



Coast Information Team

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The Coast Information Team is pleased to deliver the final version of the *CIT Ecosystem-based Management Framework (April 2004)*.

The Coast Information Team (CIT) was established to provide independent information for the central and north coasts of British Columbia and Haida Gwaii/Queen Charlotte Islands using the best available scientific, technical, traditional and local knowledge. The CIT was established by the Provincial Government of British Columbia, First Nations, environmental groups, the forest industry, and communities. It is led by a management committee consisting of representatives of these bodies; and is funded by the Provincial Government, the environmental groups and forest products companies, and the Federal Government of Canada. The technical team comprises nine project teams consisting of scientists, practitioners, and traditional and local experts. CIT information and analyses, which include this *CIT Ecosystem-based Management Framework*, are intended to assist First Nations and the three ongoing sub-regional planning processes to make decisions that will achieve ecosystem-based management (as per the April 4th 2001 Coastal First Nations – Government Protocol and the CCLRMP Interim Agreement).

Project teams working on the *CIT Ecosystem-based Management Planning Handbook*, *Hydroriparian Planning Guide*, and *Scientific Basis of Ecosystem-based Management* used the January 2003 draft *Ecosystem-based Management Framework* as the touchstone on the definition, principles, and goals of EBM. They went far beyond it in applying those principles to planning and implementation, greatly improving the approach outlined in the draft. Accordingly, the Framework has been revised in light of review comments on the draft and, above all, to incorporate the essentials on planning and implementation elaborated in detail in the EBM guidebooks.

We encourage all stakeholders involved in land and resource management decision-making in the CIT area to use the *CIT Ecosystem-based Management Framework* in conjunction with other CIT products as they seek to implement EBM and develop EBM Land Use Plans. We are confident that the suite of CIT products provides valuable information and guidance on the key tenets of EBM: maintaining ecosystem integrity and improving human wellbeing.

Sincerely,

Robert Prescott-Allen, Executive Director
on behalf of the CIT Management Committee:
Ken Baker, Art Sterritt, Dallas Smith, Jody Holmes, Corby Lamb
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Coast Information Team



Ecosystem-based Management Framework

April 2004

Preface

The people listed below collaboratively developed a draft of the Ecosystem-based Management (EBM) Framework, which they endorsed as a draft for distribution and review in January 2003.

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The draft was distributed to participants in the Central Coast and North Coast Land and Resource Management Planning tables, the Haida Gwaii/Queen Charlotte Islands Land Use Planning Forum, First Nations land use planning processes, and others.

Project teams working on the *Ecosystem-based Management Planning Handbook*, *Hydroriparian Planning Guide*, and *Scientific Basis of Ecosystem-based Management* used the January 2003 draft as the touchstone on the definition, principles, and goals of EBM. They went far beyond it in applying those principles to planning and implementation, greatly improving the approach outlined in the draft.

Accordingly, the framework has been revised in light of review comments on the draft and, above all, to incorporate the essentials on planning and implementation elaborated in detail in the EBM guidebooks. Readers should consult the Coast Information Team (CIT) *EBM Planning Handbook*, the *Hydroriparian Planning Guide*, the *Scientific Basis of EBM*, and the *Policy and Institutional Analysis* for more in-depth elaboration of the EBM Framework. All CIT documents are available for downloading from the CIT Web site at www.citbc.org

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Ecosystem-based Management Framework

An ecosystem-based management framework is an integrated set of principles, goals, objectives, and procedures that together seek to ensure the coexistence of healthy, fully functioning ecosystems and human communities.

1.0 Introduction

For several decades, land and resource decision-making regarding rural British Columbia in general, and coastal areas in particular, have been antagonistic. In a historic step, several agreements were struck in April 2001 between the Province of British Columbia, First Nations from the Central and North Coasts and Haida Gwaii, local governments, and non-government interests.¹ Consensus was reached on a definition, principles, and goals of ecosystem-based management (EBM).² Parties to the agreements made a commitment to implement EBM in coastal British Columbia as a means of achieving “healthy, fully functioning ecosystems and human communities.”

In support of this task, the Coast Information Team (CIT) was established as an independent advisory body to bring together the best available scientific, technical, traditional, and local knowledge. In achieving its mandate, the CIT embarked on a series of tasks, one of which was the collaborative design of an Ecosystem-based Management (EBM) Framework that is consistent with the April 2001 EBM definition, principles, and goals.

1.1 Purpose of an Ecosystem-based Management Framework

The purpose of an EBM Framework is to:

- identify key components and requirements of EBM
- outline a strategic approach to EBM as a framework for developing guides to planning and implementation.

