
Report of the Scientific Panel for Sustainable Forest Practices in Clayoquot Sound

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1.0 Introduction

The appointment of the Scientific Panel for Sustainable Forest Practices in Clayoquot Sound was announced by Premier Mike Harcourt on October 22, 1993. The independent Scientific Panel for Sustainable Forest Practices in Clayoquot Sound (also referred to in this document as the Clayoquot Scientific Panel, the Scientific Panel, or the Panel) was established in response to a recommendation from the Commission on Resources and Environment following the government's April 13, 1993 decision on Clayoquot land use.

The Panel's mandate is to review current forest management standards in Clayoquot Sound and make recommendations for changes and improvements. The goal of the Scientific Panel is to develop world-class standards for sustainable forest management by combining traditional and scientific knowledge.

An important criterion in assembling the Clayoquot Scientific Panel was to find members who were independent of government, industry, and environmental organizations.

Accordingly, the Panel includes: scientists expert in regional ecology and biodiversity; one chief and 3 elders of the Nuu-Chah-Nulth Nation, who are authorities on traditional land and resource use; engineers and foresters experienced in forestry planning, management, and engineering; earth scientists with expertise in soils, slope stability, and hydrology; fisheries and wildlife biologists; a scenic resources, recreation, and tourism planner; and an ethnobotanist. An important criterion in assembling the expert team was to find members who were independent of government, industry, and environmental organizations.

The Panel has met seven times since its formation, on each occasion for two or three days. Most of these 18 days of meetings were devoted to defining the Panel's task, developing its approach, and determining how such a diverse group would work together to integrate all issues and concerns. One meeting was a field trip to Clayoquot Sound, with particular attention given to Nuu-Chah-Nulth land use. Guest speakers on topics central to the Panel's task have provided background information important to the Panel's work.

The Panel has developed an operating protocol and set of guiding principles that reflect its collective view and will guide it in evaluating current standards and making recommendations. Particular effort has been expended to become familiar with the wide range of guidelines and current government initiatives that affect the region and the Panel's activities. This task has been complicated by the considerable changes to the material within the Panel's terms of reference. The task of reviewing existing local and international standards, and evaluating them against the guiding principles is underway. Important work has been completed on First Nations values and resource use in Clayoquot Sound.

2.0 Terms of Reference

The goal of the Scientific Panel is to make forest practices in the Clayoquot not only the best in the province, but the best in the world.

The general goal of the Panel, as defined by Premier Harcourt, “is to make forest practices in the Clayoquot not only the best in the province, but the best in the world.”

The Scientific Panel’s terms of reference in meeting this goal are to:

- 1 Review existing management practices for Clayoquot Sound and, as necessary, recommend changes to these standards appropriate to the ecological conditions of Clayoquot Sound based on the best available scientific information.
- 2 Recommend priorities for research to improve forest management standards for Clayoquot Sound.
- 3 Recommend key ecological indicators for future monitoring of forest management standards in Clayoquot Sound.

To meet its goal effectively, the Panel found it necessary to refine its terms of reference in two ways:

- The Panel will consider planning processes explicitly. Specifically, the role of standards in the planning process will be evaluated and the planning process itself will be examined.
- The Panel will make recommendations for implementing standards. Education and training are essential if standards are to be effectively applied. Implementation also requires that standards are clearly defined, understandable, measurable, appropriate for monitoring, and enforceable.

The terms of reference do not include addressing issues of economic sustainability. The long-term economic sustainability of the region, however, depends on sustaining the area’s forest ecosystems. The Panel’s activities focus on the development of forest management standards to ensure the sustained productivity and health of forest ecosystems in Clayoquot Sound. These standards will provide the foundation for long-term, broad-based economic activity.

The Panel reports to the public on January 31, March 31, and June 30, 1994.

3.0 Operating Principles of the Scientific Panel

3.1 Protocol

A “protocol” is an agreed procedure by which a group reaches a decision or accomplishes a task. A protocol helps ensure that different perspectives and abilities are respected and constructively incorporated in group processes. Protocol is especially important when the group is diverse and the task is complex, as is the case with the Scientific Panel in recommending the best standards to govern forest management in Clayoquot Sound.

The Panel’s task in Clayoquot Sound is one example of the larger task of managing all of British Columbia’s provincial forests. The Panel must consider a wide range of issues, including: First Nations land use, timber extraction, recreation, fisheries, and the maintenance of the area’s ecosystems. In doing so, the Panel must merge the traditions and belief systems of two groups with a long history of conflict — indigenous and non-indigenous peoples. Traditional, scientific, and practical knowledge must be assimilated and applied.

The protocol is characterized by inclusive respect for one another, for different values, and for data founded both in science and “lived experience.”

Together, the Panel forged a protocol equal to the task. The protocol reflects the Nuu-Chah-Nulth approach to group processes whereby all members participate in determining the issues, information, and actions relevant to the Panel’s task. It is characterized by a demonstrable and inclusive respect for one another, for different values, and for data founded both in science and “lived experience.” It calls for each Panel member to exercise patience, flexibility, tolerance, endurance, and faith in a process and task that are surrounded by conflict and turmoil.

