

# Criterion 9: Quality-of-life indicators

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## Abstract

This extension note is the eighth in a series of eight that describes a set of tools and processes developed to support sustainable forest management planning and its pilot application in the Arrow Timber Supply Area (TSA). It summarizes the criterion and indicators used to evaluate quality-of-life opportunities for the sustainable forest management (SFM) pilot basecase analysis of the Lemon Landscape Unit. The management of forests has broadened to include various social values and amenities that were considered during the development of criteria and indicators for the Arrow Innovative Forestry Practices Agreement. The quality-of-life criterion was assessed through indicators that addressed outdoor recreation opportunities and visual quality of the managed landscape. This assessment was informed by public input from area residents and stakeholders. Measurable quality-of-life indicators allowed trade-offs with other resources in the SFM pilot basecase analysis; protection of these quality-of-life values did not overly constrain other values modelled in the project.

**KEYWORDS:** *forest planning, outdoor recreation, social sustainability, sustainable forest management, visual quality.*

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## Introduction

Although social values, such as outdoor recreation and visual quality, contribute to quality of life and a tourism-based economy, they can be difficult forest amenities to manage. These values are perceived as subjective and hard to define, as well as a constraint to timber values. Social values, however, do not necessarily need to be at odds with timber supply. Evidence suggests that managing for visual quality, through the use of visual quality objectives (VQOs), may not constrain timber volumes if innovative harvesting techniques are used (Picard and Sheppard 2001a and 2001b). In British Columbia, a VQO refers to a physical area that contains a specific resource management objective established by the district manager or contained in a higher-level plan that reflects the desired level of visual quality based on the physical characteristics and social concern for the area. Analysis of harvesting in visually sensitive areas of British Columbia suggests that the implementation of certain partial cutting techniques (e.g., radial strip cutting used by Timfor in Knight Inlet) can increase the amount of timber available for harvest without negatively affecting sensitive viewsapes (British Columbia Ministry of Forests 1997a; Sheppard and Picard 2000).

Outdoor recreation in British Columbia is increasing, both on Crown land and in protected areas (B.C.

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*Social values do not necessarily need to be at odds with timber supply.*

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Ministry of Forests 1995; The Legacy Panel 1999; B.C. Ministry of Environment, Lands and Parks 2001). Outdoor recreation is often the interface through which the public has contact with forestry and, therefore, provides an opportunity to demonstrate sustainable forest management. A wide variety of recreationists engage in activities in provincial forests; given the projected increase in recreation participation, it has become increasingly important to include this dimension in planning efforts.

The recognition of a broad range of forest values by forest managers has underscored the importance of providing meaningful opportunities for public (stakeholder) input into forest management decision making to increase the likelihood of broad-based support for proposed management scenarios (Kimmins 1991; Beckley 1999; McFarlane and Boxall 1999).

A survey (Meitner *et al.* 2001) administered in Spring 2000 (Extension Note 3) solicited the preferences of residents in the Arrow Timber Supply Area (TSA) and the adjacent community of Nelson (see sidebar).

### The IFPA Sustainability Project

The Arrow Innovative Forestry Practices Agreement (IFPA) was established as a co-operative effort between the five licensees\* in the Arrow Timber Supply Area (see Figure 1, Extension Note 1) and the B.C. Ministry of Forests' Nelson Forest Region. The Sustainability Project was an important initiative of the Arrow IFPA that partnered forest practitioners and academic researchers to develop a comprehensive approach to planning and implementing sustainable forest management.

The result of this work has been the Sustainable Forest Management Framework, which is now being used by Canfor\* to guide certification and

sustainable forest management planning in their British Columbia operations. For further background, refer to: <http://www.sfmportal.com>

#### Disclaimer

The ideas presented in this extension note form part of a project (outlined in a series of eight notes) that was initiated to develop a system for evaluating management options under a criteria and indicators framework. These ideas do not represent real management options for the Lemon Landscape Unit, or the Arrow TSA, although they could form the basis of such options.

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\* The Arrow Forest Licensee Group was comprised of Slocan Forest Products, Kalesnikoff Lumber, Atco Lumber, Riverside Forest Products, and Bell Pole. In 2004, Slocan Forest Products Ltd. was acquired by Canadian Forest Products Ltd.

