches were able to retain forest specialists at all of the sites. However, retention of forest specialists was generally better in old growth patches than 2nd growth patches, and small patches of 2nd growth sites were particularly poor at retaining forest specialists. Carabid beetles showed edge responses, and several species had higher catches at or close to the edge of patches.

Ectomycorrhizal Fungi (AM, CFS-FSP) A study was established to examine the abundance of ectomycorrhizal fungi on tree seedlings in relation to dispersed trees and cutblock edges. Transects were established at the dispersed VRAM site (SWT-Horseshoe Lake). A chronosequence of sites was studied at the Northwest Bay operation of Island Timberlands to examine persistence of mycorrhizae in different ages of forest in proximity to mature timber edges. Data analysis for these studies is underway. An earlier study with group retention showed that the abundance of these fungi decreased with distance from forest edges.

Variable Retention and Small Streams (AM, UBC-FSP, NSERC) Pre- and post-harvest monitoring of water flow and temperature continued. The two study areas were logged June-Nov 2004, and April 2003-April 2004. Data were downloaded from stream probes and weather stations in 2005. Litter samples were collected in spring; dry weights were determined at the Malaspina UC lab. Steve Guenther, an MSc student with Dr. Dan Moore at UBC, is examining stream temperature. Preliminary results suggest that retention patches located at the downstream end of small streams can be effective in some, but not all cases, at mitigating the effect of logging on maximum stream temperatures.

Growth and Yield — Edge Study (AM, FIA) This study examines the influence of forest edges (either adjacent stands or retention patches) on seedling growth. Most of the impact on tree growth is restricted to 10m from the edge but is noticeable in all directions for all species examined. The results are highly correlated with surficial moisture. Impacts when spread across the cutblock, however, were small. There was no difference in impacts with azimuth due to high microsite variability for these young trees. Greater seedling impacts were noted for small group removal sites, rather than edges or group retention.

Growth and Yield — VRAM Experimental Plots (FIA, FSP) Permanent plots were established in experimental comparison areas to measure the impact of the amount and spatial distribution of retention on tree growth. Results are consistent with the Edge Study (above). A model is under development that tracks growing season light and moisture for fir and hemlock and produces results consistent with the field data.

Regeneration Research — Stocking, Seedlings, Seedling Improvement, Deer Browse, and Fertilization at Planting Many trials have been established over the years to monitor plantations and natural regeneration performance. New trials are established each year to address specific questions. These studies are continually measured and analyzed to provide feedback on regeneration practices to operations. Costs were shared for trials of mutual interest to Cascadia and Island Timberlands. Results show that:

1. Douglas-fir seedlings fertilized at time of planting (FAP) on mesic sites responded better than seedlings fertilized on dry and rich sites. The best cost-benefit in terms of average 2nd-year height at the mesic site was from a 412A seedling fertilized with 10g of 20-11-9 delivered in a teabag, compared to other treatment combinations: unfertilized trees, higher amounts of fertilizer (20g or 30g) and other stock types (410, 512A, 615A and 1+1 BR).
2. Three deer repellants were tested to evaluate their effectiveness in reducing incidence of deer browse. "PlantSkydd" and hydrolyzed casein were applied in the spring at two sites. Neither product significantly reduced incidence of deer browse on newly planted Douglas-fir and western redcedar seedlings.
3. Douglas-fir seedlings planted in an area that had been mechanically site-prepared (MSP) were significantly taller and larger than seedlings planted in an equivalent control area (no MSP). Plastic brush blankets were also tested at this site but had no effect on average tenth-year height or stem volume.
4. Fifteen-year height and diameter data were recorded at 10 "Plantation Assessment" sites. Information from these sites is used to address knowledge gaps in early plantation performance.
5. Results from a fertilizer screening trial established in a poorly performing stand of 30 to 40-year old Douglas-fir trees indicated that broadcast treatments of nitrogen (N), nitrogen + phosphorous (N+P), and N+P plus micro-nutrients had no significant effect on fifth-year tree height or diameter.
6. Results from 3 study sites comparing various fertilizer treatments showed that fertilizer incorporated into the growing medium at the nursery had no significant effect on average third-year height and/or stem volume. Seedlings fertilized at time of planting (FAP) with fertilizer delivered in teabags were generally larger than un-fertilized controls but results were highly variable due in part to deer browse.

