Pilot Effectiveness Audits
Use of Criteria and Indicators to Date

Lessons Learned

Special Report

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Background

The Forest Practices Board is mandated to audit government's and agreement holders' compliance with forest practices legislation, and the appropriateness of government enforcement. This mandate began under the *Forest Practices Code of British Columbia Act* (the Code) in 1995, and continues under the *Forest and Range Practices Act* (FRPA).

Board audits are independent external audits. Audit findings are reported to the public and responsible government ministers. FPB audits differ substantially from internal company audits or those undertaken for most other purposes. Significant features of the FPB audit program are:

- Audits are primarily results oriented, and not focused solely on process or systems.
- Audits are randomly selected and not on the basis of performance.
- Sample strategy is based on the risk of impact to forest values.
- Reports are publicly released and may be challenged by government, licensees, and non-government organizations.

Purpose of this Report

Since the introduction of FRPA, the Board has been experimenting with auditing effectiveness of forest practices at conserving key forest values identified in the legislation. Criteria and indicators (C&I) have been used as the means to measure effectiveness in these pilot audits.

Four pilot audits have been completed and publicly reported:

- Audit of Forest Soil Conservation, MacKenzie Forest District, November 2004.
- Audit of Stream Riparian Management, Chilliwack Forest District, November 2004.
- Audit of Visual Resource Management, Campbell River Forest District, May 2005.
- Audit of Stream Riparian Management, Wynndel Box and Lumber Company Ltd. FL A20214, July 2005.

One pilot audit is in progress:

- Audit of Water Quality Effectiveness in the Arrow Boundary Forest District.

There is also a project to develop and test biological diversity conservation criteria and indicators on Tree Farm Licence (TFL) 37, Northern Vancouver Island. This case study has been completed and is being published concurrently with this report.

The purpose of this report is to explain the process the Board has followed in using C&I and describe some of the lessons we have learned by applying it in audits.

Using Criteria and Indicators to Measure Effectiveness of Forest Practices

Criteria and indicators are an assessment tool that can be structured to suit many purposes: to describe the state of a resource; to assess impacts of practices on a value; and to assess the attainment of certification requirements. These purposes are not mutually exclusive.

There are numerous agencies and organizations that are using C&I as an assessment tool for a variety of different purposes. For example, the Canadian Council of Forest Ministers, provincial government agencies, forest companies, certification bodies, and of course, the Forest Practices Board. These organizations are all measuring the same, or similar, forest practices and forest values. It seems logical that there should be "common" criteria and indicators that are used by various parties. To that end, the Board has been facilitating and collaborating with a variety of parties, in the development and application of forestry C&I. Many of the C&I we have tested were developed by the Ministry of Forests and Range (MOFR), and we adapted them to fit the Board's audit needs, testing their on-the-ground application in the process. The Board's experience and results were relayed back to the ministry and helped to further refine those C&I sets.

While the use of C&I to measure effectiveness is a new approach for Board audits, there are many commonalities with the way the Board have always carried out its audits. For example:

- Forest practices assessed have not changed. The Board examines range practices, timber harvest, road construction, maintenance and deactivation, and silviculture.
- Board audits have always looked at how licensees ensure they have properly assessed and classified resource features and values, and how those features and values are protected, conserved, or how impact to the value is limited.
- Board audits have always examined practices on-the-ground.
- Forest values have not changed. In Forest Practices Code compliance audits, the Board used forest values to determine what practices to sample. For example, a large fish-bearing stream in the middle of a harvest block would be sampled to examine riparian management practices.
- Objectives that drive the assessment have not changed. The Board's audits address objectives to minimize impact on values, protect features, and conserve values.

How We Applied C&I in Board Audits

Step 1: Clearly Define the Values and Practices to Assess

To develop an assessment framework, the Board must first determine what value(s), or part of a value, to assess. Then the Board must clearly understand and state what the objectives are for the value(s). It can be argued that this is the role of "criteria"; however prior to setting criteria, the value must be clearly defined and described (and agreed to). For Board audits, we begin with the FRPA values and objectives.