These elements are set out in subsequent sections of this document and fully described in its accompanying guidebooks: the *EBM Planning Handbook* and the *Hydroriparian Planning Guide*.

The structure and procedures proposed in the EBM Framework and guidebooks are intended to assist planners, managers, and other interested parties in developing and implementing EBM plans to suit their circumstances. Together, they should provide sufficient clarity to distinguish activities that are EBM from those that are not.

¹ General Protocol between seven First Nations and the provincial government, and the Central Coast Framework Agreement.

² *Definition, Principles and Goals of Ecosystem-Based Management (excerpted from the CCLCRMP Framework Agreement/Draft Interim Plan)*. The agreed definition, principles, and goals of EBM have been appended to the North Coast Land and Resource Management Plan (LRMP) Terms of Reference, and will be appended to the Haida Gwaii/Queen Charlotte Islands Land Use Plan (LUP) Terms of Reference. Therefore, any references in the principles and goals section to the Central Coast should be taken as applying to all three areas.

2.0 Definition of Ecosystem-based Management

The definition of ecosystem-based management used in this framework is:

...an adaptive approach to managing human activities that seeks to ensure the coexistence of healthy, fully functioning ecosystems and human communities.

The intent is to maintain those spatial and temporal characteristics of ecosystems such that component species and ecological processes can be sustained, and human wellbeing supported and improved.³

Conventionally, EBM recognizes that people are a part of the ecosystems in which they live.⁴ This definition builds on this insight and extends the scope of EBM beyond protecting ecosystem integrity to include the wellbeing of human communities. The specifics of the relationship between natural and human systems are set out in the April 2001 principles 1-9 (Appendix 2) and addressed in the Guiding Principles (Section 3) and Goals (Section 4) of this Framework.

Expanding the definition of EBM to include human wellbeing more comprehensively also expands the policy environment in which it takes place. While the central focus of EBM remains natural resource management, EBM also links to broader policy, planning, and decision-making concerned with building and maintaining healthy communities, such as education, health, incomes, transportation, equity, economic development, and diversification.

3.0 EBM Guiding Principles

The following principles are based on the agreements made in 2001. They are intended to guide implementation of EBM.

3.1 Ecological Integrity Is Maintained

Ecological integrity is the abundance and diversity of organisms at all levels, and the ecological patterns, processes, and structural attributes responsible for that biological diversity and for ecosystem resilience.

Biological richness and the ecosystem services provided by natural terrestrial and marine processes are sustained at all scales through time (e.g., clean water, species richness, vegetation diversity, soil productivity, water quality, predator-prey interactions, carbon storage). This includes sustaining the structure, function, and composition of natural ecosystems, including those ecosystems of the land-sea interface and hydroriparian system.

3.2 Human Wellbeing Is Promoted

Ensuring improvement in human wellbeing is critical for effective EBM. Doing so will require a blend of traditional practices, new activities, and new ways of deploying existing and potential investments.

³ This definition is a refinement of the definition of EBM in the April 2001 agreements.

⁴ Grumbine, R.E. 1994. What is ecosystem management? *Conservation Biology* 8(1):27-38.

Coastal British Columbia is in transition. Re-adjustment without careful planning and consideration could further dislocate individuals, families, and communities. Risks and opportunities for communities need to be addressed.

A diversity of economic opportunities is key to healthy communities and sustainable economies. Diversification includes both the local development of different economic activities as well as local involvement in different levels of existing activities.

3.3 Cultures, Communities, and Economies Are Sustained within the Context of Healthy Ecosystems

Healthy ecosystems contribute to healthy people and communities. Empowered and healthy communities are more likely to play a leadership role in sustaining healthy ecosystems, cultures, and economies.

Healthy communities depend on healthy ecosystems but ecosystem health alone is not sufficient for human wellbeing. The implication is that EBM must sustain the biological richness and biological services provided by natural ecosystems, while stimulating the social and economic health of the communities that depend on and are part of those ecosystems.

This idea of entrenching a demand for both human wellbeing and ecosystem integrity veers sharply away from thinking in terms of a “trade-off” between people and the environment. Obviously, any practical application has hundreds of small trade-offs: between interests, between components of the ecosystem, across time, and across space. However, ultimately, maintenance of ecological integrity and improvement of human wellbeing are critical; maintaining or improving one at the expense of the other is unacceptable because either way the foundation of life is undermined.

3.4 Aboriginal Rights and Title Are Recognized and Accommodated

First Nations assert aboriginal rights and title to the lands and resources within their territories. Past and current government policies and consultation processes have not adequately recognized or accommodated these rights and title, nor have they addressed traditional governance and decision-making systems.