## CRITERION 9: QUALITY-OF-LIFE INDICATORS

The respondents confirmed that outdoor recreation and visual quality are important social values and should be included as indicators of sustainable forest management. Analysis suggested that emphasis should be placed on protecting recreation resources and the quality of recreation experiences, rather than developing new recreational facilities (Table 1). Respondents were very supportive of maintaining VQOs, although many indicated that they might accept certain changes in the landscape.

A multi-criteria analysis (MCA) was conducted with stakeholders in the Lemon Landscape Unit to prioritize the resource values that were identified in the proposed SFM criteria and indicators (Extension Note 3). Outdoor recreation and visual quality were consistently ranked after biological richness, water supply, timber economics, forest/soil productivity, and non-timber economics, but were still considered important resource values; approximately 25% of the stakeholders' numeric weightings were applied to quality-of-life indicators. Various stakeholder groups, including people associated with the forestry profession, commercial tourism, and outdoor recreation, ranked criteria somewhat similarly. Outdoor recreation and commercial tourism groups expressed considerable concern over loss of access due to road closures, though some recreation users expressed concern over further intrusions into backcountry areas.

### Criterion and Indicators

Criterion 9 of the Arrow IFPA SFM framework states: "Forest management sustains ongoing opportunities

for a range of quality-of-life benefits." The range of quality-of-life benefits considered were: outdoor recreation; visual quality; unique or significant places and features of social, cultural, and spiritual importance; and worker safety. For the SFM basecase (Extension Note 4), outdoor recreation and visual quality were selected as indicators of quality-of-life benefits.

### Outdoor Recreation

The outdoor recreation indicator was designed to ensure that resources and opportunities for recreation are maintained or enhanced. Six measures, drawn partly from the Arrow TSA survey results, were developed to monitor this indicator:

1. Areas and percentages of forest managed primarily for one or more important recreation activities (by activity) relative to baseline status.
2. Number of maintained recreation sites and facilities relative to baseline status.
3. Success in maintaining major existing access routes for recreation and communicating changes effectively to users.
4. Balance of primitive, semi-primitive, and developed recreation opportunities maintained, relative to current Recreation Opportunity Spectrum inventory (B.C. Ministry of Forests 1997b).
5. Number of visitor days attributed to recreation and tourism, relative to baseline status.
6. Level of satisfaction (for a range of activity types) maintained or enhanced relative to baseline status.

**TABLE 1.** Survey participant ranking of recreation and visual quality management objectives

Ranking	Outdoor Recreation	Visual Quality
1	Enhancing and protecting recreational resources (e.g., fish stocks, wildlife).	Protecting scenic values in "frontcountry" areas visible from main roads and communities.
2	Avoiding crowding and overuse of recreation sites.	Maintaining Visual Quality Objectives to protect existing scenic character.
3	Protecting the scenic setting for recreation/tourism activities.	Maintaining the appearance of a natural landscape.
4	Increasing income to local communities.	Protecting scenic values in "backcountry" areas.
5	Developing ecotourism and backcountry recreation opportunities (outside existing parks).	Maintaining the appearance of the landscape as it is now.
6	Developing more recreation facilities (outside existing parks).	Relaxing Visual Quality Objectives to promote more flexibility in timber harvesting and management.

*Measure 1* allows forest managers to track how areas suitable for various recreation activities change across the landscape as a result of timber harvesting, and to identify those areas where mitigation may be appropriate to address any losses of recreation activities in the managed forest. *Measure 2* allows managers to assess the availability and state of recreation sites and facilities. *Measure 3* permits forest managers to determine how recreation access is affected by road construction or deactivation. *Measure 4* uses the Recreation Opportunity Spectrum (a framework for inventorying, planning, and managing the recreational experience and setting) inventory (B.C. Ministry of Forests 1997b) to identify whether primitive and semi-primitive backcountry areas are reduced or increased over time. *Measure 5* provides forest managers with information on whether levels of use are affected by harvesting and allows general recreation use trends to be identified. *Measure 6* evaluates recreation participant satisfaction through means such as user surveys, and allows forest managers to gauge visitor quality of experience. Subsequent analyses focussed on Measures 1, 3, and 4.

