

SCIENCE

PROGRAM

LAKE LOUISE, YOHO AND  
KOOTENAY NATIONAL PARKS

1998/99

## PROJECT DESCRIPTION

# SUMMER USE STUDY

Visitor use on what is now the Lake Louise ski area began in 1950 as a summer use operation. Over the years the use changed from just a summer operation to a winter ski area. The Banff Bow Valley Study recommended that "no commercial use of the Skiing Louise or Mount Norquay facilities should be permitted outside of the normal winter season. Human use, including maintenance personnel, Parks Canada staff and independent users, not exceeds a maximum of 100 people per month. A number of recreational and commercial uses currently exist within the area. Use greatly exceeds the 100 people per month. The Summer Use Project will review existing summer uses with the Skiing Louise Lease area. Information on current and historical conditions, and visitor experience information will be compiled. This information will be used as a basis for a decision on the direction for summer use at the ski area.

## RESULTS

- completion of a summer use study that provides direction for the management of summer use at the Lake Louise ski area.

## JUSTIFICATION

The Banff National Park Management Plan utilized the information in the Bow Valley Study and proposed the following strategy.

Strategic Goal (Section 5.8.1)

C "To implement a strategy for summer and winter use of the three ski areas. The strategy will support the long term viability of the ski hills, while keeping the impact on ecological integrity to a minimum."

Objectives (Section 5.8.2)

C "To ensure summer use of ski areas considers questions of habitat security, wildlife movement and human-wildlife conflicts"

Key Actions - Summer Use, Skiing Louise (Section 5.8.3)

C Complete a review of the existing summer activities at Skiing Louise within one year. Recommend whether these activities should continue and if so, the mitigation measures required.

## LINK TO DECISION MAKING

The product of this work will be used to manage the ski hill.

## LEVEL OF INVESTMENT

1998/99	Completion of Summer use Study	\$15.6
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## COLLABORATORS

:Banff National Park

## YOHO AND KOOTENAY BOUNDARY ISSUES

The health of the ecosystems of Kootenay and Yoho National Parks is impacted by a number of land uses immediately outside park boundaries within British Columbia. Protecting sensitive wildlife habitat/corridors and managing increased park access are some of issues facing managers within Yoho and Kootenay Parks. One of the central objectives of park management is to develop more effective working relationships with neighbouring land managers so that park ecosystems can be better protected and maintained.

Good working relationships currently exist at the field level. Developing decision-making mechanisms and working relationships at the more senior levels of the Parks organization is more problematic. The Kootenay and Yoho management planning programs will be used as a opportunity to foster better working relationships and more sustained strategic working alliances at the senior management level.

### RESULTS

- collaborative decision-making with province of British Columbia and neighbouring land managers on boundary-related issues including:

- the identification and management of sensitive cultural resources
- the identification and management of sensitive wildlife habitat and wildlife corridors
- the management of sensitive access points in wildland settings

### JUSTIFICATION

This project is part of a larger initiative to develop better working relationships with our neighbours while at the same time developing strategies to resolve longstanding issues. Management planning offers an opportunistic venue for meeting with government, business and others to identify the issues and to develop long-term management strategies.

### LINK TO DECISION-MAKING

The results of this project will contribute to park decisions relating to management of park ecosystems. Working relationships and collaborative strategies established in the context of the management planning program will be the major product.

### LEVEL OF INVESTMENT AND DURATION

C 1998-99	Meeting with neighbours	\$ 3.0
C 1999-2000	Consultation on Draft Management Plan	\$15.0

### COLLABORATORS

C Rod Pickard will be project supervisor. Members of the park management team and the park planning team will be part of the process.

## PROJECT DESCRIPTION

# BURGESS SHALE MANAGEMENT FRAMEWORK

The Burgess Shales are considered by many paleontologists to be the most significant fossil bed in the world (Gould 1989). Based on its paleontological significance, Burgess Shale was declared a UNESCO World Heritage Site in 1981. Tens of thousands of fossils have been extracted from the site since its discovery in 1909. The Royal Ontario Museum has collected large quantities of fossils since 1975.

At present, there is a considerable demand for Burgess Shale research. The Royal Tyrell Museum of Paleontology is interested in established a major display of Burgess Shale fossils. Recent concerns have been raised that quarrying operations for fossils at the Walcott Quarry are reaching the limits of what can reasonably be extracted using hand tools.

To date, no plan has been produced that addresses management of research activities visitor access and related issues. This information will be needed for the update of the Yoho National Park Management Plan. The Burgess Shale Management Framework will address these issues, thus providing the necessary direction for the management plan.

## RESULTS

- research and visitor use strategies for the Burgess Shale world Heritage Site including:
  - access of research institutions to the site
  - a science strategy developed in consultation with the science community
  - access of Burgess Shale Foundation and affiliated groups to Burgess Shale
  - acceptable research methods
  - commercial operators and coordination of guided hikes
  - interpretation of Burgess Shale

## JUSTIFICATION

Burgess Shale is a World Heritage Site that requires protection and presentation worthy of its international status. Current research at the site is consumptive and could be removing the last vestiges of one of the most significant fossil beds in the world. The site is in urgent need of a management strategy.

## LEVEL OF INVESTMENT

C	1998/99	Development of Management Framework	\$10.0
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## COLLABORATORS

C	Heritage Conservation
C	Front Country (John Aldag)

## PROJECT DESCRIPTION

# YOHO AND KOOTENAY MANAGEMENT PLANS

Park management plans are essential for the direction of park managers. They are commitments to the public of Canada from the Minister responsible for Parks Canada regarding the use and protection of national parks. The 1988 amendments to the National Parks Act state that the maintenance of ecological integrity must be the first consideration in management planning. Appropriate public participation at the national, regional and local levels is an essential part of the development of management plans. The last management plans for Yoho and Kootenay were prepared in 1988. A major rewrite is now required to update the plans.

## RESULTS

- updated management plans for Kootenay and Yoho National Parks that:
  - C reflects the current direction in the 1997 Banff National Park Management Plan
  - C provides statements of management direction in sufficient detail to indicate how both parks will protect and represent the natural and cultural aspects of its region
  - C describes the type and degree of resource protection and management needed to assure the ecological integrity of the park and the management of its cultural resources;
  - C identifies the type, character and locale of visitor facilities, activities and services
  - C provides mechanisms for other levels of government, private organizations and individuals responsible for adjacent areas to participate in the planning program
  - C provides appropriate opportunities for public participation at the national, regional and local levels

## JUSTIFICATION

Management plans provide the framework for decision-making within each park. The National Parks Act requires public consultations during the preparations of park management plans and stipulates that the maintenance of ecological integrity through the protection of natural resources will be the first priority when considering park zoning and visitor use.

The recent Bow Valley Study and subsequent Banff National Park Management Plan provide an excellent context and starting point for the Yoho and Kootenay planning exercises.

## LINK TO DECISION MAKING

- all park management including the maintenance of ecological integrity, human use management, and stakeholder collaboration

## LEVEL OF INVESTMENT

1998/99	Draft Plan and initial consultations	\$75.0
1999/2000	Final consultation, final plan and printing	\$75.0

## COLLABORATORS

- C park management team
- C park planning team

## PROJECT DESCRIPTION

# BIGHORN IN OUR BACKYARD - COMMUNITIES WORKING FOR WILDLIFE

Bighorn In Our Backyard is a research and educational project that focuses on local and regional ecosystem integrity issues. The past, present and future status of Rocky Mountain bighorn sheep provide a vehicle for presentation and discussion of the broader ecosystem issues that need to be addressed in the southern Rocky Mountain Trench.

While significant efforts have been made to protect and enhance the Radium Sheep Band and their habitat in the past, few people in the surrounding community have even a basic understanding of their biology, ecology, seasonal movements, habitat needs or that their community over lays a significant portion of the band's winter range. Indeed, some residents see the "Park Sheep" as a nuisance.

A regional atmosphere of accelerated human growth, fragmentation of habitat, park boundary access, poaching, highway mortality, ATV- scouring of sensitive grasslands, non-native vegetation outbreaks, harassment from stray dogs and exposure to contaminants are all contributing to a increased stress load on the wild sheep and ecosystem of the Radium Hot Springs area.

## RESULTS

- Completion and presentation of a comprehensive communications program about the local sheep band and ecosystem issues to be delivered to community residents, businesses, Chamber of Commerce, Town Councils, and Regional District.
- Establish a wild sheep monitoring program that involves community residents.
- An up-dated assessment of winter range within and adjacent to Radium town site. *Emphasis will be on identifying potential community-based, habitat rehab projects.*
- Preliminary research and promotion of a Wild Bighorn Sheep Festival

## JUSTIFICATION

This project supports Parks Canada 's initiative of ecosystem based management. This project offers an opportunity to apply research and education to a potential high profile case study where the principles and issue related to ecological integrity, protected area boundaries, community outreach and sustainable communities can be researched and promoted.. Ecological inventories of the proposed study areas need updating.

## LINK TO DECISION MAKING

By involving community groups and individuals it is believed that a more deep rooted and longer lasting base of support can be developed for the Radium Bighorn band. In the long term this should enable Parks Canada to make decisions in a receptive social climate that are proactive in regard to the wild sheep band and the larger ecosystem. The results of Bighorn in Our Backyard will be transferable to other protected areas and to the broader regional ecosystem.

## LEVEL OF INVESTMENT AND DURATION

	To Date	1998-9	1999-00	2000-2001
Project Cost	\$66,000.00	\$13,000.00		
Park Cost	\$26,000.00	\$13,000.00		

## COLLABORATORS

- \* Foundation for North American Wild Sheep
- \* Columbia Basin Fish & Wildlife Compensation Program
- \* Environment Canada
- \* Guide Outfitters Association of British Columbia
- \* Ministry of Environment Lands & Parks
- \* Windermere School District # 4
- \* Robert Bateman

## PROJECT DESCRIPTION

# ENVIRONMENTAL EDUCATION KIT - KOKANEE IN THE CLASSROOM

Kootenay National Park embarked on an action strategy to upgrade the heritage educational resources it offers teachers, students and the informal educational community. A key component of the strategy is the development of top quality educational resources that teachers can use in their classrooms and in the field. The development of these resources will be closely linked to provincial curriculum and identify learning objectives, and to the natural and cultural heritage values of Kootenay National Park and the regional ecosystem.