Negotiated agreements with First Nations provide a mechanism for First Nations, governments, and third parties to bridge this gap in the short term until treaties define a longer-term relationship. These short-term agreements define and enable:

- relationships and understandings between the parties
- processes and procedures for cooperative planning and decision-making that enhance First Nations governance structures
- mutually acceptable standards for technical planning and operational activity
- certainty regarding access to resources and markets
- mechanisms for sharing the benefits of resource development (e.g., jobs, training, revenue, raw materials)

- development of First Nations economies
- provisions for social and environmental monitoring and information sharing.

First Nations have stated that short-term or transitional agreements that are intended to facilitate the implementation of EBM are without prejudice to legal proceedings or treaty negotiations.

3.5 The Precautionary Principle Is Applied

Knowledge of natural processes and human interactions is incomplete and inherently limited, and decisions made in the present can pose unacceptable risks for the future. Application of the precautionary principle means that where the risks associated with an action are uncertain,

- the proponent of change in the ecosystem should err on the side of caution, and
- the onus is on the proponent to show that ecological risk thresholds are not exceeded.

The precautionary approach enlists techniques such as risk assessment, cost-benefit analysis, monitoring, and adaptive management strategies.

3.6 EBM Is Collaborative

Collaborative processes are broadly participatory; respect the diverse values, traditions, and aspirations of local communities; and incorporate the best of existing knowledge (traditional, local, and scientific). They require broad participation in planning and clearly articulated decision-making processes.

3.7 People Have a Fair Share of the Benefits from the Ecosystems in Which They Live

Land and resource management decisions usually affect local people and businesses directly, and their effects, both positive and negative, may be profound. People and businesses in coastal communities depend on coastal ecosystems and often have long standing cultural and economic connections to these ecosystems. In the past, the burdens imposed on the local communities by externally driven activities have been greater than the benefits the communities have received. Effective implementation of EBM will address this imbalance.

Diverse and innovative initiatives that increase employment, economic development, and revenue, and also maintain cultural and environmental amenities and other benefits derived from resources, are pursued.

4.0 EBM Goals and Objectives

Table 1. EBM goals and objectives

Maintain the ecological integrity of terrestrial, marine, and freshwater ecosystems	Represent the biological diversity of the region in a system of protected areas according to the principles of conservation biology. ⁵
	Maintain the natural diversity of species, ecosystems, seral stages, and ecosystem functions including biological legacies (e.g., bear dens, wildlife trees, snags, coarse woody debris).
	Restore damaged or degraded ecosystems.
	Ensure that streamflow, channel characteristics, and water quality are within the range of natural variability.
	Protect or restore red- and blue-listed species and their habitats.
	Protect red- and blue-listed and regionally rare ecosystems.
	Maintain viable populations of all native species, including genetic variants, across their range.
Achieve high levels of human wellbeing	Conserve soil productivity and maintain slope failures within natural rates.
	Achieve the health, wealth, and education status required for a high quality and secure life for both aboriginal and non-aboriginal people.
	Build stable, resilient, well-served, and peaceful communities in coastal BC.
	Create a strong and diverse mix of businesses and overall economy within communities and across the region.
	Create a strong and diverse mix of non-profit and voluntary organizations and a vibrant set of traditional, cultural, and non-market activities within communities and across the region.
Ensure a fair distribution of benefits, costs, and risks across all parts of coastal BC, including aboriginal and non-aboriginal people.	

5.0 EBM Planning

5.1 Key Elements of EBM Planning

The key elements of EBM planning are:

- multiple spatial scales
- conservation planning
- socio-economic planning
- risk management
- interactive process of assessment, design, integration, and implementation
- adaptive co-management.

⁵ These principles are discussed in detail in the CIT *Scientific Basis of Ecosystem-Based Management and Ecosystem Spatial Analysis*.

5.2 Multiple Spatial Scales

EBM planning is required at and across several scales. The CIT approach to EBM recognizes five scales (Table 2). Conservation and socio-economic planning are proposed for all of them.