MASS — Montane Alternative Silvicultural Systems (CFS, FSP) This study was established in 1992 to examine alternative approaches for managing high elevation forests. Climate monitoring continued, access

to the site was maintained and new trails were established with Long-Term Research Installation infrastructure funding by the FSP. Additional vegetation transects assessing edge effects were established in 2005. A report on 10-year post-harvest vegetation response was completed in 2005. Publications on the results of natural regeneration and windthrow monitoring are underway.

Effects of Prescribed Burning This study was established in 1985 to investigate the impact of prescribed burns of different intensity on soils, tree growth, vegetation response and nutrition. Twenty-year post-fire measurements of tree growth, foliar nutrition, vegetation and erosion were completed in 2005. Several publications are underway.

SCHIRP — Salal-Cedar-Hemlock Integrated Research Program (UBC, FSP) This study was established in 1995 to investigate silvicultural treatments for establishing conifers on salal-dominated sites. Treatments include mechanical site preparation, fertilization, planting density and species selection. Ten-year measurements of tree growth, foliar nutrition and vegetation cover were completed in 2005.

Growth and Yield — Permanent Sample Plots A network of PSPs is maintained throughout the BC coast to monitor forest growth on a 5-year measurement cycle.

Old Growth Age Two studies undertaken in the early 1990s on the age of old growth forests on Vancouver Island were updated for publication. One compiled a database of over 5000 dominant and co-dominant trees in forests over 150 years old from various published and unpublished sources to examine broad trends in the age distribution by species, elevation, geographical area and biogeoclimatic unit. The second study examined the distribution of tree ages in several stands for three geographical areas on Vancouver Island.

Research Projects with Company Support

Fungal Inoculation for Artificial Nesting Cavities in Second Growth Forests (AM)

Linking multiple indicators of biological diversity to forest management (AM, UBC-FSP, MOE)

Public Perceptions of Variable Retention Harvesting (AM, UBC)

Impact of UV light on juvenile coho salmon in coastal streams (NWRI, Environment Canada)

Evaluation of biological control for salmonberry and salal competition (CFS)

Development of Native Grasses for Coastal BC (FIA)

Windthrow Natural Disturbance History (UBC-SMRFA)

Vancouver Island Marmot Study (VIM Foundation, MOE)

Marbled Murrelet Research (D. Lank, SFU, NSERC)

¹AM = Part of the Adaptive Management program in support of the Coast Forest Strategy (formerly The Forest Project). Funding sources other than the company are shown as: FIA = Forest Investment Account, Land-based Investment Program; FSP = Forest Science Program. Both are BC Provincial government programs.

Coast Forest Strategy Website: www.forestry.ubc.ca/conservation/forest_strategy/

Indicator 44: Hectares of brush treatments by method

This indicator tracks the amount of brushing that is done on the DFA in order to meet our free growing obligations. Cascadia's intention is to minimize the use of herbicides. This indicator will track both herbicide and manual brush treatments to measure what proportion of the brushing program utilizes herbicides.

Cascadia is committed to:

- Advertise the location of treatment in Campbell River and Sayward.
- Provide NIWAG with detailed site assessments prior to treatment and post treatment assessments.

History: This indicator was developed in 2003.

Objective: Minimize the use of herbicides to less than 20% of the total brushing program.

Acceptable Variance: None.

Forecast: Brush control is essential for the establishment of new plantations and achieving our free growing obligations. Herbicides are used where manual methods are ineffective or economically impractical. We expect approximately one quarter of the brushing will utilize herbicides until other feasible alternatives are developed.

Data:

Herbicide use is summarized annually and reported to the Pesticide Control Branch. The Silviculture Forester is responsible for compiling this data.

