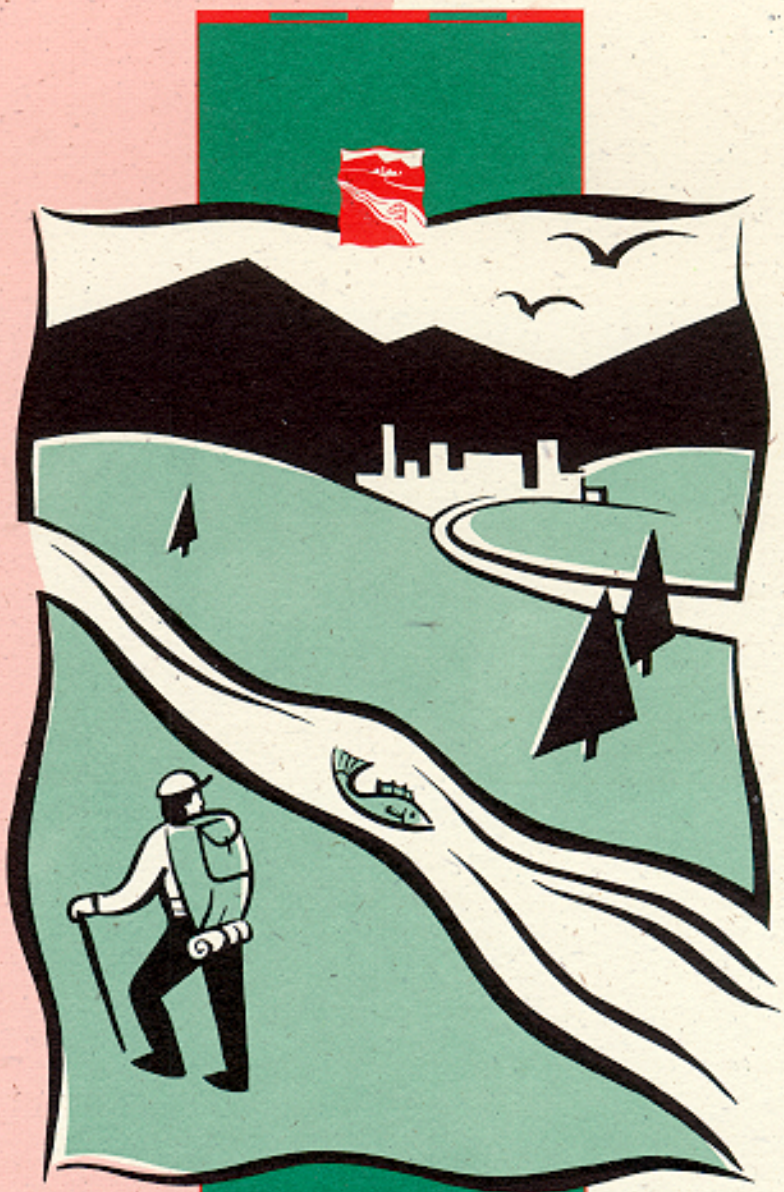
FRASER RIVER
ACTION PLAN



CREATING AND CELEBRATING OUR WATERSHED'S FUTURE

SELECTING INDICATORS FOR A SUSTAINABLE WATERSHED FUTURE

March 1 - 2, 1997
Falkland, B.C.

Workshop Report

Canada

DOE FRAP 97-08

Environment Canada Environnement Canada

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Prepared For:

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Citation: Stavinga, J.M. and MacDonald, D.D. 1997. Creating and Celebrating Our Watershed's Future- Selecting Indicators for a Sustainable Watershed Future, March 1-2, 1997, Falkland, B.C., Workshop Report. Prepared for Environment Canada's Fraser River Action Plan and the Salmon River Watershed Roundtable. DOE-FRAP . 80 pp.

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Executive Summary

The ecosystem health goals and objectives selected in 1996 are social, economic, and ecological components of a vision of a healthy sustainable Salmon River watershed. The next phare in ***Creating and Celebrating Our Watershed's Future*** involved the selection of indicators to measure success in achieving the goals and objectives. The Salmon River Watershed Roundtable, in partnership with Environment Canada through the Fraser River Action Plan organised a workshop to support the development and selection of ecosystem health indicators. This workshop was held on March l-2, 1997 in Falkand, B.C., drawing over 60 participants.

This workshop brought together the knowledge and wisdom of people with an interest in the watershed including citizens, government, business, social agencies, First Nations,. and others. Participants discussed various elements that should be considered in developing a method to select ecosystem health indicators. Numerous indicators were chosen to provide detailed information or clues to the health of the watershed. Indicators included measures of river health, economic diversity, management of forest and agricultural resources, and community decision making and participation.

Participants agreed that the indicators selected through this process require further refinement in order to be manageable. Further screening will assist in focusing research expenditures, and tailoring community monitoring programs to areas where information is insufficient to meet decision making needs.. It was suggested that this could be done in conjunction with the work planning activities of the Roundtable as a basis for identifying priorities.

The refinement of this preliminary list of indicators will assist the Roundtable, in partnership with the communities of the Salmon River Watershed to establish management strategies and specific action planning. The monitoring of these indicators will allow communities ‘of the Salmon River Watershed to see first hand whether their actions are moving them towards achieving and maintaining a healthy, sustainable future.

Sommaire

Les buts et les objectifs de santé écosystémique choisis en 1996 constituent les éléments sociaux, économiques et écologiques d'une vision écologique du bassin de la rivière Salmon. La prochaine phase du programme intitulé' ***Créer et célébrer l'avenir de notre réseau hydrographique*** comprenait la sélection d'une série d'indicateurs visant à mesurer notre succès dans l'atteinte de ces buts et objectifs. La Table ronde sur le bassin de la rivière Salmon, en partenariat avec Environnement Canada et dans le cadre du Plan d'action du Fraser, a organisé un atelier visant à promouvoir le développement et l'établissement d'indicateurs de l'état de santé de l'écosystème. Cet atelier s'est tenu les 1" et 2 mars 1997, à Falkand (Colombie-Britannique). Il a attiré 60 participants.

Cet atelier a permis de réunir les compétences et l'expérience des divers dépositaires de l'enjeu : citoyens, gouvernement, entreprises, organismes de services sociaux, Premières nations, etc. Les participants ont discuté des divers éléments qui devraient être pris en compte dans l'élaboration d'une méthode de sélection d'indicateurs de santé de l'écosystème. De nombreux indicateurs ont été choisis pour fournir de l'information ou des indices détaillés concernant la santé du bassin : mesures de l'état de santé de la rivière, de la diversité économique de la région, de la gestion des ressources forestières et agricoles, du processus de décision et de participation aux décisions; etc.

Les participants ont convenu que pour être gérables, les indicateurs choisis devront être raffmés. De plus amples travaux d'évaluation aideront à planifier les dépenses en matière de recherche et à adapter les programmes de surveillance communautaire aux secteurs où l'information est insuffisante pour répondre aux besoins décisionnels. On a suggéré que cela soit fait en conjonction avec les activités de planification des travaux de la Table ronde, afin d'établir les priorités.

La mise au point de cette liste d'indicateurs préliminaire aidera la Table ronde, en partenariat avec les collectivités du bassin de la rivière Salmon, à établir des stratégies de gestion et un plan d'action spécifiques. La surveillance des indicateurs permettra aux collectivités du bassin de la rivière Salmon de constater directement si leurs actions contribueront à assurer leur avenir écologique.

Acknowledgements: Thank you to those individuals who assisted in reviewing various drafts of the workshop guide and summary report, including: Neils Christiansen (SRWR), Kathy Grant, Annie-France Gravel (Environment Canada), Mary Lou Haines (Sustainable Fisheries Foundation), Dennis Lapierre (SRWR), Don MacDonald (Sustainable Fisheries Foundation), Fred Mah (Environment Canada), Mike Wallis (SRWR), and Cecilia Wong (Environment Canada). A sincere thanks to Lynn Smart (Leo-ness Enterprises) for providing the energy and skills to organise the two day event, as well as the various community organisations for their services. Special thanks to each workshop participant, and to the invited speakers for contributing their knowledge and creativity to furthering the efforts to create a sustainable watershed future.

Table of Contents

List of Appendices

Introduction

The Salmon River is located within the interior plateau of south central British Columbia. Its headwaters originate in the vicinity of Tahaetkun and Bouleau Mountains, south of Westwold and north-east of Merritt. From its headwaters, the river flows westward to Salmon Lake and then flows in a north-easterly direction to Salmon Arm Bay of Shuswap Lake. The Salmon River is a tributary of the South Thompson River as Shuswap Lake drains into the South Thompson. The Salmon River is approximately 110 kilometres in lengt hand it drains a total area of 15 10 square kilometres. The drainage area of the Salmon Rive ranges in elevation from 2038 m at Tahaetkun Mountain to 349 m at Shuswap Lake.

The watershed contains a diversity of landscapes which provide the basis for a variety of land and resource uses such as agriculture and forest harvesting. Numerous lakes and streams provide habitat for fish and other aquatic wildlife. The mix of different forest types and ages provide important habitat for wildlife. The watershed also provides many opportunities for outdoor recreation activities.

Concerns from citizens in the deterioration in the health of the watershed lead to the formation of the Salmon River Watershed Roundtable (SRWR). The Roundtable is a grass roots driven partnership, composed of landowners, First Nations, local government, provincial and federal ministries, industry and citizens working to restore, enhance and maintain the watershed of the Salmon River.

The Salmon River Watershed Roundtable in partnership with Environment Canada, through the Fraser River Action Plan (FRAP), and in conjunction with the Department of Fisheries of Oceans (DFO), British Columbia Ministry of Environment Lands and Parks (BCMELP), and the Vancouver Foundation established a pilot study in the Salmon River Watershed.

The mission of the Roundtable is '...to be a catalyst to achieve and maintain a healthy Salmon River Watershed through coordinatea management of all resources, respect for all concerns and cooperative, positive action. "

This project is designed to facilitate effective and balanced integration of environmental, economic and community goals into ecosystem planning and management activities. The process being followed is based upon the national framework prepared by the Canadian Council

of Minister of the Environment (CCME, 1996) outlined in *A Framework for Developing Ecosystem Health Goals, Objectives and Indicators: Tools for Ecosystem-Based Management.* A summary of this process is provided in Appendix 1.

Over the past few years, a great deal of progress has been made towards sustainable management of the Salmon River Watershed. In 1995, activities focused on identifying and evaluating the traditional and scientific information on the health of this watershed. This knowledge has been documented in a technical, as well as a public summary report entitled *The Salmon River Watershed - An overview of Conditions, Trends and Issues* (Quadra Planning Consultants Ltd., 1996) . A verbal history of the watershed was also compiled through numerous interviews with citizens of the watershed . These reports highlight that despite the relative abundance of natural resources there are serious questions regarding the sustainability of the watershed including land use decisions, settlement patterns and human activities that have not always considered effects on fish and wildlife resources or habitats (Quadra Planning Consultants, 1996).