The Panel members’ shared commitment to achieving world-class standards for Clayoquot Sound created an atmosphere that encourages open discussion and the pursuit of consensus. Statements of the Panel reflect the collective experience and views of Panel members. Following full discussion of all matters deemed relevant by members, decisions are made based on the collective wisdom of the group.

3.2 General and Guiding Principles

Current forest management standards in Clayoquot Sound relate primarily to timber production. They focus on accessing, developing, and harvesting timber products rather than on managing forest ecosystems. To ensure the long-term sustainability and health of the forests of Clayoquot Sound, and to incorporate both First Nations and non-indigenous perspectives in the evaluation of current forest management standards, the Panel collectively developed the following general and guiding principles.

The Panel holds as paramount the management of forest ecosystems for their long-term health.

General Principles

The Clayoquot Scientific Panel recognizes natural systems and processes as the source of resource values and products. In this context, the Panel holds as paramount the management of forest ecosystems for their long-term health. The Panel also holds desirable the management of forest ecosystems for a mix of resource values and products.

The Panel's general principles concerning forest management in Clayoquot Sound are:

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- 1 The world is interconnected at all levels; attempts to understand it entail analysing its components and considering the whole system.*
 - 2 Human activities must respect the land, the sea, and all the life and life systems they support.*
 - 3 Long-term ecological and economic sustainability are essential to long-term harmony.*
 - 4 The cultural, spiritual, social, and economic well-being of indigenous people is a necessary part of that harmony.*
 - 5 Restoration of historical degradation is a necessary part of a healthy human relationship with the land.*
 - 6 Standards must accommodate new information and changing social values.*
 - 7 Information on the resources of Clayoquot Sound and understanding of its forest ecosystems are incomplete.*
 - 8 Standards cannot be designed to meet all situations that will be encountered on the ground.*
 - 9 British Columbia can and should show leadership in the stewardship of forest ecosystems.*
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Each of these principles is explained more fully.

- 1 The world is interconnected at all levels; attempts to understand it entail analysing its components and considering the whole system.*

In the course of scientific study or the development of guidelines, specific functions or aspects of a system may be targeted at the expense of others, or of the system as a whole. In developing guiding principles, the Panel has tried to maintain a holistic view of forest ecosystems, to recognize connections across the landscape, and to draw on both scientific knowledge and the Nuu-Chah-Nulth "lived experience." Current forest management standards will be assessed, and new standards developed, in this context.

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- 2 *Human activities must respect the land, the sea, and all the life and life systems they support.*

Living organisms have a place in nature that must be sustained to maintain the health of the system in which they exist. The necessity to maintain natural ecological systems — including the land and sea themselves — supersedes the value that society may place on any individual component of those systems.

- 3 *Long-term ecological and economic sustainability are essential to long-term harmony.*

The Panel views harmony as a stable and healthy relationship between people and the ecosystems that support them. Maintaining harmony is the responsibility of each generation to those that follow. Standards guiding land use and resource management should ensure ecological, cultural, and long-term economic sustainability. Current rates of population growth and resource extraction may not be sustainable or permit the desired harmony.

- 4 *The cultural, spiritual, social, and economic well-being of indigenous peoples is a necessary part of that harmony.*

Indigenous peoples live within the landscape from which they and the rest of society extract resources. Because of their longer, often closer connections to nature, the cultural and spiritual relationships of First Nations peoples with their environment are different from those of other cultures. Such cultural and spiritual needs must be accommodated in standards governing land use and resource management.

- 5 *Restoration of historical degradation is a necessary part of a healthy human relationship with the land.*

Long-term harmony requires the repair of systems that have been degraded by human activities. Standards should require the rehabilitation of sites damaged through past activities, and should prevent activities that will contribute to future degradation.

- 6 *Standards must accommodate new information and changing social values.*

Forest management standards reflect, but lag, changing social values and improvements in information and understanding. Standards for land and resource management must continue to evolve by nurturing new knowledge and accommodating changing values.

- 7 *Information on the resources of Clayoquot Sound and understanding of its forest ecosystems are incomplete.*

The forest ecosystems of Clayoquot Sound are varied and complex. Understanding how these systems function and respond to human actions is incomplete. Where available, the Panel will use published literature to support the development of standards. However, its recommendations cannot be limited to what is written down. Reasoned judgment and the

“lived experience” of First Nations peoples and resource managers will be incorporated in the development of standards. Areas that are poorly understood will be addressed in recommendations for research.

- 8 *Standards cannot be designed to meet all situations that will be encountered on the ground.*

Standards must prescribe management activities appropriate at both landscape- and site-specific levels. Standards must communicate expected levels of performance.

Standards must prescribe management activities appropriate at both landscape- and site-specific levels and must communicate expected levels of performance. At the same time, standards must allow for local variance to accommodate individual situations, recognizing that external factors influence responses and that the response in one watershed system will not necessarily be the same in the next. Standards must be conservative to maintain options and flexible to accommodate new knowledge.

- 9 *British Columbia can and should show leadership in the management of forest ecosystems.*

British Columbia is one of the most biologically diverse regions in the northern hemisphere. British Columbians have a moral obligation to maintain that diversity for future generations. Clayoquot Sound presents an opportunity to show leadership in the management of forest ecosystems for a multitude of values. The area is rich in resources and is highly valued by residents and tourists alike. Indigenous people with an extensive history of resource use still live in the region. The area has had significant industrial resource development in the forest and fishery sectors. Most of its forest land is publicly owned in large contiguous tracts which permit considerable flexibility in resource allocation and use.

