5.0 Sustainable Forest Management : Values, Goals, Indicators

Newfoundland has committed to the principles of sustainable forest management through becoming signatory to the Canada Forest Accord. Similar to other jurisdictions, the focus of forest resource management in this province was, for decades, sustained yield of timber. Sustainable forest management requires that resource managers focus on the sustainability of *all values* - environmental, economic and social - which are inherent in or provided by the forest ecosystem.

There are a number of fundamental principles which are universally considered basic to the sustainable forest management concept. These are discussed briefly below:

Holistic approach: This means to view the ecosystem as a whole and considers the interdependence of the parts. For example, the forest provides habitat for forest animals. The make-up of the forest determines its inhabitants. The make-up of the forest can be described on a landscape (ie broad - measured in 100's or 1000's of hectares) or the stand (ie. site specific - usually less than 100 hectares) scale. Age class structure and degree of fragmentation (ie. amount of break in the forest cover) are common attributes (or qualities) used to describe the forest on a landscape scale. Species composition, seral (or development: closely linked to age) stage, and understory (or ground) vegetation are often used to describe the forest at the stand level.

Forest management practices such as harvesting and silvicultural treatments have a very significant impact on the forest structure at both the landscape and the stand level. Harvesting patterns can contribute to fragmentation at the landscape level and influences the availability and connectivity of wildlife habitat at both levels. Leaving portions of the forest to provide connectivity (corridors) between wildlife habitat units is an example of a management objective which demonstrates an holistic approach at the landscape level. A Riparian (habitat adjacent to water bodies) buffer is a management practice which provides landscape connectivity and is an indicator of meeting this objective. Silvicultural treatments have a significant impact on species composition within a stand and can affect its seral stage. Developing or maintaining diversity in stand species composition and vertical structure through modified silvicultural techniques is an example of a management objective which incorporates the holistic view at the stand level. Retaining a hardwood or native pine component in plantations and thinnings and leaving nesting/perch trees in cut-overs are management practices which respectively maintain or increases species composition and increases vertical diversity in a stand - both of which improve wildlife habitat compared to previous management practices. These modified practices are indicators of meeting a stand level objective which incorporates the holistic approach.

Incorporates other values: The forest ecosystem provides a multitude of values - some consumptive, such as timber, berries and big-game; some non-consumptive, such as wildlife viewing, hiking, cross-country skiing; and others intrinsic, such as tranquillity and spirituality. Some are service values that can only be insured by biodiversity and a healthy ecosystem: such as climate control, oxygen production, purification of fresh water supplies, removal of carbon

dioxide from the atmosphere, soil generation and nutrient cycling. Some of these values, such as the supply of wood fibre, can be easily measured whereas others, such as intrinsic values, are very difficult to quantify. Under the concept of sustainable forest management, *all* values are important and should be managed on a sustainable basis. Strategic and operational forest plans *must* incorporate other values and develop strategies which do not abrogate other resource development opportunities.

Includes public involvement: There has been a national and international shift to increase public involvement in resource development planning. Recognition is growing that informed and active participation by stakeholders during the planning process will lead to more balanced and readily accepted management plans. Involving people or groups who have an interest in or may be affected by resource development activities should foster more equitable and effective decisions. Private citizens, communities, special interest groups, industry representatives, aboriginals and other resource users all have an important role to play.

Considers health of the ecosystem: It is implicit in sustainable forest management that we maintain a healthy ecosystem. The health of an ecosystem can be measured in terms of its productivity and its resilience. A productive forest ecosystem is one which provides continuous recruitment of new plants and animals and steady annual incremental tree growth. A resilient ecosystem is one which recovers after man-caused (eg. harvesting) or natural (eg. wildfire, insect, etc.) disturbance. Planners must ensure that proposed forest management activities do not create changes within the ecosystem which will irreparably damage its productivity and resilience.

The District 2 Planning Team has adopted as a means of working towards sustainable forest management (SFM) the Criteria and Indicators (C and I) framework for Canada issued by the Canadian Council of Forest Ministers (CCFM). Local values have been included in this framework at the discretion of the planning team. The criteria are basically the essential elements that are contained within the SFM. The six which are presently identified are (1.) Biodiversity; (2.) Healthy Forests; (3.) Soil and Water; (4.) Global Impacts; (5.) Benefits to Society; and (6.)Public Involvement and Commitment. Some of these criteria were already discussed above and, unless necessary, further elaboration is not provided.

This section will address the values, goals, and indicators that fall under each criterion. Values answer the question: Why are the forests important? Goals look at where we want to go. Indicators provide mechanisms to measure our progress so we can know if we are going in the right direction. Objectives set a target which will establish where we want to be in a given time frame and help keep the process clear and easy to follow.

5.1 Biodiversity

This criterion deals with the conservation of biological diversity. The Canadian Council of Forestry Ministers (CCFM) has defined biodiversity as the variability among living organisms from all sources and the ecological complexes of which they are a part. The criterion has three major elements - ecosystem diversity, species diversity and genetic diversity.

Element 1: Ecosystem Diversity

Value 1.1 Representative landscapes

Goal 2: To have adequate representation of the various forest successional stages.

Indicators:

- Percent and extent of area by forest-type and age class.
- Percent and extent of area within forested riparian landscapes.

Objectives: 1. Maintain a minimum of 15% of each age class across the landscape.
2. Maintain a minimum 20 m riparian buffer around all water bodies identified on a 1:50,000 topographic map.

Refer to Figures 7.27 and 7.28

Value 1.2 Special Places

Under this value we find categories such as rare plant sites, important nesting or staging areas, areas of particularly high wildlife concentration, pristine areas.

