
Mission Creek Enhanced Watershed Advisory Committee (EWAC)

Sustainable Watershed Indicators Workshop Proceedings /

Report on Findings



Canadian EarthCare Foundation
www.earthcares.org

Province of British Columbia
Ministry of Sustainable Resource Management

Mission Creek Workshop Indicators Workshop Working Report
Draft July 15, 2003

Prepared by the Canadian EarthCare Foundation

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1. Introduction:

The Mission Creek indicators workshop was held on April 15, 2003. This report documents the complex discussion that resulted. The workshop was a step in developing a framework of sustainability indicators that will assist in the ongoing management of the Mission Creek watershed. The results of discussion on these indicators will be instrumental in developing a business case for managing the Mission Creek watershed enhanced resource management zone in a holistic and integrated manner.

2. Background:

(a) The Mission Creek Watershed:

The Mission Creek watershed is the largest watershed in the Okanagan Basin at 859 square kilometres. Comprised of eight sub-basins, predominant uses of the watershed are forest harvest, urban settlement, agriculture, and drinking water supply. Significant fishery and recreational values are well recognized by the community at large.

(b) The Mission Creek Enhanced Resource Management Zone:

The Okanagan Shuswap Land and Resource Management Plan (Province of British Columbia, effective April 2001) designates the Mission Creek Watershed as an area of enhanced resource 'RMZ' management. The goal is "to establish a process that will ensure the Mission Creek watershed is managed in a holistic and integrated manner for all water-related resource values. Crown land and private land management activities pertaining to water resources and aquatic habitat need to be accounted for, and effectively coordinated and integrated to ensure sustainability of key values."

Key objectives of the RMZ are "to develop an integrated monitoring program" and to establish an Enhanced Watershed Advisory Committee that is "to provide advice on actions for watershed restoration."

(c) Mission Creek Enhanced Watershed Advisory Committee:

The Mission Creek Enhanced Watershed Advisory Committee (EWAC) will be responsible for coordinating and providing stakeholder advice to statutory decision-makers and acting as a central information repository for activities in the watershed. The Terms of Reference for EWAC require it to develop an integrated monitoring program for the Mission Creek watershed.

(d) Objectives and format of the Workshop:

There are a variety of indicators used by different agencies and businesses to choose from when monitoring activities in the watershed. Workshop participants represented a cross-section of organizations with interest in watershed management, with broad perspectives, and anticipated to participate on the Enhanced Watershed Advisory Committee. The majority of workshop participants already use indicators to monitor the success of different management tools, objectives and programs within their organization's realm of involvement. Members of the public have even greater expectations that activities are being adequately monitored according to a broad and diverse set of indicators.

The challenge for the workshop was the identification of indicators that:

- Are reasonable in size and scope
- Provide balanced consideration of the economic, social, and environmental aspects of sustainability
- Reflect directly on management of activities within the watershed
- Have relevance and support among all interests

The following criteria were used to guide the selection and discussion of Mission Creek Watershed sustainability indicators:

- Availability – Is data available and easily accessible? Is it collected throughout the watershed and published on a routine basis; is it made available to members of the public?
- Understandable – Is the data easily understood by a diverse range of non-technical audiences?
- Credible – Is the data supported by valid, reliable information and interpreted in a scientifically defensible manner?
- Relevant to Management of Activities in Mission Creek – Data reflects changes in management and in activities in the watershed. It can be used to measure changes over time
- Integrative – Data demonstrates connections among the environmental, social and economic aspects of sustainability

The format of the one-day workshop included morning presentations on the purpose and use of indicators, and afternoon sessions focused on selecting indicators based on experience shown in other similar sustainable watershed management initiatives.

3. Workshop Presenters

Workshop presentations included:

Nelson Grant

Acting Regional Planning Manager

Ministry of Sustainable Resource Management

Topic: Introduction to Mission Creek EWAC & Okanagan Shuswap LRMP

Mike Doiron

Manager, Woodlands, Riverside Forest Products

Topic: Mission Creek Adaptive Management Program

Dr. Adam Wei

Professor, Okanagan University College

Topic: The Value of Indicators in the Bigger Picture

Dr. Victor Bartnick

Head, Ecosystem Information in the Atmospheric and Aquatic

Sciences Division of the Environmental Conservation Branch of Environment

Canada.