In December 1995, a workshop was held to facilitate the establishment of community-based vision for a healthy, sustainable Salmon River watershed. A participatory and consensus based process developed through the Institute of Cultural, Affairs was utilised at this workshop. In March 1996, interim ecosystem health goals and objectives were selected (see Appendix 2) to reflect the social, economic and ecological components of the watershed wide vision.

The next phase involves the selection of specific indictors to provide information or clues to the health of the ecosystem Indicators can be used to measure the success in achieving the ecosystem health goals and objectives , and as an indication of whether ecosystem management decisions are being effective (Environment Canada, 1997).

To proceed to this next step, the Salmon River Watershed Roundtable, in partnership with Environment Canada through the Fraser River Action Plan organised a workshop to support the development and selection of ecosystem health indicators. This workshop was held on March 1-2, 1997 in Falkand, B.C., drawing over 60 participants . This workshop brought together the knowledge and wisdom of people with an interest in the watershed including citizens, government, business, social agencies, First Nations, and others.

The selection of indicators will assist the Roundtable, in partnership with the communities of the Salmon River Watershed to establish management strategies and specific action planning. The monitoring of these indicators will allow communities of the Salmon River Watershed to see first hand whether their actions are moving them towards achieving and maintaining a healthy, sustainable future .This report summarises the outcomes of the workshop, and is organised into the following sections: 1) methods for the two day workshop; 2) refinements to the proposed approach to selecting indicators; 3) preliminary list of indicators selected for specific goals and objectives; 4) identification of next steps to facilitate the refinement of the list of indicators; and, 5) a series of appendices providing further technical information.

Methods

To support the development of ecosystem health indicators for the Salmon River Watershed, a workshop guide was created to assist participants in the selection of ecosystem health indicators. Based upon a review of the ecosystem health knowledge base documented in *The Salmon River Watershed - An Overview of Conditions, Trends and Issues (1996)* and the *Verbal History of the Salmon River Watershed (1995),* a list of candidate indicators were identified to be reflective of the established ecosystem health goals, and objectives. An approach to selecting indicators was also recommended as a means to provide a consistent basis for evaluating potential indicators. The proposed approach can be found in Appendix 3.

The workshop was composed of a series of information and work group sessions (see Appendix 4 for Workshop Agenda). The information sessions consisted of a series of presentations on the conditions, trends, and issues of the watershed including, water quality and quantity, fish and wildlife, land use, social and economic status, and rural lifestyles. The community driven process of participation in the establishment of the interim ecosystem health goals and objectives was also highlighted.

Following the information sessions, participants were provided with an opportunity to identify strengths within the community, as well as recent activities undertaken to assist in achieving a healthy, sustainable watershed. Work group sessions focused upon reviewing and refining the proposed approach to selecting ecosystem health indicators and identifying potential candidate indicators to gauge progress towards the established ecosystem health goals and objectives.

Following these discussions working groups were assigned specific ecosystem health goals and associated objectives. Through brainstorming to encourage new ideas, as well as reviewing the potential indicators in the workshop guide, a series of indicators were selected for each objective. The indicators selected are defined as components of the ecosystem (e.g., aquatic, riparian, economic, forestry and agricultural resources) which will provide information on the health and vitality of the ecosystem as a whole.

Results

The outcomes from the workshop are summarised in the following sections, including: 1) suggestions to refine the proposed approach to selecting indicators; and, 2) the ecosystem health goals, objectives, and the recommended indicators from the group discussions. A brief rationale based upon a review of literature is provided to highlight the importance of striving towards specific goals in order to achieve and rnaintain a healthy, sustainable watershed ecosystem.

The rigorous, consistent application of a comprehensive screening process in the selection of indicators was not undertaken by workshop participants. Rather indicators were selected using local knowledge, experience, and a combination of the proposed approach and the modifications suggested by participants. Workshop participants provided an initial selection of indicators based upon a pass/fail system versus numerical assignments. From this list of indicators, groups assigned a high, medium or low priority to various selections, although not all groups completed this ranking.

A series of appendices provides further information, including: 1) implementing an ecosystem approach; 2) ecosystem health goals and objectives for the Salmon River Watershed; 3) an approach to selecting indicators; 4) community strengths to achieving a healthy, sustainable watershed; and, 5) various activities being undertaken to contribute to the understanding of the ecosystem.

Refining the Proposed Approach for Selecting Ecosystem Health Indicators

Participants were asked to consider the proposed model for selecting indicators as outlined in Appendix 3, and consider means in which a series of indicators could be selected to help improve the manner in which shared resources are managed. Participants recognised that the indicators to be selected should be broadly applicable to multiple issues and conceptually linked to many ecosystem components (e.g., benthic invertebrates - may fly - water quality, fish). An indicator should have the ability to be indicative of unmeasured characteristics through potential linkages. Every attempt should be made to avoid duplication of indicator information, however the information provided should be integratable.

One discussion group highlighted the need for a tiered evaluation including an initial pass/fail; identification of a few high priority criteria for screening followed by additional criteria that would assist in prioritising the indicators . This particular discussion group suggested the following five step process for selecting indicators: 1) Establish criteria for the selection of criteria ensuring broad understanding; 2) Determine a mix of pass-fail and rated criteria with consideration to weighting (e.g., measurability, cost -effectiveness); 3) Apply a numerical scale (e.g., O-5) with a guide to the relative meaning of numbers; 4) Select some common core indicators, and some specific to issue area; and, 5) Calculate the total score to be used as a relative, not an absolute measure of value.

Another discussion group proposed the following series of questions or criteria as a means to evaluate potential indicators based on system of pass or fail: 1) Is the indicator relevant to goals and objectives, ecologically relevant, socially relevant? 2) Is the indicator easy to measure using established procedures? 3) Is measuring of the indicator going to damage the environment? 4) Does the data provide information in a timely way? Does the information derived from indicators provide the means to detect problems on the river?

> *"We shouldn 't have to go to university to read the data from the indicators. "*
>
> *Workshop Participant*

Workshop participants agreed upon the importance of indicators being linked to the established goals and objectives. In addition, it is necessary to ensure that the information provided by an indicator is linked to the decision making needs. The indicator should be measurable, sensitive, timely, and cost-effective . The aspect of ecological relevancy is significant followed by socially relevant. The criteria of non-destructive was regarded as a parameter of common sense in gathering information on the ecosystem. The characteristics of unique and appropriate scale ranked as a lower priority for the screening process.

Participants emphasised the importance of ongoing, continuous collection of information. Participants stated that the absence of historical data, however should not be a reason to eliminate the consideration of indicators. Rather there must be a willingness to accept new indicators given emerging information requirements.

Potential indicators should also be evaluated with respect to the feasibility and practicality of volunteers in collecting and monitoring data . The information derived should be socially relevant, accessible and easily communicated to the common person. Bonus points in the

selection process could be considered for those indicators that provide information that is likely to provide a quick public response, such as the cleanliness of properties in watershed.

The following four step process was suggested by another discussion group for the selection of indicators: 1) assign specific goals and objectives to a group; 2) brainstorm potential indicators to match the specific objectives; 3) apply criteria to screen indicators; and, 4) prioritise and cross reference indicators with other goals and associated indicators sets. Participants identified the need to provide an opportunity for review of indicators by the broader community.

Burning Question: "Who will be responsible for managing the information collected? "

Workshop Participant

Ecosystem Goal I: Forests Managed for Human and Natural Needs

Rationale: Forests provide a mix of benefits to society including commercial wood products, commercial and non-market goods and services, and environmental and option values. Sustainable development requires that the forest continue to provide these goods and services over the long term.

In addition to the significant commercial benefits derived, forests support a wide range of other activities that provide benefits including tourism, wildlife, recreational use of the forest, aesthetics, and wilderness values. Although not always measurable in monetary terms, these activities are also highly valued by citizens and provide significant benefits to society (Canadian Council of Forest Ministers, 1995).

Maintenance of natural genetic and ecosystem diversity across the landscape is the key to ensuring that species maintain viability through their capacity to evolve. Maintenance of the natural range of ecosystems, and the ability of the components to respond to external forces and processes, provides the balance required for the maintenance of species diversity (Canadian Council of Forest Ministers, 1995). Each stage of forest succession has unique and characteristic distributions and population levels of some species. Maintaining biodiversity in the watershed's forests depends on maintaining ecosystems in all their various stages: early, mid and late-successional stages (Fraser Basin Management Program, 1995).

Ecosystem Objectives: The Salmon River Roundtable has developed two ecosystem health objectives which, if achieved will assure that forests are effectively managed for human and natural needs, including:

- To achieve sustained yield of all forest products (timber, range, medicinaI herbs etc..) based on realistic inventories and growth and yield projections; and,
- To maintain all stages of plant succession (from bare ground to old growth forest).

Ecosystem Objectives:

1.1 Sustained vield of all forest products (timber, range, medicinal herbs etc..) based on realistic inventories and growth and yield projections; and,

1.2 Maintenance of all life forms by maintaining al stages of plant succession (from bare ground to old growth forest).

Recommended Indicators (for above two objectives):

A. Productive Capacity of Forests - Health of the Forest

No *Rank Given*

- Present state of forest ecosystem (i.e., inventory of age class distribution)
- Annual Allowable Cut (AAC) by watersheds and biogeoclimatic areas
- AAC by age and class of trees
- Amount of replanting versus the timber harvest area or vaIue of investment in reforestation activities versus the value of timber harvesting
- Percentage of chemicals used per hectare over time
- Land use trends (i.e., area of forest converted to non-forest land use)

B. Forest Harvesting Practices

No *Rank Given*

- Area and percentage of harvesting techniques to total harvested area (e.g., strip, selective, woodlot management)
- Water content and flow pattern - Soil disturbance, nutrients, minerals
  - ⇒ Percent of stream kilometres in forest catchments in which stream flow and timing has significantly deviated from historic range of variation - preservation of natural flow corridors
  - ⇒ Area and percent of forest land with significant soil erosion
  - ⇒ Water quality as measured by water chemistry, turbidity, etc.
- Percentage of forest and watershed reclamation activities
- Percentage and extent of area by forest types, age class or successional stages

C. Value Added Production

No *Rank Given*

- Percentage of total value of production within the watershed

D. Biodiversity - Species and Genetic Diversity

No Rank Given

- Number of species in the forest, location, population trends through wildlife counts
- Health/disease and recovery after catastrophe
- Number of stream kilometres with adequate riparian corridor

E. Non-timber Harvestables or NTH (e.g. range lands, mushrooms, medicinal herbs, wildlife, protected areas)

No Rank Given

- Percent of watershed income generated through NTH to total income
- Percent of land used for NTH versus total area of forest
- Number of people employed in NTH yearly

F. General Recreation and Tourism (e.g, parks, hiking, camping, skidoos, mountain bikes, access roads to virgin lands)

No Rank Given

- Number of people days associated general recreation and tourism per year in relation to population and forest area
- Area of forest as multiple use in relation to total area of forest
- Accessibility conditions of roads for multiple uses

G. Aesthetics

No Rank Given

- Noise pollution
- Amount of man-made debris
- Extent of slash burning
- Degree of preservation of natural corridors and old growth forests

H. Public Interest

No Rank Given

- Compliance with current standards
- Degree of consensus about forest use/condition (e.g. expressed through the number of blockades, letters etc..)
- Degree of public involvement and planning in multiple use of the forest systems

Ecosystem Goal 2: Agriculture Managed for Human and Natural Needs

Rationale: Farming and ranching continue to be important in the development of the social identity and economic prosperity of the Salmon River Watershed. Supporting local farms through local consumption helps protect farmland, provides fresh and minimally packaged foods, strengthens urban-rural connections, stimulates the local economy, and can offer an experience of community.