## RESULTS

To produce a top quality, locally developed and applicable resource package that use kokanee salmon as an educational vehicle for exploring issues pertaining to aquatic ecology, fish biology, environmental and cultural sustainability .

## JUSTIFICATION

This project supports Parks Canada's initiative of ecosystem based management and provides direct results for a number of business plan strategies: providing outreach activities and products which promote understanding of ecosystem issues and encourage advocacy of local and regional environmental issues ; identify and strengthen services to educate community residents...and youth in basic park awareness, ecosystem and biodiversity messages

## LINK TO DECISION MAKING

Through our efforts we strive to develop in students:

- \* value for the role of protected areas within the regional ecosystem
- \* environmental and cultural literacy
- \* informed decision-making and responsible action

## LEVEL OF INVESTMENT AND DURATION

Most of the previous investments were for the Wild Sheep of North America Edu-kit

	To Date	1998-9	1999-00	2000-2001
Project Cost	\$50,000	\$50,000	\$7,000	\$7,000
Park Cost	\$14,000	\$7,000	\$7,000	\$7,000

## COLLABORATORS

- \* Rocky Mountain School District
- \* Ministry of Environment, Lands and Parks
- \* Past partners: Foundation for North American Wild Sheep, Guide Outfitters' Assoc. of B.C., Environment Canada, Columbia Basin Fish and Wildlife Compensation Program



## PROJECT DESCRIPTION

# LIBRARY ORGANIZATION

Kootenay National Park library, in previous years was maintained in a reasonable working order. Over the past few years the library has had little attention and is therefore in need of an upgrade to become a useful resource

## RESULTS

Cull and catalogue the existing library to focus on Kootenay National Park, District west and Regional area including the Columbia Valley and Parks Canada Rocky Mountain District

## JUSTIFICATION

Library services are subject to many Acts and their policies. Libraries are important repositories of corporate and program specific information. Employees have increasingly opted to develop "Private" collections at their workstations. This "Squirreling" of information resources has resulted in worsening economies of scale and fewer readers per title, but for many it is seen as the only way to keep track of valued materials

## LINK TO DECISION MAKING

There is a requirement to make information easily accessible to the organization's decision-makers and readily available to staff and the public.

## LEVEL OF INVESTMENT AND DURATION

	To Date	1998-9	1999-00	2000-2001
<b>Project Cost</b>	\$3,000	\$20,000		
<b>Park Cost</b>	\$3,000	\$20,000		

## COLLABORATORS

- all functions within KYLL Field Unit

## PROJECT DESCRIPTION

### GOLDEN TRIANGLE AUTO TOUR

An Auto Tour publication to educate the visiting public on the special features of the national parks and surrounding area in the Golden triangle. The saleable publication will interpret the ecological significance, special features and points of interest along the #1 highway between Lake Louise and Golden, #95 between Golden and Radium, and the #93 between Radium and Lake Louise.

## RESULTS

- highlight and encourage appropriate heritage tourism opportunities in the Golden/Radium/ Lake Louise area.
- educate the public on the special features and ecological significance and issues in the Lake Louise, Yoho Kootenay ecosystem.

## JUSTIFICATION

- presentation of ecological integrity and cultural heritage
- improves service to public by providing information on ecological integrity of area
- highlights and encourages heritage tourism opportunities and partnerships

## LINK TO DECISION-MAKING

- presents ecosystem-based management issues to public so there is an opportunity to gain understanding and public support for management decisions
- provides opportunity for stakeholders and outside park businesses to provide input and collaborate with park in production and distribution, again increasing public support and sense of working with park for everyone's benefit

## LEVEL OF INVESTMENT AND DURATION

	To Date	1998-9	1999-00	2000-2001
<b>Project Cost</b>	\$3,000	\$14,000		
<b>Park Cost</b>	\$3,000	\$4,000		

## COLLABORATORS

- printing costs covered by Friends of Kootenay
- input to writing and distribution from local businesses, stakeholders and agencies

## PROJECT DESCRIPTION

# EDUCATION PARTNERSHIPS

Educational Partnerships is just that. It is away to combine energies and dollars to forge new relationships with those with compatible objectives, including private sector.

## RESULTS

To increase the number of well functioning partnerships with outside agencies and private sector operators in providing "educational" products and service..

## JUSTIFICATION

This project supports Parks Canada's initiative of ecosystem based management and provides direct results for a number of business plan strategies: Leverage resources with other partners; providing outreach activities and products which promote understanding of ecosystem issues and encourage advocacy of local and regional environmental issues ; identify and strengthen services to educate community residents..and youth in basic park awareness, ecosystem and biodiversity messages

## LINK TO DECISION MAKING

Through our efforts we strive to develop in students and community residents

- \* value for the role of protected areas within the regional ecosystem
- \* environmental and cultural literacy
- \* informed decision-making and responsible action

## LEVEL OF INVESTMENT AND DURATION

	To Date	1998-9	1999-00	2000-2001
Project Cost	\$4,500			
Park Cost	\$1,500	\$5,000	\$5,000	\$5,000

## COLLABORATORS

- \* Rocky Mountain School District
- \* Royal British Columbia Museum

## PROJECT DESCRIPTION

### LAKE O'HARA IMPLEMENTATION

Considerable resources have been spent on completing the field component of the Lake O'Hara Socio-ecological Research Project. This four year research project has looked at the issue of the allocation of land uses between competing species (grizzly bears and humans) from both the ecological and social science perspectives. The project is developing a computer based decision support model which will be used to assist Park managers in determining a human use management strategy for the Lake O'Hara area of Yoho National Park.

Once decisions have been made on the management strategy, it will be imperative at ensuring that stakeholders and the public are aware of and understand the results. This will require a comprehensive and targeted communication program.

### RESULTS

There will need to be a program consisting of:

- on site fixed signage (regulatory indicating trail closures/openings) and (informational describing rationale for the management actions, decision support process, ecological/social information)
- newspaper (describing management actions to public and stakeholder)
- printing and dissemination of final report
- preparation of summary pamphlet for distribution to visitors

### JUSTIFICATION

It is essential that Parks be observed as being transparent in its decision making process. By ensuring that the results of the O'Hara project are communicated fully, Parks will be observed as meeting this obligation.

Furthermore, Lake O'Hara is a very high profile area and is subject to intense public scrutiny. The results of the research project are of considerable interest to a variety of stakeholders and public and there will be a demand to understand the process behind decisions applied to the area .

### LINK TO DECISION MAKING

This project represents the implementation of the results of the decision making process.

### LEVEL AND DURATION OF INVESTMENT

YEAR	To Date	1998 - 1999	1999 - 2000
PROJECT COSTS	235.0	3.0	
PARK COSTS	160.0	3.0	

### COLLABORATORS

Lake O'Hara Lodge Inc., Lake O'Hara Trails Club, World Wildlife Fund, Parks Canada, BC MOE

## PROJECT DESCRIPTION

# TRUCKER INFO KIOSK

Heavy commercial and recreational traffic causes an unacceptable wildlife mortality rate.

## RESULTS

Construct small wildlife kiosks at each of the major truck pullouts on Highway 93 South (Sinclair Summit and Storm Mountain). The main idea being to enhance wildlife information available to the truckers.

## JUSTIFICATION

This was agree to at the Kootenay Parkway Standing Committee meeting November 20, 1997

## LEVEL OF INVESTMENT AND DURATION

	To Date	1998-9	1999-00	2000-2001
Project Cost		4.0		
Park Cost		1.0		

## COLLABORATORS

Members of the Kootenay parkway Standing Committee

## PROJECT DESCRIPTION

### ARCHAEOLOGY/HISTORICAL WILDLIFE ASSESSMENT

This project is intended to provide a variety of temporal perspectives on environmental conditions and the role of humans in ecosystems of Kootenay National Park and surrounding areas as far back as 10,000 years before present. Eco-history sub-projects examine ecological change through paleoecological studies, repeat photography, archaeological investigations, and review of early explorer journal reviews and other historical records.

Several of these sub-projects have already been completed under Green Plan funding which was received in 1994-5, 1995-6, and 1996-7. In 1996-7 an archaeological project, "People in the Mountain Ecosystem: a Paleocultural-Paleoenvironment Study", was initiated which will require several additional years to complete. Additionally, in 1996-7 some funds from the eco-history project were deferred until 1997-8 in order to take advantage of opportunities for collaborating with the Province of BC on repeat photograph projects.

The wildlife component of the project will include an assessment of wildlife population change through time. It will look at historical accounts and documentation in order to determine presence/absence, relative population size by species, and area of occurrence. This information/data will be analysed and compared to current wildlife monitoring data to determine issues relating to the maintenance of viable wildlife populations both within and external to the Parks.

## RESULTS

### Field work:

- archaeological studies
- repeat photography
- paleoecology (palynology) - fire history, vegetation & climate change

Wildlife assessment will produce a document which defines the historical status of wildlife populations within the ecosystem.

## JUSTIFICATION

Mandate/Policy: Ecological integrity; understanding of ecosystem components and processes, including human influences on ecosystems (natural ranges of variation of vegetation types and disturbance processes); restoration of impaired ecosystems; development of an integrated information system incorporating ecological, social, economic and cultural information.

## LINK TO DECISION MAKING

Results from the eco-history project are crucial for understanding pre-settlement ecological conditions in the Rocky Mountains west slopes region, and are relevant for development of restoration strategies in vegetation and wildlife management. Results are also very relevant to identification of, understanding,

and protection of cultural resources associated with early human inhabitants of the ecosystem (linkages to land claim discussions of First Nations).