Topic: Georgia Basin Ecosystem Indicators From Science to Change

Steve Litke

Project Coordinator

Fraser Basin Council

Topic: Sustainability Indicators for the Fraser Basin: A Tool for Change

Copies of presentations are on file at Ministry of Sustainable Resource Management, Okanagan Shuswap Land and Resource Management Plan

The workshop proceedings may also be downloaded from the Canadian EarthCare Society/Foundation website at www.earthcares.org

Discussion following the presentations is recorded in Section 5 of this report.

4. EWAC Workshop Participants April 15, 2003

Contact Person	Agency Name	Attended
Robert Louie, Chief	Westbank First Nation	No
Ron Smith	MSRM	Yes
Nelson Grant	MSRM	Yes
Ken Arcuri	RDCO	Yes
Leah Hartley	RDCO	Yes
Mike Jobke	Ministry of Forests	Yes
Doug Campbell	Weyerhaeuser	Yes
Brian Symonds	WLAP	No
Randy Hardy	Gorman Brothers	Yes
Troy Tanchuk	Joe Rich Watershed Monitoring Committee	Yes
Toby Pike	South East Kelowna Irrigation Dist.	No
Lorne Davies	Geostream Consulting	Yes
Mark Watt	City of Kelowna	Yes
Steve Matthews	WLAP	No
James Moller	BMID	Yes
Vic Bartnick	Environment Canada	Yes
Phil Epp	WLAP	Yes
Mike Doiron	Riverside Forest Products	Yes
Darryl Arsenaault	EBA Engineering	No
Byron Louis	Okanagan Nation Fisheries Commission	No
Dr. Adam Wei	OUC	Yes
Heidi Bennett	BC Lake Stewardship Society	No
Don Dobson	Dobson Engineering	Yes
Charlie Hodge	Canadian EarthCare Foundation	Yes
Tim Marshall	Mission Woodlot	Yes

Stuart Mould	Friends of Mission Creek	Yes
Dave Smith	DFO	Yes
Ken Campbell	Kettle Valley Trestle Society	Yes
Dr. Graham Bruce	Trestle Society	Yes
Reg Volk	Friends of South Slopes	Yes
Don Sloan	Okanagan Similkameen Parks Society	Yes
Don Guild	Central Okanagan Naturalists Club	Yes
Carl Withler	MAFF	No
Don McKee	LWBC	No
Dave Bacon	LWBC	No
Steve Litke	Fraser Basin	Yes
Dr. Moorhead	Interior Health Authority	No
Mike Rojam	GEID	No
Debbie Zandbelt	Tolko	No
Ted McCrae	MOF	Yes
Lloyd Manchester	EarthCare	Yes
Pat Russell	Joe Rich Ratepayers Society	Yes
Isabel Pritchard	Backcountry Horseman	Yes
Harold Hall	Mission Creek Greenway	Yes

The following agencies/people noted in the above table unable to participate in the workshop will receive the workbook and copies of this report for reference.

5. Questions and Answers

Nelson Grant - Ministry of Sustainable Resource Management

- Some questions were asked regarding the EWAC MOU and Terms of Reference.
- How does the ‘working forest’ affect the EWAC? *It is the conversion of provincial forest into areas designated for timber harvest* How does the Advisory Committee work? *The advisory committee gives advice to government.*
- What about the monitoring committee? *The committee has no decision making power and only provides advice.*
- How will First Nations participate with this process? *They are being encouraged to participate at the monitoring committee and the Memorandum of Understanding will address First Nation participation.*

Mike Doiron - Riverside Forest Products

- Does the LRMP have input into the annual allowable cut? *It provides advice but the cut is determined by the Ministry of Forests. Decision makers listen to public comment, particularly when considering amendments to AAC.*
- Concern expressed that forest companies have more say over the management of the forest. *The Adaptive Management Plan (AMP) may be modified to incorporate the whole of the Mission Creek RMZ and to provide a mechanism for input from or response to the interests expressed by EWAC.*
- How is global warming accounted for in the plan? *It is not accounted for at this time.*
- How significant is the water issue? *How the forest is planted will determine water quality. Through the AMP, indicators now being monitored include suspended solids, turbidity, temperature and connectivity.*