FRPA Value	FRPA Objective[1]
Soils	▪ Maintain soil productivity ▪ Maintain hydrologic function
Timber	▪ Maintain or enhance an economically valuable supply ▪ Ensure delivery log costs are competitive ▪ Ensure license holders are not unduly constrained
Wildlife	▪ Conserve sufficient wildlife habitat for survival of species at risk, regionally important wildlife, and winter survival of specified ungulate species
Riparian areas	▪ Conserve water quality ▪ Conserve fish habitat ▪ Conserve wildlife habitat ▪ Conserve biodiversity
Fisheries sensitive watersheds	▪ Prevent cumulative hydrological effects of primary forest activities from resulting in a material adverse impact to fish habitat for designated species
Community watersheds	▪ Prevent cumulative hydrological effects of primary forest activities from resulting in a material adverse impact on the quantity of water or timing of the flow of water from the waterworks ▪ Prevent cumulative hydrological effects of primary forest activities on the water from the waterworks having a material adverse impact on human health that cannot be addressed by water treatment required under an enactment or the licence pertaining to the waterworks
Biodiversity – landscape level	▪ Design areas, on which timber harvest is to be carried out, that resemble, both spatially and temporally, the patterns of natural disturbance that occur within the landscape
Biodiversity – stand level	▪ Retain wildlife trees
Cultural heritage resources	▪ Conserve or protect cultural heritage resources that are the focus of a traditional use by an aboriginal people and is of continuing importance to that people, and is not regulated under the *Heritage Conservation Act*.
Visual quality	▪ To ensure that the visual quality achieved is applicable to the visual sensitivity class

[1] Note: The FRPA objectives are all subject to "not unduly reducing timber supply," except Timber, Cultural Heritage and Visual Quality.

The pilot audits focus on individual values, or parts of values. For example, the Chilliwack stream riparian audit assessed mainly the FRPA objective to conserve fish habitat, not FRPA objectives for wildlife habitat, biodiversity or water quality associated with riparian areas. The audit also only assessed streams, not lakes or wetlands.

Once the value or values to be examined, and objectives for those values, are set, the Board determines what practices the audit will examine.

Board audits assess recent activities attributable to parties. These activities are operational planning, harvest, road construction, maintenance and deactivation, and silviculture practices. In order to audit, the Board must determine which practices to assess (audit scope) and the time frame of the practices to assess (audit period). For example, in the Chilliwack riparian audit, the audit scope was operational planning, harvest, and road construction and deactivation. These were viewed to be activities with the highest risk of negative impact on riparian areas. The parties audited were Teal Cedar Products Ltd., International Forest Products Ltd., and British Columbia Timber Sales. The audit examined the activities of these parties in four draft landscape units.

The audit period was October 1, 2001, to October 31, 2003.[2] A two-year period was used to assess only current activities, and to ensure a couple of winters had passed to enable assessment of windfirmness of trees in riparian reserves.

Step 2: Determine the Assessment Standard

To assess is to measure against a standard. C&I are a form of assessment standard. This structure has been adapted by many bodies; for example, the Canadian Council of Forest Ministers, the MOFR's Forest Resource Evaluation Program, and forest certification schemes.

The initial pilot audits used C&I developed by others. It was seen as important in these early stages to use C&I developed by parties other than the Board, in order to retain our independence.

However, in the later audits, the Board ended up developing its own C&I for visuals, biodiversity, and water quality. For these particular values, the C&I sets developed by others tended to not be specific enough to either the forest values or the forest practices that can impact these values.

It is important to be aware that C&I are not the assessment framework. To develop the framework, the Board has to first define what values and resource features and practices to assess; and also what questions we want to answer. At that point, techniques, indicators and thresholds can be developed in proper context.

[2] All forest practices assessed in the pilot audits were actually carried out under the Code.

To properly use criteria, clear objectives are paramount. The Board assesses the impacts of activities by a party on resource values. For this reason, our audit objectives, scope and period are designed to conclude and report on the impacts of current practices, not on the "state of the forest." The Board's mandate is reflected in the wording of the criteria, where you can see that the linkage to forest practices has been built in.