Goal 1: Establish protected areas or special management provisions to preserve biologically distinctive or unique features and critical wildlife habitat.

Indicators:

- Number of rare plant sites within Management District 2.
- Number of caribou calving areas, raptor nesting areas, migratory waterfowl nesting and staging areas.

Objectives: 1. No loss of any known rare plant sites.
2. To identify and maintain the existing caribou calving grounds, raptor nesting areas, migratory waterfowl nesting and staging areas.

Objective 1. District staff requested assistance from expert personnel with the Inland Fish and Wildlife Division to assist in the development and delivery of a rare plant survey for District 02. However, the Provincial priority was to conduct research for new rare plant sites in western Newfoundland ecoregions, which are known to have a much higher incidence of rare plant communities than is found in District 02. The District will continue to seek a co-operative approach to identify rare plant sites.

Two surveys were conducted within the District during the past five years. Elliston ridge, which is thought to have a unique (within Newfoundland) geological soil structure, was surveyed

for rare plant communities. No rare plants were found. A domestic cutting block to the west of Come by Chance was surveyed for a rare lichen known as Erioderma pedicellatum. Numerous phalli were found. Consequently, the domestic cutting block was amended to remove the areas containing erioderma.

Objective 2: Two distinct caribou calving grounds have been identified as part of the land-base review exercise for the current wood supply analysis and have been removed from the production forest for the District. These include small populations in the Keels area and on the eastern end of Random Island (refer to Appendix 1.0.) Coastal reconnaissance surveys, requisition of public knowledge and sourcing other available information have helped identify 22 new eagle and 5 new osprey nesting areas and 20 otter rubs. Appendix 1.0 shows all known nesting areas for all three species. Important migratory waterfowl staging and nesting areas are also shown on this map. Appropriate measures will be taken to mitigate any damage that may occur to these unique ecological features as a result of industrial or domestic forestry activity. District recommendation on Crown Land development proposals will also give due consideration to these important and sensitive natural attributes.

Element 2: Species Diversity

Value 1.3: Wildlife Habitat

Goal 1: Maintain, conserve and protect habitat for wildlife.

Indicators:

- Know all terrestrial species classified as extinct, extirpated, endangered, threatened and vulnerable on national, provincial and local list including change in risk status of species, and change in numbers of individuals for each species at risk.
- Percent of each forest type by age-class and extent
- Maintain special wildlife areas: caribou calving grounds, raptor nesting areas, migratory waterfowl nesting and staging areas.

Objectives:
1. Maintain a minimum of 15% of each age class across the landscape. (Refer toFigures 7.27 and 7.28)
2. To identify and protect the existing caribou calving grounds, raptor nesting areas, migratory waterfowl nesting and staging areas. (Refer to value 1.2 – Special Places.)

Value 1.4 Diversity of tree species.

Goal 1: Re-introduce native pine to ecologically suited sites throughout the District.

Indicators:

- The distribution of White Pine throughout the landscape.
- The area (ha) of Red Pine stands in the District.

Objective:
1. One hundred hectares per year will be planted with a mixture of 5% White Pine.
2. Five hectares per year will be planted with Red Pine.

Objective 1.4.1 was exceeded during the past five years. The objective was to plant 62,500 white pine seedlings throughout the area included in the District's reforestation program. A total of approximately 165,000 seedlings were planted.

Objective 1.4.2 was exceeded during the past five years. The objective was to plant a total of 25 hectares with a complement of 62,500 red pine seedlings. A total of approximately 87,000 were planted covering an area of approximately 35 hectares.

NOTE: These totals assume that proposed planting targets for the 2005 season will be met, which include 40,000 white pine seedlings and 70,500 red pine seedlings. The 2005 reforestation program was being implemented at the time of writing this plan.

Red pine sites are not common in this District, so there is limited opportunity to expand this objective. The Central Newfoundland Ecoregion (Refer to Section 2.21) has the most frequent occurrence of red pine sites in this Province. Much of District 02 is east of the normal range for red pine.

White pine is very prone to a pathogen known as White Pine blister rust. This can be fatal to young to intermediate aged trees and may affect the survival rate of the white pine plant. Ongoing plantation monitoring will record the success of achieving this aspect of the biodiversity value.

Element 3: Genetic Diversity

Value 1.5: Native and Valued Species

Goal 1: Maintain populations of selected native and other valued species. (Examples of species that are valued but not native include moose and snowshoe hare).

Indicators:

- Minimum viable meta-population of selected wildlife species (#/km^2).

Objectives:

1. Maintain moose populations that meet social and economic objectives without abrogating ecological values.

2. Establish minimum effective population of 50 pine marten in Terra Nova recovery area by the year 2010. (Western corner of District 2 (ie. North West River valley) is included within the recovery area)

Objective 1: Moose are a non-native species to insular Newfoundland, being introduced during the early years in the 20th century. The island has bountiful moose habitat and, in the absence of a natural predator, the species flourished. It has become one of the most important big game animals on the island from a social and economic perspective. Newfoundlanders have a deeply entrenched gathering culture. Many Newfoundlanders have become dependent on the moose hunt as a favored recreational pursuit and moose as a favorite source of fresh meat. On the economic front, a large out-fitting industry has developed in Newfoundland which contributes significantly to the $800 million tourism industry in the province. The out-fitting sector is highly dependent on moose to support the high hunting success rate that the market demands. (Out-fitting is not a well developed sector in District 02. It is confined to development of lodges in the remote southwest corner of the District and is not in conflict with forestry activity)

However, there is a serious ecological downside to this story. Moose, through its herbivore feeding habits, can have a major negative impact on forest succession and stand dynamics. This can impair biodiversity and as well as timber values. Hardwood tree and shrub species are a favored diet of moose. These plant species are browsed very extensively in areas with high moose populations. Other attributes of the ecosystem, such as the suite of song birds, can also be negatively affected by the change in stand dynamics resulting from browsing.