Guiding Principles

Following from these general principles, the Panel established 18 guiding principles that provide the framework for reviewing existing standards and developing new standards for forest management in Clayoquot Sound.

Forest management standards must prescribe practices that:

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- 1 *Meet or exceed international and emerging world standards.*
 - 2 *Are based on the capabilities, limitations, and sensitivities of ecosystems.*
 - 3 *Recognize cumulative effects and response thresholds within ecosystems.*
 - 4 *Maintain healthy ecosystems that sustain well-distributed populations of native species.*
 - 5 *Avoid activities that would damage natural ecosystems, and where unforeseen damage has occurred due to human activity, rehabilitate such landscapes and habitats.*

- 6 *Recognize the watershed as the basic unit for planning and management. More than one watershed may be required to plan for values such as biodiversity, scenery, and cultural features.*
 - 7 *Take an ecosystem approach to planning, in which the primary planning objective is to sustain the productivity and natural diversity of the Clayoquot region, and the flow of specific forest products are determined in a manner consistent with this objective.*
 - 8 *Recognize that the rate (percent of area affected per unit time) and geographical distribution of timber harvesting are more important determinants than total volume when wood harvest is planned and removed.*
 - 9 *Provide for sustainable activities such as logging, fishing, tourism, and cultural pursuits.*
 - 10 *Accommodate the needs of First Nations for cultural, social, and economic well-being.*
 - 11 *Protect cultural and spiritual values and other special sites.¹*
 - 12 *Represent the best application of scientific, traditional, and local knowledge and experience in the Clayoquot region.*
 - 13 *Are adaptive and respond to new knowledge and experience as well as to unforeseen natural and human-induced environmental changes.*
 - 14 *Involve local people and affected parties in planning and management processes.*
 - 15 *Provide a constructive and safe working environment.*
 - 16 *Are clear, understandable, and enforceable. Where local decisions may replace prescribed standards, they must result in equal or better integrated resource management.*
 - 17 *Are supported by ongoing education and training programs to ensure that standards are applied correctly and effectively.*
 - 18 *Are continually monitored, evaluated, and improved.*
-

This simple list of principles does not adequately express their underlying foundations. To support these guiding principles, Panel members have assembled knowledge and developed targets for specific components of natural systems; these are not summarized here.

The relevance of these principles in light of stewardship responsibilities has also been considered. For instance, aboriginal self-government and jurisdiction over land and resources, currently being addressed by government, may substantially

¹For example: areas of cultural or spiritual significance; habitats for threatened, rare, or endangered species; exceptional natural features (e.g., caves and hot springs); community watersheds; or important recreational and scenic areas.

influence forest practices in Clayoquot Sound. The guiding principles articulated above, however, derive from the vision of future forest stewardship shared by all Panel members. The Panel believes that these principles will remain relevant as guidelines for developing world-class forest management standards regardless of the outcome of deliberations about resource jurisdiction.

4.0 International Standards

The Panel sees three reasons to “make forest practices in the Clayoquot not only the best in the province, but the best in the world”:

- British Columbia has an obligation to protect and manage the forests of Clayoquot Sound for the benefit of all peoples of the world.
- British Columbia has an opportunity to show leadership by developing the best standards for sustainable forest practices.
- International interest in Clayoquot Sound and British Columbia’s dependence on international markets will require the province to practice sustainable forestry that meets emerging standards described in international treaties, conventions, agreements, and certification programs.

The Clayoquot Scientific Panel initiated a review of international standards currently in place or being developed by international conventions and treaties and in bilateral agreements involving countries and non-government organizations.

The Panel’s review of international principles and standards considered the following conventions, agreements, and statements of guiding principles for sustainable forestry:

- the report of the *World Commission on Environment and Development*
- four forest-related documents that emerged from the United Nations Conference on Environment and Development (UNCED): *Framework Convention on Climate Change, Convention on Biodiversity, Agenda 21, and Guiding Principles on Forests*
- the *Forest Stewardship Council Principles and Criteria of Natural Forest Management*
- the *International Tropical Timber Organization Guidelines for the Sustainable Management of Natural Tropical Forests*

Consideration of international standards helped ensure that the Panel’s general and guiding principles for Clayoquot Sound meet or exceed existing world standards.

Consideration of these international standards helped ensure that the Panel’s general and guiding principles for Clayoquot Sound meet or exceed existing world standards. Some of the relationships between specific agreements and the Panel’s framework of principles are noted.

The report of the *World Commission of Environment and Development* (also known as the Brundtland Commission Report, *Our Common Future*) sets out the principle of sustainable development. The report emphasizes the equity of human generations and the necessity of meeting the needs of present generations without impairing the ability of future generations. These sentiments are embodied in the Clayoquot Scientific Panel’s general principles 2, 3, and 6.

The *Framework Convention on Climate Change*, which Canada signed, commits us to protecting old-growth forests and wetlands, and to sustainable forest management as part of our global obligation. These commitments are found in the Clayoquot Scientific Panel's general principles 2, 5, 7, and 9.