### LEVEL OF INVESTMENT AND DURATION

Year	To Date	1998 - 1999	1999 - 2000	2000 - 2001
Project Cost	111.0	20.0		
Park Cost	111.0	20.0		

### COLLABORATORS

- Archaeological Services - Calgary
- Parks Canada
- University of Calgary
- BC Ministry of Small Business, Tourism and Culture

## PROJECT DESCRIPTION

### CARNIVORE MANAGEMENT UNITS (CMU)

The carnivore management unit concept has been proposed within the Banff Park Management Plan as a method of managing human use to achieve habitat effectiveness targets for large carnivores (grizzly bears). It is one method of addressing the Bow Valley Task Force recommendations relating to the management of human use levels to help provide secure, high quality habitat for carnivores that are sensitive to the presence of humans.

The application of habitat effectiveness analysis has been derived from the USDA Forest Service Cumulative Effects Model. This model analyses a combined habitat (food, cover, edge protein and grazing impact) and displacement (type, nature, and intensity of human activity) layer to assess overall habitat effectiveness.

To implement the CMU concept, the following steps are required:

- the park is subdivided into carnivore management units (which approximate watersheds, or parts of watersheds (i.e. geographic areas the size of a female grizzly bear's home range).
- Geographic Information Systems (GIS) and existing resource inventory data are used to determine the habitat quality for each unit.
- the types and intensities of human use and development are determined and a "disturbance" rating is calculated (i.e. percentage of pristine value).
- a target habitat effectiveness value is assigned to each CMU (generated by Park mgmt.)
- human use is managed to achieve the assigned habitat effectiveness target. Various management options exist for managing human use.

Some of the work has already been completed for this project in an earlier application of the model to Yoho and Kootenay Parks (1993). This project will therefore be directed at performing another "run" of the model based upon current human use data and revisions to natural resource data which have been acquired since 1993.

## RESULTS

- GIS will be used to produce visual products of the carnivore management units in Yoho and Kootenay Parks.
- The completion of the model will provide the Field Unit with current habitat effectiveness ratings and will provide the basis upon which effectiveness targets are derived.
- the completion of the analysis for Yoho and Kootenay Parks will allow for integration with the Banff work already completed and the Jasper work in progress. The final result will be a current Mountain Parks cumulative effects model for grizzly bears.

(a value added project, being coordinated by Banff, is developing an interactive version of the carnivore management unit analysis. This product is intended to be used to educate and inform stakeholders and visitors on the approach being used by Parks Canada to manage human use. It is intended that the enlarged CMU model prepared for the Mountain Parks be incorporated into the interactive model currently developed for Banff NP).



## JUSTIFICATION

The application of the carnivore management unit concept has been endorsed and requested by senior levels of Parks Canada Management. The determination of target habitat effectiveness ratings will be a critical inclusion into the updated Park Management Plans for Yoho and Kootenay Parks.

## LINK TO DECISION MAKING

The habitat effectiveness targets will be used in the Management Plans to indicate Parks intent for the management of human use.

## LEVEL OF INVESTMENT AND DURATION

YEAR	To Date	1998 - 1999	1999 - 2000	2000 - 2001
PROJECT COSTS	40.0	20.0	10.0	
PARK COSTS	40.0	20.0	10.0	

## COLLABORATORS

- Banff National Park
- Jasper National Park
- GIS consultants
- stakeholders

## PROJECT DESCRIPTION

# STRATEGIC SCIENCE ASSESSMENT

The importance of ecological integrity in National Parks is clearly defined in the legislation and policy, and the LLYK Field Unit faces some unique challenges in fulfilling that mandate because of the recent amalgamation of the field unit. These challenges include current knowledge gaps, historic monitoring programs, external resource management issues, the initiation of "State of the Park" reporting, the existence of various issue specific strategies such as the carnivore conservation/wildlife/vegetation strategies, and continuing advances in scientific knowledge. While individually, each of these factors are worthy of consideration, an integrated approach to program development based on a clear vision and principles will be required to ensure that the mandate is met.

An approach similar to the Ecosystem Workshop held in Elk Island National Park is being proposed as a means of achieving integration. The initial goal is for the Field Unit to produce a vision of ecological integrity and the principles by which it will be managed for. Using this as a reference, a workshop is then held to identify a full set of ecological, social and economic issues facing the park. These issues are then prioritized, and initial strategies suggested for the highest priority issues. A vision-principles-issues-strategies hierarchy will be used to form the basis of the strategic direction and will consist of the following components:

- Vision - developed by the group -
- Principles -
  - principles from thematic strategies
  - principles from national documents
  - principles from Banff mgmt plan
- Issues - review and expand upon existing list.
  - develop mechanism for prioritization of issues list
  - issues would include: management decisions, knowledge gaps, valued species, potential indicator species, etc.)
- Strategies - developed at a workshop or after in conjunction with external experts (briefly describe how each of the top issues would be addressed [research, monitoring, cooperation with internal and external stakeholders, interpretation program etc.)
  - prioritization, implementation and review (responsibility of Park)

Overall, it is felt that the following four key objectives can be accomplished through the hosting of workshops:

- provides the Field Unit with a peer reviewed science program against which funding and management decisions can be made.
- critical input to the management plan re-write.
- provides a mechanism for educating and involving regional stakeholders in the identification and resolve of regional ecosystem/land-use issues.
- can integrate social, economic and ecological issues

## RESULTS

- development of an ecological vision
- identification of principles (ecological, socio-economic)

- identification of issues facing the park.
- prioritization of the issues
- development of initial strategies for the highest priority issues
- final written products of all discussions

**JUSTIFICATION**

- will provide a context for and a review of the existing science program.
- profiles and develops credibility and scientific support for the Field Unit
- will integrate the three geographic areas of the Field Unit into one managed unit
- will take an integrated look at all of the internal and ecosystem issues that face the Field Unit and will give it a level of analysis which is unattainable with existing staff or resources.
- will fully integrate ecological, social and economic criterion.

**LINK TO DECISION MAKING**

- will provide direction for funding of ongoing science program
- will ensure the most efficient use of funds by establishing a prioritized and peer reviewed science program
- will feed into development of Management Plans for Yoho and Kootenay

**LEVEL OF INVESTMENT AND DURATION**

YEAR	To Date	1998 - 1999	1999 - 2000	2000 - 2001
Project Costs		80.0	20.0	
Park Costs		80.0	20.0	

**COLLABORATORS**

- a scientific steering committee will be organized to assist with workshops organization and participant selection.
- numerous external agencies, groups and academics from various disciplines will be involved in the workshops.

## PROJECT DESCRIPTION

### HUMAN USE MODELLING

Human use management involves the direction and guidance of people, their numbers, their behaviour, permissible activities and the necessary infrastructure. The objective of human use management is to allow people to visit a national park without damaging its ecological integrity while ensuring a quality visitor experience.

Currently, there is little direct management of human use in parks. It is a situation that cannot continue if Parks Canada is to offer quality visitor experiences and fulfill its mandate of ecological integrity. While human use may require some restrictions, it is not a limitation on people's freedom. It should be seen instead, as a means to protect the park for future generations, while allowing as many people as possible to enjoy the experiences and activities it has to offer.

At present, there is little known about the levels of intensity and types of users visiting Lake Louise, Yoho and Kootenay. Even less is known about the human activities occurring adjacent to the District on provincial crown lands. External human use can have similarly significant or greater impacts than activities occurring within Parks due to the unrestricted and motorized nature of most external opportunities. The acquisition of the baseline data on human use is necessary if prudent land management is to be realized.

Furthermore, the recent acceptance (by the ADM) of the principles of the grizzly bear cumulative effects model and the application of carnivore management units within the Banff Management Plan emphasize the need for accurate and current human use data.

## RESULTS

- collection of human use data to increase understanding of:
  - seasonal and temporal patterns of f/c and b/c recreational use
  - user type and level of use by activity
  - distribution of b/c visitors spatially across peak and shoulder seasons
  - seasonal use (type and level) outside of Parks
- assemblage of human use data and text similar to components within the Bow Valley Study Technical Report.

## JUSTIFICATION

- Bow Valley Study
  - research recommendations - trail use - plan to minimize conflicts among users, conflicts among user groups (assess conflicts in b/c areas: implement), crowding and visitor satisfaction (assess perceptions of crowding in popular areas), human use data (survey numbers and activities of visitors and residents), quality of visitor experience (develop social indicators and assess quality of experience), visitor behaviour (assess how to best change visitor behaviour), human use data base (monitor numbers and activities of visitors & residents), human use management (develop and implement plans Parks-wide; update).

- Banff PMP (1997) "people's values, interests, and concerns as they relate to the ecosystem will be considered in all decision-making associated with that ecosystem."
  - "to improve understanding of elements of the ecosystem, including the role of human activities, through monitoring of trends and ensuring development of scientific expertise and ecosystem knowledge."
  - contribution to development of b/c mgmt. plan.
  - application of cumulative effects model to carnivore management units.

### LINK TO DECISION MAKING

- issues of trail/area closures relating to the management of human use.
- response to access management planning initiatives outside of Parks.
- determination and impacts to human use levels of habitat effectiveness targets

### LEVEL OF INVESTMENT AND DURATION

YEAR	To Date	1998 - 1999	1999 - 2000	2000 - 2001
PROJECT COSTS	4.0	16.0	16.0	
PARK COSTS	4.0	16.0	16.0	

### COLLABORATORS

- Parks Canada - District West
- Parks Canada - Calgary Service Centre

## PROJECT DESCRIPTION

### MOOSE-DAINARD

The Moose/Dainard Creek Valleys have been recognized both as important external habitats and movement corridors for the maintenance of a viable regional grizzly bear population, and as areas which provide for wilderness recreational opportunities not available with the adjacent National Parks.

The Moose-Dainard project focuses upon the wildlife issue and proposes to assess the value of the valleys by evaluating the bear habitat provided by several critically important plant species utilized by foraging bears. The research will provide baseline data on relative levels of distribution and abundance of these species in the provincially managed land base adjacent to national park lands. Baseline data will allow for continuing and future ecosystem research that investigates the differences in community and population structure, and potential population regularizations that result from anthropogenic modifications to the landscape. These data will be used to determine relationships between grizzly bear habitat use and movements and structural forest attributes.

is assessing bear habitat and bear use within three valleys on the west boundary of Yoho and Kootenay National Parks. The Ice River, Helmet Creek will be assessed for bear habitat to add to habitat work done in Moose Creek. Moose Creek and Dainard Creek will be assessed for bear activity using DNA information gathered from hair and scat samples.

