Babine Watershed Monitoring Trust

2005 Annual Monitoring Plan

Prepared for:

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Approved: July 2005

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1.0 Introduction

The Babine Watershed Monitoring Trust (BWMT) is responsible for effectiveness monitoring of government land-use plans in the Babine River Watershed in north-central British Columbia. Effectiveness monitoring assesses whether following planned management strategies achieve desired objectives.

This document constitutes the 2005 Annual Monitoring Plan for the Babine Watershed Monitoring Trust, which the Trustees are required to produce under Section 10.2 and Schedule C of the BWMT Agreement.

The plan describes the first year of monitoring activities by the Babine Watershed Monitoring Trust. It sets out the year's budget, lists high-priority monitoring projects, describes projects approved for direct funding, and identifies topics requiring additional funding. The plan provides a synopsis and rationale for each approved project. The BWMT allocates funds to monitoring projects using the process for determining priorities and costs prescribed in the BWMT Agreement and described in the Babine Watershed Monitoring Framework (see www.babinetrust.ca).

2.0 Budget

The funds available from the Babine Watershed Monitoring Trust Revenue Trust Account (BWMT Agreement, Section 3.1.3) are set out in Table 1. There are currently no funds in the Trust Account (BWMT Agreement, Section 3.1.1) and no property in the Non-monetary Trust Property (BWMT Agreement, Section 3.1.2).

The calculation of funds available in the budget (BWMT Agreement, Schedule C, Section 2) is affected by two related factors. First, the British Columbia government requires that funds contributed to the development of the BWMT and its monitoring projects be matched by non-government funds at a 2:1 ratio. Second, some government-contributed funds were spent prior to BWMT establishment, in order to develop the BWMT Monitoring Framework.

Table 1. Budget

	Contributed	Available under the 2:1 private/public ratio rule		Unavailable in 2005 (banked)
Revenue Trust Account				
1. Income				
Babine River Foundation	$52 802	52 802		
BC gov't (MSRM, WLAP)	85 000	26 400		59 600
			79 202	
2. Expenses				
a. Pre-BWMT Monitoring Framework		(23 100)		
b. BWMT Available Funds				
i. Contract Management		(17 000)		
			(40 100)	
ii. 2005 Monitoring Projects			$39 102	

3.0 Monitoring Priorities for 2005

The Trust supports monitoring projects, maintains the Babine Watershed Monitoring Framework and administers the monitoring program. The allocation of available funds for this year is shown in Table 2.

Table 2. Allocation of available monitoring program funds.

Activity	Projected Allocation
Contract Management and Planning	
Financial administration	$2,000
Contract management	2,500
Communications	1,500
Prepare Annual Monitoring Plan	5,000
Meeting support	3,000
Miscellaneous expenses	500
Continuing projects	0
Proposal development	2,500
New Projects	39,000
Total	**$56,000**

The priority for maintaining the Monitoring Framework increases with the time elapsed since the last revision. The Knowledge Base and Monitoring Priority Tables, found in the Monitoring Framework, were created in 2004. Elapsed time and new information do not warrant a review or update of the Knowledge Base and Monitoring Priority Tables this year.

The Monitoring Priority Tables generated by the Monitoring Framework show priorities and associated costs for the following types of monitoring:

- collecting indicator data,
- monitoring to improve knowledge and reduce uncertainty,
- monitoring to detect negative consequences.

Tables 5 to 7 of this document summarise funding decisions for high-priority monitoring topics in each of the three types. The order within each list indicates relative priority assigned by the Monitoring Framework. The tables also provide a brief rationale for each funding decision. Not all topics can be funded. Higher-priority topics will usually be funded preferentially. When a lower-priority topic is selected for funding, a rationale is provided as to why the higher-priority topics were not chosen. All non-funded topics lower on ranked lists are not funded because of insufficient funds.

4.0 Approved Projects

Four projects are approved for funding by the BWMT Trustees in 2005 (Table 3).