Dr. Adam Wei - Okanagan University College

- How do we measure indicators effectively? *An appropriate monitoring network allows for detecting changes, explaining changes, and then taking the right actions. We need to look at all the indicators and adapt a combined approach. Cumulative impact is the most challenging measurement.*
- Why is the big picture so important? *You need to understand both the cause of change and the condition resulting from change. Taking the right actions in this context reduces uncertainty and supports basin wide objectives. It also allows for more integration of partnerships across stakeholder groups*

5. Questions and Answers cont'd

Dr. Victor Bartnick - Environment Canada

- What is the main goal of developing a good indicator framework? *Monitoring/developing/selecting and measuring indicators will lead to good policy development. These indicators should also tell you when and where the problems may be.*
- What are some problems with indicators? *The main problem with indicators is that people collect data differently and try to 'marry the data'. Mission Creek needs to establish a database that can be used effectively.*

Steve Litke - Fraser Basin council

- How successful was the Fraser Basin Advisory Council process? *It was extremely successful in that the development of indicators increased stakeholder involvement and participation. This is crucial if you are to succeed.*
- What is the main value of indicators? *They are a method to measure progress and maintain a sustainable area.*

6. Indicator Selection and discussion.

Through working group sessions, participants evaluated and provided comment on nine proposed indicators, and then suggested two additional monitoring tools. Workshop participants used the following matrix on the whole, and where they did not, group comments have been incorporated. Conclusions reached at the workshop are reflected on the next 10 pages.

Indicator (s)	Criteria	Comments – Does this indicator meet the criteria?
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<p>Water Quality /Ambient Water Quality/ Water Quality Index/ Watersheds</p>	<p>Available/ Known Source of Data?</p>	<ul style="list-style-type: none"> • Lots of information on this topic. This information is housed in various locations including WLAP, RDCO, Forest companies, and OUC • Water Quality data is available for review. There are some standards. Turbidity, nitrates are measurable • Need to know all the data collected (who, what, and where there is a data warehouse. What are all the standards?) • Ambient water quality changes constantly • Need a vision of what the water is to be used for. What do you want from your watershed? Target uses then need to be gauged • Cart before the horse – having to set framework changes
	<p>Understandable</p>	<ul style="list-style-type: none"> • Yes with common standards being applied • Indexes are understandable
	<p>Credible Any pros or cons to using this indicator?</p>	<ul style="list-style-type: none"> • Need to assess low flows • Index can be skewed by one reading • Need to know how much is being used during critical periods

	Conclusions/ other comments:	<ul style="list-style-type: none"> This indicator was also considered to be relevant and integrative
Indicator (s)	Criteria	Comments – Does this indicator meet the criteria?
Fish Stocks (Stocks at Risk/ Salmonid/ Bull trout & brood stocks)	Available/ Known Source of Data?	<ul style="list-style-type: none"> WLAP, MSRM and OUC WLAP should have the data and licenses for data Data needs to be understandable Fish productivity needs to be dealt with Maintain healthy fish How to separate impacts of fish in lake versus fish in watershed – (shrimp) (where parallel process are imperative) Kokanee spawning grounds – a good indicator of lake conditions Rainbow trout juvenile stock may be better indicator of watershed conditions
	Understandable	<ul style="list-style-type: none"> Yes EWAC - who has the final say in the management?