Canada also signed the *Convention on Biodiversity* which defines "biological diversity" as an attribute of life variability rather than as entities in life such as species or ecosystems, and "sustainable use" as being ecosystem-, rather than species-oriented. This convention commits us to use and manage our resources in a manner and at a rate that meets the needs and aspirations of present and future generations but that does not lead to the long-term decline of biological diversity. Concepts of biological diversity and sustainability are embodied in the Clayoquot Scientific Panel's general principles 1 through 9.

International standards represent an important baseline against which to measure forest management standards in Clayoquot Sound.

Agenda 21 provides important guidance in recognizing and strengthening the role of indigenous peoples and their communities. In particular, *Agenda 21* recognizes that the lands and communities of indigenous peoples should be protected from activities that are environmentally unsound or socially or culturally inappropriate. The *Agenda 21* document recognizes the value of traditional knowledge and resource management practices, and the link between traditional direct dependence on renewable resources and the cultural, economic, and physical well-being of indigenous people and their communities. These values are supported in the Clayoquot Scientific Panel's general principles 3 through 7, but especially 4.

The *Guiding Principles on Forests*, developed from UNCED, provides the best model for the Panel's framework. Pertinent excerpts from the document are noted below, along with the most relevant of the Clayoquot Scientific Panel's general principles in parentheses.

Selected statements from the *Guiding Principles on Forests*:

- Forestry issues and opportunities should be examined in a holistic and balanced manner within the overall context of environment and development, taking into consideration the multiple functions and uses of forests, including traditional uses... (CSP general principles 1, 2, 4)
- All types of forests embody complex and unique ecological processes which are the basis for their present and potential capacity to provide resources to satisfy human needs as well as environmental values, and as such their sound management and conservation is of concern to the Governments of the countries to which they belong and are of value to local communities and the environment as a whole. (CSP general principles 3, 6)
- Forest resources and forest lands should be sustainably managed to meet the social, economic, ecological, cultural, and spiritual human needs of the present and future generations. (CSP general principles 3, 4)
- National forest policies should recognize and duly support the identity, culture and rights of indigenous people, their communities and other communities, and other forest dwellers. (CSP general principle 4)

- Forest management should be integrated with management of adjacent areas so as to maintain ecological balance and sustainable productivity. (CSP general principles 1, 2)

The Forest Stewardship Council is an international organization recently formed to accredit certification programs for forest products. The Council's draft document of principles and criteria contains broad policy statements that are meant to be translated into national or local standards to meet locally defined needs and realities. These statements relate most directly to the Clayoquot Scientific Panel general principle 9.

The International Tropical Timber Organization (ITTO) Guidelines for the Sustainable Management of Natural Tropical Forests contains a set of principles intended to provide the standard for national or local guidelines. Prior to UNCED these were the only international standards addressing forestry; the UNCED *Guiding Principles on Forests* broadens their application. The ITTO guidelines were reviewed to ensure that the Panel's approach was at the forefront of international guidelines.

International standards represent an important baseline against which to measure existing forest management standards in Clayoquot Sound. They also provide a strong model for ensuring that the forest practice standards the Panel develops will be the "best in the world."

5.0 Applicable Guidelines and Standards

The refined terms of reference of the Clayoquot Scientific Panel call for the review of existing forest management standards, including planning guidelines, codes of practice, and specific measurable standards of performance for operations. The first step in addressing this task has been to identify the relevant documents and standards.

The Panel is reviewing over sixty standards and ground rules applicable to Clayoquot Sound.

Tables 1 through 4 classify those documents identified as relevant to the Panel's review of existing forest management standards in Clayoquot Sound. The "Relevant documents" columns include all applicable provincial, coastal, and regional standards, standards of practice, and standard operating procedures. Circular letters, which are used extensively in the Vancouver Forest Region (in which Clayoquot Sound is located) are signed by the Regional Manager and have the force of a Regulation. The "Status" columns denote standards as draft, emerging, interim or established (estab.), in increasing order of force, and also indicate their scope as regional, coastal, or provincial. The rapidly changing nature of standards is indicated by the recent dates of most relevant documents, as well as the many draft, interim, and emerging standards.

Two recent documents deserve special note. The *Clayoquot Sound - Forest Practices Standards* (June, 1993) is specific to the Clayoquot Sound decision area. Though its title implies completeness, it is but one source of current forest management standards. It makes extensive reference to, and thereby encompasses, a considerable range of existing documents on standards. The *Proposed Forest Practices Code Rules for British Columbia* (November, 1993) describes provincial-level forest management standards that will apply in Clayoquot Sound and elsewhere. The document is currently undergoing public review and will be amended. While the Panel is considering aspects of this document, a detailed review is not contemplated. The Panel's attention is directed to standards applied at the sub-regional level.

Table 5 is a partial list of field guides, research and discussion papers, and handbooks that have been produced to assist forest and land managers in meeting regulations, policy, and standards (including standards of practice and standard operating procedures). Such guidance for implementation covers planning at all levels — management unit, development and operational. The list does not include many other related research papers (published or otherwise) that provide further support and documentation. Table 5 is not intended to represent a comprehensive bibliography or review of these documents.