Table 3. Approved projects, 2005.

Project Number	Title	Funding
2005-1	Riparian Ecosystems and Fish Habitat	$16,500
2005-2	Stream Crossing Quality	12,500
2005-3	Water Quality in Relation to Stream Crossings	5,000
2005-4	Wilderness Value of Babine River Corridor	5,000
Total		**$39,000**

The BWMT Trustees will seek partnerships and/or prepare proposals for funding two additional projects (Table 4).

Table 4. Projects approved for funding sourcing, 2005.

Project Number	Title	Potential Funding Source
2005-5P	Stand Level Biodiversity	Forest Sciences Program; SFM Network
2005-6P	Human/Bear Interactions and Open Road Density	Grizzly Bear Conservation Strategy

Each project is described in the following Synopses.

In future Annual Monitoring Plans, the Synopses section will record results of ongoing or completed monitoring projects until the results have been incorporated into the Knowledge Base and included in other processes (e.g. BWMT Plan Amendment Process and Criteria). In particular, the subsections listing consequences for the Knowledge Base and consequences for management will summarise actions precipitated by each project.

5.0 Project Synopses

Project 2005-1: Riparian Ecosystems and Fish Habitat

Objectives listed in land-use plans: Legislation and planning documents pertinent to this project include: 1) The British Columbia Forest and Range Practices Act (FRPA), which establishes objectives for conservation of ecological values associated with riparian areas, 2) The Kispiox Land and Resource Management Plan (LRMP), which includes an objective (within the goal of maintaining biodiversity) to maintain riparian areas, and 3) The Bulkley Landscape Unit Plans (LUPs), which include objectives (within goals of maintaining fish habitat) to retain structure within riparian management zones. Both the Bulkley LUPs and Kispiox Sustainable Resource Management Plan (SRMP) include maps of Landscape Riparian Corridors.

Type of monitoring: Collecting indicator data.

Possible leaders: Invite proposals.

Possible partners: Ministry of Forests, Bulkley Aquatic Resources Committee (chair Dave Wilford), University of Montana (Tom Bansak, British Columbia Research Coordinator), Forest Investment Account stream classification database project[1], others to be identified.

Status: Initiated in 2005.

Funding: $16,500 for one year.

Abstract: The goal of this project is to examine the status of riparian forest ecosystems adjacent to fish-bearing and non-fish-bearing streams throughout the Babine Watershed. The project will consistent of two stages:

Stage 1: Research design. This will involve a meeting of researchers to define detailed research design for Phase 2, and potential research methods to be used in subsequent years.

Stage 2: Preliminary assessment of riparian buffers. To be defined in Stage 1.

Consequence for knowledge base: This project will allow for assessment of current risk and associated uncertainty to riparian ecosystems and to fish habitat in relation to forest harvesting activities. It will also provide additional information on windthrow susceptibility.

Consequence for management: This project will support management decisions, through appropriate processes which are separate from the BWMT, by presenting the level of risk and uncertainty associated with current strategies of riparian retention. It may increase confidence in current activities, suggest further monitoring projects, or lead to initiation of plan amendment processes.

[1] Proposal undergoing review - funding uncertain at this time.

Project 2005-2: Stream Crossing Quality

Objectives listed in land-use plans: The Kispiox SRMP includes an objective to maintain water quality within its natural range, and presents specific targets relating to sediment introduction at stream crossings within the Nichyeskwa, Shelagyote and Babine mainstem watersheds. The Bulkley LRMP includes an objective to maintain existing levels of water quality.

Type of monitoring: Collecting indicator data; Improving Knowledge and Reducing Uncertainty

Possible leaders: Pierre Beaudry; technical reviewer: Dave Wilford (Ministry of Forests).

Possible partners: Ian Sharpe (Ministry of Water, Land and Air Protection), Ministry of Forests, Bulkley Aquatic Resources Committee, BC Timber Sales, others to be identified.