Credible Any pros or cons to using this indicator?	<ul style="list-style-type: none"> • Pros include measuring Kokanee Spawning • Measurement of resident fish like trout is important as well
Relevant	<ul style="list-style-type: none"> • LRMP provides direction on this
Conclusions/ other comments:	<ul style="list-style-type: none"> • This indicator was considered to be integrative with water quality and flows

Indicator (s)	Criteria	Comments – Does this indicator meet the criteria?
Age & Species Composition of Forests / Ecosystem representation	Available/ Known Source of Data?	<ul style="list-style-type: none"> • LRMP/MSRM Data sets very complete. Okanagan IFPA Society also has information • Good data available on patch size distribution, rare species and forest inventory is readily available and accessible

Understandable	<ul style="list-style-type: none"> • Yes • Innovative Forestry Practice
Credible Any pros or cons to using this indicator?	<ul style="list-style-type: none"> • Pros include Endangered Species and the ability to model over time • Need to know what we are striving for • What do the implications mean • Spotted Owl as an example of needed baseline data (Indicator Species) to measure by • Need to set targets.
Relevant	<ul style="list-style-type: none"> • Yes • Forestry
Conclusions/ other comments:	Integrative with biodiversity

Indicator (s)	Criteria	Comments – Does this indicator meet the criteria?
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Boil Water Advisories/ Access to Potable Water/ Total Coliform and E.Coli/ Waterborne Disease Outbreak	Available/ Known Source of Data?	<p>Data on boil water from provincial health</p> <ul style="list-style-type: none"> • Interpretation of ‘advisory’ needed • Indicator – number of residents who use bottled water • Total coliform is science based results • E-coli is measurable • Livestock is a key indicator of this in the watershed
	Understandable	<ul style="list-style-type: none"> • A difficult indicator to communicate but easy to defend
	Credible Any pros or cons to using this indicator?	<ul style="list-style-type: none"> • Is a ‘boil water’ advisory a good indicator (boil orders are common now) • An indicator is when people are ill
	Relevant	<ul style="list-style-type: none"> • Yes
	Conclusions/ other comments:	<ul style="list-style-type: none"> • Integrative with health

Indicator (s)	Criteria	Comments – Does this indicator meet the criteria?
Average daily water use per capita/ Average consumption	Available/ Known Source of Data?	<ul style="list-style-type: none"> • Irrigation Districts • City of Kelowna • WLAP and SRM
	Understandable	<ul style="list-style-type: none"> • Yes, providing you break it into Irrigation and domestic sources
	Credible Any pros or cons to using this indicator?	<ul style="list-style-type: none"> • Yes, even though some information is estimated • Need to track relationship with climate change • Should differentiate between watershed and lake sources
	Relevant	<ul style="list-style-type: none"> • Depends on who is using the information
	Conclusions/ other comments:	<ul style="list-style-type: none"> • Integrative with water quality and fish stocks

Indicator (s)	Criteria	Comments – Does this indicator meet the criteria?
Type of sewage disposal / Extent of community wastewater collection	Available/ Known Source of Data?	<ul style="list-style-type: none"> • City of Kelowna and RDOC • Septic system sources are important (e.g. Joe Rich Area). • Need to know % of households on septic/community systems and degree of contamination (ground water and surface)
	Understanda ble	<ul style="list-style-type: none"> • Yes
	Credible Any pros or cons to using this indicator?	<ul style="list-style-type: none"> • Pros include relation to water quality throughout the system

Relevant	<ul style="list-style-type: none">• Relates to water usage as well
Conclusions/ other comments:	<ul style="list-style-type: none">• Integrative with water quality

Indicator (s)	Criteria	Comments – Does this indicator meet the criteria?
Number of water meters installed	Available/ Known Source of Data?	<ul style="list-style-type: none"> • City of Kelowna and Irrigation Districts
	Understandable	<ul style="list-style-type: none"> • Yes
	Credible Any pros or cons to using this indicator?	<ul style="list-style-type: none"> • Yes for water meters measuring usage but not as good when users are charged at a flat rate • Estimates of usage can still be done when charged at a flat rate
	Relevant	<ul style="list-style-type: none"> • Yes to flow and consumption
	Conclusions/ other comments:	<ul style="list-style-type: none"> • Works with other water quality indicators

Indicator (s)	Criteria	Comments – Does this indicator meet the criteria?
Amount and timing of flow / Extent and frequency of flood events	Available/ Known Source of Data?	<ul style="list-style-type: none"> • Historic data (WLAP/SRM), Industry data, Snow pillow data, lake levels and flow rates in Mission Creek
	Understandable	<ul style="list-style-type: none"> • Yes, but hydrological information is not complete
	Credible Any pros or cons to using this indicator?	<ul style="list-style-type: none"> • Need to know if the hydrograph is changing • Nutrient levels are important • Historic data helps to provide a baseline
	Relevant	<ul style="list-style-type: none"> • Yes, to how we manage flows and fish habitat • Population is growing therefore the need to make informed decisions