## RESULTS

The following objectives will be addressed:

1. Estimate the minimum number of bears that use the ecosystem that encompasses Moose and Dainard Creek valleys and compare this index of use with estimates derived from areas in adjacent national park lands.
2. Attempt to better identify the movement corridors for animals that are dependent on habitat requirements in both provincial and adjacent national park lands.
3. Evaluate and compare the habitat available to grizzly bears on both provincial and federal lands, and to determine seasonal usage of different habitat types. The value of the forest cover will be investigated and subjective vegetation comparisons of logged and unlogged areas will be undertaken.
4. Evaluate the potential implications of existing grizzly bear management guidelines proposed under the KBLUP Implementation Strategy and Managing Identified Wildlife Guidebook, and to make recommendations on possible improvement to these guidelines.
5. Provide recommendations for forest harvesting in the study area.
6. Acquire expanded metapopulation data for Eastern and Western Slopes bear studies.
7. Evaluate the effectiveness of applying different DNA collection methodologies to habitat evaluation, and to develop cost effective, efficient techniques that can be employed for long term monitoring of bear population trends within the area.

## JUSTIFICATION

Logging and mining activity are proposed for Moose and Dainard Creeks. Habitat assessment in the Ice River will determine its significance to regional bear habitat. Monitoring in the Moose and Dainard valleys will determine bear use levels using nonintrusive DNA fingerprinting methods. These three valleys have

been identified as being important habitat for grizzly bears and further research is required to identify critical habitat and amounts of bear activity.

### **LINK TO DECISION MAKING**

This study will assist in making the following decisions:

- Ensuring ecological integrity of bears on a landscape scale.
- Provide information for input into logging and mining plans in Moose and Dainard Creeks.
- Provide information for input into Kootenay and Yoho Bear Management Plans.
- the analysis will allow for the assessment and mitigation of impacts resulting from land-use activities that includes forest development and mining.

### **LEVEL OF INVESTMENT AND DURATION**

Year	To Date	1998/1999	1999/2000
Project Cost	26.0	35.0	10.0
Park Cost	20.0	29.0	10.0

### **COLLABORATORS**

- University of Northern BC
- BC Provincial Ministries of Environment and Forestry
- Evans Forest Products Limited
- University of Alberta
- biological consultants

## PROJECT DESCRIPTION

### ECOLOGICAL LAND CLASSIFICATION (ELC) MAP

From the period 1993 to 1996, Yoho invested significant capital resources in the completion of an updated ELC for the Park. In 1996/97 the independent field work reports were combined and a final hard copy ELC report printed. This has resulted in Yoho now having an ELC product which is consistent with the remainder of the Mountain Parks.

Yoho does not however have an updated map set to accompany the final report. Although an interim product exists, it utilized a NAD 27 base map. This base has been recently replaced by NAD 83 products in both 1:20000 (TRIM) and 1:50000 (NTS) scales. Differences between the datums do not allow a simple overlay of the ecosite digital files onto the new base. The digital files must therefore be corrected before a final map can be produced and printed.

### RESULTS

- production of a geometrically corrected base map using ecosite information and 1:50000 NTS digital files.
- incorporation of abstracted and master ELC legends.
- printing of 1000 four colour map sheets (2 sheets per set).

### JUSTIFICATION

- existing report product is useless without the map component.

### LINK TO DECISION MAKING

The ELC information is critical baseline data for ongoing management decisions (land use allocation, appropriate activities, and application of CEAA).

### LEVEL OF INVESTMENT AND DURATION

YEAR	To Date	1998 - 1999	1999 - 2000
PROJECT COSTS	292.0	10.0	
PARK COSTS	292.0	10.0	

### COLLABORATORS

- District West
- GIS contract
- printing contract





## PROJECT DESCRIPTION

# ECOLOGICAL DATABASE

The principles of ecosystem based management rely heavily upon the ability to work across administrative and ecological boundaries and within a regional scale. This need necessitates the acquisition of datasets from outside of Parks and for the greater regional ecosystem. District West has taken advantage of past land use planning exercises to acquire many of these datasets.

In the regional land use planning process occurring in the East Kootenays, national park lands are being included for calculations of forest seral stage representivity. This has the real potential of negatively affecting resources within the park and on parks ability to deliver upon its mandate. It is critical to understand the potential impacts that this provincial planning direction could have on Parks. This requires the completion of a landscape assessment using the ATLAS and SIMFOR GIS modelling environments.

## RESULTS

- the funding requested in this project will allow both the continued acquisition of digital data (thematic layers include forest inventory, biodiversity emphasis, natural disturbance typing, ungulate winter range, grizzly bear habitat/management areas, terrain stability, and fisheries) and the upgrading and analysis of existing files. All acquired data will be linked to existing Parks Canada projects or land use planning exercises which affect Parks Canada (i.e. Landscape Unit Planning as per Kootenay/Boundary Land Use Plan, 1997).
- impacts of landscape unit planning objectives will be assessed for the western boundary of Yoho and Kootenay Parks.

## JUSTIFICATION

"Decision-making must be based on an understanding of surrounding environments and the cultural systems of which they are a part." (PMP, 1997)

"It is recognized that these places are not islands, but are part of larger ecosystems and cultural landscapes. Therefore, decision-making must be based on an understanding of surrounding environments and their management." (Guiding Principles and Operational Policies, 1994).

"Increase understanding of ecosystems and human influences (deliverable by March 1998)."... "full participation with the BC Forest Service and BC Environment in landscape unit planning adjacent to Parks." (BUP, 1997).

## LINK TO DECISION MAKING

- baseline digital data is used for presentation, discussion and analysis of a multitude of regional ecosystem issues.
- impact analysis will be used directly within landscape unit planning discussions.

## LEVEL OF INVESTMENT AND DURATION

YEAR	To Date	1997 - 1998	1998 - 1999	1999 - 2000
PROJECT COSTS	28.5	17.0	20.0	20.0
PARK COSTS	28.5	17.0	20.0	20.0

## COLLABORATORS

- Parks Canada
- BC Ministry of Forests
- University of BC
- contract

## **WILDLIFE PROGRAM SUMMARY: 1998-9**

The wildlife program is developing research and monitoring approaches that are responsive both to internal decision-making in areas such as environmental assessment and human use management, and to trans-boundary management issues through cooperative research programs with other agencies and stakeholders. Much of the research is focused on medium and large carnivores. These species are generally excellent ecological indicators due to low reproductive rates, large areal requirements, sensitivity to human disturbance, and susceptibility to human-caused mortality. Some of the other research and much of a new wildlife monitoring plan are directed toward species of special management concern, including ungulates and avifauna. These latter programs also provide baseline information from which to measure environmental change, and are crucial elements of environmental impact assessment and State of the Park reporting.

Nearly all projects proposed for funding in this program are funded through multiple partners, and the KYLL business unit funds only a relatively small portion. However, research objectives have remained relevant to all partners; in part this is a realization of ecosystem-based management in which all land management agencies have come to recognize that ecosystems transcend jurisdictional boundaries and agencies must work with each other to achieve conservation goals. Major funding partners for wildlife research initiatives include the Columbia Basin Fish and Wildlife Compensation Program, BC Environment, BC Forest Service, and various funds administered by those organizations.

The credibility of the wildlife program is enhanced by the participation of these agencies and their scientists in the planning, implementation, and reporting of research initiatives. However, an increasingly large network of scientists affiliated with universities and other agencies is being engaged to review and contribute to research projects in many different ways. In addition, a review of the KYLL unit science program by a panel of scientists and Parks Canada managers in 1998-9 is expected to develop further support and recommendations for improving the scientific credibility of the wildlife program in the future.



## **PROJECT DESCRIPTION**

### **EAST KOOTENAY LYNX PROJECT**

A five year field investigation of lynx in Yoho, northern Kootenay, the middle Bow Valley and provincial lands adjacent to YNP and KNP. The project involves the collaring and monitoring of lynx to determine abundance, distribution, habitat preference and behaviour. The project will establish lynx habitat requirements and forest management guidelines to maintain lynx habitat. Study areas within the National Parks provide controls for assessing the habitat impacts of forestry activities on provincial lands.

## **RESULTS**

1. Determine lynx distribution, abundance and ecosystem association at a regional scale.
2. Develop a habitat suitability model.
3. Develop forest management guidelines to maintain lynx habitat and habitat connectivity.

## **JUSTIFICATION**

Lynx occur at low densities and are vulnerable to habitat change and over exploitation. The failure of populations to recover to historical levels despite the closure and restriction of harvesting over the past ten years has led to regional management concern for the species. No lynx studies have been done in the province and four studies within the northwest United States are not applicable due to different ecological conditions. As result there are no guidelines to direct forest management which has the most significant impact on lynx habitat.

The determination of lynx habitat preference, along with measurement of responses to human disturbance, provide important tools for environmental impact assessment.

The study is also providing a means to develop and calibrate methods of DNA fingerprinting of lynx hair. This will enable future studies and monitoring programs to assess population status of lynx without necessarily having to resort to capture/radio-tagging techniques.

## **LINK TO DECISION MAKING**

The study will assist in making the following decisions:

- Ensuring ecological integrity of lynx on a landscape scale.
- Developing management guidelines to maintain lynx habitat within national parks.
- Developing forest management guidelines to maintain lynx habitat on provincial lands, ensuring habitat connectivity.

Enabling assessment of environmental impacts of proposed developments and current activities, immediately relevant to decision making in the Vermillion Pass (Storm Mtn.) area, Hamlet of Lake Louise, and Yoho West gate area.

## **LEVEL OF INVESTMENT AND DURATION**

The project is a five year field investigation with part of a sixth year for data analysis, habitat modelling and guideline development.

