

# Babine Monitoring Framework: Setting priorities for Effectiveness Monitoring

Prepared for the Babine Monitoring Trust Governance Design Group  
By Karen Price and Dave Daust

## Why Monitor?

To determine if management strategies are achieving land-use objectives.

Land-use plans set objectives for resources and values on a tract of land, and provide strategies designed to achieve these objectives. Implementation monitoring assesses whether strategies are being followed, and effectiveness monitoring assesses whether following strategies achieves objectives.

## Why Use a Monitoring Framework to Determine Monitoring Priorities?

It is neither possible nor necessary to monitor the effectiveness of all strategies. Ad-hoc approaches can be inefficient, following bandwagons rather than focussing on those projects providing the most useful feedback on the effectiveness of strategies. A transparent, science-based monitoring framework ensures fair treatment of the diversity of values included in land-use plans.

## The Monitoring Framework

The Monitoring Framework has three components:

- 1. Land-use Plan Summary:** summarises the goals, objectives and management strategies from existing land-use plans.
- 2. Knowledge Base:** summarises scientific information about the relationships between the objectives and strategies listed in the land-use plans. It provides all relevant information currently available to assess the monitoring priority.
- 3. Procedures:** specific methods used to determine monitoring priorities for each objective and strategy.

## Land-Use Plan Summary

Six land-use plans include objectives and strategies for the Babine Watershed:

- Bulkley LRMP
- Babine Landscape Unit Plan
- Nilkitkwa Landscape Unit Plan
- Kispiox LRMP
- West Babine SRMP
- Babine River Corridor Park MDS

This component of the Framework summarizes the commitments that require monitoring from the six Babine land-use plans and provincial legislation. These commitments include goals, objectives and strategies.

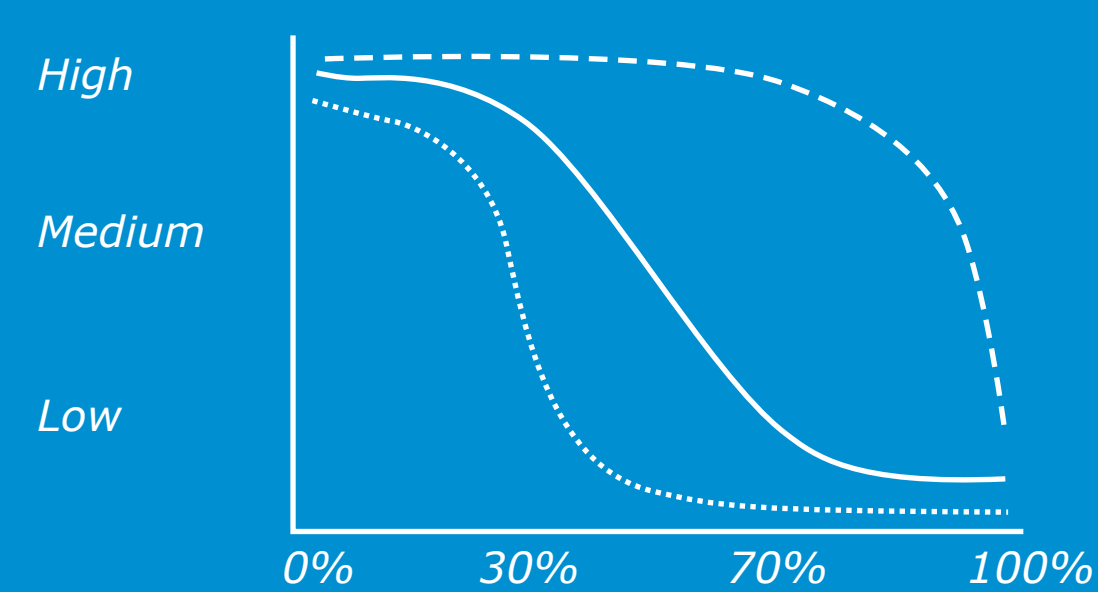
Types of Commitment	Example
Goal	Conserve grizzly bears
Objective	Minimize human/bear interaction
Strategy	Maximum density of open roads per watershed

## Knowledge Base

The Monitoring Framework relies on the concepts of risk and uncertainty to assess monitoring priority. The information needed to assess current and future risk and uncertainty forms the core of the Knowledge Base and allows for assessment of the relative benefits of monitoring for a particular objective and strategy.