Environmental health is important to the fanning community. The vitality of the agricultural community depends directly on the natural environment. Due to this relationship a respect for the natural environment has always been crucial for sustaining the viability of agricultural operations.

A common need for all watershed agriculture is to use and sustain the land and water resources for crop and animal production in cooperation with other watershed land and water users. The long term sustainable existence of the agricultural industry within the watershed is dependent upon protecting the resource base including soil health, water quantity and quality. The agricultural land base and the various farming practices should treat soil as a fragile and limited resource to ensure long term sustainability of agricultural activities.

Ecosystem Objectives: The Salmon River Roundtable has developed four ecosystem health objectives which, if achieved will assure that agriculture is effectively managed for human and natural needs, including:

- To encourage local consumption;
- To use best agricultural practices;
- To maintain the agricultural land base; and,
- To achieve agriculture which is ecologically sustainable and diverse.

Ecosystem Objectives:

2.1 Encourage local consumption

Recommended Indicators:

High

- Local farm market sales including the amount and diversity of value added products
- Percentage of imported food determined through supermarket and restaurant surveys
- Total gross farm receipts by community
- Product Mix

Medium

- Direct Farm Marketing Activity determined through the SIDFMA

2.2 Maintenance of agricultural land base

Recommended Indicators:

High

- Changes in the acres of farmland expressed through the Agricultural Land Reserve
- Fragmentation and the creation of multiple parcels of farm land based upon land title separations and sales
- Number of farms and net income per farm
- Ratio of input investment to output
- Accessibility of farming operations to sources of water
- Water demand cross referenced to the type of crops being grown
- Value of the product per acre foot water used in irrigation

Medium

- Capacity for productivity per acre expressed as net value of crop yield per acre

Low

- Monitor farm land value as an indicator of development pressures
- Ratio of commercial fertiliser to "fertiliser" produced in the basin

Ecosystem Objectives (con't):

2.3 Use of best agricultural practices; and,

2.4 Ecologically sustainable and diverse agriculture.

Recommended Indicators (for above two objectives):

High

- Soil health measured through aspects of biology, chemistry, fertility on a regular basis (e.g., every 5 years)
- Water demand cross referenced to crop grown
- Efficient irrigation practices measured through consumption /acre and moisture levels in soil
- River and wetland ecosystem resilience and river bank processes
- Health of riparian corridor
  ⇒ Percent or kilometres of Class A riparian per kilometre of stream
  ⇒ Extent of wildlife in riparian to field acreage
- Degree of wildlife and cattle interaction in forests
- Surface water quality (e.g., nitrogen, phosphorous, pesticides)
- Ground water quality (e.g., nitrogen, phosphorous, pesticides)
- Water quantity

Medium

- Animal grazing units
- Number of operations practising organic farming

Low

- Measure of compliance with agricultural guidelines and regulations
- Manure application rate versus recommended rate
- Number of operations applying integrated pest management

Ecosystem Goal 3: A Diverse and Sustainable Economy

Rationale: The local economy of the Salmon River Watershed is part of a global ecosystem and global economy. The economy is embedded within a complex fabric of social, economic and political systems within an even more complex natural system. One can not consider the economy without considering these related systems.

Kline (1995) provides the following illustration to highlight the difference between economic growth and economic security as a goal of sustainable communities:

No *matter how many jobs are created a community's economic security is not furthered unless those jobs are well paying, support local residents, last over time, incorporate education, and training opportunities to enable employees to adjust and respond to change.*

Jobs is not a sufficient indicator of sustainability and may, in fact be misleading. If a community believes that its priority is to generate a certain percentage increase in jobs, then it may allocate its financial and technical resources to programs and projects with that objective in mind (e.g., tax subsidies to attract business). By doing so, the community may, in fact be undercutting its ability to foster economic security because it fails to recognise and support the related and essential links to other job creation aspects of economic development (e.g., education, skills development, day care).

Ecosystem Objectives: The Salmon River Roundtable has developed three ecosystem health objectives which, if achieved will assure a diverse and sustainable economy, including:

- To encourage products and services of high value added;
- To support new initiatives on products, marketing and training; and
- To encourage diverse, local control of economic resources.

Ecosystem Objectives:

3.1 Encourage products and services of high value added;

3.2 Suppotr new initiatives on products, marketing and training: and

3.3 Encourage diverse, local control of economic resources.

Recommended Indicators (for above three objectives):

A. Employment Measures within the Watershed, B.C. and across Canada

High

- Diversity of Economic Sectors

Medium

- Distribution of Economic Sectors
- Educational Level
- Residence of Employee (include adjacent urban areas since watershed residents are also employed in these areas)

B. Number of Jobs, Levels and Total Value of Product and Number of Businesses

Very High

- Number of jobs, levels and total value of product and number of businesses in specific sectors including forestry, agriculture, tourism, self employment

High

- Services, Manufacturing, Health, Schools, Arts, Government Agencies, Recreation
- Number of products, processes and services of high value
- Number of jobs created through profit and non -profit organisations and government to total employment (e.g. performing and visual arts, environmental organisations)
- Amount of natural resources proceeded locally (e.g., wood and mining)

C. Number of Persons with No Job or Under Employed

Very High

- Number of people looking for work
- Number of under employed or the number of persons employed part-time preferring full-time

C. Number of Persons with No Job or Under Employed (con't)

Very High

- Number of Retirees

High

- Number of people not looking for work, permanently stopped looking or disadvantaged

D. Other Measures for Economic Analysis

Very High

- Number of new businesses
- Percentage of people who own their home
- Percentage of people renting
- Poverty level and number of people on social assistance rolls

High

- Number of people living in watershed who work outside the watershed versus people living outside the watershed who work in the watershed
- Local spending versus non-local spending
- Number of locally owned businesses in the watershed
- Extent of community support of an informal economy (e.g. bartering - possibility of tracking "Indicator people", measuring monetary versus non-monetary exchanges)
- Availability of support initiatives or networks for new businesses (e.g., Community Futures, government, corporate)

High to Medium

- Bankruptcy rate
- Number of businesses that have left the watershed
- Percentage of locally owned businesses as compared to ownership elsewhere
- Loans analysis (e.g., ratio of loans for micro versus large scale business)

Medium

- Percentage of population spending more than l/3 of income on rent

Low

- Local prosperity
- Local control of economic resources
- Percent of community generated taxes kept locally
- Number of people involved in training
- Number of people in lending circles

Ecosystem Goal 4: A Healthy River

Rationale: The Salmon River watershed is the major watershed entering the Salmon Arm of Shuswap Lake at the north end of the Okanagan Valley. The river provides water for irrigation, livestock production, dairy operations and drinking. In-stream, the river provides critical spawning and rearing habitat for indigenous populations of coho and chinook salmon, as well for low numbers of stray Adams River sockeye. Non-anadromous fish species and various plant and animal species also rely upon the river for habitat and food resources. Fisheries resources have traditionally provided an important source of protein to First Nation peoples through early spawning runs which supplement the later (and larger) Adams River runs (Quadra Planning Consultants Ltd., 1996).

Water is the lifeblood of the Salmon River watershed. It sustains trees, crops, fish and wildlife, and humans. Water provides recreational and tourism opportunities. It carries and dilutes wastes. Virtually all activities in the watershed involve water in one way or another.

Established riparian corridors provide cooler water, increase insect abundance, stabilise banks, and lower oxygen demand within the river water. High summer water temperatures effect fish rearing, unstable banks increase sedimentation, and both elevated temperatures and increased sediment loads negatively impact salmonid egg survivorship. Increased vegetative cover and overhang along the banks enhances the quality of rearing habitat for juvenile salmon (Quadra Planning Consultants Ltd., 1996).

Wetlands are important ecological components to a watershed ecosystem. They act as physical and ecological transition zones between upland and aquatic habitats and provide stability to surrounding ecosystems. Some of the roles of wetlands which are becoming understood include water level moderation, water filtration, water storage, habitat for waterfowl, wildlife, insect, fish, reptilian, amphibian and plants; and, hydraulic energy absorption (Quadra Planning Consultants Ltd., 1996).

Ecosystem Objectives: The Salmon River Roundtable has developed three ecosystem health objectives which, if achieved will assure a healthy river, including:

- To provide for clean water;
- To reduced peaks and troughs in surface and ground water flow patterns; and
- To re-established riparian corridors and wetlands.