### Visual Quality

The visual quality indicator was designed to ensure that the visual quality of the managed landscape is acceptable to a range of stakeholders. Three measures, drawn from the Arrow TSA survey results and current perceptual research findings, were developed to monitor this indicator:

1. Success in meeting approved VQOs.
2. Public acceptance of visual impacts in visually sensitive areas outside established VQOs (e.g., provincial parks and special use areas).
3. Success in demonstrating sustainable forest management to the public through enhanced visual treatments and by providing information along public access routes.

*Measure 1* applies to areas that are already subject to VQOs, particularly in the frontcountry. *Measure 2* is intended to gauge whether harvesting is acceptable in visually sensitive areas outside inventoried scenic areas (equivalent to a Partial Retention VQO). *Measure 3* is intended to demonstrate “visible stewardship” (care for the landscape) to the public, using techniques such as signage and landscape design (e.g., organic block shapes,

feathered edges, various levels of green-tree retention) (Hull *et al.* 2000; Sheppard 2000). Subsequent analyses focussed on Measures 1 and 3.

## Applying the Concept: Sustainable Forest Management Pilot Basecase Analysis

### Outdoor Recreation

The following sustainability thresholds were identified for selected mapped recreation activities (Measure 1) in the Arrow TSA:

- “sustainable”: 10% or less of recreation activity areas affected by resource use
- “marginally sustainable”: 10–20% of recreation activity areas affected by resource use
- “unsustainable”: more than 20% of recreation activity areas affected by resource use

These thresholds were relative to the baseline status identified in the 1999 Recreation Features Inventory. Although the adjacent Kokanee Glacier Provincial Park can accommodate many non-motorized outdoor recreation activities, much of the Lemon Landscape Unit already has road-accessible recreation. Consequently, the SFM basecase focussed on enhancing backcountry skiing and snowmobiling opportunities in two areas where variable retention harvesting prescriptions were applied to improve alpine access. Existing access (Measure 3) was maintained for most public recreation routes and areas.

The location of Ministry of Forests’ recreation sites, trails, and viewpoints were considered in the establishment of semi-primitive areas and recreation activity management. An analysis of the 1999 Recreation Opportunity Spectrum inventory for the [former] Arrow Forest District<sup>1</sup> indicated that no primitive areas existed in the Lemon Landscape Unit and that semi-primitive, non-motorized areas were confined to alpine areas (Measure 4). The preservation of remaining backcountry character should be a priority, but given that a considerable portion of the landscape unit is designated as a provincial park, additional primitive areas were not necessary; however, to provide a diversity of recreation experiences and settings, an area of valley bottom in Timber Creek was set aside from harvesting.

<sup>1</sup> After April 1, 2003, the Arrow Forest District in the Nelson Forest Region was amalgamated with the Boundary Forest District to form the Arrow Boundary Forest District in the new Southern Interior Forest Region. See: <http://www.for.gov.bc.ca/mof/maps/regdis/nDAB.htm>

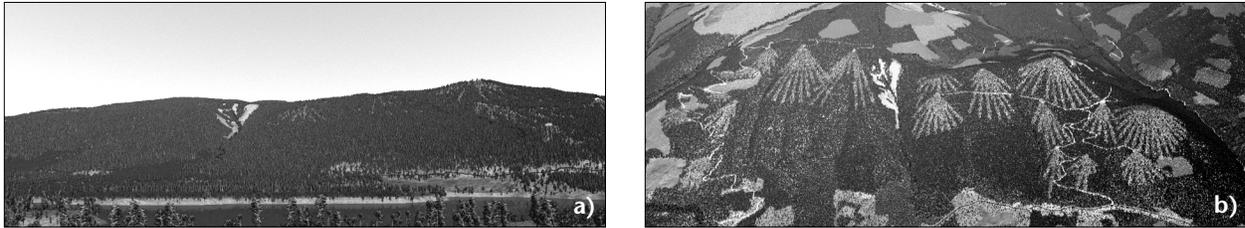


FIGURE 1. Example perspective (a) and aerial (b) visualizations of the Ringrose Face (Meitner *et al.* 2001).

### Visual Quality

The Ringrose Face is a visually sensitive frontcountry viewscape that can be seen from the town of Slocan, Valhalla Provincial Park, and various locations on Slocan Lake. Based on analysis of three-dimensional visualizations (Figure 1), prepared by the University of British Columbia's Collaborative for Advanced Landscape Planning, the application of radial strip-selection harvesting on Ringrose Face maintained existing VQOs (Measure 1) and reduced constraints on the amount of timber available for harvesting.