Clear objectives provide the concepts that guide assessments:

Conserve	Conserve values such as biodiversity.
Protect	Protect resource features such as karst, culturally modified trees, etc.
Minimize	Minimize the amount of sediment entering a stream.
Sustain	Sustain timber supply, maintain or enhance wildlife populations, ensure clean water supply.

These concepts can be seen in these criteria sets:[3]

1. Forest soils conservation audit

a. Productivity and hydrologic function losses to forest soils from road, trail and land construction activities are *minimized.*

b. Productivity and hydrologic function losses from harvest activities are *minimized.*

2. Stream riparian audits

a. The physical and biological characteristics of streams *have not been altered*, or put at risk, as a result of forest practices.

b. Downstream resources *have not been put at risk* as a result of forest practices.

c. S1 to S3 stream reserves are *of appropriate size* considering the biological and physical characteristics of streams.

d. Streamside reserves are *adequately safeguarded* from windthrow.

e. For S4, S5 and S6 streams, *sufficient vegetation* has been retained in streamside management zones considering the physical and biological characteristics of streams.

f. Soil disturbance in streamside management zones has been *minimized.*

g. The properly function condition of streams *has not been impacted* by forest practices.

h. Sedimentation has been *minimized* at road crossings.

[3] The balance of the criteria and indicator sets are found in Appendix A.

3. Visual resource management audit

a. Within designated scenic areas, *visual management meets or exceeds established VQOs or RVQCs*.

b. Within designated scenic areas, good landscape design is fully utilized to *reduce visual impacts.*

4. Biodiversity conservation audit

a. Ecologically distinct ecosystem types are *sufficiently represented* in unmanaged state across the landscape.

b. *Sufficient habitat exists* across the landscape for species at risk and locally important species.

c. Forest planning adequately *supports the conservation* of biological diversity and fosters continuous improvement in biodiversity conservation.

d. Stand-level forest practices *conserve* important elements of biological diversity.

5. Water quality audit

a. Criterion 4 – Practices

i. Licensees conduct forest activities to *minimize* impacts to water quality, quantity and timing of flow.

ii. Licensees conduct range activities to *minimize* sediment production that could impact water quality and to minimize fecal contamination of water bodies that could transport harmful material downstream and impact water quality.

b. Criterion 6 – Observable and recorded results

i. Forest practices have *not materially affected* water quality at the intake.

ii. Forest practices have *not materially affected* the quantity of water or timing of flow at the intake.

iii. Range practices have *not materially impacted* water quality at the intake – sediment or fecal contamination, or quantity or timing of flow.

Step 3: Determine How to Measure the Achievement of Criteria

The achievement of criteria is typically measured using indicators. Indicators are measures of a forest resource that, alone or with other indicators, allow for conclusion on the achievement of a criterion. For example, the Wynndel riparian audit had a criterion that properly functioning condition of streams not be impacted by forest practices. The indicators of properly functioning condition used were:

- channel beds are undisturbed
- channel banks are undisturbed
- channel large woody debris processes are undisturbed
- channel morphology is undisturbed
- all aspects of the aquatic habitat are sufficiently connected to allow for normal, unimpeded movement of fish, organic debris and sediments
- streams support a good diversity of fish cover attributes
- the amount of moss present indicates a stable and productive ecosystem
- the introduction of fine sediment has been minimized
- streams support a good diversity of aquatic invertebrates
- the vegetation in the riparian management area has been sufficiently protected from windthrow
- the amount of bare ground or soil disturbance in the riparian area has been minimized
- sufficient vegetation has been retained to maintain an adequate root network or large woody debris supply

If these indicators were met, the Board could conclude that the criterion had been achieved.

Once the indicators are set to support the criteria, audit methodology is designed to efficiently and effectively measure the indicators. Assessment methodologies include direct observation, inspection, computation, measurement, and inquiry and confirmation. Any and all of these techniques help to measure indicators and conclude on criteria.

A general framework for Board audit methodology is:

1. Determine the population of activities (i.e., relevant operational plans, number of harvest blocks, areas of road construction, maintenance and deactivation, areas with silviculture activities).