### Risk

Risk curves display how indicators (representing strategies) relate to the risk to an objective (see Graph 1). Risk is defined as the chance of not achieving an objective for any management strategy. The Knowledge Base contains information on current and future indicator levels, based on inventory data and land-use targets respectively.



**Graph 1.** Risk to biodiversity versus amount of each seral stage (relative to natural amount) in each biogeoclimatic subzone.

### Uncertainty

The risk level is rarely certain because of incomplete knowledge. The Monitoring Framework acknowledges uncertainty and uses it to rank monitoring projects. Uncertainty is defined as the probability that the actual risk falls within an estimated risk class (Low, Medium or High), and can be visualized (in two dimensions) as a band around the risk curve (see Graph 1).

### Supplementary Features

The Knowledge Base also lists supplementary features that influence the benefits of monitoring and estimates cost by listing the relative ease of monitoring particular objectives and strategies. Supplementary features include

- influence of the goal on other goals,
- influence of the objective on the goal,
- recovery period of the objective.

### Information included in Knowledge Base (example)

Plan Component	Example
Goal	Maintain biodiversity
Objective	Maintain natural seral stage distribution
Indicator	Percent of each seral stage relative to natural

### Current and Future Risk and Uncertainty

Current indicator value (x-axis):	Old seral, Nilkitkwa landscape unit: 73 – 100%
Future indicator value (x-axis):	Old seral, Nilkitkwa landscape unit: 35 – 48%
Current risk of not achieving objective (y-axis)	Low, with high uncertainty
Future risk of not achieving objective (y-axis)	Moderate, with high uncertainty

### Supplementary features

Influence of goal on other goals	High
Influence of objective on goal	High
Recovery period of objective	High



Photo by James Cuell

## Procedures for setting monitoring priorities

The Monitoring Framework generates three separate lists of priorities:

- collecting indicator data,
- detecting negative consequences associated with management activities,
- improving knowledge and reducing uncertainty.

Priorities within each list are determined using a process which considers current, and future, risk and uncertainty. Priority to collect indicator data is high when insufficient data exist to estimate the indicator value on the x-axis of the risk curve, and hence to determine current risk and uncertainty. Monitoring to detect negative consequences is generally assigned high priority when risk is high and uncertainty is low. Monitoring to improve knowledge is assigned high priority when uncertainty is high.

## Using supplementary information

Within each of the three lists, objectives and strategies are ranked first by priority as based on risk and uncertainty and then by a score based on three supplementary features.

## Updating the Monitoring Framework

The Monitoring Framework is intended to be a living document, to be improved upon as new information emerges from relevant research, monitoring studies, and scientific literature. It will be necessary to revise the three lists of monitoring priorities with each update of the Knowledge Base.

## Results for the Babine

The Babine Watershed Monitoring Trust has used the Monitoring Framework to determine high-priority monitoring projects for 2005. Projects highlighted for funding or for seeking funding include

- examining the condition of riparian forest (fish, biodiversity),
- investigating stream crossing quality and relationship to water quality (water),
- designing a non-biased methodology to investigate wilderness values of the Babine River Corridor (recreation, tourism),
- measuring open road density in relation to human/bear interaction (grizzly bears),
- measuring stand structure in young natural and logged stands (biodiversity).

## General Conclusions

The Monitoring Framework was successful in its first application, determining priorities among diverse values and strategies. The Knowledge Base provides an organised, compact, easily-updatable means of compiling data over time that facilitates Adaptive Management. The Monitoring Framework identifies strategies that have a high risk of not achieving desired objectives, and could be used to help decision-making before undertaking monitoring projects. The risk curve approach facilitates multi-stakeholder discussion by providing explicit models of relationships.

## Literature Cited

Karen Price and Dave Daust. Babine Watershed Monitoring Framework. Jan 27 2005.

Liz Ozborn, Karen Price, and Dave Daust. Babine Watershed Monitoring Framework – Overview. Jan 27 2005.



Photos by James Cuell