Table 2. Planning scales, areas, processes, and outputs

Scale	Size (ha)	Map scale	Processes	Outputs
Region	10,000,000 +	1:1,000,000 +	Policy making Institutional design Strategic development	Regional agreements and policies Regional economic strategies Regional land use strategies
Territory/ Subregion	500,000 to 5,000,000	1:100,000 to 1:250,000	Strategic planning (First Nations LUPs, LRMPs)	Strategic land use zoning/management direction Timber supply determination/allocation Community socio-economic development plans Resource development planning First Nation/local community/business agreements
Landscape	30,000 to 100,000	1:50,000	Tactical planning (Sustainable Resource Management Plans, Forest Stewardship Plans)	Sustainable resource management plans Forest stewardship plans Landscape reserves Business and project plans Community–business partnerships
Watershed	1 000 to 50,000	1:20,000	Tactical planning (watershed planning)	Watershed reserves Resource use/development plans Business and project plans
Site	Less than 250	1:5,000	Site planning	Site ecosystem reserves Resource use or harvesting plans Business and project plans Site tenure/management plans

5.3 Conservation Planning

Conservation planning helps to sustain important ecological and human values by developing a system of protected areas and reserves:

- *Protected areas* – relatively large undeveloped areas, identified at regional and subregional scales and designated for protection by governments (federal, provincial, First Nations) under specific legislation or authority. Protected areas may be established to protect representative samples of all native ecosystems and seral stages; provide critical and seasonal habitat to sustain viable populations of all native species; protect regionally rare or unique landforms and biophysical features; protect culturally and socially significant areas and values; or provide a benchmark against which to evaluate and compare managed landscapes.
- *Landscape, watershed, and site reserves* – areas where no, or very little, extractive resource use takes place but the land is not formally designated under legislation. Reserves are established to protect specific resource values or biophysical features (e.g., cultural heritage resources and features, unstable terrain, scenic areas, and recreation features) or achieve objectives to maintain ecosystem representation, wildlife habitat and movement corridors, riparian forest, and other landscape design elements.

- *Site retention and management* – in which individual trees, groups of trees, plant communities, or other features are retained or managed on the site to maintain ecological structures in the unprotected landscape (e.g., wildlife habitat, old forest structure). Site planning and management should focus on maintaining biological legacies (e.g., coarse woody debris, snags, understory plants), maintaining connectivity between landscape and watershed reserves, providing for seasonal and critical wildlife habitats, and protecting special ecological elements (e.g., bear dens, endangered plants, small wetlands).

5.4 Socio-economic Planning

Socio-economic planning in an EBM context seeks to create and implement plans that will generate wealth, provide sustainable livelihoods, distribute benefits and burdens equitably, and enhance cultural, community, and household wellbeing. Key elements include:

- Development of cultural and socio-economic objectives based on collaborative assessment of socio-economic conditions and community, sectoral, or organizational vision and goals.
- Land and resource use plans that support a variety of economic activities (formal and informal) and provide for cultural and social use opportunities.
- Resource use objectives for the managed landscape that best meet socio-economic goals while recognizing ecosystem thresholds.
- Consideration of the trade-offs and complementarities involved in allocating the managed landscape to different sectors and identify opportunities to reconcile different land and resource uses.
- Fine-tuning of plans by assessing and considering the cultural and socio-economic implications of proposed land uses and by developing new arrangements that will enable economic transitions.
- Development of institutional and planning arrangements through which communities and businesses seek to innovate and find new ways of generating wealth.

5.5 Risk Management

Risk management is a central feature of EBM. The CIT's approach involves three key steps:

1. Identify indicators for key management objectives (e.g., old forest representation is an indicator of coarse filter biodiversity).
2. Develop curves relating indicator values to risk (e.g., the amount of old forest in a landscape). Risk curves should combine information from as many sources as possible, including natural reference points or benchmarks (e.g., natural streamflow rates), research reports and empirical data, and instances of collapse (e.g., local or expert knowledge of species extirpation). Recent approaches use "range of natural variability" (RONV) – the range of dynamic change in natural systems over historic time periods – as a benchmark for risk assessment. The assumption is that risk increases in proportion to the amount that management causes patterns and processes to depart from their natural range (Figure 1).