Table 1. Management unit planning (broad, long-term planning)

Plan/Permit	Purpose	Relevant Documents	Format	Status
Management Plans (TFL, FL, Woodlot Licence)	Planning document for entire tenures (e.g., TFL). Sets AAC.	Forest Licence Management and Working Plan (MWP) Outline.	Circular Letter - VR-88-520	Estab. standard (regional)
		TFL Management and Working Plan - Recreation Content. 1988.	Document	Pending revision?
		Forest Inventory Environmental Protection Area Guidelines. Applies to TSA Plan as well.	Inventory manual chapter	Estab. standard (provincial)
		Archaeological Impact Assessment Guidelines. 1991. Applies to TSA Plan as well.	Booklet	Estab. standard (provincial)
TSA Plan (Land and Resource Mgmt Plan)	Planning document for entire TSA. Sets AAC.	as for MWP.		
Local Resource Use Plan	Long-term planning to determine land-use priorities and allocation in a given area. Usually a public process in area of some controversy and high values.	Local Resource Use Plans. MOF. 1991.	Guide, procedures	Estab. (provincial)
Wilderness Area Mgmt Plans			Discussion paper	
Integrated Watershed Mgmt Plan	MOF and Water Mgmt Branch, integrated plan for community watersheds.	Guidelines for Watershed Management of Crown Lands Used as Community Water. 1980.	Booklet	(provincial)
		Community Watershed Guidelines Project - Guiding Principles and Summary of Public Input.	Booklet	Draft, progress report (provincial)
Total Resource Plan	Long-term planning to guide timber harvesting over a given area, e.g., a watershed. An integrated use plan after basic land-use decisions are made.	Total Resource Planning. MOF. 1993.	Discussion paper	Proposed process (provincial)

Table 2. Development planning (5-Year Development Plans and long-term development plans)

Purpose	Relevant Documents	Format	Status
Presents plan for logging and road construction for 5-year period or up to 20-year period (for long-term plans proposed in Code), based on allowable annual cut, and management objectives and constraints in MWP. Annually updated.	Development Plan Guidelines. Vancouver Forest Region. December 10, 1993.	Circular Letter	Estab. standard procedures (regional)
	Coast Planning Guidelines, Vancouver Forest Region. October 8, 1993.	Circular Letter	Estab. standards (regional)
	Watershed Workbook - Forest Hydrology Sensitivity Analysis for Coastal B.C. Watersheds - 2nd Edition. 1993.	Document	Draft (coastal)
	Watershed Workbook - Forest Hydrology Sensitivity Analysis for Coastal Watersheds. 1987.	Booklet and floppy, procedures	Interim, approved (coastal)
	Guidelines for Watershed Management of Crown Lands Used as Community Water. 1980.	Booklet	(provincial)
	Community Watershed Guidelines Project - Guiding Principles and Summary of Public Input. 1993.	Booklet	Draft, progress report (provincial)
	British Columbia Coastal Fisheries/Forestry Guidelines. Revised 3rd Edition. July 1993.	Booklet	Estab. standards (coastal)
	Guidelines to Maintain Biological Diversity in TFL 44 and 46. December 1991.	Document	Approved for TFL 44 and 46
	Guidelines to Maintain Biological Diversity in Coastal Forests. October 27, 1993.	Document	Emerging standards, (coastal)
	Interim Forest Management Recommendations to Protect Marbled Murrelet Nesting Habitat in Coastal British Columbia. February 8, 1991.	Letter	Interim - not approved
	Conservation of Marbled Murrelet Habitat. November 12, 1993.	Memo	Draft
	Guidelines for Terrain Stability Assessments. November 18, 1992.	Circular Letter	Estab. procedures (regional)
	Landslide Hazard Mapping Guidelines; Guidelines for B.C. January 12, 1994.	Document	Draft
	Interim Forest Landscape Management Guidelines for the Vancouver Forest Region.	Booklet	Interim - approved (regional)
	Visual Landscape Management Guidelines for Visually Sensitive Areas within Provincial Forests. December 1993.	Document	Draft - confidential (provincial)

Table 3. Operational planning

Plan/Permit	Purpose	Relevant Documents	Format	Status
Pre-harvest Silviculture Prescription (PHSP)	Legal contract between Licensee and Province that prescribes the appropriate silvicultural system, harvesting practices, and regeneration measures up to "free-to-grow" for a specific cutblock.	Silviculture Regulation, B.C. Reg. 147/88.	Reg. under <i>Forest Act</i>	Statute (provincial)
		Pre-harvest Silviculture Prescription Procedures and Guidelines for the Vancouver Forest Region. 1991.	Circular Letter - VR-91-554	Estab. standards (regional)
		Site Diagnosis, Tree Species Selection and Slashburning Guidelines for the Vancouver Forest Region. 1984.	Booklet	Estab. standards re: species (not slash-burning) (regional)
		Site Degradation Guidelines for the Vancouver Forest Region. 1991. Interim Site Degradation Guidelines for Road Fill Slopes.	Circular Letters	Estab. standard and interim (regional)
		Minimum Cutting Ages for TSAs.	Circular Letter - VR-85-470	Estab. standards (regional)
		Residual Falling Policy.	Circular Letter - VR-78-34591-554	Estab. standards (regional)
		Guidelines for Slash Disposal Orders.	Circular Letter - VR-86-505	Estab. standards (regional)
		Guidelines for Free Growing Stocking Standards for the Vancouver Region.	Circular Letter - VR-90-545	Estab. standards (regional)
		Hemlock Dwarf Mistletoe Mgmt.	Circular Letter - VR-85-485	Estab. standards (regional)
		Sitka Spruce Weevil Mgmt.	Circular Letter - VR-85-471	Estab. standards (regional)
		B.C. Coastal Fisheries/Forestry Guidelines . Revised 3rd ed. July 1993.	Booklet	Estab. standards (coastal)