Ecosystem Objectives:

4.1 Clean water

Recommended Indicators:

A. Physical, Chemical and Biological Health

High

- Clarity
- Temperature (e.g., in situ measurement at critical periods such as spawning and migration)
- Dissolved Oxygen Levels
- Bio-indicators (e.g., algae, coliform, insects, fish, reptiles, amphibians, birds, mammals)

Medium

- Nutrients and contaminants (e.g. trace metals) relative to background levels

Others - No Rank Given

- Suspended Sediment Concentrations and Loadings
  - ⇒ Turbidity
  - ⇒ Non-filterable residue values
- Nutrient concentrations and loadings
  - ⇒ chlorophyll-a
  - ⇒ phosphorous
  - ⇒ total-ammonia
- Organic Carbon Concentrations and loadings
- pH and Hardness
- Trace Metal Concentrations and Loadings
  - ⇒ Iron and Lead Extractable
- Organic Contaminants Concentrations
- Microbial Indicators
  - ⇒ Fecal Coliforms (e.g., *Escherichia coli)*
  - ⇒ Microbacterial levels as it relates to the potential for water contact recreational activities (e.g., fishing, swimming)
- Aquatic macroinvertebrates (including Caddisflies, Stone Flies, Mayflies, Riffle Beetles, True Flies)

Ecosystem Objectives (con't):

4.2 Reduced peaks and troughs in surface and ground water flow patterns

Recommended Indicators:

A. Flow Related

High

- Magnitude of peak discharge
- Duration of peak discharge
- Magnitude of low flow
- Duration of low flow
- Mean monthly discharge
- Mean annual discharge
- Water level
- Variability in water level
- Snow pack measurements and weather data

Medium

- Estimate of groundwater withdrawal and timing
- Amount of surface flow withdrawals
- Upper watershed snow melt patterns

B. Policy and Protection Agreements

High

- Quantity of water withdrawn from the system based upon licensed water withdrawals versus minimum flow requirements for sustaining salmon reproduction requirements
  - ⇒ Number of licensed diversion points and logged wells and quantity of water withdrawn
- Total effective expenditure on public and user education of the needs and benefits of more conservative use of water
  - ⇒ Number of incentive programs to encourage licensees to find alternative water sources or to develop more efficient works measured against participation rate
  - ⇒ Number of agreements with licensees to achieve voluntary reductions in historically allocated quantities

Ecosystem Objectives (con't):

4.3 Re-established riparian corridors and wetlands

Recommended Indicators:

A. Riparian Corridor Health

No Rank Given

- Quality of shoreline habitat
- Size of delta areas
- Sedimentation rate in delta areas
- Quantity of wetlands
- Biodiversity (e.g. plants, animals)
- Extent of flooding
- Duration of flooding
- Timing of flooding
- Frequency of flooding

B. Instream Geomorphic Variables

No Rank Given

- Wetted width
- Stream depth
- Stream gradient
- Pool to riffle ratios
- Wetted areas in side channels
- Depth in side channel
- Substrate stability
- Quantity of large organic debris
- Quantity of instream cover
- Channel stability (e.g., eroding banks and ice scour)
- Extent of log jam related problems
- Runoff
- Bank stability

C. Riparian Policy and Protection Agreements

No Rank Given

- Number of participatory landowner agreements for stream bank restoration projects
- Number and extent of restoration projects including bank stabilisation, revetments rip rap, tree planting

Ecosystem Objectives (con't):

4.3 Re-established riparian corridors and wetlands

Recommended Indicators (con't):

C. Riparian Policy and Protection Agreements (con't)

No Rank Given

- Degree of continuity and connectedness of riparian habitats

D. Wetland Ecosystem Diversity

No Rank Given

- Inventory of wetlands (e.g., percentage and extent in area of wetland types to total wetland area, level of fragmentation and connectedness)
- Area, percentage and representativeness of wetland types in protected areas

E, Wetland Species Diversity

No Rank Given

- Number of known wetland-dependent species classified as extinct, threatened, endangered, rare or vulnerable relative to total number of wetland dependent species
  - ⇒ Frequency of occurrence within selected indicator species (vegetation, birds, mammals, fish; also an indicator for healthy land/air/water linkages)
- Population levels and changes over time of selected species and species groups (e.g., amphibians such as frogs and toads)
- Number of known wetland dependent species that occupy only a small portion of their former range

F. Wetland Genetic Diversity

No Rank Given

- Extent to which a strategy is in place to conserve endangered wetland vegetative species.

G. Wetland Policy and Protection Agreements

No Rank Given

- Number of cooperative agreements to participate in wetland restoration or protection projects and area extent providing for setbacks restricting agricultural production and livestock access.

Ecosystem Goal 5: Mentally, Physically, Emotionally and Spiritually Healthy People

Rationale: The provision of clean air, water and food for human and natural needs is fundamental to achieve and maintain a healthy and sustainable Salmon River Watershed ecosystem. There is a need to broaden the definition of health in the community to assist in a greater understanding of the relationships among health and other community issues.

The Healthy Communities movement across Canada builds on the recognition that the greatest contributions to health of the nation over the past 150 years were made, not by doctors or hospitals, but by local communities and government.

> *Health is defined broadly as a sense of complete physical, mental and social well-being (World Health Organisation)*

A healthy community is one that is continually creating and improving those physical and social environments and strengthening those community resources which enable people to mutually support each other in performing all the functions of life and achieving their maximum potential (Hancock, 1993).

Ecosystem Objectives: The Salmon River Roundtable has developed four ecosystem health objectives which, if achieved will assure mentally, physically, emotionally and spiritually healthy people, including:

- To empower the citizenry;
- To provide for medical, environmental and social preventative and curative health care;
- To provide for clean air, water and food; and
- To foster a spiritual approach to living as individually expressed.

Ecosystem Objectives:

5.1 An Empowered Citizenry

Recommended Indicators:

No indicators were suggested for this specific objective. However participants suggested that linkages can be made to those recommended indicators listed under Goal 7 - Objective 7.3 and Goal 11 - Objective 11.4.

5.2 Medical, Environmental and Social Preventative and Curative Health Care

Recommended Indicators:

A. Quality of Life and Community

High

- Crime Rates
- Percentage of affordable housing units versus total housing
- Percent of people on assistance programs versus total population (e.g., drug abuse, child abuse, welfare, food bank)
- Level of Education
  - ⇒ Number of graduates
  - ⇒ Drop out and return rates
  - ⇒ Comparison of results of students on standard exams to B.C.
  - ⇒ Number of environmental studies/courses or clubs specific to watersheds
  - ⇒ Number of students returning to the community
- Percentage of people with significant debt/affluence/material possessions
- Stress levels (e.g., life events)
- Perceived well being (e.g., self-worth and esteem)
- Type and extent of support networks (e.g., use of counselling facilities at school/use of friends/support groups)
- Number of cultural activities
- Compatibility between the generations (e.g., young and old)
- Number of sports and recreational activities (e.g., fitness levels)
- Treatment of newcomers
- Suicide rates
- Population rates, trends and diversity
- Degree of geographic isolation
- Number and availability of counselling services

Ecosystem Objectives (con't):

5.2 Medical, Environmental and Social Preventative and Curative Health Care

Recommended Indicators (con't):

B. **Mental Health**

Low

- Percentage of people diagnosed with a mental disorder

C. Physical Health

High

- Mortality rate, disease rate, average life span
- Number of people involved in recreational activities

D. Social Economic Well Being

High

- Rates of absenteeism from various employment sectors
- Number of youth moving out of the watershed to find employment

Medium

- Average income
- Number of people employed versus total number of people available

No *Rank Given*

- Employment/unemployment rate
- Number of people served by shelters and food banks
- Number of homeless people
- Number of times eating out
- Degree of job stability
- Proportion of watershed residents requiring medical services (e.g., number of medical visits) and costs associated with health care per unit of service
- Birth rates, death rates, life expectancy
- Percentage of population perceiving hopefulness and future vision

Ecosystem Objectives (con?):

5.3 Clean Air, Water and Food

Recommended Indicators:

High

- Quality of Air (e.g., Air Quality Index)
- Quality of Water (i.e., linkage to Goal 4 - A Healthy River)

No Rank Given

- Levels of nutrition
- Number of accidental deaths and injuries
- Level of alcohol and tobacco consumption
- Support for the practice of natural medicines

5.4 A Spiritual Approach to Living as Individually Expressed

Recommended Indicators:

High

- Number of people attending watershed activities (e.g., celebrations, tree planting, wildlife surveys, nesting boxes, weeding/watering)
  ⇒ Percentage of families participating in activities for the Salmon River Watershed
- Number of people participating in organised spiritual activities versus total population
- Percentage of single parents versus traditional families
- Number of volunteers versus total population

Ecosystem Goal 6: Healthy and Diverse Natural Species and their Habitats

Rationale: Fish, mammals, birds and other species possess an intrinsic value, independent of whether or not they have any particular "use" to humans. When habitats are altered, there can be serious implications on the food chain and interrelationships between life forms. When a species is removed from the food chain of a habitat, a break occurs which has ramifications throughout the biological community. Some species may be driven out, others may overpopulate, and others may develop a dependency on humans. There is also the potential for habitat fragmentation where habitat is isolated into small units, unable to support viable populations of fish and wildlife (Quadra Planning Consultants, 1996).

Protecting natural areas and a diversity of plants and animals is an important indicator of the health of human communities. In addition, natural areas have both an economic and social value. The watershed contains significant forest resources that have the ability to sustain economic, social and environmental values in perpetuity. The same can be said for productive soils, waterbodies and wetlands of the watershed. Many of these areas also provide recreational and tourism opportunities (Quadra Planning Consultants, 1996).

Linking important habitats through corridors is, a critical element in protecting and maintaining a healthy ecosystem. Riparian corridors are especially important for a wide variety of wildlife and in connecting upland and lowland habitats.

Ecosystem Objectives: The Salmon River Roundtable has developed two ecosystem health objectives which, if achieved will assure healthy and diverse natural species and their habitats, including:

- To maintain and increase habitats to support all life forms; and
- To maintain and restore species and populations.

Ecosystem Objectives:

6.1 Maintenance and increase of habitats to support all life forms

Recommended Indicators:

Very High

- Depth and width of channel at mouth for fish migration
- Number of replanting and restocking activities
- Area or extent of riparian vegetation shown by reaches on the river
- Water quality (e.g. temperature) and presence of contaminants (e.g., toxic substances, phosphates, nitrates, algae)

High

- Nature, extent and changes over time of critical habitats (e.g. forests by age classification, marsh, wetlands)
- Rates of loss of particular habitats (e.g., conversion of land uses)
- Amount of habitat,
- Number of sensitive habitats enhanced, maintained and restored
- Number and extent of land stewardship covenants
- Acreage of protected habitat through demonstration reserve areas
- Changes in human harvesting of fauna and flora (e.g., logging, hunting, fishing, private clearing)

Low

- Extent of physical barriers to wildlife movement along and across habitat

6.2 Maintenance and restoration of species and populations

Recommended Indicators:

Very High

- Population densities of species (e.g. shrubs, plants through vegetation surveys and birds, mammals, amphibians, reptiles, fish, insects through wildlife surveys) recognizing that some species (e.g. threatened endangered or unique species) will provide more insightful information than others
- Number of Vulnerable and Sensitive Species (i.e., blue-listed species)
- Number of Threatened or Endangered Species (i.e., red-listed species)
- Population densities of salmon species
- Population densities of benthic invertebrates (e.g. special counts targeting intolerant bugs)

Ecosystem Goal 7: A Strong Sense of the Watershed as a Community

Rationale: Given the degree of complexity and multi-jurisdictional nature of most problems in the watershed, solutions will require cooperation among users, governments, organisations, businesses and individuals Resources will be required, both in terms of people and money to implement actions. This is closely related to cooperation, because very few individuals, government agencies or businesses alone, have the necessary resources to tackle a problem. In many cases, it may be necessary to more efficiently and effectively utilise and allocate existing resources.