2. Assess the risk of the individual activities to the value of interest. For example, in a riparian audit, harvest areas with fish streams immediately adjacent to, or within, the harvest area would be considered higher risk than a harvest area well removed from streams.

3. Determine a sample of activities to be assessed. Generally, a sample is chosen to assess more activities from higher risk categories, but also to include some lower risk activities. Broad coverage, both geographically and temporally, is considered to select samples.

4. Measure the indicators at the samples. This may include measuring a 'control' sample that is not affected by the activity, as well as at the activity site itself. For example, indicators of properly functioning condition may be measured at an undisturbed stream reach above a harvest block, and then at a stream reach within the harvest block.

5. Determine if the sample is adequate to conclude on criteria. If not, extend the sample.

6. Analyze and report.

Step 4: Conduct the Assessment

After the assessment methodology has been determined, the assessment must be completed. This topic area is largely covered in the Board's compliance audit reference manual. However, there are a couple of important aspects worth highlighting:

- Board auditors need open access to inventories, resource assessments and plans. The more accurate and descriptive the plans and prescriptions are, the easier the assessment process. The inability to obtain sufficient evidence from plans and prescriptions means the Board requires a larger field sample to collect the evidence, which increases the time, effort and cost of the audit.

- Audits that use C&I designed to conclude on effectiveness of forest practices are very technical from both the audit and forestry perspective. This can require expertise in many different subject areas. Even with the right specialist knowledge, there are no guarantees that the audit will provide satisfactory answers on the question of effectiveness, given that science is often at its limits. For example, we may not know how much habitat is sufficient to conserve a species, or what level of impact to water quality is acceptable.

What Have We Learned?

The Assessment Framework

The Board's pilot program is as much about learning how to use C&I to assess effectiveness as it is about concluding on the impacts of the practices themselves. One of the objectives of these pilot projects is to determine if the audit procedure, and the criteria and indicators, are adequate and appropriate to conclude on the achievement of objectives for a specific forest value.

In all the pilot audits to date, the Board has stated that the C&I do work. However, the Board cannot state that any of the C&I sets are fully developed. For example, we have C&I for some values that adequately assess site impacts, but they may not provide a complete picture for landscape level impacts. This is clearly seen in the riparian audits:

- The Chilliwack riparian audit notes that the indicators are stream-reach specific. This may not be the best approach to assess the landscape level impacts on a stream system. Landscape-level assessments, such as the number of crossings over fish streams, amount of bare ground directly connected to streams via road networks, measurement of riparian vegetation lost through road crossings, etc., may be required to present a more complete picture.

- The Wynndel riparian audit demonstrates that assessing individual stream reaches, without landscape context or considering underlying forest management systems, restricts audit conclusions to site-level forest practices or those forest practices that are, by their nature, obvious. For the Board to fully assess practices against FRPA's riparian objective, the criteria and indicators need to address broader questions such as:
  - How have landscape-level objectives for riparian areas been established?
  - Have the components of the overall management system, designed to achieve the objectives, been identified?
  - Have appropriate forest practices been prescribed?
  - Have results been measured and assessed in relation to the objectives?
  - What do these results indicate about the achievement of the objectives?
  - How are management practices adapted to achieve objectives?

The C&I developed later in the pilot audit program (biodiversity and water quality) illustrate how the Board has changed its criteria to address these issues. The C&I, and methods of assessment, will continue to evolve as the Board gains more experience and addresses more challenges and issues in future effectiveness audits.

Context in Which Forest Practices Take Place

The pilot audits also provided an excellent opportunity to assess the impacts of forest practices themselves, often bringing forward more information than a standard Board compliance audit. The increased knowledge about how, and why, practices happen the way they do enables the Board to make meaningful and appropriate recommendations for improvements to practices.