Figure 1. Range of natural variability (RONV) and ecological risk

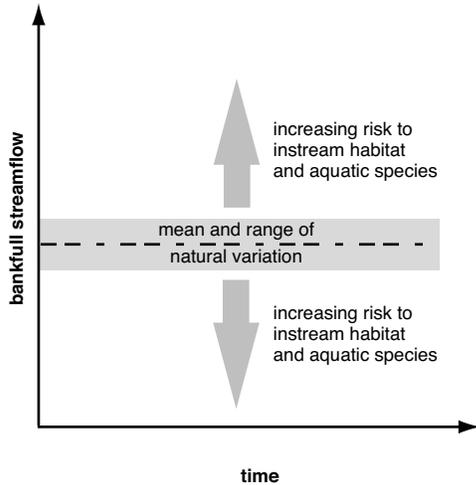
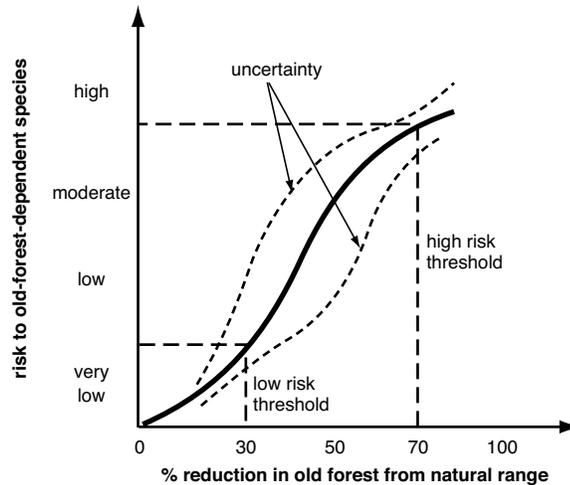


Figure 2. Example of risk thresholds



The shape of the uncertainty band around the risk curve indicates that low and high risk are more easily determined than the mid range.

- Identify thresholds that aid risk interpretation, and use these to develop management targets. This involves dividing risk for each indicator into classes ranging from very low to high, where low risk begins at the threshold where adverse impacts begin to be detected, and the transition to high risk corresponds to where significant loss of ecological function is expected to occur. "Precautionary" management targets, reflecting a commitment to achieve a high probability of maintaining ecological integrity, should be equal to or below the low risk threshold. Management should not exceed the high-risk threshold because there is a high probability that ecological and conservation values would not be sustained (Figure 2).

Ecological, cultural, and social values and resource development opportunities are not evenly distributed across the landscape. Application of precautionary targets everywhere may constrain pursuit of socio-economic objectives and tend to disperse resource development more widely over the landscape at any point in time (assuming resource harvest or use levels remain constant). Allowing management flexibility at lower scales, on the other hand, can enable greater focus on economic gains in areas where ecological or cultural values are not as significant; greater environmental protection in areas with significant ecological values; and exploration of alternative management practices and outcomes.

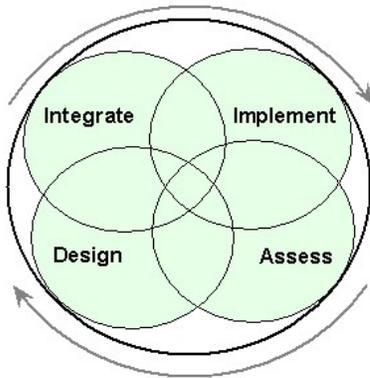
The CIT approach to EBM seeks to secure a high probability of maintaining ecological integrity overall at the subregional scale and in landscapes and watersheds with significant cultural and ecological values, while allowing for greater focus on economic activity in landscapes, watersheds, and sites with lower conservation value. Application of management targets at lower planning scales ranging from precautionary to no higher than the high-risk threshold – within the overarching objective to manage to low risk at the subregional level – provides for operational flexibility and exploration of alternative management practices in different watersheds and sites.

The underlying assumption is that it is not necessary to sustain all species and processes everywhere all the time to maintain ecological integrity, as long as lower risk management objectives and targets are being achieved at strategic subregional and landscape planning scales.

5.6 Interactive Process of Assessment, Design, Integration, and Implementation

EBM is an interactive, ongoing cycle of four overlapping planning functions – assessment, design, integration, and implementation – within and across scales (Figure 3). EBM is interactive because planning is rarely a sequential, step-by-step process. Plan design and integration often require new assessments and consideration of planning at other scales. EBM is ongoing in the sense that, even when plans are finalized and implemented, adaptive co-management and monitoring will yield new information that over time will be used to revise resource policies, management objectives, and targets, adjust resource harvest levels, and where necessary modify existing land use plans.

Figure 3. EBM planning functions



- *Assessment* refers to the range of ecological, biophysical, cultural, and socio-economic inventory and analysis that is carried out to develop information needed to engage in design, integration, and implementation at various planning scales, and also to monitor the outcomes of management activity.
- *Design* is a creative step in EBM planning in which inventories, knowledge (traditional, local, and scientific), and technical analysis are synthesized to develop initial proposed plans. The goal is to develop draft plans that achieve ecological and socio-economic objectives. These initial designs provide a reference point for assessing the risks and trade-offs of alternative plans. Ecological design has two interrelated components. The first involves use of coarse filter, fine filter, and landscape conservation planning approaches to develop initial plans for protected areas, ecosystem reserves, and management of site retention as appropriate at each scale. The second involves developing management objectives and targets that will maintain the ecological integrity and cultural values within landscapes, watersheds, and sites in the unprotected landbase. Design to meet community and socio-economic objectives involves the development of draft land use allocations, management objectives, community and business economic development strategies, and transition plans.