Table 3. continued

Plan/Permit	Purpose	Relevant Documents	Format	Status
Road Permit	Legal document that approves a road location and sets road construction standards.	Forest Road and Logging Trail Engineering Practices (Interim). July 15, 1993.	Booklet	Interim, approved standards
		Engineering Specifications for the Planning, Location, Design, Construction and Deactivation of Logging Roads and Drainage Structures in the Vancouver Forest Region. 1989.	Document	Estab. approved standards (regional)
		B.C. Coastal Fisheries/Forestry Guidelines. Revised 3rd ed. July 1993.	Booklet	Estab. approved standards (coastal)
Cutting Permit	Legal document that approves a cutblock and gives authority to cut. Embodies PHSP contents.	Utilization Standards - Coast. 1989.	MOF Policy	Estab. standards (coastal)
		Provincial Harvesting Guidelines for the Management and Maintenance of Wildlife Trees.	Booklet	Draft not approved (provincial)
		Cave Management Handbook. 1990.	Handbook	Estab. standards (coastal)
		Interim Mobile Backspar Trails Construction and Rehabilitation Strategies. 1991.	Booklet	Interim (regional)
Foreshore Use Permit	Authority for log sorting, booming, and storage.	Guidelines for Log Dumping. MOE.		(coastal)
Special Use Permits	Authorizes various uses including logging camps.			

Table 4. Second-growth management

Plan/Permit	Relevant Documents	Format	Status
Second-growth Management	Free Growing Surveys.	Circular Letter - VR-90-546	Estab. standards (regional)
	Guidelines for Free Growing Stocking Standards for the Van. Region.	Circular Letter - VR-90-545	Estab. standards (regional)
	Coastal Seed Transfer Guidelines. 1990.	Booklet	Estab. standards (coastal)
	Stand Tending Guidelines.	Circular Letter - VR-91-558	Estab. standards (regional)
	Aerial Spraying of Herbicides.	Circular Letter - VR-84-453	Estab. standards (regional)
	Methods to Maintain Wildlife Habitat Characteristics in Managed Stands. August 21, 1992.	Letter	Approved
	Guidelines for Maintaining Biodiversity During Juvenile Spacing. 1993.	Booklet	Interim, not approved
	Interim Wildlife/Forestry Guidelines for Biological Diversity at the Stand Level During Juvenile Spacing Entries. February 1992.		Interim

Table 5. Documents intended to provide guidance for implementation of standards, procedures, and requirements in development and operational planning

<p>Cultural/Heritage:</p> <p>Clayoquot Sound Indian Land Use. Bouchard and Kennedy. 1990.</p> <p>Cultural Heritage Background Study, Clayoquot Sound. Wilson, Bouchard, Kennedy and Heap. 1991.</p> <p>Forestry and Fishing in Clayoquot Sound. Sam. 1993.</p> <p>Herring in Clayoquot Sound. Sam. 1993.</p> <p>History of Ahousaht. Sam. 1993.</p> <p>Hesquiaht Ethnobiology. Turner and Efrat. 1982.</p> <p>Ditidaht Ethnobiology. Turner et al. 1983.</p> <p>Manhousaht Ethnobotany. Turner and Ellis. 1978.</p> <p>Pacific Rim Ethnobiology. Fenn <i>et al.</i></p> <p>Manhousaht Beach Food: Teaching of the Tides. Ellis and Swan.</p>
<p>Fisheries:</p> <p>A Handbook for Fish Habitat Protection on Forest Lands in B.C. Toews and Brownlee. 1981.</p> <p>Streamside Management, A Decision-making Procedure for South Coast B.C. Moore. 1980.</p> <p>Stream Rehabilitation Using LOD Placement and Off-channel Pool Development. Poulin. 1991.</p> <p>Using LOD to Restore Fish Habitat in Debris-torrented Streams. Tripp. 1982.</p>
<p>Silviculture:</p> <p>A Stand Level Guide to the Selection of Reproduction Methods for Regenerating Forest Stands in the Vancouver Forest Region.</p> <p>Silvicultural Systems - Their Role in British Columbia's Forest Management. MOF. March 1991.</p> <p>Guide to Prescribed Burning in the Vancouver Forest Region. 1985.</p> <p>First Approximation of Correlated Guidelines for Free-growing Stocking Standards for the Ecosystems of B.C. 1990.</p> <p>Operational Summary: Guidelines for Alder Seed Tree Control. Lousier. 1990.</p>
<p>Slope Stability and Sediment/Erosion Control:</p> <p>Field Guide for the Management of Landslide Prone Terrain in the Pacific Northwest. Chatwin <i>et al.</i> 1991.</p> <p>Silvicultural Alternatives for the Management of Unstable Sites in the Queen Charlotte Island. Sanders and Wilford. 1986.</p> <p>Handbook for Forest Roadside Erosion Control. Carr. 1980.</p> <p>Watershed Rehabilitation Options for Disturbed Slopes on the QCI. Carr. 1985.</p> <p>A Soil Erosion and Sediment Control Planning System for Managed Forest Land: A Case Study, Shomar Creek, QCI. Carr and Chatwin.</p> <p>Watershed Rehabilitation Strategies (Draft). Rollerson. 1991.</p> <p>Planning and Implementing Site Rehabilitation and Road De-activation. Horel. 1993.</p>