The Board found that, in general, those involved in the audits were very open, and many frank discussions around the drivers behind forestry activities took place. Some examples from the audits:

- In the Mackenzie soils audit, the licensees identified numerous disincentives—financial and operational—which are precluding rehabilitation of some roads. For example: high costs associated with rehabilitating fine-textured soils; increased liability associated with the cost and stand-tending activities required to successfully regenerate these areas; ensuring crew safety in remote areas; and the need to maintain access for potential future silviculture treatments.

- The Campbell River visuals audit revealed some of the challenges in managing visual resources, such as the difficulties of designing cutblocks for visual management in areas with high risk of blowdown; ensuring that expected results are assessed against the applicable visual quality class definition, rather than on meeting a calculated percent alteration; the difficulties of ensuring that visual quality objectives are achieved along visual corridors; managing for visual quality when the visual resource development framework for roadside and other foreground harvest is not fully developed, and management of the visual resource using polygons rather than landforms.

- The Wynndel riparian audit described how the impact of other users of the road networks can impact on an individual company's ability to manage water and sediment delivery.

To consider effectiveness, or lack of effectiveness, without looking at the context within which companies operate, would be inappropriate. The pilot audits provided an avenue to hear and understand that context.

What Are We Still Grappling With?

There are many issues that have come to light through the Board's pilot audit process. Many of them are described below. This list is not comprehensive. As the audits continue to be completed, issues will continue to develop. Some of what we have seen so far:

- C&I are incomplete for some of the values audited. For example, the C&I used in the riparian audits apply specifically to fish habitat, not the full objective, which includes wildlife habitat and water quality. These audits also were specific to streams—more work is required to include lakes and wetlands.

- The Board continues to work on what needs to be included for a complete C&I set for a value. In the biodiversity pilot, the C&I have changed from the start to the report stage. It is very unlikely that the Board will develop a commonly accepted set of C&I without several tests.

- Audits are looking at the effectiveness of forest practices in achieving government's objectives for the important values set out in FRPA. To some extent the Board can do that. However, there are many other factors that can affect those forest values that are not captured or considered by our audits. For example:

    - Many of the values the Board assesses are affected by a much larger range of factors than just forestry. There are other industries, urbanization, natural impacts, etc. For example, a Board audit may assess the impacts of forestry road crossings on a stream, and conclude that more sediment was introduced to the stream than necessary. That same stream may have mining activity further upstream, cattle ranging impacts, and development impacts on the lower,

generally more vital fish habitat reaches downstream. However, it is difficult to say how much of the impact is attributable to forestry practices, given all the other impacts on the resource that are outside the scope of the audit.

- A related issue is that Board audits are of a party or parties, over a defined geographic area. Within that defined area there can be other users, both licensed and unlicensed, that affects a party's ability to manage impacts on values. Examples include oil and gas overlapping tenures with forest companies, forest companies responsible for water management and road maintenance in areas with high recreation use. These other users, in the same geographic area, can complicate reporting on an individual party's performance.
- There is the issue of past development and its impact on forest values. Examples of this are the amount and quality of remaining old growth (since a considerable amount of old growth has been harvested in the past decades in the most productive areas) and the existing condition of streams in heavily developed areas (past harvest and road practices have had significant impact on stream condition in some areas, but the practices have since changed).
- The Board reports on current forest practices—concluding on the impact of forest practices on values, such as biodiversity and riparian values. However, for these "broader" values, focus on forestry may miss other very real risks to the value, such as geographic location of important values and the relationship to activities (e.g., most "biodiversity hotspots" are more endangered by urban development, most salmonids prefer to spawn in lower reaches closer to the ocean, where urbanization and agriculture pressures dominate).

- Perhaps the most significant issue the Board has found is that government requirements for some forest values do not necessarily ensure the objectives for that value will be achieved. Conservation of biodiversity is the best example of that. The FRPA requirements for biodiversity are not adequate to ensure conservation of biodiversity values in all circumstances. The C&I used by the Board attempt to define (within current scientific knowledge) what would be required to achieve this objective, but they require much more analysis and forest retention than the current legal requirements do. This creates a problem in that the majority of forestry licensees in the province are meeting government's legal requirements, but that may not be adequate to conserve biodiversity in many cases. Applying C&I to measure achievement of biodiversity conservation at the present time means no party could or would be found effective. This gap between legal requirements, and what would be required to effectively conserve biodiversity, needs to be addressed by government.