Status: Initiated 2005.

Funding: $12,500.

Abstract: With this project, the quality of stream crossings in the Nichyeskwa Watershed will be examined, using the Stream Crossing Quality Index developed by Pierre Beaudry. The relationship between stream crossings and water quality will be investigated by choosing sites, analysing data, and drawing conclusions in collaboration with project 2005-3 (Water Quality in Relation to Stream Crossings).

Consequence for knowledge base: This project will allow for assessment of current risk and associated uncertainty to water quality in relation to stream crossings. In collaboration with project 2005-3, it will help to define the currently undefined risk curve relating stream crossings to water quality.

Consequence for management: This project will assess each crossing for its potential to produce sedimentation, and rank them into risk groups (High, Medium and Low). This will support management decisions, through appropriate processes which are separate from the BWMT, by showing the level of risk and uncertainty associated with stream crossings. It may increase confidence in current activities, suggest further monitoring projects or lead to initiation of a plan-amendment process.

Project 2005-3: Water Quality in Relation to Stream Crossings

Objectives listed in land-use plans: The Kispiox SRMP includes an objective to maintain water quality within its natural range, and presents specific targets relating to sediment introduction at stream crossings within Nichyeskwa, Shelagyote and Babine mainstem watersheds. The Bulkley LRMP includes an objective to maintain existing levels of water quality.

Type of monitoring: Collecting indicator data.

Possible leaders: Ian Sharpe (Ministry of Water, Land and Air Protection); technical reviewer: Dave Wilford (Ministry of Forests).

Possible partners: Pierre Beaudry; Ministry of Forests; Bulkley Aquatic Resources Committee; Ministry of Water, Land and Air Protection; BC Timber Sales; others to be identified.

Status: Initiated 2005.

Funding: $5,000 for participation in extension of existing water quality project.

Abstract: The goal of this project is to investigate the relationship between stream crossings and water quality by using a multi-variate index to describe current stream quality in reference streams in the Nichyeskwa Watershed and below the stream crossings examined in project 2005-2 (Stream Crossing Quality). If funds allow, further reference streams may be included within the Shelagyote Watershed[2]. Project sites will be chosen, data analysed, and conclusions drawn in collaboration with project 2005-2.

Consequence for knowledge base: This project will assist in definition of the risk curve relating stream crossings to water quality (currently not defined). In addition, the project will allow for improved assessment of current risk and associated uncertainty to water quality in relation to stream crossings.

Consequence for management: This project will support management decisions, through appropriate processes which are separate from the BWMT, by showing the level of risk and uncertainty associated with stream crossings. It may increase confidence in current activities, suggest further monitoring projects or lead to initiation of a plan-amendment process.

[2] Shelagyote is unroaded; hence access will require helicopter travel.

Project 2005-4: Wilderness Value of Babine River Corridor

Objectives listed in land-use plans: The Babine River Corridor Park MDS (Management Direction Statement) includes an objective to maintain a wilderness experience in the corridor, including a sustainable level of recreation. The Kispiox SRMP includes an objective to maintain the aesthetic quality (visual and auditory) of the Babine River Corridor (BRC).

Type of monitoring: Detecting negative consequences (sustainable use); reducing uncertainty (auditory disturbance).

Possible leaders: Invite proposals.

Possible partners: Ministry of Water, Land and Air Protection; University of Northern BC; others to be identified.

Status: Initiated 2005.

Funding: $5,000 for initial investigation of problem and design of survey methodology.

Abstract: The aim of this project is to design a non-biased methodology to investigate perceptions of wilderness value in the Babine River Corridor. It will consider socially acceptable levels of sustainable use, with particular focus on the Natural Environment Zone of the Park. Secondarily, it will investigate perceptions of auditory disturbance throughout the Park, and sustainable use in the Wilderness Recreation Zone.