Year	To Date	98/99	99/00	00/01	01/02
Project Cost	171.0	100.0	100.0	100.0	42.0
Parks Cost	55.0	35.0	35.0	35.0	0.0

### **COLLABORATORS**

Field work conducted by Clayton Apps as part of graduate degree at the University of Calgary. Collaborators include the B.C. Ministry of Environment - Habitat-Silviculture Assistance Fund 20K, Habitat Conservation Trust Fund 38K, Wildlife Conservation Society (formerly New York Zoological Society).

## PROJECT DESCRIPTION

### WEST SLOPE BEAR STUDY

A five year multi-agency investigation of bear activity in the North Columbia and Rocky Mountains from Yoho National Park through the Rocky Mountain Trench to Glacier National Park. The project involves monitoring collared grizzly and black bears and using DNA fingerprinting from hair to determine abundance, survival and recruitment rates, mortality sources, impediments to movement/dispersal and food habits.

## RESULTS

1. Determine bear distribution, abundance and ecosystem association on a landscape scale.
2. Develop management guidelines for grizzly and black bears.
3. Develop DNA fingerprinting as a method of monitoring bear populations and activity.

## JUSTIFICATION

There is a concern for the population viability of bears, particularly grizzly bears, in the Rockies and Columbia Mountains. With bear home ranges often extending beyond park boundaries, management activity on adjacent land has a significant effect on the viability of park bears. With the research area including areas both within and adjacent to national parks the results will be applicable on a broad landscape scale.

## LINK TO DECISION MAKING

The study will assist in making the following decisions:

- Ensuring ecological integrity of bears on a landscape scale.
- Developing a regionally integrated management plan for bears in the Central Canadian Rocky Mountains and Northern Columbia Mountains.
- Developing management guidelines to maintain bear habitat in and adjacent to national parks.

## LEVEL OF INVESTMENT AND DURATION

This is year four of a five year project.

Year	To Date	98/99
Project Cost	590.0	150.0
Glacier Cost	320.0	80.0
Yoho Cost	82.0	15.0

## COLLABORATORS



Project manager is John Woods, wildlife specialist for Glacier Park. Graduate students are involved in researching specific aspects of the study. Collaborators include, B.C. Ministry of Environment, B.C. Ministry of Forests, the Mica Compensation Programme, the University of B.C. and the University of Alberta.

## PROJECT DESCRIPTION

# COLUMBIA VALLEY BADGER ECOLOGY

A five year study of badgers in the Columbia Valley from Canal Flats to Brisco. The project involves collaring and monitoring of badgers to establish abundance, distribution, habitat preference and behaviour. The project includes review of historical records and radio-tagging and monitoring of badgers to establish habitat requirements and guidelines to maintain badger habitat.

## RESULTS

1. Determine badger distribution, abundance and ecosystem association at a regional scale.
2. Develop forest management guidelines to maintain badger habitat and habitat connectivity.

## JUSTIFICATION

Badgers are rare in the mountain national parks and blue-listed (at risk) in B.C. It is estimated that half of the provincial population occurs in the East Kootenay region. No badger studies have been done in the province and continued development threatens their low elevation grasslands and open forests habitat. The results of the research will be used to develop guidelines for both urban development and forest management.

## LINK TO DECISION MAKING

The study will assist in making the following decisions:

- Ensuring ecological integrity of badgers on a regional scale.
- Developing guidelines to maintain badger habitat in the East Kootenay region.

Determination of status and management recommendations for limited badger habitat occurring within southern KNP.

## LEVEL OF INVESTMENT AND DURATION

This is year three of a five year project.

Year	To Date	98/99
Project Cost	370.0	150.0
Park Cost	30.0	15.0

## COLLABORATORS

Forest Renewal B.C. 160K, Columbia Basin Compensation Program 30K.

## PROJECT DESCRIPTION

### WETLANDS MONITORING

Parks Canada contribution to a Canadian Wildlife Service long term monitoring project for wetlands within the interior of B.C. Kootenay park monitors three sites within the park and two sites on the Columbia River, one at Radium, the other at the Columbia National Wildlife Area at Wilmer. Yoho monitors along an elevational gradient with sites located at Deer Lodge, Lenchoil, Ottertail and Wapta Lake and Lake O'Hara. Monitoring involves spring counts of waterfowl and shorebirds over a one month period.

### RESULTS

1. Long term trends in waterfowl numbers throughout the interior of B.C..
2. Assessment of wetland conditions throughout the interior of B.C.

Greater public awareness of the provincial and international significance of the Columbia River wetlands, and greater support for their conservation.

### JUSTIFICATION

The Columbia River has internationally significant wetlands. Within Kootenay National Park, wetlands while limited in area, are significant habitat for a variety of wildlife species. Long term monitoring provides indicators of ecosystem health and habitat change.

The wetlands also provide critical low elevation winter habitat for many wildlife species, including wildlife which occupy national parks during other seasons. Enhanced conservation measures for waterfowl will therefore also help maintain populations of other wildlife.

### LINK TO DECISION MAKING

These projects will assist in making the following decisions:

- Ensuring ecological integrity of waterfowl and shorebirds on a landscape scale.
- Providing long term monitoring information for State of the Park reporting.
- Providing information on trends in vegetation change and habitat availability.

Providing information for conservation and protection of wetlands through Wildlife Management Area management planning initiatives currently underway.

### LEVEL OF INVESTMENT AND DURATION

Year	96/97	98/99	99/00
Project Cost	200.0	100.0	100.0
Park Cost	7.0	9.0	6.0

### COLLABORATORS

Monitoring is conducted by park staff and co-op students. Collaborator and project manager is the Canadian Wildlife Service.

## PROJECT DESCRIPTION

### WILDLIFE MONITORING PROGRAM

A regular wildlife monitoring program has not been implemented in Kootenay National Park since 1990 and in Yoho National Park since approximately 1980. Consequently little recent information is available about population trends for certain key species. The Lake Louise area has been covered through implementation of the Banff wildlife monitoring plan up until recently, but monitoring activities in the LL area are no longer the responsibility of Banff (District East).

A workshop was held in November, 1997 in Yoho National Park to prioritize wildlife monitoring requirements for the KYLL unit, including regular monitoring of a few key species in selected areas, and coordination with other agencies conducting monitoring in adjacent areas, including Banff National Park, BC Environment, BC Parks, and the Columbia Basin Fish and Wildlife Compensation Program.

### RESULTS

- Information on long-term population trends for key species in selected areas.
- Identification of changes in population status and distribution.
- Baseline information for State of the Parks reporting, environmental impact assessment, etc.

### JUSTIFICATION

Mandate/Policy: Ecological Integrity; 3.2.6: An integrated data base will be developed and kept up to date for each national park to provide, along with research and environmental monitoring, the baseline information required to protect and maintain park ecosystems and contribute to State of the Parks reporting to parliament. BNP Management Plan (1997): Identify and research key indicators, fill critical information gaps, increase credibility and public understanding of the information on which decisions are based, demonstrate through collection and use of data that issues ... transcend jurisdictional boundaries, study the historical presence of goats in the park and restore.... KNP & YNP Management Plans (1998): monitor wildlife and their habitats; more information on the status, productivity and distribution of Park wildlife.

### LINK TO DECISION MAKING

Provides baseline information for assessing environmental change and deriving management strategies. In some cases the program focuses on key species known to be sensitive to change or at risk; thus is relevant to management of sensitive species. In interagency context, cooperative monitoring brings attention to wildlife status and issues in transboundary areas, and feeds into management approaches of provincial agencies as well as of Parks Canada.

### LEVEL OF INVESTMENT AND DURATION

	To Date	1998/99	1999/2000	2000/2001
Project Cost		4.5	12.6	10.3
Park Cost		12.6	12.6	10.3

\* Note: does not include costs of collaborators in implementing their wildlife monitoring programs.

## **COLLABORATORS**

- \* BC Environment
- \* BC Parks
- \* Columbia Basin Compensation Program
- \* Banff National Park

## PROJECT DESCRIPTION

# BIGHORN COOPERATIVE MONITORING PROGRAM

Kootenay National Park and the B.C. Ministry of Environment have an established agreement for management and monitoring of bighorn sheep in the Radium area. Annual aerial survey monitoring occurs yearly in the spring. Survey costs are alternatively funded by the two agencies. Monitoring has been conducted since 1989.

## RESULTS

1. Annual counts of the Radium sheep herd to determine yearly status of the herd.
2. Long term monitoring of bighorn sheep to establish trends in population numbers.

## JUSTIFICATION

The Radium sheep herd moves between Kootenay National Park and adjacent provincial land, requiring cooperative management of the herd. The herd's home range includes significant areas of developed land and areas with high levels of human activity, both inside and outside the park. As result it is necessary to closely monitor the herd to ensure its long term viability.

## LINK TO DECISION MAKING

Long term monitoring will assist in making the following decisions:

- Ensuring ecological integrity of bighorn sheep on a regional level.
- Providing information for management requirements for the Radium herd.
- Providing long term monitoring information for State of the Park reporting.

## LEVEL OF INVESTMENT AND DURATION

This is a long term monitoring program.

Year	96/97	97/98	98/99	99/00
Project Cost	4.5*	4.5	4.5	4.5
Park Cost	0.0	4.5	0.0	4.5

\*Alternative year costs covered by the B.C. Ministry of Environment.

## COLLABORATORS

The project is carried out by Park and Fish and Wildlife staff. The collaborator is the B.C. Ministry of Environment - Fish and Wildlife Branch.

## PROJECT DESCRIPTION

# WILDLIFE CORRIDOR STUDY

The project involves monitoring of areas adjacent to the communities of Lake Louise, Field and Radium to assess wildlife movement through the area. Work is conducted during the winter months when snowfall allows tracking of wildlife. If further funding is available corridor monitoring should occur throughout the entire Kicking Horse Valley and selected locations within Kootenay National Park.

## RESULTS

1. Identification of wildlife corridors on a regional scale.
2. Identification of wildlife activity and movement on a local scale.