Backcountry VQOs were established for two important recreation destinations in the Lemon Landscape Unit—Sapphire Lakes and the trail to the Heather Lake Campground—both in Kokanee Glacier Provincial Park. The concept of visible stewardship was applied to the two main public access routes to Kokanee Provincial Park via Lemon Creek and Enterprise Creek. Objectives were met through various levels of retention within harvest blocks plus roadside practices (Measure 3).

### Future Directions

The development of clear management objectives based on public input, and the attempt to establish meaningful criteria, indicators, and measures for quality of life, permitted important social values to be incorporated into the SFM basecase. Spatially explicit recreation and visual quality considerations enabled trade-off analyses with other criteria in the planning exercise. The application of limited recreation constraints in backcountry areas, and innovative partial cutting techniques in frontcountry areas, enabled overall harvesting volumes to be improved relative to current conditions (Extension Note 4). These applications, however, should receive more thorough testing with visualizations and perception studies to gauge long-term quality-of-life effects, as well as short-term social acceptability. The effects of

other factors on partial cutting, such as root rot and windthrow, also need to be demonstrated.

The B.C. Ministry of Forests and Range Recreation Feature Polygon significance rating could be incorporated to identify areas containing unique or important features that attract recreation use. A feature significance rating is assigned to each land unit to aid in management decisions regarding the protection and (or) development of recreational areas. These ratings are determined by the feature's quality, uniqueness, and availability, and range from a very high capability to attract recreational, educational, or scientific use to a limited ability to attract recreational use. An outdoor recreation survey (Gregoire and Buhyoff 1999) would also be necessary to obtain visitor use and satisfaction information for outdoor recreation Measures 5 and 6.

Mail-survey respondents indicated that they would be willing to "trade-off" frontcountry visual quality for reduced ecological impacts in the backcountry. This finding should be explored further to determine the degree to which people are indeed willing to accept these trade-offs. Finally, it would be instructive to determine the extent to which timber harvesting could enhance outdoor recreation opportunities, and whether or not backcountry skiers would accept harvest areas as recreation areas.

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The application of criteria and indicators to social values in forest landscapes is becoming more sophisticated and meaningful. This study suggests that criteria and indicators designed to plan for and monitor quality of life in the Arrow TSA can be objectively assessed and will not necessarily constrain other management goals.

## Conclusions

In isolation, the two quality-of-life indicators described here cannot address all aspects of quality of life; however, the inclusion of these values in the spatial planning process represents a step forward in our ability to address multiple social concerns. This study also demonstrates that there are win-win situations to be realized. Often non-timber value indicators are seen as constraints on timber harvesting; however, the inclusion of these indicators in the initial design phase of spatial planning and appropriate application of innovative harvesting practices allows us to find solutions that ensure continued access to all of benefits derived from our forests. Lastly, we hope to emphasize the importance of including multiple criteria and indicators in the planning process. All too often the indicators chosen are the ones that are easiest to address. Although this is a practical solution to making decisions with limited resources, the inclusion of indicators that begin to deal with quality-of-life issues allow us to be more able to meet society's needs.

## Acknowledgements

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## Test Your Knowledge . . .

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*Arrow IFPA Series: Note 8 of 8 – Criterion 9: Quality-of-life indicators*

How well can you recall some of the main messages in the preceding extension note?

Test your knowledge by answering the following questions. Answers are at the bottom of the page.

1. In the multi-criteria analysis that was conducted with stakeholders in the Lemon Landscape Unit, what percentage of numeric weightings were applied to quality-of-life-indicators:
  - A) 10%
  - B) 15%
  - C) 25%
  - D) 35%
  - E) 50%
2. The SFM basecase focussed on enhancing backcountry skiing and snowmobiling opportunities in two areas where variable retention harvesting prescriptions were applied to improve alpine access.
  - A) True
  - B) False
3. Which of the following were *not* used as an indicator of visual quality:
  - A) Success in meeting approved visual quality objectives.
  - B) The total land area protected under the heading of visual quality objectives.
  - C) Public acceptance of visual impacts in visually sensitive areas outside established visual quality objectives.
  - D) Success in demonstrating sustainable forest management to the public through enhanced visual treatments and by providing information along public access routes.

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**ANSWERS**

1. C 2. A 3. B