Moose census is very out-dated in District 02. The Bonavista Peninsula (Moose Management Area 29), where most of the forestry activity occurs in the District, has not been surveyed since 1989; the southern portion of the District (Area 28) was surveyed during 1997; and Random Island (Area 47) in 2001. The Department of Natural Resources will convey its concerns with respect to the lack of current scientifically validated information on moose population levels within District 02. When it is evident that population levels are high enough to seriously compromise other values, the District will lobby for an increase in hunting pressure

(through increased license quotas) to help regulate the problem. This will include pursuing localized strategies to manage moose densities in potential hardwood management areas (for the high end value added sector.)

Objective 2: It is estimated that the current population is between 30-35 animals. A further re-introduction of 3 animals occurred during the fall of 2005. Refer to Section 4.1.1 (Rare/Threatened/Endangered Species) and Section 7.5.1.5 (Newfoundland Marten Recovery Program)

5.2 Healthy Forests

There are three elements listed under this criterion. They are: incidence of disturbance and stress; ecosystem resilience; and extant biomass.

Element 1: Disturbance and Stress

Value 2.1: Natural Processes

Goal 1:Support the ecosystem's ability to maintain natural processes over time.

Indicators:

- Amount (ha) of not-sufficiently-stocked (NSR) forest areas.
- Amount (ha) of area burned by wildfire or prescribed fire.

Objectives:

1. Prevent long-term change in natural processes, such as creation of kalmia heaths or alder beds after timber harvesting.

2. To explore the logistics and feasibility of initiating a slash burning program.

Objective 1: Refer to Section 3.2.2.

Objective 2: During the past five years, a total of 28.5 hectares have been burned through wildfire in District 02. Prescribed fire has not been used in the District during the past planning period.

Fire is most effective in maintaining natural processes, particularly the removal of thick organic (or duff) layers on the forest floor and the eradication of kalmia, when drought codes are high. These conditions help in the re-establishment of black spruce, which normally occurs through natural succession on many Central Newfoundland Forest Ecoregion sites. High drought codes indicate hazardous fire conditions characterized by deep ground fire that challenges fire crews during mop-up. Burning during periods which have the most positive effect in maintaining natural processes also poses considerable risks to other values – timber, as well as surrounding communities, agricultural developments and cabin areas. This reality inhibited District staff from pursuing a prescribed fire program.

Fires during times of lower indices are less intense and burn closer to the surface of the forest floor. These fires are easier to suppress and pose less threat to other values. Burning during these periods will not provide as great an ecological benefit as when indices are higher. However, there are still some silvicultural advantages. It provides an operational benefit for reforestation by removing the slash load and improving cut-over access for planting. It also provides some biological benefits by (1) giving the new forest a flush of nutrients and (2) removing some of the duff layer, which helps the rooting system of planted trees to reach mineral soil. (Mineral soil has a more consistent moisture regime than the surface duff layer. Duff layers often become parched during extended drought periods and can lead to seedling mortality.

The District will explore the logistics and feasibility of initiating a slash burning program during the next planning period.

Element 2: Ecosystem Resilience

Value 2.2: Long-term ecosystem health (natural resiliency, organization, vigour).

Goal 1: Maintain the resiliency, organization and vigor of the forest in the light of current climate change predictions and scenarios.

Indicators:

- Amount of forest in open grown multi-age condition due to human disturbances

Objectives: 1. Use selection and clear-cutting to improve the structure in stands with multiage conditions resulting from past human disturbances.

The District will continue with a silviculture program which targets highgraded stands with multiage conditions and low productivity. During the past five years, a total of 497 hectares of low volume “junk” forest was cleared and readied for reforestation using this program.

Element 3: Extent Biomass

Value 2.3: Natural productive capacity

Goal 1: In areas that are managed for timber production, maintain and/or enhance the structure, function, and productivity of ecosystem components.

Indicators:

- Mean Annual Increment for timber (MAI)
- Number of moose/km^2

Objectives:
1. The mean annual increment (mai) of 2.0m^3/ha for Balsam Fir and Black Spruce will be maintained.
2. Maintain moose populations that meet social and economic objectives without abrogating ecological values. Study the impact of moose browsing on stand dynamics and attempt to correlate it with moose densities.

Objective 1: Refer to Section 3.2.1.1 – productivity with respect to the black spruce component of Objective 1. With respect to balsam fir, it is unrealistic to expect to maintain a high mean annual increment of growth from this species due to the proliferation of balsam woolly adelgid throughout the District during the past five years. As a result of the worsening adelgid situation in the fir component of the forest, the District has suspended its pre-commercial thinning program. The strategy to improve productivity on balsam fir sites will be to intermix young fir stands with adelgid resistant tree species. Older adelgid infested stands will be targeted for commercial harvest and, post-harvest, will be reforested with a suitable stocking level of adelgid resistant tree species.

Objective 2: Refer to Value 1.5;Goal 1;Objective 1. Also refer to 7.5.1.1 Moose/Snowshoe Hare Exclosure and 7.5.1.2 Moose Yarding Areas

5.3 Soil and Water

The CCFM defines this criterion as the maintenance of soil and water quality. Soil and water are essential to life. They provide the basis from which things grow and develop. Maintaining a consistent quantity and quality of water is an indicator of sustainable forest management. Because harvesting and its associated activities can impact on water in many ways, it is imperative that planners carefully approach the ecosystem with any plans which will create disturbance.