- *Integration* is the process whereby planning participants and/or decision makers assess initial designs in relation to ecological and socio-economic objectives and targets, and engage in consultation or negotiation to develop final plans that address core EBM principles and goals (i.e., promote human wellbeing within the context of maintaining ecosystem functions and processes), achieve a balance among competing uses, and secure commitments and arrangements to support plan implementation.
- *Implementation* is the process of carrying out plans and may include:
 - establishing protected areas, reserves, and retention and other land use zones
 - pursuing social and cultural activities and business operations
 - developing and engaging in adaptive co-management, monitoring, and research
 - pursuing transition strategies, capacity building, communication, and public education.

5.7 Adaptive Co-Management

Adaptive management is a formal process of “learning by doing,” where management activities are designed as experiments to test different management assumptions and hypotheses. *Adaptive co-management* (ACM) is a collaborative approach to adaptive management that explicitly engages governments, proponents, and planning participants in defining issues, developing management plans, and monitoring outcomes. ACM is not a panacea, and decisions to implement it should consider the uncertainties and risks associated with the proposed management activity as well as the costs associated with producing useful results. In practice three options are available: precautionary co-management, passive adaptive co-management, and active adaptive co-management.

For more detailed information on EBM planning, see the *EBM Planning Handbook* and the *Hydroriparian Planning Guide*.

6.0 EBM Implementation

6.1 Institutional Design

The most challenging aspect of the transition to EBM involves the identification and reform of resource policies or governance arrangements. To identify potential reform, it is usually adequate to isolate a specific management issue or EBM objective and identify the barrier or gap that is preventing realization of that objective

Because current institutions may not provide well for resolution of policy or management issues in the short term, interim working arrangements ranging from informal handshakes to formal protocols may be required to achieve EBM objectives. A common formal mechanism is a protocol or memorandum of understanding among relevant parties that clarifies mutually acceptable understandings, commitments, and requirements. The goal is to develop and implement new arrangements that will support implementation of EBM by:

- providing coordination and harmonization among policies, plans, and objectives

- promoting and strengthening collaboration among First Nations, governments, and stakeholders including tenure holders, non-governmental organizations, research institutions, and local community and resource user groups
- ensuring that management activities are consistent with EBM goals and objectives
- providing for equitable distribution of resource rights, benefits, and responsibilities
- providing forums and mechanisms for resolving disputes (e.g., procedures for negotiation, conciliation, mediation, and arbitration)
- providing for coordinated, accountable, and efficient monitoring of resource use.

A thorough discussion of institutional needs to facilitate the transition to EBM and ensure its full implementation is provided in the CIT *Policy and Institutional Analysis*.

6.2 Trade-Offs

The transition to EBM is likely to be difficult, fraught with challenging trade-off decisions between human vulnerability and ecological risk. Before opting for trade-offs it is necessary to carefully assess whether the trade-offs are real or whether other courses of action are available. There may be opportunities to improve human wellbeing that do not increase risk to ecosystems, or to reduce risk to high value ecosystems without reducing human wellbeing. For instance, if a community is vulnerable because resource extraction has provided few local benefits, a first step is to ensure that resource development retains greater local benefits. Means to improve the flow of local benefits include local tenures; local service contracting, resource processing, or manufacturing; and revenue sharing arrangements. Despite such measures, there may still be trade-offs that need to be worked through.

Clearly, a trade-off is unacceptable if it reduces human vulnerability now by making it worse later, or if it poses higher risk to ecological integrity over large areas, or if there are no clear, achievable plans that will enable ecological recovery. Acceptable trade-offs are those that compromise ecological integrity in the short term at smaller scales to achieve more sustainable outcomes overall than would otherwise have been the case.

6.3 Economic Diversification and Innovation

Economic innovation is key to the success of EBM. Because the old-style focus on high levels of resource extraction is unsustainable in the long run and inconsistent with EBM principles, the need for sustainable, livelihood-producing economic enterprises is a major challenge. Some coastal communities already have unsatisfactory levels of human wellbeing, and implementing EBM will in some cases reduce resource flows and economic benefits. A key transition challenge is to develop new opportunities through economic diversification and innovation.

A more diverse and innovative economy will be more resilient to external surprises, will multiply types of employment, and will provide new business opportunities and niches. Land uses and resource development that maintain ecosystem integrity also provide a solid basis for long-term investment and community security. Institutional arrangements play a large role in enabling economic diversification. Governments, communities, and stakeholders can help to create an enabling environment in which innovation and diversification are supported and obstacles and barriers are systematically reduced.