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6.0 Procedure and Criteria for Reviewing Existing Standards

6.1 Procedure

The Panel's general and guiding principles provide guidelines against which to assess and recommend changes to the forest management standards outlined in the previous section. From these principles, the Panel distilled six review criteria:

- 1 Standards must be justifiable on scientific and/or cultural grounds.
- 2 Standards must be clear, unambiguous, and enforceable.
- 3 Standards must be consistent internally and in relation to other standards.
- 4 Standards must be sufficiently rigorous to achieve their objectives.
- 5 Standards must be sufficiently complete to achieve their objectives.
- 6 Standards must be sufficiently complete to meet emerging world standards.

Where a standard is found deficient in one of these areas, the Panel will propose changes to address the deficiency. Where standards are incomplete, the Panel will recommend new ones. Where appropriate, the Panel will also evaluate draft or emerging standards (e.g., the Draft Coastal Biodiversity Guidelines).

6.2 Examples of Preliminary Results

The Panel found some standards to be adequate, and others to require improvement to keep pace with changing goals and objectives.

The detailed review of standards is in its early stages. In its initial review, the Panel found some standards to be adequate, and others to require improvement to keep pace with changing goals and objectives. Some standards that appear to meet both their intended objectives and the Panel's criteria may require modification to meet broader objectives, such as the maintenance of biodiversity. For example, streams and their associated riparian zones are important not only as habitat for fish, but also for other organisms such as amphibians, aquatic invertebrates, and small mammals. Because current standards for riparian protection are restricted largely to fisheries concerns, the Panel likely will recommend changes to these standards.

The Panel considers the integrated overall planning of forest management activities to be fundamental to sound forest practice. Standards and procedures for higher-level planning must reflect the importance of large geographical areas and long time frames, as articulated in the Panel's guiding principles. Panel recommendations will reflect recent scientific understanding of linkages among different ecological processes and will embody the principle that sustaining ecosystem function is more important than producing any particular output.

Specific examples of planning-level issues the Panel is addressing include:

- the “netting down” approach used to accommodate environmental, cultural, and other “non-timber” resources
- requirements for inventory of ecological features and resources other than timber
- recognition of First Nations cultural resources in planning standards
- consideration of silvicultural systems other than clearcutting
- use of ecologically-defined planning units

7.0 Outline of Tasks and Progress

Principles and standards developed for Clayoquot Sound may be useful in developing principles and standards for other regions.

The Scientific Panel for Sustainable Forest Practices in Clayoquot Sound was charged with reviewing standards for forest harvesting, road construction and engineering, access, slope stability, and hydrology in its first report. The Panel recognized that such assessments could not be made reasonably nor logically in isolation from the review of standards for silvicultural systems, soil conservation, second-growth management, biodiversity, and others scheduled for later in the reporting timetable. Furthermore, the Panel felt that the review of forest management standards must also assess standards for planning. Both conclusions stem from the Panel's general and guiding principles which require consideration of whole ecosystems as well as their individual components. Therefore, the Panel is developing standards for all forest practices in an integrated manner.

To fulfill its refined terms of reference, the Panel identified the following tasks:

- 1 Collecting and reviewing relevant information on resources and characteristics of the study area, including the interrelationships of processes.
- 2 Establishing the principles and consequent goals or targets for each subject area.
- 3 Evaluating those principles with respect to international standards.
- 4 Identifying achievable, measurable objectives for each subject area, and selecting relevant indicators to assess their achievement.
- 5 Identifying criteria for evaluating standards.
- 6 Identifying current standards that relate to each subject area.
- 7 Identifying deficiencies in the standards for each subject area.
- 8 Recommending revisions to existing standards or creating new standards.
- 9 Noting obstacles and opportunities to achieving new standards.
- 10 Recommending methods for monitoring and assessing the effectiveness of new standards.
- 11 Recommending research to address deficiencies or uncertainties.

Over the course of its first three months, the Panel completed efforts on tasks 2 through 6 while developing its familiarity with Clayoquot Sound. Substantial progress has been made on tasks 7, 8, and 9: the Panel will concentrate on these steps through February and March, 1994. Although research needs will be flagged as they are encountered, a detailed examination of monitoring approaches and research needs will begin in April.

Progress to date indicates that British Columbia can make forest practices in Clayoquot Sound among the best in the world. By designing processes to

recognize and accommodate different values and needs, the principles and standards developed for Clayoquot Sound can contribute usefully to developing principles and standards for other regions.

Appendix I

Scientific Panel for Sustainable Forest Practices in Clayoquot Sound Backgrounder

Creation of the Scientific Panel

On April 13, 1993, the B.C. government announced its land use decision for Clayoquot Sound. The decision attempted to balance environmental, economic and social values for the area. New forest practices and standards were to be implemented in Clayoquot Sound to ensure that harvesting was carried out sustainably and protected environmental and tourism values.