This criterion has two elements: physical environmental factors and policy and protection of forest factors.

Element 1: Physical Environmental Factors

Value 3.1: Water

Goal 1: Maintain naturally occurring flow rates and chemical composition of water.

Indicators:
- Canadian Water Quality Standards
- Flow rates of selected waterways in m^3/sec

Objectives:
1. To have water quality stay within the acceptable range as

defined in the Canadian Water Quality Standards on selected water ways.

2. Water flow rates (m^3/sec) will remain within natural flow cycles on selected water ways (Refer to Table 3.2)

Value 3.2: Soil

Goal 1: Prevent soil erosion and compaction during forestry operations.
Goal 2: Ensure there is no long-term net loss of soil nutrients.

Indicators:

- Amount (% timber operating area) of soil exposure (as defined by the Disturbance Survey method of the Engineering Services Division of the Department of Forest Resources and Agrifoods).

Objectives:

1. Less than 10% of mineral soil will be exposed during forest logging operations (ie. with development of access roads, extraction road, and landings. Mineral soil exposure for a silvicultural purpose (scarification as an example) is not included within this 10% objective.

Element 2: Policy and protection of forests

In order to ensure that ecosystems are maintained, it is important that policies are in place which provide for management practices for the protection of the environment.

Value 3.3: Healthy Environment

Goal 1: To have current policies and plans that provide direction for protection of the environment.

Indicators:

- The five year operating plan is released from further assessment as per the Environmental Assessment Act.
- Environment requirements for forest management activities are in place.

Objectives:

1. Complete the five year operating plan and submit the document to the Minister of Environment and Labor for review and approval

under the Environmental Assessment Act.

2. Implement and monitor for compliance with the environmental guidelines.

Objective 1: The Five Year Plan was submitted and approved under the Environmental Assessment Act.

Objective 2: It is a condition of all commercial permits issued in the District that woods operations must conform with the Environmental Protection Guidelines for Ecologically Based Forest Resource Management. Harvest inspections are conducted on commercial operations to ensure compliance with these guidelines, as well as with all other aspects of the Forestry Act and Regulations. During the past five years, there have not been any infractions detected as a result of field monitoring efforts.

5.4 Global Impacts

Carbon dioxide is the most significant of the "greenhouse" gases. These gases (nitrogen, oxygen, etc.) help keep the earth's temperature within a liveable range, however, there is a growing concern that human activities cause too much carbon dioxide to be released into the atmosphere. Healthy forests can help to store some of that carbon and therefore remove it from the atmosphere. At the same time, significant climate change might weaken the forests of our province with potentially serious consequences for everyone. Planners must strive to keep the "big picture" in mind as they develop planning programs for the forest ecosystems under their respective jurisdictions.

Criterion four has five elements. These are: contribution to global carbon budget; forest land conservation; forest sector CO_2 conservation; forest sector policy factors; and contributions to hydrological cycles.

Element 1: Contribution to Global Carbon Budget

Value 4.1: Stable Climate

Goal 1: Lengthen the life cycle of forest products.

Indicators:

1. The percentage of the District's forest resource used in the value added sector.

Objective: *1.* To increase the amount of value added forest product from local fibre by 10% within five years.

Objective 1: The benchmark for value added forest products in District 02 has been measured for 2005. (Refer to Section 7.2) The production level will be monitored in the 2006-10 planning

period.

Value 4.2: Forests as carbon sinks.

Goal 1: Increase the understanding of the forest as a carbon sink.

Indicators

1. Understanding by staff and forest operators of the role of the forest as a carbon sink

Objectives:
1. Review literature regarding tons of carbon/ha, tons released into the atmosphere, and ways to reduce emission.
2. Disseminate information to staff and forest operators.

Element 2: Forest Land Conservation

Value 4.3: Forest land-base

Goal 1 Minimize the net loss of forest area due to human causes or natural occurrences.

Indicators:

- Area (ha) of permanent forest depletion.

Objectives:
1. Return abandoned or gratuitously cleared agricultural land to the production forest land base.
2. Two kilometres of forest access road will be decommissioned each year. (Decommission means that all water-crossings will be removed; the road-bed will be removed and restored with top-soil; the abandoned road will be replanted.)

Objective 1: Refer to Section 7.4 Item (1) Idle Agriculture Land

Objective 2: Refer to Section 7.3.1.10

Value 4.4: Long-term ecosystem health (natural resiliency, organization, vigour).

Goal 1: Maintain the resiliency, organization, and vigour of the forest (including soils and peat lands).

Indicators:

- The amount of area disturbed (hectares) as a result of forest management practices and the percentage of that disturbed area which is regenerating following natural successional patterns.
- List of the known plant and animal species within District 2.

Objectives:

1. One hundred percent of forest management induced disturbance (cutting) will be regenerated naturally or artificially within 5 years with silviculturally acceptable species**.**

2**.** DNR will make its best effort to ensure that the number of known plant and animal species in the District will not be reduced as a result of forestry practises.

Objective 1: This objective has been changed from the previous Five Year Plan, which implied that harvested areas would be encouraged to regenerate according to known successional patterns. This will still be true, with the exception of balsam fir sites. It is very highly probable that the proliferation of balsam woolly adelgid throughout the District will negatively impact growth and yield in future balsam fir stands. In an attempt to mitigate the impact of the adelgid outbreak on growth and yield in the District, a silviculture strategy will be implemented which will include stocking naturally occurring fir sites with adelgid resistant tree species.