Consequence for knowledge base: This project constitutes the first step in detecting negative consequences to sustainable use and wilderness value of the Babine River Corridor.

Consequence for management: This project will provide information to assist with the development of targets through a Management Plan process that may be undertaken by the Ministry of Water, Land and Air Protection.

Project 2005-5P: Stand-level Biodiversity

Objectives listed in land-use plans: Both the Bulkley LUPs and the Kispiox SRMP include objectives to maintain structural attributes and diversity within managed stands. Indicators include wildlife tree patches (both Forest Districts) and amounts of specified attributes (Kispiox)[3]. The Bulkley LUPs also include an objective, and associated indicators, to maintain a diversity of tree species.

Type of monitoring: Collecting indicator data (stand structure); reducing uncertainty (tree species composition).

Possible leaders: To be identified.

Possible partners: Ministry of Forests, forest companies, University of Northern BC, others to be identified.

Status: Pursuing funding in 2005 for future study.

Funding: From proposal development budget ($2,500 total; see Table 2).

Abstract: The objective of this project is to measure stand structure in young naturally disturbed and logged stands. Because few young natural stands exist within the Babine Watershed, it will be necessary to choose sites over a broader area – likely Forest District, stratified by biogeoclimatic subzone. With the movement of mountain pine beetles into the area, the potential for before/after study design is good. The project will also examine tree species composition in the selected stands.

Consequence for knowledge base: This project will allow for assessment of current risk and associated uncertainty to stand structure and to tree species composition in relation to forest harvesting activities. The project will also collect information that will reduce the uncertainty around both risk curves.

Consequence for management: This project will support management decisions, through appropriate processes which are separate from the BWMT, by showing the level of risk and uncertainty associated with current levels of stand-level retention. It may increase confidence in current activities, suggest further monitoring projects or lead to initiation of a plan-amendment process.

[3] See Knowledge Base for details and rationale for indicator (www.babinetrust.ca)

Project 2005-6P: Human/bear Interaction and Open Road Density

Objectives listed in land-use plans: The Babine LUP (Bulkley) and the Kispiox SRMP include objectives and associated strategies relating to road use and forest harvesting, for reducing the number of human-bear interactions. The SRMP includes specific road density targets for two watersheds.

Type of monitoring: Collecting indicator data.

Possible leaders: To be identified.

Possible partners: Grizzly Bear Conservation Strategy, Ministry of Forests, forest companies, Tony Hamilton.

Status: Pursuing funding via Grizzly Bear Conservation Strategy.

Funding: From proposal development budget ($2,500 total; see Table 2).

Abstract: This project aims to measure road density per watershed within the Babine using a roving window approach. To improve the robustness of the study, it will include nearest community and estimates of the amount of bear use per watershed as model variables and will investigate the success of access controls and the extent of mitigative activities (e.g. screening, line-of-sight). Orthophotos and digital access-control points exist for the Bulkley but not for the Kispiox.

Consequence for knowledge base: This project will allow for assessment of current risk and associated uncertainty to human/bear interactions in relation to open road density.

Consequence for management: This project will support management decisions, through appropriate processes which are separate from the BWMT, by showing the level of risk and uncertainty associated with current open road densities in each watershed. It may increase confidence in current activities, suggest further monitoring projects or lead to initiation of a plan-amendment process.

Table 5. Funding decisions for high priority topics for collecting indicator data. Topics are ordered by relative priority as determined by Monitoring Framework[4]. Topics below the dashed lines have a low priority for funding within the next 5 years.