The *EBM Planning Handbook* provides more detailed information on assessing trade-offs and on economic diversification and innovation.

7.0 The Coast Information Team Products

The EBM Framework offered guidance for the development of all CIT products, which included planning and operational guidebooks on EBM and assessments of the cultural, socio-economic, and ecological values of the CIT analysis area.

7.1 Planning and Operational Guidance for EBM

The CIT's approach to EBM outlined in the EBM Framework was further developed with ecological management targets described in the *Scientific Basis of Ecosystem-based Management*, and implementation tools such as the *EBM Planning Handbook* and *Hydroriparian Planning Guide*.

7.2 Context Assessments for EBM

The CIT undertook context assessments through thematic, integrative, and subregional analyses. Thematic analyses, including a *Cultural Spatial Analysis*, several *Economic Gains Spatial Analyses*, and an *Ecosystem Spatial Analysis*, were conducted to identify priority areas for all of these value sets (cultural, economic development, and biodiversity conservation, respectively). A subregional *Ecosystem Trends and Risk Assessment* for the Central Coast considered the probability of maintaining coarse filter biological diversity and function over space and time under current management conditions. A *Wellbeing Assessment* integrated environmental and socio-economic conditions and trends in the region and developed a combined indicator of human and ecosystem wellbeing to provide context for land use decisions and a baseline for monitoring implementation. An *Institutional Analysis* analyzed present conditions and recommended institutional and policy arrangements to implement EBM in the CIT analysis area.

Copies of all CIT products, and information on the CIT's history, functioning, participants, and outcomes, can be found on the CIT Web site at www.citbc.org.

Appendix 1: April 2001 Definition, Principles and Goals of Ecosystem-based Management

(excerpted from the CCLRMP Framework Agreement/Draft Interim Plan, April 2001)

Definition:

Ecosystem-based management is a strategic approach to managing human activities that seeks to ensure the coexistence of healthy, fully functioning ecosystems and human communities. The intent is to maintain those spatial and temporal characteristics and processes of whole ecosystems such that component species and human social, economic, and cultural activities can be sustained.

#	Overarching Principles
1	Healthy, fully functioning ecosystems provide the basis for sustaining communities, economies, cultures and the quality of human life therefore ecological sustainability is fundamental to land and marine management.
2	Empowered and healthy communities play a leadership role in sustaining healthy eco-systems, cultures and economies.
3	Focus planning on the needs of the ecosystems and the values that you want to maintain.
4	Planning should be done over ecologically and economically relevant time frames and involve regional, landscape and site scale planning.
5	Incorporate the best of existing knowledge (e.g. traditional, local and western science) into planning and decision-making.
6	Knowledge of natural processes and human interactions is incomplete and inherently limited, and decisions made in the present can pose unacceptable risks for the future. Apply the Precautionary Principle and practice adaptive management in decision-making. Monitor the consequences of decisions and adopt a learning approach to planning.
7	Maintain natural, social and economic capital in the region and preserve the full range of options for future generations.
8	Respect individuals, communities of interest (including businesses) and cultures.
Recognition of First Nations History and Rights	
9	Respect and acknowledge aboriginal rights and title as defined by the Constitution and case law.
10	First Nations of the Central Coast should be engaged with the governments of BC and Canada in a process to reconcile outstanding land issues involving aboriginal rights and title including securing interim measures agreements.
11	Support the efforts of First Nations to establish government-to-government to government tables with the objective of developing interim measures agreements.
12	Aboriginal settlements must be based upon mutual trust, respect and understanding. They must be fair and equitable and recognize the interests and aspirations of individual First Nations including providing tools and resources to enable social and economic prosperity for First Nation people as well as other people of BC.
Ecological Principles	
13	Sustain the biological richness and the biological services provided by natural terrestrial and marine processes at all scales through time (e.g. water quality, soils and vegetative productivity, species richness, predator/prey interactions, etc.).
13a	Conserve hydro riparian areas and maintain hydro riparian functions.
13b	Ensure an appropriate level of ecological representation and habitat connectivity.
13c	Protect and conserve focal species, as well as rare, threatened and endangered species and their habitats as a priority.