Also, refer to Section 3.2.2 Resilience, Item 2. Percentage of disturbed area successfully regenerated naturally and artificially and Section 7.5 – Silviculture Strategy

Objective 2: Refer to Section 3.2.1 Productivity, Item 2. Frequency of occurrence within selected indicator species. Also refer to Section 4.4 Mammal and Bird Distributions

5.5 Benefits to Society

The national designation to this criterion is multiple benefits to society and, based on the CCFM definition, deals with sustaining the flow of benefits from the forest for current and future generations. The benefits to society from the forest vary widely from timber to non-timber values, consumptive to non-consumptive values, and so on. It is in this area, more than any other, that the planner must balance the competing demands on the forest in a way which will address all concerns to the best extent possible.

The criterion has four elements associated with it. These are: productive capacity; competitiveness of resource industries (timber and non-timber related); contribution to the economy (timber and non-timber sectors); and non-timber values (including local option values).

Element 1: Productive Capacity.

Value 5.1: Commercial Timber

Goal 1: Enhance tree growth and quality of trees on lands managed intensively for commercial timber.

Goal 2: Enhance the use of the land-base to support commercial timber production. (Note: enhance may involve practising intensive management on specific areas of the forest land-base, allowing for a greater diversity of uses in other areas).

Goal 3: Increase the utilization of wood fibre.

Goal 4: Harvest timber volumes at sustainable levels.

Indicators:

- Mean annual increment, by site class (high, medium, poor).
- Area(ha) that has been treated to encourage the growth of timber for sawlog production.
- Area(ha) and percentage of the land base available for commercial timber production.
- Volume of wood left on site after harvest.
- Percentage of annual allowable cut that is used for lumber.
- Volume of wood exchanged between pulp mills and sawmills.
- Volume of lesser used species used in forest products manufacturing (Note: Lesser used species refers to species other than Spruce or Fir).
- Annual allowable harvest level.
- Volume of timber used in the local manufacture of value added forest products.
- Area of forest that has the correct silvicultural prescription during harvesting. (ie. generally speaking, selection harvest in uneven-aged stands and clear-cut harvest in diseased or mature and over-mature even-aged stands).

Objectives:

1. Maintain the MAI of low/medium/high site classes to 2.0m^3/ha.
2. Increase the area treated under the silviculture program annually for sawlog production by 20%. This objective will be revised. Refer to Objective 2 below.
3. Maintain the net area of Class I land base in the District. Class 1 land is the portion of the land base identified for timber production (this does not preclude other compatible uses on these lands).
4. Volume of merchantable timber left after harvesting will not exceed 6m^3/ha.
5. Increase the percentage of the annual allowable cut used for lumber by 10% by the year 2010.
6. Increase the volume of timber (m^3) exchanged between CBPP/A-C and Crown sawmillers by 10% by the year 2010.

7. Determine the sustainable supply of lesser-used species (larch, birch) and maintain the harvest within that level.
8. Softwood timber harvest level will not exceed the sustainable supply.
9. Increase by 10% the volume of local lumber used to manufacture value added forest products by the year 2010.
10. Encourage the practise of selection logging in all forest stands allocated for harvest where this silvicultural technique will benefit current wood supply demands and the future productivity of the forest.
11. Encourage the practise of clear-cut logging in all forest stands allocated for harvest where this silvicultural technique will benefit current wood supply and the future productivity of the forest.
12. DNR will continue to make its best effort to eliminate selective cutting (highgrading) in the District throughout the planning period.

Objective 1: Refer to Section 3.2.1.1 – Productivity: Item 1 and to Section 5.2 – Healthy Forest: Value 2.3 – Natural Productive Capacity: Objective 1.

Objective 2: District 02 has had an aggressive silviculture program during the past five years and has exceeded the target set in Objective 2. The average annual amount of area treated during the period 1996 – 2000 was 379 hectare. The average amount of area treated annually during the recent planning period was 769 hectare. This is more than double the amount of silviculture activity in consecutive planning periods. The District achieved a high level during the past five years because of the amount of backlog area in the District. This rate of increase cannot be maintained. It is anticipated that the core silviculture program (scarification and planting) in District 02 will be reduced during the coming five year period due to the availability of area to treat. However, the District will attempt to diversify the program.

Objective 3: Objective 3 has to be qualified with a caveat. There is continuous demand to remove productive forest from the production forest in the District to accommodate other Crown Land Developments. This may prevent achievement of this objective.

Objective 4: Surveys conducted on District 02 cutting operations prior to 2001 indicated that there was, on average, a high level of poor utilization throughout the District. A deduction of 18% was applied to the gross AAC during the 2001 wood supply analysis to account for wasteful logging practises. In 2001, the District introduced a merit program to encourage better timber utilization on its commercial cutting operations. One of the requirements of the merit program was to conduct utilization surveys on an individual commercial operator basis, which has been on-going during the past five years. Commercial operators received a credit of 9% of their regular quota volume if they met the required utilization standard. The average utilization loss resulting from integrated logging operations (which comprise 89% of the total commercial harvest) was less than 5%..

Objective 5: Increase the percentage of the annual allowable cut used for lumber by 10% by the year 2004. There are a number of Departmental policies that were developed to encourage the manufacture of lumber in the District and the Province. The Department has been very supportive of the integrated sawmilling approach – which now manufacturers nearly 90% of the lumber in the District and 80% of the lumber island wide. Waste is minimal in these mills

compared to conventional carriage or push-bench mills. Milling efficiencies allow for markedly improved lumber yields and a tremendous decrease in minimum sawlog size and improved tolerance in acceptable sawlog form. The other huge advantage of integrated mills is the fact that slabs are recovered for pulp-chips, which improves the viability of the sawmills and increase fibre supply to the pulpmills. In addition to other supports to integrated sawmills, the Department has adopted a policy that allows non-integrated mill owners to be exempt from a sawmill licence claw-back policy if their mills remain idle during periods that they ship their round logs to integrated mills. Finally, the Department has lowered the royalty rate on sawlogs during the past five years, equalizing the rate with that of other products such as pulpwood and firewood.