## JUSTIFICATION

Increasing development and human use is fragmenting wildlife habitat. Corridors are necessary to ensure movement through developed areas and maintain connectivity. Highway twinning and community development in Lake Louise and Field require information on movement corridors to incorporate into planning processes.

A community planning process is currently underway at the village of Radium Hot Springs, and local residents and politicians have shown considerable interest in incorporating wildlife values into their planning initiatives.

## LINK TO DECISION MAKING

The study will assist in making the following decisions:

- Ensuring ecological integrity by reducing habitat fragmentation.
- Identifying local and regionally significant movement corridors.
- Providing a base of local wildlife information for environmental impact assessment

## LEVEL OF INVESTMENT AND DURATION

A minimum of four seasons of monitoring is required to establish a baseline database. Subsequent monitoring may be required to detect impacts on wildlife through development and human activity. Commercial business support of such monitoring is currently being negotiated.

Year	To Date	98/99	99/00
Project Cost	80.0	24.0	24.0
Kicking Horse Corridor	18.0	25.0	25.0

## COLLABORATORS

Project to be carried out by a contractor. No collaborators confirmed at present, but arrangements are being negotiated with some commercial interests.

## PROJECT DESCRIPTION

# ROCKY MOUNTAINS GRIZZLY BEAR PLANNING COMMITTEE

At the initiative of the federal Minister of Canadian Heritage, and following correspondence with the BC Minister of Environment, Lands and Parks, a multi-agency planning committee for grizzly bear management has been established. The committee includes membership from the provincial governments of BC and Alberta, the US Fish and Wildlife Service, the US National Park Service, and Parks Canada. The KYLL unit has taken the lead on this initiative for Parks Canada, although Jasper, Banff, and Waterton Lakes also participate. The mandate of the committee is to develop recommendations for establishment of specific Grizzly Bear Conservation Areas within the Rocky Mountains of British Columbia (under the BC Grizzly Bear Conservation Strategy), recommend similar land classifications for other jurisdictions as feasible, and recommend management practices and guidelines to be applied to lands other than Conservation Areas.

The committee chair rotates annually, and Parks Canada is expected to chair the committee in 1998-9. This role includes covering costs of meeting facilities and field trips (which may require helicopter support).

## RESULTS

- Interagency dialogue at a scale not previously undertaken but appropriate for grizzly bear management.
- Multi-agency approaches to bear management, including mortality databases, population estimation and targets, and maintenance of key habitats and movement corridors.
- Establishment of no-hunting grizzly bear conservation areas and other bear conservation measures.

## JUSTIFICATION

**Mandate/Policy:** Ecological Integrity; cooperation with other agencies/jurisdictions to prevent loss of ecological values. Grizzly bears are a federally listed (vulnerable) species under COSEWIC, are blue-listed in BC, and also serve as an ecological "umbrella". **Management Plans:** Grizzly bears have been identified as a target species for habitat effectiveness analysis and human use management under the BNP management plan.

## LINK TO DECISION MAKING

Enhanced mortality databases and coordinated population estimates (used for setting hunting quotas, etc.) will enable all participating agencies to better manage shared bear population. Committee will make recommendations for establishment of Grizzly Bear Conservation Areas, which may be multi-jurisdictional and include National Parks, and would be a significant step forward in managing grizzly bears.

## LEVEL OF INVESTMENT AND DURATION

	To Date	1998/99	1999/2000	2000/2001
Project Cost		7.0	3.5	7.0
Park Cost		3.5	0.0	0.0



## **COLLABORATORS**

- \* BC Environment, Victoria and Cranbrook offices
- \* US Fish and Wildlife Service
- \* US National Park Service
- \* Alberta Environmental Protection

## PROJECT DESCRIPTION

### FOREST CARNIVORE COMMITTEE CONFERENCE

An international committee on forest carnivores (lynx, wolverine, marten, and fisher) holds a conference each year at which leading edge research results and methods are discussed in a formal setting. The KYLL unit has agreed to host the conference this year. This will provide an opportunity for Parks Canada to present key research (eg, lynx habitat research, corridor studies) and get the best possible exposure to peer review from academics, agency scientists, and consultants who have studies forest carnivores.

Most of these wildlife species are on endangered species lists in some or all western US states so there has been considerable interest and expertise developed in assessing the status and habitat requirements of these species. US researchers and managers are particularly interested in Parks Canada's use of highway mitigative structures to reduce habitat fragmentation.

### RESULTS

- Peer review of Parks Canada research initiatives.
- Networking/collaboration among key researchers.
- Showcase Parks Canada highway crossing structures.

### JUSTIFICATION

Mandate/Policy: Ecological Integrity. BNP Management Plan (1997): Peer review process for research; work with others to improve the use of science; invite the scientific community [and others] to help develop and implement research strategies.

### LINK TO DECISION MAKING

Improves quality of information available for assessing status of these sensitive carnivore species, and how to mitigate human activity and development.

### LEVEL OF INVESTMENT AND DURATION

	To Date	1998/99	1999/2000	2000/2001
Project Cost		0.0	0.0	0.0
Park Cost		5.0	0.0	0.0

### COLLABORATORS

- \* US Fish and Wildlife Service
- \* World Wildlife Fund, Canada

## PROJECT DESCRIPTION

### UNGULATE ECOLOGY

Elk populations appear to be declining in the East Kootenay region of BC, while status of other ungulate species including mule deer and white-tailed deer is less well understood but appears to be changing. In Kootenay National Park, for example, roadside elk surveys conducted over the last several decades have indicated a sharp decline of elk numbers in the 1990's; mule deer numbers also appear to have dropped and white-tailed deer numbers appear to have fluctuated up and down. Regionally the extent of population shifts is not clearly understood, nor is the significance and interplay of possible causes including changing forest age-class structure, loss of winter range, predation, hunting, and highway mortality.

A study to investigate elk ecology in the East Kootenay and develop management strategies appropriate to relevant jurisdictions is proposed.

### RESULTS

- Information for managing factors relevant to elk ecology, including vegetation management recommendations, changes to hunting regulations in adjacent lands, predator management, etc.

### JUSTIFICATION

Mandate/Policy: Ecological Integrity.

The apparent decline in elk populations is of great concern. Elk population status has strong implications for other ecosystem components due to their ability to impact plant communities, compete with other herbivores, and provide a prey base for carnivores. Outside the park elk are also important economically due to their status as a game species and potential competition with livestock for winter forage.

### LINK TO DECISION MAKING

Multi-jurisdictional and park-level management recommendations.

### LEVEL OF INVESTMENT AND DURATION

	To Date	1998-9	1999-00	2000-2001
Project Cost		\$5,000.00	\$50,000.00	\$55,000.00
Park Cost		\$0.00	\$20,000.00	\$20,000.00

### COLLABORATORS (possible)

\* BC Environment, East Kootenay Wildlife Association, Columbia Basin Fish and Wildlife Compensation Program and Forest Renewal BC

## **PROJECT DESCRIPTION**

### **BIGHORN SHEEP HABITAT AND POPULATION ASSESSMENT**

There have been two notable patterns in bighorn sheep ecology in the East Kootenay this century. One has been cycles of epizootic die-offs followed by gradual recovery, with an overall trend to lower numbers. The other pattern has been decreasing forage availability. In the Radium Hot Springs area bighorns use habitats within and adjacent to Kootenay National Park, and face additional pressures including rapidly increasing human development of winter ranges and capture/translocation of a portion of the population every two years.

The East Kootenay Bighorn Sheep project commenced in 1996-7 with the broad goal of describing fall-to-spring habitat preference with reference to ecosystem mapping categories and range evaluation and, ultimately, development of a plan for enhancing and protecting the most limiting habitat elements. The study areas currently identified include Mt. Broadwood, Steeples Range, Canal Flats, and Stoddart Creek, with intensive study and radio-telemetry work on the Steeples and Canal Flats herds. The intensive study can be extrapolated to the less-intensively studied areas with a small amount of field work.

It is proposed to fund a small sub-project to monitor sheep movements and habitat selection, and collect faecal pellets in the Radium area (transitional ranges) to allow extrapolation of study results to this area. Project partners include BC Environment, East Kootenay Wildlife Association, and Arc Wildlife Services.

## **RESULTS**

- enhanced understanding of sheep utilization of transitional and winter ranges..
- an assessment of preferred habitats, forage selection, and nutritional value of preferred plant foods.
- a determination of whether present sheep populations are degrading or likely to degrade range quality in the habitat types used.

## **JUSTIFICATION**

Mandate/Policy: Ecological Integrity; cooperation with other agencies/jurisdictions to prevent loss of ecological values; contributes to possible development of measurable goals to ensure protection of sheep and their habitats. Park Management Plan: Bighorns are a key component of the Stoddart-Dry Gulch Zone I special preservation area in southwestern Kootenay National Park. Cost effectiveness: builds on a significant funding investment already in place by other partners and helps establish a working relationship with other key stakeholders in bighorn sheep management in the East Kootenay region.

## **LINK TO DECISION MAKING**

On adjacent provincial and municipal lands this research is crucial to development of strategies for range enhancement, habitat acquisition (greenbelts, ecological reserves), and direct population management (capture and translocation of "surplus" animals). However the research will be less relevant to management of the Radium bighorns if supplementary research does not take place within the Radium study area. For Parks Canada the research results are relevant to multijurisdictional planning initiatives,

as well as directly to vegetation management strategies for the Radium Area, including establishment of priorities for use of prescribed fire and non-native plant control.

### LEVEL OF INVESTMENT AND DURATION

	To Date	1998/99	1999/2000	2000/2001
Project Cost		244.6	168.4	124.6
Park Cost		11.0	11.0	11.0

### COLLABORATORS

- \* BC Habitat Conservation Fund
- \* BC Environment, Cranbrook
- \* East Kootenay Wildlife Association
- \* Columbia Basin Fish and Wildlife Compensation Program
- \* Foundation for North American Wild Sheep
- \* Wild Sheep Society of BC

## PROJECT DESCRIPTION

### LAKE LOUISE - SKOKI GRIZZLY BEAR MONITORING

It is expected that, in 1998, five four year old grizzly bears will be weaned in and around the Lake Louise area. Currently three three year old cubs belonging to one sow grizzly are radio-marked; two others belonging to another sow grizzly are not. Various factors in combination create a situation that is important to monitor: the number (five) of young bears seeking to establish themselves, the tendency of sub-adult bears to occupy sub-optimal habitats, and the proximity of these bears to areas of very high human use levels.