Subsequent to the decision, British Columbians raised several questions about the government's decision on Clayoquot Sound. Stephen Owen, B.C.'s Commissioner on Resources and Environment, detailed some of those questions and provided recommendations in a report submitted to the provincial government.

In early June 1993 the government responded with a public report and proposed to establish, in cooperation with CORE, a scientific panel under the direction of an independent Chair. The panel was to review the forest management standards for Clayoquot Sound and make recommendations for changes and improvements where required to develop a set of "world-class" forest practices for Clayoquot Sound.

Commissioner Owen responded to government's proposal with the following recommendations:

1. That the members of the scientific panel be multidisciplinary and generally recognized provincially and internationally as objective, credible and leaders in their respective areas of expertise. Expertise should include harvesting systems, silviculture, fisheries, wildlife, soil/terrain stability, biodiversity, hydrology and visual assessments.
2. That the Chair of the scientific panel be demonstrably impartial, widely respected and familiar at least as a generalist with the technical and scientific issues involved.
3. That direct employees of government or industry be excluded as candidates for the scientific panel.

CORE reviewed and endorsed all panel appointments, and the Scientific Panel for Sustainable Forest Practices in Clayoquot Sound was announced October 22, 1993.

Terms of Reference

Working under the direction of the independent Chair, the Scientific Panel will:

- a. Review the existing forest management standards for Clayoquot Sound. These standards will include planning guidelines, codes of practice and specific measurable standards of performance for operations.

These standards will apply to forest harvesting, road construction and engineering, access, slope stability, hydrology, silviculture systems, soil conservation, second growth management, biodiversity, fish and wildlife habitat, scenic resources and cultural resources.
- b. Recommend changes to these standards appropriate to the ecological conditions of Clayoquot Sound and based on the best available scientific information.
- c. Identify areas where scientific information is not definitive and a firm standard cannot be set. Recommend priorities for research to improve forest management standards for Clayoquot Sound.
- d. Recommend the key ecological indicators for future monitoring of the forest management standards in Clayoquot Sound.
- e. The Chair and selected members of the Scientific Panel will be recalled in subsequent years to provide an independent review of the effectiveness of the Panel's recommendations.

Public Reporting Schedule

1st Progress Report, January 31, 1994: Initial report of standards review and recommendations for forest harvesting, road construction and engineering, access, slope stability and hydrology.

2nd Progress Report, March 31, 1994: Initial report of standards review and recommendations for silviculture systems, soil conservation, second growth management, biodiversity, fish and wildlife habitat, scenic resources and cultural resources.

3rd Progress Report, June 30, 1994: Completion of research priorities and key ecological indicators for future monitoring and final report on standards review and recommendations.

Appendix II

Scientific Panel for Sustainable Forest Practices in Clayoquot Sound

Panel Members

Chair

The panel is chaired by **Dr. Fred Bunnell**, Professor of Forest Wildlife Ecology and Management at the University of British Columbia Centre for Applied Conservation Biology. Dr. Bunnell's work extends worldwide, including service on more than 70 provincial, national, and international committees dealing with resource management.

In addition to Dr. Bunnell, the scientific panel members are:

Co-Chair

Dr. Richard Atleo, Hereditary Chief UMEEK, Researcher, Consultant, Indigenous Human Resources, New Westminster

Biodiversity

Dr. Ken Lertzman, Assistant Professor, Forest Ecology, Simon Fraser University

Dr. Chris Pielou, Ecologist, Denman Island

Laurie Kremsater, Consultant, Forest Management and Wildlife Biology, Vancouver

Ethnobotany

Dr. Nancy Turner, Professor, Environmental Studies, University of Victoria

First Nations

Ernest Lawrence Paul, Hesquiaht Elder, expert in Hesquiaht history, culture, traditional resource use and language, Hesquiaht

Roy Haiyupis, Ahousaht Elder, expert in Ahousaht history, culture, language and traditional use of resources, Lytton

Stanley Sam, Ahousaht/Tla-o-qui-aht First Nations Elder, expert in First Nations history, language, culture and traditional resource use, Ahousaht

Fisheries	Dr. Gordon Hartman , Consultant, Fisheries Biology, Nanaimo
Forest Harvest Planning	Keith Moore , Registered Professional Forester, Consultant, Environmental Forestry, Queen Charlotte City
Hydrology	Dr. Mike Church , Professor, Fluvial Morphology, Department of Geography, University of British Columbia
Roads and Engineering	Dr. Peter Schiess , Professor and Head of Forest Engineering, University of Washington, College of Forest Resources, Seattle
Scenic Resources, Recreation, and Tourism	Catherine Berris , Consultant, Landscape Architecture and Land Use Planning, Vancouver
Silviculture Systems	Dr. Jerry Franklin , Professor, University of Washington, College of Forest Resources, Seattle
Slope Stability	Dr. June Ryder , Consultant, Terrain Analysis, Vancouver
Soils	Dr. Terry Lewis , Consultant, Soils and Land Use, Courtenay
Wildlife	Dr. Alton Harestad , Associate Professor, Wildlife, Simon Fraser University
Worker Safety	Jim Allman , Regional Manager, Workers' Compensation Board, Victoria
Secretariat to the Panel	Melissa Hadley , Cortex Consultants Inc., Halfmoon Bay