The proportion of the local resource being used to manufacture lumber has grown steadily during the first half of the past decade and has since levelled off. In 1995/96, a total of 23780m^2 of local sawlog resource was used to manufacture lumber, representing 44% of the total harvest (refer to table 5.3). During 2000/01this had increased by 29% to 30770 m^2, now representing 62% of the total commercial harvest in the District.

	1995/96	2000/01	2004/05
Integrated Operators	32	42	36
% of Total	16%	29%	40%
**Allocated Volume (m^3 solid)	37590	38,806	41571
% of Total	70%	82%	89%
# Selective Operations	172	104	53
% of Total	84%	71 %	60%
**Allocated Volume	16250	8249	5315
% of Total	30%	18%	11%
Total Harvest			
*Commercial pulpwood	27500	12280	17490
*Commercial firewood	3130	6690	9400
*Commercial sawlog	23780	30770	27030
*Total	54410	49740	53920

Table 5.3 Change in Resource Allocation and Product Use: 1995-96 to 2004-05

Objective 6: Increase the volume of timber (m^3) exchanged between CBPP/A-C and Crown sawmillers by 10% by the year 2004.

Objective 7: Determine the sustainable supply of lesser-used species (larch, birch) and maintain the harvest within that level.

Historically, Birch has not played an important role in the local forest industry, albeit this is now changing significantly with the growth of the value added forest products sector in the Province. As a result (and in light of other priorities), the Department has used limited

resources to determine an accurate birch inventory in the District (and on a Provincial scale). Given the limited growth and yield information available, an attempt was made during the planning period to determine a sustainable supply of white Birch. Given the uncertainty in the calculated birch AAC, the District is exercising caution when allocating birch quotas. During the next planning period, the District will attempt to improve the information base for white birch which would allow the calculation of a more scientifically valid sustainable harvest level.

Objective 8**:** Softwood timber harvest level will not exceed the sustainable supply. Table 6.1 shows the actual harvest in the District during the past five years compared to the AAC. The District has maintained the harvest within the sustainable supply during the previous planning period.

Objective 9: Increase by 10% the volume of local lumber used to manufacture value added forest products by the year 2004.

Objective 10: By 2001, practise selection logging in all forest stands allocated for harvest Where this silvicultural technique will benefit current wood supply demands and the future productivity of the forest. The District encouraged selection cutting by (1.) Conducting a selection harvest trial project during the first year of the planning period; (2.) allocating stands which matched the type of harvesting which would occur; and (3.) establishing a set of harvest conditions which placed a size restriction on timber to be harvested. This met with very limited success in achieving true selection harvesting.

Objective 11: By 2001, practise clear-cut logging in all forest stands allocated for harvest where this silvicultural technique will benefit current wood supply and the future productivity of the forest. The District has made significant strides in meeting this objective. The portion of the local industry known as integrated operators have grown used to the improved product utilization and increased efficiency achieved through clear-cutting. The District implemented an allocation buy-out policy through-out the past five year period which allowed operators who practised sound silvicultural logging practises to acquire the allocation of operators who wished to retire their logging operation. This favoured those who were clear-cutting and has led to a dramatic improvement in the utilization in the District's forest. Table 5.3 quantifies the impact. On a percentage basis (with volume allocation being the unit of measure) , th*e* amount of area clear-cut in this District has grown from 70% of the total commercial harvest in 1995/96 to 82% of the total cut in 2000/01 and, furthermore, to 89% of the total harvest by 2005.

Objective 12: Eliminate selective cutting (highgrading) in the District by the year 2004. As mentioned above, significant strides have been made in securing positive change in harvesting practises in the District during the past five years. The proportion of the District where selective cutting occurs can be represented by the number of non-integrated permit holders who still operate in the District and the share of the total allocation to which they are entitled. During 1995/96 a total of 174 non-integrated operators received a total of 30% (or 16,250m^2) of the District 02 commercial allocation. This was reduced to 104 operators by 2000/01, when this group received 18% (or 8249 m^2) of the commercial allocation. The District

continued to implement strategies during the past five years to discourage selective cutting. Consequently, the total number of non-integrated commercial operators was reduced to 53 by 2004/05, who by then received only 11% (or 5315 m^2) of the total commercial allocation.

Element 3

Value 5.2 Employment

Goal 1: Increase employment benefits from timber-based activities, non-timber, and value-added utilization of the resources.

Indicators:

- Number of people employed in forest/agriculture-based activities, broken down by category (ie harvesting, sawmilling, value-added forest product manufacturing, agriculture, outfitting).
- Forest/agriculture-related employment per unit (people employed in forestry industry per cubic metre harvested, outfitting industry per moose licence issue, agriculture industry per hectare alienated for agricultural purposes).

Objectives: 1. Increase the total person hours/weeks (or $wages earned) of people employed in the forestry/ agriculture/outfitting industries by 10% by 2004.

Objective: 1. Table 5.2 provides a breakdown of direct employment related to the forest industry in District 02 during 2004/05. A total of approximately 400 jobs contributes a total of nearly 10,000 person-weeks of employmentduring 2004/05. This is down significantly from the employment level of approximately 700 jobs during 1997/98. Despite some employment growth in the value added forest products sector and an expanded sawmill sector, the overall employment level in the local forest industry is lower than the earlier study period due to reduced number of operators due to (1) amalgamation of quotas, (2) increased mechinization within the harvesting sector and (3) increased efficiencies and mechanization in the sawmill industry.