Conclusions/ other comments:	<ul style="list-style-type: none">• Yes with fish stocks and water quality
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Indicator (s)	Criteria	Comments – Does this indicator meet the criteria?
Vulnerable Aquifers / Groundwater/ Levels	Available/ Known Source of Data?	<ul style="list-style-type: none"> • State of the environment reporting. • Water Branch (well reports and water licenses)
	Understandable	<ul style="list-style-type: none"> • Yes, with more data
	Credible Any pros or cons to using this indicator?	<ul style="list-style-type: none"> • Data gaps in this area are large • No legislation in place to protect groundwater • Recharge rates and zones important • Monitoring of well water quality
	Relevant	<ul style="list-style-type: none"> • Yes, if you can identify recharge zones

Conclusions/ other comments:	<ul style="list-style-type: none"><li data-bbox="922 159 1349 233">• Yes, with consumption and draw down
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Additional Indicators

The following indicators were discussed at the workshop. Indicators that were suggested but not discussed are also included in this report.

Indicator (s)	Criteria	Comments – Does this indicator meet the criteria?
Equivalent Clearcut Area (ECA)	Available/ Known Source of Data?	<ul style="list-style-type: none"> • Integrated Watershed Assessment Procedure reports • WALP/MSRM/LRMP
	Understandable	<ul style="list-style-type: none"> • Many factors are associated with ECA such as terrain sensitivity, hydrologic sensitivity, soil erosion index
	Credible	<ul style="list-style-type: none"> • Yes • Amount of area harvested and slope potentially affects water quality
	Relevant	<ul style="list-style-type: none"> • Yes
	Conclusions/ other comments:	<ul style="list-style-type: none"> • Yes with terrain stability and runoff

Indicator (s)	Criteria	Comments – Does this indicator meet the criteria?
Urban/Watershed Riparian	Available/ Known Source of Data?	<ul style="list-style-type: none"> • Interior Watershed Assessment Report for Mission Creek • LRMP files
	Understandable	<ul style="list-style-type: none"> • Yes
	Credible	<ul style="list-style-type: none"> • Yes, provided there is an evaluation of what riparian exists today so it can be looked at in the future. • Need to look at the amount that is not disturbed • Need a bylaw in ‘urban’ to protect it
	Relevant	<ul style="list-style-type: none"> • Yes • Regional growth will affect Mission Creek

	Conclusions/ other comments:	<ul style="list-style-type: none"> • Peak flows, natural disturbance and road density
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Additional Indicators proposed to measure Cause of Change	
Riparian condition	<ul style="list-style-type: none"> • Disturbed versus non disturbed riparian habitat
Population	<ul style="list-style-type: none"> • Population residing in the watershed • Number recreation users in upper watershed
Runoff, spills, erosion	<ul style="list-style-type: none"> • Km paved urban roads • Km active resource roads • Km resource roads deactivated in last two years
Forest Harvest	<ul style="list-style-type: none"> • Recommend use the ‘area of harvest by decade’ correlated with ‘slope class’ • This indicator is more relevant than Equivalent Clearcut Area, soil erosion index or terrain stability rating
Water use	<ul style="list-style-type: none"> • Final license surveys
Natural Disturbance	<ul style="list-style-type: none"> • Historic events such as wildfire, pine beetle, landslides

Additional Indicators “nominated from the floor “
<ul style="list-style-type: none"> • Equivalent Clearcut Area
<ul style="list-style-type: none"> • Change in forest cover / permanent deforestation by decade
<ul style="list-style-type: none"> • % Water consumed that is recycled
<ul style="list-style-type: none"> • Forest encroachment on grasslands
<ul style="list-style-type: none"> • Distribution and proportion of land uses in the watershed
<ul style="list-style-type: none"> • Sectoral water use
<ul style="list-style-type: none"> • Protected area as a control indicator
<ul style="list-style-type: none"> • Wildlife species quantity and health
<ul style="list-style-type: none"> • Education – Is it effective or not
<ul style="list-style-type: none"> • Road density/Road construction
<ul style="list-style-type: none"> • Benthic invertebrates
<ul style="list-style-type: none"> • Climate change