Note:

2005 numbers reflect Cascadia Forest Products Ltd. Defined Forest Area after the removal of Eve River (20% takeback area to BCTS).

Information pertaining to Island Timberlands will be an appendix to this document; provided by them.

Performance:

The table below shows percentage of use by both herbicide and manual brushing treatments.

Brushing Treatments

Year	Hectares Treated By Method						
	Manual Methods			Herbicide Methods			Grand Total Of All Methods
	Girdling	Brush Saw or Other Manual Method	%	Individual Tree	Ground Foliar	%	
2003	0	79.8	100	0	0	0	100
2004	0	52.8	100	0	0	0	100
2005	0	145.5	71	58.4	0	29	203.9

Indicator 45: Allocation of resources from BCCT to the development and implementation of non-herbicide alternatives specific to current herbicide uses as reported to NIWAG quarterly

This indicator tracks the allocation of resources.

History: This indicator was developed in 2004.
 Objective: Research and implementation of options that reduce the need to use herbicide within the DFA.
 Acceptable Variance: None.
 Forecast: Under review.

Data:

Under review.

Performance:

NIWAG to answer the question "Is Cascadia actively involved in researching and implementing alternatives to herbicide use?"

Year	Comment
2004	<ul style="list-style-type: none"> ▪ Development of a biological control strategy for management of weedy <i>Rubus</i> spp. in Conifer Regeneration Sites (Dr. Simon F. Shamoun).
	<ul style="list-style-type: none"> ▪ Development of a bioherbicide for control of Salal (<i>Gaultheria shallon</i>) in Conifer Regeneration Sites (Dr. Simon F. Shamoun). Pacific Forestry Centre.
2005	<ul style="list-style-type: none"> ▪ Cascadia continues to support the above research into biological controls.

Indicator 46: Aboriginal Employment on the DFA

This indicator tracks aboriginal employment on the Defined Forest Area.

History: This indicator was developed in 2005.

Objective: 6% of employment on the Defined Forest Area to be filled by local (Hamatla) Status First Nations people.

Acceptable Variance: $\pm 5\%$

Forecast: The forecast is the objective.

Data:

Under review.

Performance:

NIWAG to answer the question "Is the Aboriginal Employment Objective being diligently pursued?"

* Note: Hamatla requested implementation of a tracking system.

Appendix 3

ISLAND TIMBERLANDS LP LTD.

2005 SFM Indicators Data Set Report – Island Timberlands LP Ltd.

April 2006

Island Timberlands LP Ltd.

CAN/CSA-Z809-96 Indicators Summary – 2005

#	Indicator	2005 Objective	Acceptable Variance	2005 Result	Comments
1	Percent of primary, secondary and tertiary species weighted by hectare (for 2nd growth)	Maintain percentage of second growth species	+ 20% 1997 inventory baseline	Objective Met	
2	Gross volume by species of mature forest	Maintain percentage of mature species	± 20% 1997 inventory baseline	Objective Met	
3	Percent of forest > 60 years old	36%	> 36%	Objective Met	
4	Number of identified species at risk	Zero annual increase as a result of mgmt activities	None	Objective Met	
6	IT ob	100% reforestation within 3 years	6% above 3 years old as a % of total NSR	Objective Met	
7	Pct of openings' area occupied by permanent access structures	Less than 5%	+ 0.5%	Objective Met 5.4	Including heli areas.
8	Area that does not meet free growing (FG) commitments	Zero hectares of FG non-compliance	0	Objective Met	
9	The number of forest fires caused accidentally by industrial activity	0	1 per year	Objective Met 0	
10	Area of regeneration failures	Current regen failure is less than 5% of current area established	+5%	Objective Met 0	
11	Forest inventory by percent of age class distribution	Historically implicit in AAC; to be redefined in Forest Project	Not applicable	N/A	No AAC determined.
12	The area of water bodies	No change in area of water bodies	None	Objective Met 0	
13	Hectares sold out of DFA (MF19)	0	0	Objective Met 0	
14	Harvest Levels				
		MF: 300,000 m3	MF: ± 20%	Objective Met	320,000 m3.