The current fragmentation of jurisdictions and decision making authority of various government agencies and other bodies in the watershed are not conducive to an ecosystem approach to resource management This fragmentation of administrative bodies has led to a perception within the watershed of little local control and involvement in decisions affecting the watershed.

There are positive signs of increasing community involvement as more residents take an interest in sustainability of the watershed and participate in forums and programs such as those sponsored by the Salmon River Watershed Roundtable and its members.

Ecosystem Objectives : The Salmon River Roundtable has developed four ecosystem health objectives which, if achieved will create a strong sense of the watershed as a community, including:

- To ensure resource management recognises watershed boundaries when resource use overlaps into adjacent watersheds;
- To encourage residents and others to recognise and take responsibility for their actions on the watershed;
- To foster collective empowerment and involvement in watershed planning and action; and
- To support participation and cooperation in watershed wide events and celebrations.

Ecosystem Objectives:

7.1 Resource management recognising watershed boundaries when resource use overlaps into adjacent watersheds

Recommended Indicators:

High

- Number of jurisdictions operating within the watershed boundaries
- Strength of the linkages between the various jurisdictions operating in the watershed

7.2 Residents and others recognisine and taking responsibilitv for their actions on the watershed;

7.3 Collective empowerment and involvement in watershed planning and action; and

7.4 Participation and cooperation in watershed wide events and Celebrations.

Recommended Indicators (for above three objectives):

High

- Number of people taking action in various activities to restore and protect the Salmon River ecosystem
- Percentage of population who are aware of the activities of the Roundtable
- Number of schools involved in watershed related activities
- Readership of Salmon River Youth Experience newsletter and mailing of Roundtable newsletter

Medium

- Degree of public involvement in ecosystem approaches to developing ecosystem health goals, objectives and indicators as supported by the Canadian Council of Ministers of the Environment
- Number of active members in groups or number of groups and agencies addressing issues within the watershed
- Number of joint community events offering diverse activities (serves to measure the degree of differentiation and recognition of community subsets fostering a complete mix of interests in activities)

Ecosystem Goal 8: Accessible and Appropriately Located Recreation Opportunities

Rationale: Many recreational opportunities exist throughout the watershed, including fishing, hunting, wildlife viewing, cross-country skiing, camping, hiking, snowmobiling and horseback riding. The majority of the "back country" recreational opportunities in the watershed are found within the Provincial Forest Lands. The presence of additional outdoor recreational opportunities could draw additional tourists into the region.

Salmon Arm's extensive waterfront provides residents and visitors with opportunities for a variety of water-related leisure activities, wildlife observation, nature enjoyment and vistas of lake and mountain. There is a potential to enhance bird watching and duck hunting opportunities through the reclamation of wetland areas. Generally, most of the Salmon River is not classified as having high recreational opportunities or high tourism potential because of the problem of low water flows and dry river beds found during the late summer and early autumn months. In the Vernon Forest District particularly, few boating and fishing opportunities are found. The most popular recreation access route is found along the Salmon River road to Douglas Lake where in autumn, dude ranching, trail riding and freshwater fishing occur in ranch country.

As population increases in the watershed, more people can be expected to participate in outdoor recreational activities. In general, limited water based recreational activities exist in the Salmon River due to low seasonal flows and the difficulty of access across privately owned lands. Recreational opportunities of the Salmon River will need to also consider such factors as turbidity as it relates to aesthetics, and bacteria counts for safety of contact sports. Nutrient enrichment or eutrophication in Tappen Bay may also decrease the desirability of this area for water contact sports should excess algal blooms occur (Quadra Planning Consultants, 1996).

Ecosystem Objective: The Salmon River Roundtable has developed one ecosystem health objective which, if achieved will assure accessible and appropriately located recreational opportunities, including:

- To create a recreational plan for the watershed

Ecosystem Objective:

8.1 Recreational plan for the watershed

Recommended Indicators:

High

- Amount of tourism and eco-tourism
  - ⇒ Revenue generated through eco-tourism and agri-tourism
  - ⇒ Number and location of public recreational facilities
  - ⇒ Mix of indoor/outdoor opportunities
  - ⇒ Amount of space to parks and recreational areas
  - ⇒ Total kilometres of public trails available
- Linkage between facilities/services and needs/interest
  - ⇒ Proximity of facilities to population served
  - ⇒ Accessibility costs (e.g., transportation, fees, etc.)
  - ⇒ Number of hunting, fishing, trapping licenses issued
  - ⇒ Number of user days per recreational activity
  - ⇒ Monitoring the range and intensity of recreational tourism activities

Low

- Number and degree of private and or public recreational opportunities

Ecosystem Goal 9: Community Pride in Rural Roots and Lifestyle

Rationale: Preserving rural lifestyles and traditional livelihoods will require that sustainable approaches to resource management are followed. Not only will productive agricultural land need to be protected, but soil productivity must also be maintained through good farming practices. The same is true of forest lands and forestry practices. Both sectors must be managed on an ecosystem basis to ensure that ecological, social and economic values are integrated. This also applies to land use and community planning.

Rapid population growth and fewer jobs in forestry and agriculture are viewed by many people as an erosion of the traditional rural lifestyle in the watershed. A perceived decline in the sense of community is directly related to this view. While more traditional resource dependent jobs are expected to decline in some areas of the watershed over the years, there will be an increase in employment in tourism and service industries (Quadra Planning Consultants, 1996).

Ecosystem Objective: The Salmon River Roundtable has developed one ecosystem health objective which, if achieved will assure community pride in rural roots and lifestyle:

- To encourage residents to express their pride in the watershed.

Ecosystem Objective:

9.1 Residents expressing their pride in the watershed

Recommended Indicators:

No Rank Given

- Number of community activities and events related to roots and traditions and participation rates
  - ⇒ Number and frequency of regular and special community events
  - ⇒ Number and frequency of farm market events (and craft sales)
  - ⇒ Number of community associations and percentage of population involved
- Condition of the community with regards to aesthetics and tourism impacts (e.g. heritage parks and houses
- Existence and maintenance of a recorded history of the watershed
- Record of historical sites (extent of preservation to rate of destruction)
- Number of oral history events (e.g., story telling)
- Extent to which uses along the river are changing (past, present and future)

Ecosystem Goal 10: Cooperation to Control Local Resources

Rationale: Communities are integrated systems of people and the natural environment with which they interact. Consequently for sustainable community development to be successful in the long run requires dealing with all the issues of all the people and of their surrounding natural environment. Such a whole system approach implies a high degree of integration and cooperation *among* individual members of a local community and all levels of government if issues are to be resolved rather than ignored, denied or suppressed.

> *The concept of sustainable development transcends biological, ecological and economic benchmarks. Ultimately it is about people. It is about society's values, the quality of life of citizens both individually and collectively, and the effectiveness with which we have organised ourselves as a society to ensure that we are managing the relationship between ourselves and our resources in a way that is in the best interests of present and future generations (Canadian Council of Forest Ministers, 1995).*

Part of society's responsibility to sustainable development is a commitment to improve our collective understanding of ecosystems and the relationship between the environment and the economy. Each and every member of society has an obligation and responsibility to understand the issues, express their position, and understand and respect the positions of others (Canadian Council of Forest Ministers, 1995).

There is a general level of frustration among many residents that most decisions affecting sustainability are being made outside the watershed, with little effective local input or control.

Ecosystem Objective: The Salmon River Roundtable has developed one ecosystem health objective which, if achieved will assure cooperation to control local resources:

- To encourage community members to participate in shared land use and resource management decision-making.

Ecosystem Objective:

10.1 Community members participating in shared land use and resource management decision-making

Recommended Indicators:

High

- Extent to which community members participate in shared land use and resource management decision making
  - ⇒ Degree of consensus in decision making processes
  - ⇒ Extent to which the decision making process ensures the participation of First Nations
- Percentage of watershed under completed management plans, programs or guidelines which have included public participation and encourages best practices codes
- Extent of public involvement in events and activities (e.g., number of persons and days)
- Extent of shared use of private land per voluntary restriction of use for community benefit
- Number of landowners willing to accept help in resource management

Medium

- Number of school based projects
- Number of initiatives undertaken by other organisations
- Investment value of volunteer services in watershed restoration and protection activities

Ecosystem Goal 11: Government Supporting Watershed Community Needs

Rationale: The degree to which various institutions effectively integrate the full range of social values in decisions and the responsiveness of these institutions to changes in values over time is a determining factor in monitoring progress towards achieving and maintaining a healthy, sustainable Salmon River watershed ecosystem.

Ecosystem Objectives: The Salmon River Roundtable has developed four ecosystem health objectives which, if achieved will develop knowledge and support with government supporting watershed community needs, including:

- To provide information for watershed decision making (e.g., water withdrawals);
- To provide continuity of technical and financial support of community groups in watershed management and resource use;
- To support training and quality control and quality assurance for community monitoring of watershed development; and
- To support community empowerment leading to shared decision making.