The East Slopes Grizzly Project is expected to provide for a base level of monitoring of radio-collared bears in the Lake Louise area in 1998. However it does not provide for intensive ground-based radio-tracking, or for radio-marking of additional bears.

## RESULTS

- Radio-marking of two sub-adult bears in LL area and intensive monitoring of all radio-marked bears within the Lake Louise area, including the ski hill.
- Information on habitat selection and security cover within the intensive study area.

## JUSTIFICATION

**Mandate/Policy:** Ecological Integrity. Grizzly bears are a federally listed (vulnerable) species under COSEWIC, are blue-listed in BC, and also serve as an ecological "umbrella". **Management Plans:** Grizzly bears have been identified as a target species for habitat effectiveness analysis and human use management under the BNP management plan. **Public Safety:** bear movements can be monitored more frequently by researchers and Park wardens if public safety concern arises.

## LINK TO DECISION MAKING

Obvious links to operational decision-making regarding bear management in high human use areas. Contributes to on-going assessment of acceptable human use patterns and levels throughout LL ski hill - Skoki areas. Contributes to assessment of new proposals for summer use at ski hill and elsewhere within study area.

## LEVEL OF INVESTMENT AND DURATION

	To Date	1998/99	1999/2000	2000/2001
Project Cost		50.0	40.0	30.0
Park Cost		25.0	20.0	10.0

## COLLABORATORS

\* East Slopes Grizzly Project (large list of contributors), \* Skiing Louise (expected), \* CPR (possible)

## PROJECT DESCRIPTION

### MULTI-SPECIES ANALYSIS

Much of the wildlife research conducted in the Rocky Mountains of Canada and the northern US has been focused on single species and has examined habitat preferences at relatively small scales. Although some findings of such research (such as mortality causes and rates, human influence/disturbance) can be extrapolated over larger areas, it is problematic to extrapolate habitat selection to areas without appropriate vegetation or habitat mapping. Additionally, if habitat management is based on the requirements of a single species, it is likely that many other species will be missed.

This project is part of a much larger, international initiative to conduct broad-scale habitat mapping through use of remote sensing (satellite imagery) and to assess habitat values based on preferences of multiple species. This geographically large scale of research and management is appropriate for wide-ranging wildlife which depend, ultimately, on continuous networks of effective habitat and corridors all along the Rocky Mountains. Other partners for this research are being lined up by the Yellowstone to Yukon initiative's science program.

### RESULTS

- Multi-species habitat models and decision support systems based on human use levels
- Broad-scale habitat mapping

### JUSTIFICATION

Mandate/Policy: Ecological Integrity

### LINK TO DECISION MAKING

Multi-jurisdictional and park-level management recommendations. Provides a basis for assessing habitat effectiveness for multiple species, including some species active in winter (current bear CEA modelling is not responsive to wildlife winter habitat requirements). Through broad-scale habitat mapping/modelling provides a basis for decision-making and development of management guidelines at scales appropriate for wide-ranging species and metapopulations.

### LEVEL OF INVESTMENT AND DURATION

	To Date	1998/99	1999/2000	2000/2001
Project Costs		0.0	Unknown	Unknown
Park Costs		0.0	20.0	20.0

### COLLABORATORS (possible)

\* Y2Y network, including WWF, CPAWS, NRCC, CNF, other ENGOs, other agencies, universities

## PROJECT DESCRIPTION

### TCH PHASE IIIB MONITORING

It is expected that a proposal for the twinning of the Trans-Canada highway from Castle Junction to Lake Louise is imminent. Mitigation of such a project would likely need to include wildlife crossing structures. Winter track surveys, sensitive species surveys, and other monitoring of the highway corridor is urgently needed to ensure that an adequate wildlife database including highway crossing points is compiled in sufficient time to adequately assess impacts of a twinned highway. Such a database needs to compile information over a minimum of 3-5 years to account for variability of weather conditions and other factors

Although some money for TCH wildlife research is available through the Highways Service Centre, most of these funds are expected to go into monitoring effectiveness of mitigative structures on the existing twinned sections of the TCH in Banff National Park.

#### RESULTS

- Baseline information for assessing impacts of highway twinning proposals and for developing mitigative strategies if such a highway is approved.

#### JUSTIFICATION

Mandate/Policy: Ecological Integrity

#### LINK TO DECISION MAKING

Direct link to decision-making on the approval of a major project.

#### LEVEL OF INVESTMENT AND DURATION

	To Date	1998/99	1999/2000	2000/2001
Project Costs		150.0	150.0	Unknown
Park Cost			20.0	20.0



## PROJECT DESCRIPTION

# BOW VALLEY BEAR HABITUATION PREVENTION PROJECT

Reductions in bear habituation to humans is achieved through prompt response to bear problem situations in the field, and through an improved communications program. This project will fund two seasonal wardens who will devote their time exclusively to bear/people management in the Bow Valley. This will significantly enhance the current situation where seasonal wardens are available part time to assist the Wildlife/Human Conflict Specialist's . This will allow prompt action on problems such improperly stored food/garbage and grain spills and visitors stopping and approaching roadside bears. This will contribute to reducing bear removals and enhance/provide high levels of public safety. This project will contribute funding to assist and enhance communication program.

## RESULTS

1. Ensure a viable bear population in the Bow Valley.
2. Reduce bear habituation incidents .
3. Ensure that aversive conditioning of bears is initiated early before a bear becomes accustomed to people and advancing the overall program by ensuring consistency in application.
4. Reduce bear/human encounters, improving visitor safety.
- 5.Reduce and manage grain spills on the CPR and Trans Canada Hwy pulloffs.
- 6.Increase overall bear monitoring system.

## JUSTIFICATION

High levels of human use in the Bow Valley create the opportunity for bears to become habituated to human presence and park facilities. Once habituation occurs it is often necessary to remove the bear from the Bow Valley. Bear habituation is identified as a major threat to the continued existence of bears in the Bow Valley and Banff National Park. Existing staff levels do not permit the level of effort required to manage and reduce bear habituation situations.

## LINK TO DECISION MAKING

The project will assist in making the following decisions:

- Ensuring ecological integrity of bears on a landscape level.
- Assessing the level of effort required to manage bears/people in the Bow Valley.
- Providing information for input into the District Bear/Human Conflict Management Plan.

## LEVEL OF INVESTMENT AND DURATION

Year	98/99
Park Costs	30.0

## COLLABORATORS

The Friends of Banff will collaborate in a pilot project utilizing volunteers in a roadside education program. The two seasonal wardens will assist and evaluate the success of this project.

**PROJECT DESCRIPTION**

**Field Wildlife Corridor Implementation**

The Field Community planning process has identified a number of mitigative measures to reduce the impact of the community on wildlife utilizing local habitats and/or moving by or through the townsite. These measures include the use of fencing to separate humans from wildlife, and construction of wildlife trails and/or bridges to facilitate the movement of wildlife around the south side of Field.

**RESULTS**

- Mitigation of the impacts of Field townsite on local wildlife and of the constriction effect of the townsite on the wildlife corridor through the Kickinghorse Valley.

**JUSTIFICATION**

Mandate/Policy: Ecological Integrity. Field Community Plan (1997). The Kickinghorse Valley is a natural wildlife movement corridor, but is very constricted by steep terrain in the Field area. The effectiveness of the corridor for wildlife is reduced by the physical footprint of Field and by the sensory disturbance of human activity.

**LINK TO DECISION MAKING**

Implements decision made as part of Field Community Planning process.

**LEVEL OF INVESTMENT AND DURATION**

	To Date	1998-9	1999-00	2000-2001
Project Cost		\$0.00	\$20,000.00	\$20,300.00
Park Cost		\$0.00	\$20,000.00	\$20,300.00

**COLLABORATORS**



# KOOTENAY, YOHO AND LAKE LOUISE - FIELD UNITS AQUATIC CAPITAL PROJECTS 1998-2000

## JUSTIFICATION AND LINKS TO DECISION MAKING:

There has been a significant degradation of the ecological integrity of aquatic resources in the mountain national parks, especially in the Bow Valley where human use is most concentrated. Many factors have contributed to this situation. Water has been impounded and water levels controlled. Overfishing and the introduction of non native fish and other species have severely affected aquatic ecosystems. The increasing urbanization of the Town of Banff, Hamlet of Lake Louise and the Town of Field have resulted in the release of nutrients and other chemicals into the water. Landfills, mining, in stream disturbances, gravel extraction and atmospheric pollutants have also compromised aquatic resources.

The Kootenay, Yoho and Lake Louise (KYLL) Aquatics Capital Project submission for FY 1998/2000 has been designed according to the direction and commitments provided in the following:

- Ministers commitment (tabled at the release of the Banff Bow Valley Study Report)
- Strategic Goals and Guidelines outlined in the Banff National Park Management Plan (1997) Kootenay National Park Management Plan (1988), Yoho National Park Management Plan (1988)
- 1997 Banff Business Plan
- Round Table Summary Report - Strategic Goals
- Aquatics Management Strategy - Mountain Parks
- Science and Monitoring Review - Kootenay, Yoho and Lake Louise Field Unit (draft)

These commitments include:

### 1. Ministers Speech:

- Improve efforts to restore the aquatic biodiversity in the entire park;
- Work with stakeholders to develop feasible ways to restore natural processes such as fire and flooding. Removal of Lake Minnewanka will not be considered, but Parks Canada will work with TransAlta and others to develop other solutions;
- Improve sewage treatment immediately at all our facilities, and reduce phosphate use at source; and
- Provide excellence in stewardship practices, and progressive work to rehabilitate specific elements of the environment

### 2. Management Plans:

#### Banff National Park

- Evaluate and monitor the status of unique, rare, threatened and endangered species in the park
- Participate with other government agencies and groups in the development and implementation of recovery and management programs for unique, rare, threatened and endangered species
- Designate selected aquatic ecosystems as benchmarks

- Implement an ecological monitoring system for important elements of the aquatic resources in the park including: native fish species, non-native species, invertebrate and algal populations, herptiles, and waterfowl
- Pursue experimental restoration of native fish and invertebrate populations by reducing or eliminating non-native fish species and introducing native species
- Eliminate fishing in waters where native species or genetic diversity is threatened by human-caused mortality
- Restore physical processes and biotic communities in the Vermilion Wetlands, other floodplain wetlands, riparian wetlands and outwash fans
- Minimize the effects of transportation corridors (culverts, stream channelization, bridge abutments) and other structures on volume and seasonal changes in water flows and levels
- Promote water conservation
- Ensure park residents and visitors are aware of the value and status of aquatic systems, and how they can minimize their own impact on aquatic resources.