#	Indicator	2005 Objective	Acceptable Variance	2005 Result	Comments
15	North Island division margin	Not set			
16	Recordable Incident Rate	2.3	Less than 1.9	Objective Met	
17	Number of recreational sites maintained	Continue with the maintenance of existing sites.	None	Objective Met	no designated Rec sites. Provided a hunting season.
18	Km of active road	Retain the active network	± 20%	Objective Met	
19	Number of FPC contraventions related to road, soil and water management	0	None	N/A	
20	Advisory group active membership	All sectors represented	None	objective not met	2 vacancies: Contractor, Member at Large.
21	Planting by species compared to harvest	Plant cedar in proportion to harvest (10 year average)	± 20%	Objective Met	
22	Stand level retention in openings as pct of total opening area	≥10%	>10%	Objective Met 20%	Met in final year 2005.
23	Percent of total opening area harvested with non-clearcut systems	100% of total opening area harvested	5%	Objective Met 100%	One non-VR block.
24	Percent of annual harvest area within forest influence	50% for non-clearcut blocks	> 50%	Objective Met 62%	One non-VR block.
25	Percent of identified High Conservation Value areas under special management	100% of HCV areas identified are under special management	None	N/A	
26	Old growth representation by BEC variant	Meet MoF biodiversity guidebook targets	0	N/A	
27	Total number of trees at 'free growing' vs. planted total	Trees at FG > planted total	None	Objective Met	
28	Number of reportable oil spills	≤ 7 spills	+ 1 (i.e., 8)	Objective Met	

#	Indicator	2005 Objective	Acceptable Variance	2005 Result	Comments
29	Natural wildfires by number and area	< 50 hectares	Fires exceeding 50 ha are actively managed	Objective Met 0	
30	Areas > 500 hectares at high risk of mortality due to insects or disease	0	N/A	Objective Met 0	
31	Area of naturally induced slides	Track for baseline	N/A	0	
32	Percent of openings in which soil disturbance exceeds plan	0	None	Objective Met	
33	Water quality measurements for selected watersheds	Turbidity < 5 NTU	+ 10%	N/A	No testing.
		Temperature < 15o C		N/A	
34	Area and percent of total slides from harvested areas or roads	Zero as result of post-1995 activities	None	Objective Met	
35	Distribution of revenues by percentage	Track distribution and report	None	N/A	
36	Compliance with required public consultation processes	100%	None	Objective Met	Met with ORWC committee 3 times. One field trip.
38	Maintenance of certified SFM system	Maintain SFM certification	None	Objective Met	
39	Compliance with treaty settlements and IMAs	100%	None	Objective Met	There are no settlements or interim measure agreements in place.
40	First Nations information sharing and referrals program	Annually review FDP with First Nations	None	N/A	
41	First Nations partnership agreement	Partnership agreement in place	None	N/A	
42	Public education, communications and consultation program	100% compliance to plan	None	N/A	Done under Weyerhaeuser.

#	Indicator	2005 Objective	Acceptable Variance	2005 Result	Comments
43	Corporate and operational research program	Programs linked to strategic ecosystem management and operational issues	N/A	Objective Met	Mass site.
44	Hectares of brush treatments by method	Minimize the use of herbicides to less than 20% of the total brushing program	None	Objective Not Met 50% of program was chemical	Backlog of areas requiring chemical treatment.
45	Allocation of resources from BCCT to the development and implementation of non-herbicide alternatives specific to current herbicide uses as reported to NIWAG quarterly	Research and implementation of options that reduce the need to use herbicide within the DFA	None	Objective Met	Working with FERIC on Bio-herbicide trials.
46	Aboriginal Employment on the DFA	6% of employment on the Defined Forest Area to be filled by local (Hamatla) Status First Nations people.	± 5%		Allowed 1st nations to bid on planting program; some hired by archeologist for AIAs.