What does the Future Hold for Board Pilot Effectiveness Audits?

The Board plans to continue developing ways to assess the impacts of forest practices on resource values. This will likely include more C&I sets, and refinement to the existing sets. The Board plans to continue develop the programs for other values that we have not yet examined

The Board will also be looking at different ways of applying the C&I. This could include multi-value audits, or examination of topics over a broader geographic area. An example of a multi-value audit may be one that looks at riparian reserve management, minimization of access structures and ecological representation. An example of a broader geographic range may be a look at ecological representation over the Southern Interior Forest Region.

The effectiveness audits were developed in anticipation of the results-based environment for forest management created by FRPA. However, as FRPA is being implemented, it is increasingly clear that licensees are only required to be consistent with government's objectives for forest values and that licensees are not committing to achieve results in their stewardship plans. The only commitments licensees appear to be making are to meet the legislated practice requirements of FRPA. Board audits of how effective forest practices are at achieving government objectives, when there are few legal requirements or commitments, will, we hope, stimulate increased rigour in the results-based regime. It will also be a means of highlighting forest practices that exceed the minimum legal requirements, in the quest to achieve government's objectives and public expectations for managing the values outlined in FRPA.

At this point in time, the use of C&I is still experimental and developmental. The Board welcomes ideas, suggestions, and comments from those interested in this process. To provide us your feedback and comments, please contact:

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Audit reports and more information about the Board are available at www.fpb.gov.bc.ca.

Appendix A: Criteria and Indicator Sets

Soil Conservation

1. **Productivity and hydrologic function losses to forest soils from road, trail and landing construction activities are minimized.**

    - The area occupied by unproductive soil as a result of permanent access construction is minimized given the site conditions, harvest constraints and equipment utilized.
    - Temporary access is utilized where appropriate, and adequately rehabilitated and regenerated.
    - There is a minimal level of altered natural drainage and no significant erosion, or risk of significant erosion, caused by roads, trails and landings.
    - There is an absence of unproductive soil in the net area to be reforested as a result of landslides or gully erosion caused by road construction, maintenance or deactivation.

2. **Productivity and hydrologic function losses to forest soils from harvesting activities are minimized.**

    - There is an absence of unproductive soil in the net area to be reforested as a result of landslides or gully erosion caused by harvesting.
    - There is minimal disruption of natural drainage patterns in the net area to be reforested.
    - The level of dispersed and concentrated soil disturbance in the net area to be reforested is minimized given the site conditions, harvest constraints and equipment utilized.
    - Areas of excessive soil disturbance have been appropriately rehabilitated and regenerated.

Stream Riparian Management

1. **The physical and biological characteristics of streams have not been altered, or put at risk, as a result of forest practices.**

    - Channel beds are not disturbed channel banks are not disturbed.
    - Large woody debris processes have not been changed.
    - Channel morphology has not been changed.
    - Introduction of fine sediments into streams has been minimized.
    - Movement of fish, organic debris and sediments has not been impeded.

2. **Downstream resources have not been put at risk as a result of forest practices.**

    - The potential for debris or exposed sediments to enter the stream is remote.
    - Steep slopes adjacent to the stream are stable and unlikely to fail and enter the stream.
    - Bare ground subject to surface erosion and movement to the stream is less than one percent of total area hydrologically linked to the stream.
    - The number of stream crossings has been minimized.
    - Temporary stream crossings have been appropriately deactivated.
    - Permanent stream crossings are appropriately placed and armoured.

3. **S1 to S3 streamside reserves are of appropriate size considering the physical and biological characteristics of streams.**

    - Sufficient streamside vegetation has been retained to provide shade, reduce bank microclimate change, and maintain an adequate root network and large woody debris supply.

4. **Streamside reserves are adequately safeguarded from windthrow.**

    - The incidence of windthrow, or risk of windthrow, in reserve zones is appropriately minimized.
    - Riparian reserve zones are intact within 10 metres of the stream channel.