Objective	Indicator	Decision	Project #	Project name	Funding	Project length	Rationale if not funded
Stand structure	% of natural	Seek funding in 2005	2005-5P[5]	Stand-level biodiversity	Proposal budget	1 – 3 years	High priority to fund, but insufficient funds in entire annual budget to complete project; requires coordination over broader area; ideal candidate for graduate student
Fish habitat	% of natural riparian habitat	Fund in 2005	2005-1	Riparian ecosystems	$20,000	1 year	—
Riparian biodiversity	% of natural riparian habitat	Fund in 2005	2005-1	Riparian ecosystems	Include in 2005-2	1 year	—
Rare ecosystems	% of natural	Re-assess in 2006	—	—	—	—	Requires PEM - analyses in progress; PEM should be available by spring 2006
Human/bear interaction	Road density	Seek funding in 2005	2005-6P	Human/bear interaction and open road density	Proposal budget	1 year	Potential funding partner exists to allow completion of more robust analysis
Human/bear interaction	Screening	Seek funding in 2005	2005-6P	Human/bear interaction and open road density	Include in 2005-6P	1 year	Modifies above study
Human/bear interaction	Education	Not funded	—	—	—	—	Uncertainty not resolvable within the Babine
Water quality	Stream crossing	Fund in 2005	2005-2, 2005-3	Water quality and stream crossings	$14,000	1 year	—
Water quality	Landslides	Re-assess in 2006	—	—	—	—	Some data already collected and analysis in progress - re-assess status before pursuing
Water quality	Planning	Not funded	—	—	—	—	—
Bull trout	Bridge location	Not funded	—	—	—	—	—
Bull trout	Protected habitat	Not funded	—	—	—	—	—

[4] Ordered by secondary score (all topics have high priority for data collection; see Monitoring Framework for methods www.babinetrust.ca).
[5] Project numbers followed by a "P": proposals will be prepared to seek funding (i.e. no operational budget in 2005).

Table 5 (Continued). Funding decisions for high-priority topics for collecting indicator data.

Objective	Indicator	Decision	Project #	Project name	Funding	Project length	Rationale if not funded
Steelhead	Repeated capture	Not funded	—	—	—	—	—
Deciduous stands	% of natural	Not funded	—	—	—	—	—
Wildlife	% of wildlife areas in ETDs	Not funded	—	—	—	—	—
Water quantity	ECA	Not funded	—	—	—	—	—
Connectivity	Winter logging	Not funded	—	—	—	—	—
Timber salvage	% susceptible	Not funded	—	—	—	—	—
Timber salvage	% controlled	Not funded	—	—	—	—	—
Timber salvage	% salvaged	Not funded	—	—	—	—	—
Backcountry recreation	Amount primitive	Not funded	—	—	—	—	—
Gunanoot Lake	Visual quality	Not funded	—	—	—	—	—
Pine mushroom habitat	% mature sites	Not funded	—	—	—	—	—
Huckleberries	% sunlight in cutblocks	Not funded	—	—	—	—	—
Huckleberries	% soil disturbance	Not funded	—	—	—	—	—
Access to recreation	Inaccessible destinations	Not funded	—	—	—	—	—

Table 6. Funding decisions for high-priority topics for monitoring to improve knowledge and reduce uncertainty. Topics are ordered by relative priority as determined by Monitoring Framework[6]. Topics below the dashed lines have a low priority for funding within the next 5 years.

Objective	Indicator	Decision	Project #	Project name	Funding	Project length	Rationale if not funded
Natural seral	% of natural old and old + mature	Re-assess in 2006	—	—	—	—	Requires PEM - analyses in progress; PEM should be available by spring 2006
Tree species	% of natural	Seek funding in 2005	2005-5P	Stand-level biodiversity	Include in 2005-5P	1 – 3 years	Ideally included with stand-level biodiversity study that also looks at stand structure
Pattern	% of natural (biggest patch)	Not funded	—	—	—	—	Overlapping uncertainties mean that reducing resolvable uncertainty would not appreciably reduce total uncertainty
Connectivity	% of mature and old	Seek funding over long-term	—	—	—	—	Low priority within biodiversity
Grizzly habitat	% high-value	Seek funding over long-term	—	—	—	—	Low priority within grizzly bears
Goat habitat	% unmodified nearby	Re-assess in 2006	—	—	—	—	Analysis in progress - re-assess status before pursuing
Goat habitat	Harvest during natal period	Re-assess in 2006	—	—	—	—	Analysis in progress - re-assess status before pursuing
Wilderness value of BRC	Auditory disturbance	Fund in 2005	2005-4	Wilderness value of BRC	Include in 2005-4	2 – 3 years	This topic is a sub-set of Project 2005-4 listed in Table 7
Wilderness value of BRC	Visual quality	Not funded	—	—	—	—	—
Grizzly bear habitat	% critical habitat	Not funded	—	—	—	—	—
Goat habitat	Kotsine connector	Not funded	—	—	—	—	—
Goat population	Road density	Not funded	—	—	—	—	—