13d	Conserve native species and their habitats within the range of natural variability.
13e	Protect sensitive soils and unstable terrain.
13f	Sustain the structure, function and composition of natural ecosystems including the land-sea interface.
13g	Incorporate ecological restoration of degraded landscapes, stands and sites into forest management.
13h	Avoid the introduction of alien species
13i	Sustain adequate levels of spawning biomass and population age structure of all aquatic species (e.g., rock fish, lingcod, salmon).
13j	Recognize that the dynamics and resiliency of ecosystems vary.
14	Establish a credible terrestrial and marine protection area system that contributes to sustaining the biological richness and the biological services provided by natural terrestrial and marine processes.
15	Use zoning as a management and planning tool.
16	Sustain human communities within the limits of ecosystem processes.
16a	Ensure that the consumptive use of natural resources is maintained within limits that can be sustained.
16b	Employ resource use techniques that emphasize low environmental impact and ensure that activities do not degrade ecosystems or conflict with meeting conservation goals.
16c	Ensure that the harvesting of natural resources and rates of harvest are an output of planning and do not compromise the long-term ecological integrity of landscapes and watersheds.
16d	Ensure sustainable harvest of old growth (250 years +) and second growth timber.
16e	Ensure that the development of non-renewable resources is undertaken in a manner that is consistent with the ecosystem framework.
16f	Redefine tenure arrangements to make them more ecologically relevant.
Socioeconomic Principles	
17	Promote the well being of the communities in the Central Coast for this and future generations.
18	Recognize the interests of work communities on the Central Coast whose residents live outside the Central Coast.
19	Maintain the historical, current and future unique qualities of life on the Central Coast as a basis for diversified economic activity.
20	A diversity of economic opportunities is key to healthy communities and sustainable economies. Diversification should include both the local development of different economic activities as well as local involvement in different levels of existing activities.
21	Provide greater local employment and economic benefits to communities through increased local access to local resources.
22	Build community economic capacity including employment and business opportunities beginning with communities in the Plan Area. Ensure access to leadership, decision-making, business planning and management skills training.
23	Redefine tenure arrangements to make them more equitable.
24	Encourage diverse and innovative options that increase the employment, economic development, revenue, cultural and environmental amenities and other benefits derived from resources.
25	Recognize the financial investment and economic contribution of the full range of existing economic enterprises and their employees and shareholders.
25a	Seek new ways of deploying existing investments within the context of these principles and goals.
25b	Increase the economic viability and sustainability of existing investments within the context of these principles and goals.
25c	Incorporate potential economic contributions of local, regional and global interests.
26	Seek out and encourage new and innovative investment opportunities in the region in support of these goals and attract capital investments in those opportunities.

26a	Explore innovative ownership structures (including private ownership), rights allocations and opportunities to share assets or business functions.
27	Ensure the full range of impacts and opportunities are considered in decision-making. Develop full-cost accounting tools and models to assess opportunities and impacts of resource management alternatives.
28	Do more with less: prioritize business and economic strategies based on quality, adding value and decreasing material throughput thereby improving economic and ecological outcomes.
29	When land use decisions are made in the public's best interests the costs of such decisions should not be visited on individual parties. Thus, direct loss of economic livelihood or employment resulting from a breach of contract resulting from land use planning decisions must be subject to mitigation first and fair and timely compensation as a last resort.
Principles of Information and Adaptive Management	
30	Practice Adaptive Management
30a	Identify benchmarks against which future management performance can be measured.
30b	Establish explicit objectives for managing risk.
30c	Incorporate science, local and traditional knowledge and available data into management decisions.
30d	Identify research and inventory priorities that will increase the effectiveness of ecosystem-based planning and management in the future.
30e	Monitor performance and outcomes for the purpose of adapting and improving planning and management.
31	Adopt a coordinated approach to information management.
Principles for Managing Ecosystem-Based Planning Processes	
	Follow up processes shall:
32a	be neutrally administered
32b	be transparent
32c	ensure full public access to relevant information necessary to make informed decisions
32d	consider all community and other interests affected
32e	look to find common ground
32f	respectful of the diverse values, traditions and aspirations of local communities
32g	fair
32h	efficient and effective (efficient use of time and resources)
32i	measurable and enforceable (decisions must be properly monitored and enforced)
32j	adaptive and flexible (capable of modifying decisions in response to technological innovations, field experience, shifts in social preferences and new information)
32k	comprehensive and integrated (cross sector and addressing the full range of economic, social and environmental concerns and values)
32l	accountable (decision makers must be accountable to all participants in the process as well as to the broader public)
33	Recognizing regional, provincial, national and international interests establish collaborative land use planning and decision-making processes that empower, and build capacity, within local communities.
34	Resolve conflicts with generosity, compassion and clear understanding.
35	Engage independent expertise in a manner that reveals the consensus of opinion and the differences of opinion on issues of concern.