Ecosystem Objectives:

11.1 Providing information for watershed decision making (e.g., water withdrawals)

Recommended Indicators:

High

- Provision of information collected from government agencies (e.g., Geographic Information Systems (GIS) from the Land Resource Management Plan and information on water supplies, allocations, withdrawals from provincial agencies)
- Amount of resources spent (e.g., time, dollars) on acquiring government information
- Number of requests for information that are filled

No Rank Given

- Number of presentations to government by individuals/concerned groups for groundwater regulation
- Number of reports used by watershed

Ecosystem Objectives (con't):

11.2 Continuity of Technical and Financial Support of Community Groups in Watershed Management and Resource Use

Recommended Indicators:

High

- Degree of technical and financial support from government departments (e.g., municipal, provincial, federal)
  - ⇒ Number of partnerships between the Roundtable and government agencies
  - ⇒ Amount of knowledgeable/professional resources supplied by municipal, provincial, federal and private industry
  - ⇒ Number of government representatives supporting each project
  - ⇒ Number of helpful government representatives involved per project
  - ⇒ Number of work hours per government representatives involved in projects
  - ⇒ Proportion of successful partnerships to total desired partnerships
  - ⇒ Number of participants in a watershed workshops
  - ⇒ Number of projects involving educational institutions
  - ⇒ Proportion of government contributions from each agency to Roundtable budget

Medium

- Degree of respect for government departments through acknowledgement of positive actions measured through surveys and questionnaires
- Degree of availability of public servants
- Effectiveness of public relations publications from government to residents

11.3 Training and quality control and quality assurance for community monitoring of watershed development

Recommended Indicators:

No Rank Given

- Number of training workshops and follow up activities associated with the various citizen monitoring programs (e.g. monitoring and collecting data, quality assurance and control procedures)
  - ⇒ Number of trained people and hours of training
  - ⇒ Number of people trained by government who remain involved in projects
  - ⇒ Percentage of data usable to data collected

Ecosystem Objectives (can't):

11.3 Training and quality control and quality assurance for community monitoring of watershed development

Recommended Indicators (con't):

No Rank Given

- Extent to which the data retrieval system gives data that can be compared with provincially and federally collected data
- Extent to which government agencies will implement Quality Assurance/Quality Control with respect to community monitoring efforts

11.4 Supporting community empowerment leading to shared decision making

Recommended Indicators:

No Rank Given

- Number of landowners involved in watershed activities
- Number of people living in the watershed involved in decision making with respect to land and water use
- Number of government agencies from relevant areas that recognise watershed as geographic basis for planning
- Percentage watershed population that participates in activities of the Roundtable
- Number of decisions which affect the watershed that are made jointly by the government and community
- Number of government decisions made that could have been tabled at meetings of the Roundtable
- Amount of financial support returning to the community for all activities
- Extent of financial input and support for non-profit organisations

Ecosystem Goal 12: Sustaining the Visioning Process for the Watershed

Ratiunale : The Salmon River Watershed Roundtable recognises that the successful development and implementation of a watershed stewardship plan hinges upon the active participation and creativity of all citizens within the community. Issues are being identified by those experiencing them, and partnerships are being formed within the watershed to address these issues.

Ecosystem Objectives: The Salmon River Roundtable has developed two ecosystem health objectives which, if achieved will assist in sustaining the visioning process for the watershed, including:

- To maintain regular feedback to residents on progress towards vision; and
- To foster community participation in vision, goals, and objectives adjustment.

Ecosystem Objectives:

12.1 Regular Feedback to Residents on Progress Towards Vision: and

12.2 Community Participation in Vision, Goals, & Objectives Adiustment

Recommended Indicators (for above two objectives):

High

- Number of residents, private businesses and public agencies participating in innovative projects (e.g. monitoring, restoration)
- Degree of community participation in the refinement of vision, goals and objectives
- Number of people living in the watershed involved in decision making (e.g., land and water use)
- Amount of financial support from the local community to sustain visioning process
- Amount of in kind support from local community (e.g., equipment etc.) to sustain visioning process

Medium

- Amount of financial support from other sources (e.g., Foundations)

No Rank Given

- Number of newsletters, media communications
- Number of avenues for community to provide input/feedback to the Roundtable
- Percentage of community involved in watershed education processes (e.g., number of schools involved in watershed projects)
- Awareness of watershed issues throughout the community

Ecosystem Goal 13 :Gaining and Spreading Knowledge of the Watershed

Rationale : Through an ecosystem based planning process and targeted field actions the Roundtable is creating momentum within the communities of the watershed to achieving and maintaining a healthy, sustainable Salmon River watershed ecosystem. Increasing awareness, education, enhancing communication between various partners and providing opportunities to involve local residents in various restoration activities increases the ability to create and celebrate a sustainable future for the watershed.

Numerous field actions are being undertaken by the community to enhance the health of the watershed while generating long term community momentum, and building the capacity to sustain future initiatives. Activities include site restorations, installation of bird nesting boxes, adopt-a-site programs, tree planting projects, and reclamation of wetland areas. These projects involve the active participation of landowners, and extensive volunteer labour from the community.

The Roundtable has completed thirty-five restoration projects with twenty-four landowners, and an additional 15 projects initiated in the spring of 1996. Through an Adopt-a-Site Program begun in 1995 students from three local schools have been actively involved in planting and maintaining native tree stocks at restoration sites, while recording information on growth and survival rates of the plants. This program was expanded to another three schools in 1996. In addition, two youth groups, Ladder and Katimavik are also assisting in restoration programs.

Environment Canada has provided six high schools in the watershed with computer software packages and training in Geographic Information Systems. Two teachers per school have been trained thus far, with follow up sessions expected this fall.

The Roundtable is also participating in the implementation of a continuous monitoring program for surface and ground water, as well as for meteorological conditions. The system will be maintained through a citizen-based monitoring network of community volunteers coordinated through the Roundtable.

Ecosystem Objectives: The Salmon River Roundtable has developed four ecosystem health objectives which, if achieved will assist in gaining and spreading knowledge of the watershed, including:

- To support pro-active education and awareness programs;
- To provide open communications between citizens and agencies;
- To foster citizen data gathering; and,
- To encourage innovative programs (e.g., demonstration programs).

Ecosystem Objectives:

13.1 Pro-active education and awareness programs

Recommended Indicators:

Very High

- Number of school presentations

High

- Total effective kxpenditure on public resources education
- Number and frequency of diverse and alternative media outlets (e.g., evaluate how media is passing on knowledge, identifying how people can help, public relations)
- Degree of community awareness of watershed issues evaluated through the following mechanisms:

  Very High

  ⇒ Door-to-door surveys

  Medium

  ⇒ Phone Survey

  ⇒ Questionnaires or census

  ⇒ Analyses news, media exposure

  ⇒ Billboard or other sign frequency

  Low

  ⇒ Internet exposure

  ⇒ Prevalence as coffee room talk

  ⇒ Tests and oral quizzes in schools

Medium

- Number of follow-up visits after presentations

Low

- Degree of acceptance and effectiveness of newsletters (e.g.,, survey of waste baskets, dumpsters and outhouses)
- Degree of tourist exposure and awareness to the watershed actions (i.e., do they read the information; do they understand the publicity)

Ecosystem Objectives (con't):

13.2 Open communications between citizens and agencies

Recommended Indicators:

Very High

- Number of volunteers
- Attendance figures at meetings
- Percentage of citizens who feel agencies are not doing a good job at communicating and addressing issues to achieve and maintain a healthy and sustainable watershed
- Degree of satisfaction of the Roundtable regarding contacts with government

13.3 Citizen data gathering

Recommended Indicators:

Very High

- Percentage of residents participating in data collecting
- Extent of active involvement by various age groups, families and new residents (e.g., participation in meetings, monitoring tasks by children, youth and seniors)
- Number of volunteers trained
- Number of volunteers working

13.4 Encouragement of Innovative Programs (e.g., demonstration programs)

Recommended Indicators:

No Rank Given

- Number of proposals brought to the Salmon River Watershed Roundtable by citizens, private businesses and public agencies
- Number of citizens, private businesses and public agencies that participate in innovative programs throughout the watershed

Next Steps

- **Refine the List of Indicators:**

Participants agreed that the list of indicators selected through this workshop process requires further refinement in order to be manageable. It was suggested that the process of refinement could be done in conjunction with the work planning activities of the Roundtable as a basis for identifying priorities. Participants raised the need to clearly identify the various target audiences (e.g., government agencies, economic and social sectors, watershed residents) to understand their needs and perspectives (e.g., public awareness versus technical and scientific audiences), and the various contexts in which they will be using the indicators. It will also be important to address who will manage the information that is collected, whether it be through the Roundtable and/or partnering agencies. Further screening will assist in focusing research expenditures, and monitoring programs to areas where information is currently insufficient to meet decision making needs.

- **Applv a Consistent Selection Process:**

A modified tiered evaluation process created from that outlined in Appendices 3 and 4 was suggested by participants. This would include an initial pass/fail system based upon linkages to goals and objectives, the identification of a few high priority criteria for screening; followed by additional criteria that would assist in prioritising the indicators. Participants suggested that consideration should be given to weighting certain criteria (e.g., measurability, cost-effectiveness). Indicators should be evaluated on the ability to be indicative of unmeasured characteristics through potential linkages. A total score would be calculated and used as a relative, not an absolute measure of value. Selected indicators should be cross referenced with other goals and associated indicators sets. Every attempt should be made to avoid duplication of indicator information, however the information provided should be integratable. Participants identified the need to provide an opportunity for review of the indicators by the broader community.

- **Evaluate Existing Resources:**

Consideration should be given to examining the resources that are available to measure the various indicators. Participants emphasised the importance of ongoing, continuous collection of information. Participants stated that the absence of historical data, however should not be

a reason to eliminate the consideration of indicators. Rather there must be a willingness to accept new indicators given emerging information requirements. The Roundtable may wish to focus its efforts upon gathering data on those indicators in which information is not readily available from other sources.

- **Explore Partnerships:**

Opportunities should be explored to enhance existing partnerships or create new ones in order to collect and evaluate information for various indicators. Partnerships could be formed with the various high schools involved in the geographic information systems training with Environment Canada. Information that is currently being collected through the citizens monitoring program could feed into the GIS, building upon existing resources within the local community. Participants acknowledged that to a certain degree the strengths of the community are not being utilised to the greatest extent possible. It was suggested that a strategy and schedule for action could be developed in order to more fully integrate the various strengths of the community.

- **Establish Targets:**

The establishment of a comprehensive list of indicators that adequately reflects the goals and objectives that have been established for the Salmon River Watershed will bring the Roundtable one step closer to identifying quantifiable attributes and defining acceptable ranges or targets for these variables. If all the measurable attributes or indicators fall within acceptable ranges, then the ecosystem as a whole would be considered to be healthy. Targets or acceptable ranges could be chosen based upon historical information, where available, adopted from other similar watersheds, or developed specifically for this watershed.

- **Create Monitoring Systems:**

The prioritised list of ecosystem health indicators will create the basis for a community monitoring system to measure progress towards a healthy, sustainable watershed. Indicators that are “measurable” or “quantifiable” are particularly useful in monitoring programs: however, equally important are those indicators which may not have sufficient current information for measurement, yet are considered critical yardsticks of progress towards stated objectives (Environment Canada, 1997). Indicators which are qualitative in nature, such as how people “feel” about the watershed, can also serve as significant measures. Monitoring programs should

be designed and implemented to evaluate the current status and trends of the ecosystem and provide essential data for defining and refining the targets for the suites of indicators. Some monitoring programs may already exist, such as the citizen based water quality and quantity programs whereas, other measurements will required the design of data collection programs.

- **Moving Towards Integrated and Informed Decision Making: and Action:**

The information collected through monitoring systems will also provide a basis for identifying data gaps and research needs to further support the implementation of the ecosystem approach. The results of monitoring programs will provide a scientific basis for further evaluating the indicators, refining the list of health indicators, and determining if the goals and objectives have been achieved. Periodic reporting of information will increase participation and commitment within the communities and partnering agencies of the Salmon River Watershed to design specific management strategies and actions to achieve a healthy, sustainable watershed future.