7. Lessons Learned at the Mission Creek Indicators Workshop

All participants were asked to point out the two key thoughts they gained from the workshop and presentations:

- Set realistic expectations
 - What indicators are and are not
 - Short versus long term
- Limitations of data and analysis
- Need to blend the public/technical process
- Find the right balance
 - Comprehensive yet concise
- Social, economic, environmental sustainability
- Technical merit and public interest/acceptance
- Lack of understanding water quality
- Economic values outweigh others –need to look at best bang for the buck
- Benthic Invertebrates important analysis expensive time/training defensible
- Need to identify the audience – decision makers
- Where will the money come from?
- Define issues
- Sometimes it is hard to see the mountain when you are part of it
- Challenge it to make sure you have the ability to integrate information from all the groups
- Think carefully about what you want to do with the indicators. What do you want to measure?
- Good public education is essential but be careful in the way that you do that. It is clear that water is the ecosystem linkage so there is a need to focus on it
- Include non-measurable indicators. EWAC has to develop a definition for sustainability that meets the needs of Mission Creek

- We don't need an indicator to say that Mission Creek is over subscribed for water – this is already known and accepted. Water shortages possible. Need an action plan for the problems we know exist now
- Rate indicators in a priority fashion. With the population expanding we will have to shift priorities in a direction towards a main focus, due to changing demands on the watershed
- Causal or correlated indicators. Pick indicators for scientific validity
- Paired studies. Need control and non-control standardized monitoring plan
- How long do you want to be monitoring for set objectives?
- EWAC good group to monitor
- Parallel process seeks public input and scientific process

7. Lessons Learned at the Mission Creek Indicators Workshop cont'd

- Concern with climate change, land use needs more understanding about hydrology of Mission Creek. What is happening with water quality?
- Sometimes economic values outweigh social/health issues, which can shift priorities
- Indicators can be information as well, not just input. Importance of measuring and public awareness. Change in behaviour. Process or action plan
- Need to have adequate resources to develop a communication strategy to bring about changes in public education and awareness. Decision makers need enough information to make change happen. Need adequate resources for a communications strategy
- Look valley wide beyond Mission Creek. Costs are a hindrance. Proper use of funding for proper studies
- Anecdotal evidence is just as important as scientific evidence
- Actions we are going to take when we identify these problems. Sediment problem. Monitoring must continue as long as there is industrial activity
- Main audience is policy makers. Need to take into account the local level. Look ahead to what is going to come out of this and how we influence the policy makers?
- Where is the buck coming from and how do we get the best bang for the buck?
- Need to have our position embraced by the policy makers from the beginning so as information comes in and it is endorsed by the policy makers. Have some form of charter for sustainability
- Define the issues and keep it simple
- Get it down to something that is manageable and do-able
- Scale and time – two indicators
- Look at things three dimensionally
- Invasive species

- This approach has a long-term nature. Commitment
- Select the indicators wisely, so we get the right data. Right for of data. Continuity
- Key values – fundamentals. Need to be determined
- Understanding hydrology. Surface/Ground water
- Capitalize on the expertise of the room
- Opportunities to pool our resources
- Must stay in the guidelines of the LRMP

Conclusion:

As a first step in developing a framework of sustainability indicators that will assist in the ongoing management of the Mission Creek watershed, the April EWAC opening workshop was very productive. A diverse cross-section of participants, including the bringing together of so many key stakeholders, was paramount in achieving that goal. Many of these indicators will prove very instrumental in the upcoming process of developing a comprehensive strategy for managing the Mission Creek watershed enhanced resource management zone in a holistic and integrated manner.

We have attempted to summarize the variety of indicators as suggested by various stakeholders attending the workshop. Much work is still needed in gaining full insight into Crown land and private land management activities that pertain to water resources and aquatic habitat. This is imperative in order to identify appropriate sustainability indicators.

We look forward to your comments on this working document.