Table 5.2. Direct Employment in the District 02 Forest Industry 2004-05

Category	Full-Time	Part-Time	Total Jobs	Total Man Weeks
Management & Protection	43	--	43	979

Harvesting	78	36	114	1434
Sawmilling	68	24	92	3091
Value Added	64	3	67	2515
Transportation	28	2	30	1078
Other (admin, scaling, marketing)	22	5	27	945
Total	303	70	373	10,042

Element 4: Non-timber Values

Value 5.3 Revenue from non-timber forest/land-use products and services.

Goal 1: Encourage a greater diversity of forest-based or other land-use based, resource-generating activities.

Indicators:

- Total revenue generated by the outfitting industry.
- Total revenue generated by the trapping industry.
- Total revenue generated by the agriculture industry.

Objectives: 1. Monitor the revenue level of:
a) outfitting lodges/businesses.
b) trappers.
c) agriculture industry.

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Value 5.4 Recreation

Goal 1: Maintain or increase the amount and diversity of recreational forest-based activities.

Indicators:

- Number of domestic hunting/fishing licences.
- Resource base available for selected recreational activities.

Objectives: 1. Maintain the number of domestic hunting/fishing licences.
2. a) Establish 2 waterway canoe routes.
b) It is recognized that hiking, skiing and ATV trails are diversified uses of the forest. The development of these trails will

be monitored throughout the next planning period. It is recognized that careful development is required to avoid negative environmental impact (particularly with respect to ATV trails)

Value 5.5 Forest products for personal use.

Goal 1: Provide for a sustainable domestic harvest of wood, meat, fish and berries.

Indicators:

- Volume harvested for timber (m^3), berries (lbs).
- Number of big game and small game hunting licenses.

Objectives:
1. The volume of timber available for the domestic harvest will remain at 34% of the AAC.
2. Number of domestic big game licences to remain at 1400**.**

Objective 1: Refer to Table 7.1
Objective 2: It was the consensus of the planning team that there should be flexibility in the number of big game licenses issued within the District. There may be a requirement to adjust the number of licenses as a management tool to address the impact of over-browsing by moose. The District will make representation to the Inland Fish and Wildlife Division if there is an apparent need to moderate or increase moose hunting pressure to address other timber or ecological values.

Value 5.6 Heritage

Goal 1: Encourage the continuation of traditional activities and rights of common access where they are consistent with the principles of sustainable development.

Indicators:

- Number of people who received hunting licences and domestic cutting permits in their area of preference.

Objectives:
1. Local citizens will have licences to hunt and permits to cut timber in the area of their historical use.

Objective 1: Local citizens have the right to hunt big game in any management area within the Province, subject to the priority pool and draw system implemented by the Inland Fish and Wildlife Division. Residents can acquire licenses to hunt small game or salmonids at locations of their choice, subject to open seasons. As in the past, domestic harvest blocks will continue to be designated to include traditional harvesting areas.

Value 5.7 Spiritual values.

Goal 1: Ensure that intrinsic and intangible values are adequately considered in forest management.

Indicators:

- Percentage of each watershed or valued view scape that has been cut in the previous ten years.
- Number of communities with established green belts.

Objectives:
1. A maximum of 40% of the forested portion of any major watershed will be harvested within a ten year period.
2. Green belts will be encouraged around all communities in the District.
3. Landscape design will be used to plan cutting patterns on sensitive viewscapes.

Objective 1**:** A maximum of 40% of the forested portion of any major watershed will be harvested within a ten year period. An analysis conducted by DNR indicated that this ojective was met.

Objective 2: Green belts will be established around all communities in the District.

GREENBELTS

Land-use planning is currently practiced in District 2 generally only by the larger communities with a formal municipal government infrastructure. For most of the communities in District 2, there is very little land-use planning except to the extent that this Ecosystem Strategy Document is a form of land-use plan. Today, land-use planning is being recognized as an important component of lands' management in all communities.

It is also recognized that designating greenbelts assists with the effective management of lands and natural and mineral resources. Therefore as a priority land-use planning initiative, the establishment of greenbelts of Crown Land surrounding communities in District 2 are encouraged.

Such greenbelts can provide the following benefits:

- Environmental protection including lands identified through a natural heritage, water resource, and landform conservation approaches,

- Recognition of transportation and infrastructure needs and concerns,
- Preservation of the natural resource from activities that are not sympathetic with the ecosystem approach to resource management,
- Include a mix of wetlands, forestlands, grasslands, and agricultural lands,
- Protection of steeply sloped lands forming more or less continuous escarpments, poorly drained or flood prone lands, or any other lands having unique scenic or locational attributes, and
- Recognition of wildlife habitat, esthetic amenities, and recreational needs.

Greenbelts will have a minimum width of 0.5 kilometer but may be wider if additional land is needed to accomplish the specific requirements of the greenbelt surrounding a specific community.

Harvesting of trees will be permitted where it supports the maintenance of a productive forest. Harvesting will be managed in such a way as to ensure conformity with the benefits and/or characteristics identified above. Landscape planning principles will be applied to mitigate any negative impact of harvesting on sensitive viewscapes.

Greenbelts can be set aside when the municipality, local service district or some other interest group agrees with the principles and are willing to sponsor the designation. The community(s) will need to support the designation of a greenbelt by way of planning, organizing and designating resources to the management of these greenbelts. Greenbelts require a long term commitment by the community(s) and sponsoring agency(s) to their ongoing maintenance.