[6] Ordered by priority to reduce uncertainty and then by secondary score (see Monitoring Framework for methods www.babinetrust.ca).

Table 6 (Continued). Funding decisions for high-priority topics for monitoring to improve knowledge and reduce uncertainty.

Objective	Indicator	Decision	Project #	Project name	Funding	Project length	Rationale if not funded
Timber growth	% old	Not funded	—	—	—	—	—
Grizzly bear disruption	Forest harvesting	Not funded	—	—	—	—	—
Grizzly bear disruption	Other activities	Not funded	—	—	—	—	—
Sustainable use	Campsites	Not funded	—	—	—	—	—
Timber salvage	% susceptible	Not funded	—	—	—	—	—

Table 7. Funding decisions for high-priority topics for monitoring to detect negative consequences. Topics are ordered by relative priority as determined by Monitoring Framework[7]. Topics below the dashed lines have a low priority for funding within the next 5 years.

Objective	Indicator	Decision	Project #	Project name	Funding	Project length	Rationale if not funded
Sustainable use	Encounters in Natural Environment Zone	Fund initial study; pursue additional funding	2005-4	Wilderness value of BRC	$5,000 this year	2 – 3 years	—
Natural seral	% of natural old and old + mature	Re-assess in 2006	—	—	—	—	Requires PEM—analyses in progress; PEM should be available by spring 2006
Tree species	% of natural	Not funded	—	—	—	—	Difficult to detect
Pattern	% of natural (biggest patch)	Not funded	—	—	—	—	Difficult to detect
Connectivity	% of mature and old	Not funded	—	—	—	—	Very difficult to detect
Goat habitat	% unmodified nearby	Not funded	—	—	—	—	Very difficult to detect
Goat habitat	Harvest during natal period	Not funded	—	—	—	—	Very difficult to detect
Timber salvage	% susceptible	Not funded	—	—	—	—	Data already collected
Wilderness value of BRC	Auditory disturbance	Fund in 2005	2005-4	Wilderness value of BRC	Include in 2005-4	2 – 3 years	Can include in 2005-4 at low extra cost
Sustainable use	Floatcraft encounters	Fund in 2005	2005-4	Wilderness value of BRC	Include in 2005-4	2 – 3 years	Can include with 2005-4 at low extra cost
Wilderness value of BRC	Visual quality	Not funded	—	—	—	—	—

[7] Ordered by priority to detect consequences and then by secondary score (see Monitoring Framework for methods www.babinetrust.ca).

Abbreviations

BRC ..... Babine River Corridor
BWMT ..... Babine Watershed Monitoring Trust
ECA ..... Equivalent Clearcut Area
ETD ..... Enhanced Timber Development Zones
FRPA ..... The British Columbia Forest and Range Practices Act
GIS ..... Geographic Information System
LRMP ..... Land and Resource Management Plan
LUP ..... Landscape Unit Plan
MDS ..... Management Direction Statement
MSRM ..... Ministry of Sustainable Resource Management
PEM ..... Predictive Ecosystem Mapping
SFM Network ..... Sustainable Forest Management Network
SRMP ..... Sustainable Resource Management Plan
WLAP ..... Ministry of Water, Land and Air Protection