Appendix 1. Implementing an Ecosystem Approach

The process being followed the Salmon River Roundtable is based upon the national framework prepared by the Canadian Council of Minister of the Environment (CCME, 1995) outlined in *A Framework for Developing Ecosystem Health Goals, Objectives and Indicators: Tools for Ecosystem-Based Management.* This framework provides a basis for integrating environmental, economic and societal goals and values into ecosystem planning and management activities, through the establishment of ecosystem goals, objectives and indicators. The framework highlights the role of community participation in setting ecosystem health goals, objectives, and is based on the experiences and lessons learned from many successful ecosystem initiatives across Canada. This process for implementing an ecosystem approach to management has essentially four elements:

1. Developing an understanding of the existing health of the watershed through such sources as traditional and community knowledge and scientific information;

2. Creating a vision, and establishing goals reflecting the importance of the Salmon River Watershed ecosystem to the communities;

3. Establishing a set of objectives for the various components of the ecosystem which clarify the scope and intent of the ecosystem health goals; and,

4. Selecting indicators to provide a means of measuring progress towards the goals and objectives. The establishment of such indicators can serve to focus research expenditures, and monitoring programs to areas where information is currently insufficient to meet decision makers' needs.

Over the past few years, a great deal of progress has been made towards sustainable management of the Salmon River Watershed. In 1995, activities were focused on identifying and evaluating the traditional and scientific information on the health of this watershed. This knowledge has been documented in a technical, as well as a public summary report entitled *The Salmon River Watershed - An Overview of Conditions, Trends and Issues.*. The verbal history of the watershed compiled through numerous interviews with citizens of the watershed is documented within a *Verbal History of the Salmon River Watershed.*

Community meetings held in Mt. Ida, Silver Creek, Falkland, and Westwold identified **a** number of economic, social and environmental problems facing the watershed. A verbal history of the watershed was also compiled through numerous interviews with citizens of the watershed.

In December 1995, a community forum entitled *Creating and Celebrating our Watershed's Future,* was held in Falkland. This two day workshop attracted over 130 participants with the goal of establishing a community-based and watershed-wide vision and action plan for the future of the watershed. A participatory and consensus based process developed through the Institute of Cultural Affairs was used at this workshop. From these workshop discussions, interim ecosystem health goals and objectives were derived and agreed upon by the Roundtable in 1996, and summarised in Appendix 2.

The next step in this process is the selection of indicators. The approach presented in Appendix 3, as well as the various refinements suggested by workshop participarits are intended to provide a consistent basis for evaluating potential indicators. However, it is anticipated that local experience and traditional knowledge will also be required to establish a suite of indicators that adequately reflects the goals and objectives to achieve and maintain a healthy, sustainable Salmon River Watershed ecosystem.

Appendix 2. Interim Ecosystem Health Goals, Objectives - 1996

It is the intention of the Salmon River Watershed Project to achieve and maintain a healthy, sustainable Salmon River Watershed ecosystem by:

Managing for ecosystem health with:

1.0 **Forests managed for human and natural needs:**

1. Sustained yield of all forest products (timber, range, medicinal herbs etc.) based on realistic inventories and growth and yield projections; and
2. Maintenance of all life forms by maintaining all stages of plant succession (from bare ground to old growth forest).

2.0 **Agriculture managed for human and natural needs:**

1. Encouraging local consumption;
2. Use of best agricultural practices;
3. Maintenance of the agricultural land base; and
4. Agriculture which is ecologically sustainable and diverse.

3.0 **A diverse and sustainable economy through:**

1. Encouraging products and services of high value added;
2. Supporting new initiatives on products, marketing and training; and
3. Encouraging diverse, local control of economic resources.

4.0 **A healthy river having:**

1. Clean water;
2. Reduced peaks and troughs in surface and ground water flow patterns; and
3. Re-established riparian corridors and wetlands.

5.0 **Mentally, physically, emotionally and spiritually healthy people through:**

1. An empowered citizenry;
2. Medical, environmental and social preventative and curative health care;
3. Clean air, water and food; and
4. A spiritual approach to living as individually expressed.

6.0 **Healthy and diverse natural species and their habitats through:**

1. Maintenance and increase of habitats to support all life forms; and
2. Maintenance and restoration of species and populations.

Interim Ecosystem Health Goals, Objectives (con't)

It is the intention of the Salmon River Watershed Project to achieve and maintain a healthy, sustainable Salmon River Watershed ecosystem through:

Active community social life including:

7.0 **A strong sense of the watershed as a community with:**

1. Resource management recognising watershed boundaries when resource use overlaps into adjacent watersheds;
2. Residents and others recognising and taking responsibility for their actions on the watershed;
3. Collective empowerment and involvement in watershed plarming and action; and
4. Participation and cooperation in watershed wide events and celebrations.

8.0 Accessible and appropriately located recreation opportunities through:

1. A recreational plan for the watershed.

9.0 **Community pride in rural roots and lifestyle with:**

1. Residents expressing their pride in the watershed.

10.0 Cooperation to control local resources with:

1. Community members participating in shared land use & resource management decision- making.

Developing Knowledge and Support with:

11.0 Government supporting watershed community needs through:

1. Providing information for watershed decision making (e.g. water withdrawals);
2. Continuity of technical and financial support of community groups in watershed management and resource use;
3. Training and quality control and quality assurance for community monitoring of watershed development; and
4. Supporting community empowerment leading to shared decision making.

12.0 Sustaining the visioning process for the watershed with:

1. Regular feedback to residents on progress towards vision; and
2. Community participation in vision, goals, and objectives adjustment.

13.0 Gaining and spreading knowledge of the watershed with:

1. Pro-active education and awareness programs;
2. Open communications between citizens and agencies;
3. Citizen data gathering; and
4. Encouragement of innovative programs (e.g. demonstration programs)

Appendix 3. An Approach to Selecting Ecosystem Health Indicators

What are Indicators?

It is impossible to 'measure' or evaluate everything in a watershed. It is therefore necessary to determine the information that will provide a representative picture of the health of the watershed. These are called indicators, and when observed over time, they should be able to communicate specific information about progress, and indirectly comment upon the effectiveness of existing programs and policies to achieve the desired goals.

Indicators that are "measurable" or "quantitative" are particularly useful: however, equally important are those indicators which may not have sufftcient current information for measurement, yet are considered critical yardsticks of progress towards stated objectives (Environment Canada, 1997). Indicators which are qualitative in nature, such as how people "feel" about the watershed, can also serve as significant measures. The characteristic of "measurable" or "quantitative" is particularly important when the indicator chosen is in association with articulated goals or desired outcomes of ecosystem health. If measurements of these attributes fall within acceptable bounds or targets, it is assumed that the ecosystem as a whole is being protected.

Information provided through a comprehensive suite of indicators should help answer the following questions.-

⇒ *How clean is the environment?*

⇒ *How quickly are we making progress toward achieving the desired outcome?*

⇒ *What and where are the causes (stresses)?*

⇒ *Are present protection, restoration and pollution prevention programs, policies, processes and practices working?*

⇒ *Can we detect the onset of harmful conditions and respond before significant impact occurs?*

Modifired from International Joint Commission, 1996.

Although there are various models for developing and selecting ecosystem health indicators, there are a number of common ‘elements that are integral to successfully undertaking such a process. These following key elements are highlighted:

- Single indicators rarely provide an accurate picture of progress towards a specific goal. Therefore, a comprehensive suite of indicators must be identified, and designed to gauge progress, identify problems and help set priorities. This will also assist in developing an understanding of the changes required to progress towards the articulated objectives and goals.

- The selection of indicators must be grounded within the context of ecosystem health goals and objectives reflecting societal values and expectations. Public participation is a crucial element in the development of goals, objectives and indicators and will help to ensure that the expectations for achieving ecosystem objectives remains high.

- The selection of ecosystem health indicators is based upon both traditional and contemporary scientific knowledge. The information derived from a given indicator must be relevant to the participants involved in the process. The understanding and acceptance of this information will increase the degree of success in communicating actions that must be undertaken by the community and decision-makers.

- Indicators and the associated monitoring are critical tools for evaluating progress towards sustainability and redirecting activities, as needed. These tools provide a means of increasing knowledge, participation and commitment within the community for informed decision-making and action to achieve the desired goals and objectives.

Potential Procedure for Selecting Ecosystem Health Indicators

The choice of ecosystem health indicators is of tremendous importance if the health and the sustainablity of the watershed and the human uses of the resources within the watershed are to be adequately addressed and protected.

Ecosystem health indicators should provide an early warning of impending environmental degradation, support the assessment of the status and trends in environmental quality conditions, and improve our understanding of the linkages between components in the watershed.

For this reason a procedure for evaluating candidate ecosystem health indicators has been developed and described,

The evaluation of potential indicators, is dependent in part, on the availability of information that links changes in the specific elements of the ecosystem (e.g.., the abundance of salmon in the river) to alterations in other elements (e.g., the hydrological regime or water flow of the river).

A suite of indicators facilitates the identification of adverse environmental conditions before significant impacts occur on the structure or function of the ecosystem. Monitoring programs and data collection will be used to assess trends in environmental quality and compliance with objectives (e.g., water quality).

In the future it will be necessary to establish acceptable ranges for the suite of ecosystem health indicators that are ultimately accepted for the Salmon River watershed. However, that step is beyond the scope of this workshop.

It is proposed that indicators be selected through an evaluation process that considers whether specific characteristics are evident. The evaluation of potential indicators using the following process described in detail below will provide a means of prioritising in terms of broad applicability and scientific defensibility. It is proposed that a score of 0 be assigned if an indicator does not have the desired characteristic. If it is unknown whether the indicator has the desired characteristic, a score of 1 should be assigned. A score of 2 is allocated if the indicator has the desired characteristic. The following steps and scoring are summarised in Table 2.'

1. **Linkage to Goals and Objectives** - the indicator should be grounded within the context of the desired goals and objectives. Indicators that do not this criteria should not be considered any further.

2. **Ecologically Relevant** - the indicator must be important for maintaining a balanced community and sensitive to alterations in physical and biological components of the ecosystem.

[1] This method is adapted from a three step evaluation process used successfully in the selection of candidate ecosystem indicators for the Transboundary River Systems within the Mackenzie River Basin (MacDonald, 1995).

3. **Socially Relevant -** the indicator has obvious value to, and observable by stakeholders. The actual indicator may not be relevant to the broader community, however the information derived from the indicator or the insights it provides must be.

4. **Sensitive -** sufficient information is available which demonstrates that the candidate indicator responds to moderate changes in ecosystem conditions, without exhibiting extreme natural variability.