5. **For S4, S5 and S6 streams, sufficient vegetation has been retained in streamside management zones considering the physical and biological characteristics of streams.**

    - Non-merchantable conifer trees (less than 30 centimetres DBH), understorey deciduous trees, shrubs, and herbaceous vegetation have been retained to the fullest extent possible within five metres of the stream channel.
    - Further retention is evident as necessary to accommodate stream values (including landscape-level RMZ retention objectives).
    - The incidence of windthrow, or risk of windthrow, in management zones is appropriately minimized.

6. **Soil disturbance in streamside management zones has been minimized.**

    - Total soil disturbance directly linked to the stream in the first 10 metres of the management zone is less than one percent.
    - Total soil disturbance directly linked to the stream in the first 10 metres of the management zone plus all other areas hydrologically linked to the stream is less than five percent.

Visual Resource Management

1. **Documented public input relating to visual quality has been fully addressed by operators through operational planning and forest practices.**

2. **Scenic areas are designated over areas of visual sensitivity.**

3. **VQOs (or RVQCs) within scenic areas are appropriate to manage visual quality.**

4. **Within designated scenic areas, visual management meets or exceeds established VQOs or RVQCs.**

5. **Within designated scenic areas, good landscape design is fully utilized to reduce visual impacts.**

6. **Auditees have management systems in place to achieve VQOs and RVQCs and they are work effectively.**

Biodiversity Conservation

1. **Ecologically distinct ecosystem types are sufficiently represented in unmanaged state across the landscape.**

2. **Sufficient habitat exists across the landscape for species at risk and locally important species.**

3. **Forest planning adequately supports the conservation of biological diversity and fosters continuous improvement in biodiversity conservation.**

    - Pre-industrial condition and natural disturbance regimes across the landscape have been identified.
    - Responsibility for biodiversity conservation across the landscape has been established in relation to the scale and scope of forestry practices.
    - Objectives for biodiversity conservation have been developed that take into consideration natural disturbance regimes, ecosystem diversity, maintenance of habitat and licensee responsibility.
    - Strategies have been developed at appropriate scale in relation to objectives, and include measurable and verifiable targets for ecosystem representation and wildlife habitat retention.
    - Landscape and site level plans are developed that describe the operational implementation of strategies.

- Inventory data is sufficient to support objectives, strategies and plans, and includes forest cover, ecosystems, wildlife habitat and riparian areas.
- The achievement of objectives is evaluated us appropriate spatial and temporal scales, including ecosystem function and species populations.
- Strategies and plans are adapted in relation to effectiveness monitor results, including recruitment and/or restoration of ecosystems, structures and habitat.

4. **The results of forest practices reflect intended results established in strategies and plans.**

5. **Stand-level forest practices conserve important elements of biological diversity.**
    - Sensitive plan communities, ecosystems, sites and structures of biological significance are conserved.
    - Wildlife habitat is conserved.
    - Native tree species diversity is conserved.
    - Aquatic species habitat is conserved.
    - Botanical species are conserved.

Water Quality

1. **Background information**
    - Licensees are aware of the legislation, relating to protect water quality, govern their operations in community watersheds.
    - Licensees are aware of the location of the water systems in the community watersheds, and the capabilities of those water systems.
    - Water quality, including turbidity and water quantity, has been measured to determine the normal range of variability for the watershed. Licensees have obtained this information and incorporated it into their planning framework.
    - Planning takes into account the proximity and potential impacts of activities other than forestry in the community watershed.

2. **Responsibilities, objectives and communication**
    - The responsibilities of the various participants in the matter of water quality and quantity in the CW have been delineated and are understood.
    - Objectives and expectations for water quality have been established.
    - Communication among forest agreement holders, government agencies and water suppliers are responsive and effective.