Harvesters (commercial and domestic) and the general public will need to be educated as to the requirements and benefits of the designation of and orderly management of these greenbelts.

As communities evolve and lands are set aside for forest and agrifoods development, the maintenance of greenbelts is one way of ensuring the responsiveness towards societies' social, economic and environmental concerns. Lands and natural resources need to be effectively managed for the greatest public good.

Objective 3: Landscape design will be used to plan cutting patterns on sensitive viewscapes.
A number of sensitive viewscapes with scheduled harvest blocks were identified in comments from the Department of Tourism, Culture and Recreation following submission of the Five Year Plan for the planning period, April 01, 2001 and March 31, 2006. After discussion between DNR and TCR, it became clear that two areas should receive high priority for the application of landscape design principles. These include the West side of the Southwest River (blocks 218 near Port Blandford) and the south side of Clode Sound (block 230 – opposite side of Clode Sound from Charlottetown.) Harvest block 271 will also be managed using viewscape design principles to help maintain tourism values along coastal Sweet Bay.

Port Blandford, located at the entrance to Terra Nova National Park, is a popular tourist destination and boasts a large tourism infrastructure. The west side of the lower portion of the

Southwest River is a particularly sensitive, large scale forested viewscape from both the Trans Canada Highway as well as the Trans Canada Trailway. Harvest block IN 30 is located on the southern shore of Clode Sound approximately 2 kilometre North of Bunyon's Cove. This ridge is a medium scale viewscape from Terra Nova National Park and Clode Sound.

The District has conducted pre-planning in these areas for the past three seasons in an attempt to organize cut-block shapes, sizes and orientation on the landscape. The visual impact of harvesting within these blocks is monitored from sensitive viewing perspectives.

The District also agreed to monitor harvesting disturbance within domestic cutting blocks that are visible from strategic tourism assets or popular travel corridors. The objective was to close portions of domestic cutting blocks to cutting for a period of years once more than 30% of visible slopes were harvested. The closed portions could be reopened for domestic harvest after green-up of the harvested sections. A portion of domestic Block 76, in the Trinity area, was closed to harvest during 2002. The District will continue to monitor this, as well as other domestic cutting blocks, through the 2006-10 planning period and make changes that are consistent with this commitment.

5.6 Public Involvement and Commitment

The CCFM definition for this criterion reflects the idea that resource management choices be fair, equitable and effective. There has been increasing recognition in recent years that resource management decisions should be made with the informed and active participation of all affected people. Experience has shown time and time again that active involvement from interested groups can result in better decisions, and decisions that are more fully accepted by all. Private Citizens, non-governmental organizations and communities all have important roles to play. Along with the right to be involved, of course, they also have the responsibility to exercise that right in an informed and accountable manner. In the case of forests, there is a special obligation to acknowledge and respect the established rights and interests of aboriginal people, since aboriginal livelihoods have often been inseparably intertwined with the forests and certain Aboriginal rights are given unique consideration in Canadian law.

The criterion has five elements. They are: Aboriginal and treaty rights; participation by Aboriginal communities in sustainable forest management; sustainability of forest communities; fair and effective decision-making; and informed decision-making.

Element 3: Sustainable Communities

Value 6.1 Forest contribution to community sustainability.

Goal 1: Ensure that sustainable forest management contributes to the sustainabilitycommunities.

Indicators:

- Amount of employment in forest based industries.

Objectives: 1. Amount of employment in the forest based industry will be maintained or increased during the next 5 years.

Refer to Table 5.2 and Section 5.5, Vaue 5.2

Element 4: Fair decision-making

Value 6.2 Public involvement in resource planning

Goal 1: Incorporate, on an ongoing basis, active public involvement in the forest management planning and decision-making process.

Indicators:

- Number of different stakeholders represented on forest management planning or monitoring teams/committees.

Objectives: 1. Increase the number of stakeholders on future forest management planning teams.

Objective 1. The District invited, via direct written contact, all known pertinant government and non-government agencies to participate in the planning process to develop the Five Year Plan: 2006-10. This included Federal and Provincial Government Agencies; all local Municipalities and Local Service Districts; local development groups such as Development Associations, Zonal Board, Tourism Associations; all local interest groups such as ATV Associations, Cabin Associations, Trail Associations and directly impacted stakeholders, including the Newfoundland and Labrador Lumber Producers Association and Commercial logging contractors. In addition, concerned Citizens, the general public and other interest groups were invited to participate through local and Provincial newspaper advertisements. Appendix 13 provides a complete list of all organizations and agencies who received a direct written invitation to participate.

Element 5: Informed and responsible decision-making

Value 6.3 Public Relations

Goal 1: Increase awareness, understanding, and practice of sustainable forest management.

Indicators:

- Funding allocated to forest related communication and awareness-raising, education and training.
- The number of presentations on the SFM delivered to schools and service clubs.

Objectives: 1. Promote within the Department the need for increased funding for communication and aware-ness raising, education and training.

2. Make SFM presentations to schools and service clubs in the District.

Objective 1. The District was very vocal in an effort to secure additional funding and raise the priority of Education and Information within the Department. This included participation by the District Ecosystem Manager on a Regional I. an E. committee. The District was successful in developing some I and E. material in-shop.

Objective 2. District staff have had extensive involvement in an I. and E. effort during the past five years. This includes, but is not only limited to, many visits to local schools and other interest groups; participation in local envirofests; initiation of an annual drawing/essay contest throughout all schools and including all school-age children in the District (the only such initiative in the Department); print of articles in the local newspaper. A more extensive list of I. and E. activity is presented in Section 7.7.