5. **Measurable -** valid metrics have already been developed to assess the status of the candidate indicators (i.e., easy to measure). In addition, the accuracy and precision of the suite of indicators can be evaluated using established procedures.

6. **Appropriate Scale -** data provides relevant information on the ecosystem as a whole. For example species that occur throughout the drainage basin may be more useful as indicators than species that occur only at specific sites.

7. **Historical Data Available -** sufficient traditional knowledge or scientific information is available to support the determination of natural variability, trends, and targets.

8. **Non-destructive -** collection of the required data does not change the structure and/or function of the ecosystem.

9. **Timely -** data provide information quickly enough to support the initiation of effective management actions before significant and lasting effects on the ecosystems have occurred.

10. **Unique -** data provide information on the status of the ecosystem that is not redundant with other measured indicators. This characteristic can only be evaluated on a relative basis, and is intended to be used for establishing a suite of indicators that provides comprehensive information on the status of the ecosystem.

11. **Cost Effective - the** indicator which is the least expensive to monitor should be selected when several indicators provide similar information on the status of the ecosystem. (i.e., maximum amount of information per unit effort).

Based upon this procedure, an indicator that has all of the characteristics would be individually assigned the maximum score resulting in a final evaluation score of (FES) of 20. FES's can be used to develop a short list of indicators that are most suitable for the system under consideration. High scores indicate that the indicator is highly applicable for the anticipated uses of the resultant monitoring data. Whereas, lower scores indicate that the indicator is more generally applicable for evaluating the status of ecosystem, but would not provide information that is directly relevant for assessing ecosystem impacts and trends, for providing an early warning, or for establishing linkages.

It should be acknowledged that insufficient data may be available to fully evaluate many of the candidate indicators that are identified. With this being the case, it will be difficult to develop a ptioritised list of indicators using the scoring system alone. However it is anticipated that traditional environmental knowledge, local experience and judgement will be required to complete the evaluation process

The prioritised list of ecosystem health indicators will create the basis for a community monitoring system to measure progress toward a sustainable watershed. Monitoring programs should be designed and implemented to evaluate the current status and trends of the ecosystem and provide essential data for defining and refining the targets. for the suites of indicators.

The establishment of a suite of indicators that adequately reflects the goals and objectives that have been established for the Salmon River Watershed will assist in identifying the quantifiable attributes and define acceptable ranges or targets for these variables. If all the measurable attributes or suites fall within acceptable ranges, then the ecosystem as a whole would be considered to be healthy and vital. The information collected during this process will also provide a basis for identifying data gaps and research needs to support implementation of the ecosystem approach. The results of monitoring programs will provide a scientific basis for further evaluating the indicators, refining the suites of health indicators, and determining if the goals and objectives have been achieved.

A Recommended Procedure for Evaluating Candidate Ecosystem Health Indicators for the Salmon River Watershed.

Evaluation Procedure for Candidate Indicators	**Possible Scores**
Evaluate Important Characteristics of Ecosystem Health Indicators	
Relevant to Goals and Objectives	Pass or Fail
Ecologically Relevant	0,1,2
Socially Relevant	0,1,2
Sensitive	0,1,2
Measurable	0,1,2
Appropriate Scale	0,1,2
Historical Data Available	0,1,2
Non-destructive	0,1,2
Timely	0,1,2
Unique	0,1,2
Cost Effective	0,1,2
Final Evaluation Score	**0 to 20**

Score of 0 is assigned if an indicator does not have the characteristic.
Score of 1 is assigned if it is unknown whether the indicator has the characteristic.
Score of 2 is assigned if the indicator has the desired characteristic.

Appendix 4. Workshop Agenda

March I- 2,1997, Falkland Community Hall
Sponsored by Salmon River Watershed Roundtable and Environment Canada

Saturday, March 1st

08:30	Registration - Beverages and Muffins - Falkland & District Historical Society
09:00	Opening Ceremonies *Renee Lapierre on behalf of Dennis Lapierre, Chair of SR WR* *Dorothy McLean, VP., Falkland and District Community Association* *Salmon River Youth Experience* *Darrel Stinson - Member of Parliament - Okanagan-Shuswap*
09:20	Purpose of the Workshop
09:25	Overview of Ecosystem Management Framework *Fred Mah -Environment Canada Pacific & Yukon Region*
09:35	Steps Completed in the Salmon River Watershed to Date *Neils Christiansen, SR WR*
10:00	Community Connectedness and Prosperity - *Ellen Hayakawa*
10:15	Break - Falkland & District Historical Society
10:30	Working Group Discussions - *What are the strengths of our community that will assist us in achieving and maintaining a healthy, sustainable watershed?*
11:30	Reports from Working Groups
12:00	Lunch - Falkland International Sled Dog Races
01:00	Current Reality of the Health of the Watershed *Michael McPhee - Quadra Consultants*
01:20	Indicators in Actions - Lesson Learned - Quadra Planning Team *Human Activities & the Health of the Watershed -* *Martin Gebauer, Mike Wallis* *Agricultural Activities in the Valley - Gary Runka* *Social and Economic Health - Gay Holman*
02:20	Group Discussion -Are *there new activities undertaken since this knowledge base was compiled that contribute to our understanding of the ecosystem?*
02:35	Break - Falkland & District Historical Society
02:50	Potential Procedure for Selecting Indicators
03:00	Working Group Discussions - *How should we select a series of ecosystem health indicators that will help us to improve the manner in which we manage our shared resources?*
04:00	Reports from Working Groups
04:30	Wrap Up

Falkland Seniors Association will be hosting a Community Ham Dinner at 5:00 p.m.
Music by Lonestar Entertainment

Sunday, March 2nd

08:30	Registration - Beverages and Muffins - Falkland & District Historical Society
09:00	Welcome
09:l0	Working Group Discussions - *As the Salmon River Watershed Community, what indicators do we wish to use in monitoring progress towards our goal of managing for ecosystem health?*
10:15	Break - Falkland & District Historical Society
I0:30	Working Group Discussions
11:30	Reports from Working Groups
12:00	Lunch - Falkland International Sled Dog Races
01:00	Working Group Discussions - *As the Salmon River Watershed Community, what indicators do we wish to use in monitoring progress towards our goals of active community social life and developing knowledge and support?*
02:30	Break - Falkland & District Historical Society
02:45	Reports from Working Groups - Reflection on Establishing Priorities
04:00	Workshop Wrap Up

Set up and Clean Up Crew

Falkland Skating Rink Committee
Falkland / Westwold First Responder Society

Appendix 5. Community Strengths

The following section summarises the discussions on the morning of Day One in which workshop participants identified the strengths within the community that will assist them in achieving and maintaining a healthy, sustainable watershed.

The beauty of the natural environment of the watershed has created a strong sense of connectiveness to the land and water and pride in the community. This connectiveness has served to increase the realisation of the impacts of resource management decisions on the community at large. Participants noted that the watershed is rich in established community groups, societies, and associations highlighting a strong sense of cooperation and partnerships in areas of common interest. The value of teamwork, patience, and commitment were emphasised as key ingredients in moving towards common goals

The process used by the Roundtable fosters inclusiveness based upon a broad definition of community including residents, agencies, business, First Nations, and youth. This inclusiveness fosters a diversity of perspectives, experiences, expertise, and skills. It is a process that encourages the sharing of knowledge, a willingness to explore new ideas, and movement towards consensus and a collective wisdom. The organisational strength of the Roundtable was re-affirmed by its ability to survive a change in leadership in 1996. In addition, the accessibility to various funding sources for restoration projects including the Forest Renewal British Columbia Funding was cited a strength.

There is a high degree of motivation and mobilisation of volunteers in numerous watershed restoration activities. Volunteer activities have been enhanced through an increasing involvement of youth and local schools contributing new energy and ideas

Increasingly there is a growing awareness of activities of the Roundtable throughout the watershed, as well as increasing political attention. Residents are able to see first hand examples of best practices and the benefits of community action. These restoration and protection activities are building upon the existing support within the community strengthening the momentum for positive change. These various activities have also encouraged the emergence of grass roots initiatives in other areas, such as Bolean Creek.

Participants emphasised that the respect for the history of watershed, the willingness to change and the sharing knowledge and perspectives balanced with concrete actions stand out as tremendous strengths within the community. Increasingly citizens are expressing an optimism about the ability to make a positive difference, a willingness to accept responsibility, and engage in solutions to achieve a healthy, sustainable watershed future.

Participants acknowledged that to a certain degree the strengths of the community are not being utilised to the greatest extent possible. It was suggested that a strategy and schedule for action could be developed in order to more fully integrate the various strengths of the community.

Appendix 6. New Activities in the Watershed

Following the presentations on existing conditions within the watershed, workshop participants were asked to identify new activities undertaken within the community since this knowledge base was compiled. These, discussions are summarised below.

A number of new activities are being undertaken including a community group working towards repairing riparian health along Bolean Creek, in conjunction with Riverside Forest Products Company Ltd., Department of Fisheries and Oceans and others. This initiative will be feeding into the Forest Renewal British Columbia Program. In addition, a group along Spa Creek is undertaking an evaluation of side channels, as well as main channels. Recently Chase Creek has approached the Roundtable seeking information on approaches to restoration activities.

The First Annual Western Grebe Festival was held in the Salmon River watershed with music, art, and celebration serving to increase awareness of the various watershed issues. Participants noted that perhaps the Salmon Arm Bay Nature Enhancement Society, which is now six years old could provide a means in which to monitor long term trends in various bird species.

Local schools are encouraging green curriculum or themes as well as participation in numerous restoration projects over the summer (e.g. adopt - a - stream program). Using *The Salmon River Watershed - An Overview of Conditions, Trends and Issues* a program is being tailored for the watershed. High school students are participating in various training opportunities including the identification of benthic invertebrates as a means to monitor the health of the river. In addition, the Salmon River Youth Experience is reviving the newsletter of the Roundtable.

An overview assessment report card is under development in cooperation with Riverside. Forest Products Company Ltd., FRBC and other partners It will include assessments on harvesting, river channels, sediment sourees, and access management maps to identify the potential to repair or decommission roads and trails. This process will include the Roundtable, as well as encouraging interaction between other user groups. In addition, the Land Resource Management Plan has included the Salmon River Watershed enhancing the ability of the Roundtable to influence the decision making process.

Numerous educational tours have been conducted throughout the watershed including the Elder Hostel. This type of publicity enhances awareness and consequently the receptivity of the political climate to the activities of the Roundtable. Videos on the numerous watershed activities including restoration techniques and the importance of community involvement will also be released in approximately one month. Land owner agreements to protect riparian zones are also in the initial stages of development.

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