3. **Planning to address potential water quality and quantity impacts**

    - Areas of erosion risk and areas producing sediment have been identified and mapped (e.g., soils with high erosion hazard rats and areas with unstable slopes, and ditch lines at stream crossings).
    - Licensees have identified higher risk forest practices that can impact water quality and quantity and have incorporated this awareness into environmental policy and procedure, and the forest operational planning process.
    - Licensees have developed results and strategies in relation to the objective established for water quality in the CW.
    - Plans, including detailed operational plans (site plans, road layout etc), address sediment and other water quality risks by avoid high risk areas, or design risk mitigation strategies where necessary.
    - Plans adequately assess and manage for potential impacts on water quantity and timing of flow.

4. **Practices**

    - Licensees conduct forest activities to minimize impacts to water quality, quantity and timing of flow.
    - Licensees conduct range activities to minimize sediment production that could impact water quality and to minimize fecal contamination of water bodies that could transport harmful material downstream and impact water quality.

5. **Monitor and report**

    - Forest and range practices are monitored to assess the achievement of plans in relation to conservation of water quality and quantity.
    - Water quality and flow is monitored and the data are sufficient and available to assess changes in water quality and quantity in the community watershed.
    - Licensees appropriately notify water suppliers as soon as possible when a turbidity event becomes apparent or likely.
    - Government agencies with enforcement responsibilities effectively monitor licensee activity and obligations in the CW.

6. **Observable and recorded results**

    - Forest practices have not materially affected water quality at the intake.
    - Forest practices have not materially affected the quantity of water or timing of flow at the intake.
    - Range practices have not materially impacted water quality at the intake – sediment or fecal contamination, or quantity or timing of flow.

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NEWS RELEASE

For Immediate Release
April 20, 2006

Watchdog tests new approach to auditing effectiveness of forest practices

VICTORIA – The Forest Practices Board has successfully tested new tools to audit the effectiveness of forest practices in maintaining biodiversity and other important forest values, according to two new board reports released today.

The first report addresses the testing of criteria and indicators to evaluate the maintenance of biodiversity – probably the most difficult forest value to measure. The board found that criteria and indicators provide an objective, science-based assessment standard for evaluating biodiversity conservation by forest licensees.

Canfor's management of biodiversity on Tree Farm Licence 37 on northern Vancouver Island was the subject of the testing process. Canfor's operations under this licence are certified by the Canadian Standards Association and overseen by a sustainable forest management plan with specific provisions for biodiversity, which provided the ideal test environment for the board's new audit tools.

"We appreciate Canfor's willingness to volunteer in helping the board test this new approach to auditing the effectiveness of forest practices on the ground," said board chair Bruce Fraser.

The second report summarizes the experience and lessons learned in five pilot audits examining soil conservation, visual quality, and stream riparian management, in addition to the biodiversity work. The criteria and indicators and the audit methods were the subject of consultation and discussion with government agencies, academics and forestry licensees.

"By developing and testing these audit tools, we can report to British Columbians on the effectiveness of forest practices in protecting biodiversity, fish and wildlife habitat, community watersheds, and other forest values, which is essential in a results-based regulatory environment," said Fraser.

The report also notes that using criteria and indicators in board audits is complicated by several issues. For example, it can be difficult to attribute impacts directly to one operator's forest practices when there are other activities such as ranching, mining, or private land development taking place on the same land.

"Despite some weaknesses, criteria and indicators are vitally important tools to measure the effectiveness of forest practices conducted under the Forest and Range Practices Act," said Fraser. "We will continue to develop and refine our auditing tools over the coming years, as the new legislation starts to influence practices on the ground."

The Forest Practices Board is an independent public watchdog that reports to the public about compliance with the Forest and Range Practices Act (FRPA) and the achievement of its intent. The board's main roles under FRPA are:

- Auditing forest practices of government and licence holders on public lands.
- Auditing government enforcement of FRPA.
- Investigating public complaints.
- Undertaking special investigations of forestry issues.
- Participating in administrative appeals.
- Providing reports on board activities, findings and recommendations.

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Conservation of Biological Diversity: An Assessment of the Application of Criteria and Indicators

This report addresses the testing of criteria and indicators to evaluate the maintenance of biodiversity – probably the most difficult forest value to measure – and found that the criteria and indicators used provide an objective, science-based assessment standard for evaluating biodiversity conservation by forest licensees.

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