### **Kootenay National Park**

- Ensure that sound effluent management occurs at all facilities
- Water quality will be monitored and, wherever necessary, all measures will be taken to eliminate or prevent pollution
- Standards will be developed to ensure that any necessary modification of stream channels or flows will minimize water siltation, loss of habitat, and changes to natural flow patterns
- Aquatic resources will be managed on an ecological basis through the development of an aquatic resources management plan
- Viable native fish populations in the park will be maintained, appropriate sport fishing locations and strategies for maintaining fish populations will be identified in a fisheries management plan
- Air quality will be monitored to ensure that any deterioration is detected quickly

### **Yoho National Park**

- Ensure that sound effluent management occurs at all facilities
- Water quality will be monitored and, wherever necessary, all measures will be taken to eliminate or prevent pollution
- New facilities will be sited and designed to avoid conflicts with natural flow patterns. During facility redevelopment, efforts will be made to eliminate past and projected conflicts
- Standards will be developed to ensure that any necessary modification of stream channels or flows will minimize water siltation, loss of habitat, and changes to natural flow patterns
- Aquatic resources will be managed on an ecological basis through the development of an aquatic resources management plan
- The heritage values of the Kicking Horse River which lead to its nomination as a Canadian Heritage River will be preserved
- A fisheries management plan will be developed to maintain viable native fish populations in the park and identify appropriate sport fishing locations and strategies for maintaining fish populations in those locations
- Air quality will be monitored to ensure that any deterioration is detected quickly

### **3. 1997 Banff National Park Business Plan**

#### Section 2.1 Protection and Presentation

- improved sewage treatment
- reestablishment of more natural flow regimes on alluvial fans, 40 Mile Creek and from Lake Minnewanka
- enhanced native fish populations

#### Section 2.3 Improve Research Linked to Decision Making

- completion of a long term research strategy
- decisions founded on research and analysis
- research implemented through partnerships
- public discussion of research and results

#### Section 2.4 Reduce Site Contamination

- improved sewage treatment
- rehabilitation of other disturbed or contaminated sites
- phosphate use reduced

### **4. Round Table Summary Report - Strategic Goals**

#### Water Quality:

In the Banff-Bow Valley, water quality will be maintained and, where necessary and feasible, will be restored to the highest possible standards, where human use of surface and groundwater does not impair the ability of aquatic and riparian systems to support a full range of naturally occurring species, or the safety of water for human consumption and use. The Banff-Bow Valley will demonstrate world leadership on how humans can manage and maintain high water quality.

#### Flow Regimes:

Maintain, and where feasible, restore natural flow regimes and water levels in the Banff-Bow Valley. The Banff-Bow Valley will be exemplary in its awareness and practice of water conservation.

#### Aquatics Biodiversity:

Maintain, and where feasible, restore natural biodiversity of aquatic ecosystems. Aquatic systems in the Banff-Bow Valley will serve as ecological benchmarks for aquatic systems.

### **5. Aquatic Management Strategy - Mountain Parks**

Recently Parks Canada tabled an Aquatics Management Strategy - Mountain Parks (draft). This working document details the overall goal of aquatic management as: To maintain and, where necessary, restore the ecological integrity of aquatic ecosystems.

The strategy, founded on a number of guiding principles presents several results, key actions and performance measures related to maintaining biodiversity (baseline data, species and habitats at risk, identification of aquatic benchmarks) are outlined below:

### **Baseline data**

Aquatic inventories are conducted related to specific reporting requirements and decision-making.

- aquatic inventories will be undertaken and maintained as required to address priority management concerns, to establish baseline monitoring, and to identify research needs.
- data are integrated into baseline data collection and aquatic indicators package.
- identify special features related to aquatic and riparian systems.

### **Species and habitats at risk**

The natural biodiversity of aquatic systems within the Mountain Parks is maintained and restored.

- establish a genetic inventory of rare, endangered, threatened or unique species.
- evaluate and set priority areas where restoration of aquatic habitat and native species is required. Work cooperatively with other agencies, organizations and the public to develop and implement appropriate restoration plans.
- give public information on the impacts of fish stocking programs on natural systems, ecology of native fish species and fishing regulations.

### **Identification of aquatic benchmarks**

On a Mountain Park level, representative and unique aquatic ecosystems are designated to serve as aquatic benchmarks for research, environmental monitoring and education.

- determine changes in biota in both disturbed and undisturbed benchmark systems, and assess the extent of changes in fish, invertebrate and algal populations over time.
- identify and provide opportunities for public involvement through participation in cooperative activities.
- ensure accessibility and accountability for data through annual reporting process, advisory/peer review panel, public fact sheets and inter-agency agreements.

## **6. Science and Monitoring Review - Kootenay, Yoho and Lake Louise Field Unit**

The Lake Louise, Yoho and Kootenay, (LLYK) field unit is made up of two national parks and a large portion of Banff National Park. All have previously been managed separately with independent funding, differing management priorities, area specific issues, and differing levels of expertise. Accordingly, there exist differences in the amount and quality of the information available on the ecosystem and its integrity. Now that the region is managed as a unit there is the need to develop a science and monitoring program that successfully manage and protects the entire ecosystem of which the LLYK field unit is a part.

## PROJECT DESCRIPTION

### SCIENCE ADVISORY GROUP

Development of an Aquatic Research Strategy. Assemble a group of experts in aquatics sciences to develop a peer review work plan to initiate commitments outlined above. Utilize this group to vet the parks aquatic research strategy.

## RESULTS

Completion of a long term research strategy, decisions based on science, research implemented through partnerships, public discussion of research and results. Products include: Work Plan; prioritization of projects; costing, collaboration initiatives, communication strategy, etc.

## JUSTIFICATION

Key action (2) identified in the Research and Information Management Strategic Goal - BNP Mgmt. Plan. Business Plan - Improved Research Lined to Decision Making. Identified in the Aquatic Management Strategy - Mountain Parks.

## LINK TO DECISION MAKING

Peer review research group established. Clear goals on research, resource management and ecosystem management are developed and integrated into the management decision framework.

## COMMUNICATION STRATEGY

Strategy developed and published; various aquatic/fish media releases and fact sheets. Strategies for the management of fisheries issues. Informed park staff, managers and clients. AV products in co-operation with other collaborators.

## LEVEL OF INVESTMENT

Year	1998/99	1999/2000	2000/2001	2001/2002
Project Costs	15.0			
Park Costs	5.0			
Park Costs	.4 PY	.05 PY	.05 PY	.05 PY

**Note: Project costs are based on equal sharing with BNP, Jasper and Waterton Field Units.**

## COLLABORATION

Science Advisory Group: Parks Canada (Aquatics; Heritage Communications); Universities- (Dr. Dave Schindler; Dr. Dave Donald; Dr. Joseph Culp; Dr. Pat Chambers; Dr. Eric Taylor; Dr. Peter Moyle);



Stakeholder Advisory Group: Golder Associates, Freshwater Research Ltd., Peter McCart, etc); TransAlta Utilities, CP Rail; BRWQC; Alberta Environmental Protection; WSOC, commercial users.

Scientific credibility - Developed with input and peer review from scientists, industry and commercial/public users. Groups which the strategy would be vetted through include: Trout Unlimited, Kananaskis Country, Alta. Fish and Wildlife, park anglers, local media, angling businesses, various park staff, Heritage Communications

## PROJECT DESCRIPTION

# DNA ANALYSIS- STATUS OF NATIVE FISH POPULATIONS

There is general agreement that the native fishes of the Mountain National Parks have been detrimentally affected by past management practices, particularly by an aggressive stocking program during which exotic and native species of sport fish were introduced into park waters. Stocking also occurred in many lakes and streams that originally were not occupied by fish. This practice resulted in local extirpations, replacement and to some degree introgression of native species. With greater concern for the preservation, protection and maintenance of natural systems in recent years it has become increasingly important to know the status of native fish populations.

## RESULTS

Determine inter-drainage genetic divergence across major drainage systems in the mountain national parks. Determine intra-drainage genetic variation among native fish. Collect evidence to determine hybridization. Establish a baseline genetic data bank for native (westslope cutthroat trout and bull trout) populations in the mountain national parks. Building on research efforts to date, develop a research protocol for DNA isolation procedures. Prioritize populations for data collection. Product include: Delineation of aquatic systems as ecological benchmarks. Protection of unique, rare and threatened species (cutthroat trout, bull trout). This data will enhance the Park's ability to manage and protect the remaining stocks of genetically pure native fishes.

## JUSTIFICATION

This project will enhance Parks Canada ability to manage and protect the remaining stocks of genetically pure native fish.

## LINK TO DECISION MAKING

- Linked to PMP strategic goal - Species and genetic diversity; Aquatic ecosystems - designate selected aquatic ecosystems as ecological benchmarks
- Continue research on benchmark aquatic systems and prepare inventories of the distribution of native fish

## COMMUNICATION STRATEGY

Research findings will be used to delineate benchmark aquatic systems; develop strategies for species removals and reintroduction. Research findings will be discussed with the scientific advisory panel and user groups.

## LEVEL OF INVESTMENT

Year	1998/99	1999/2000	2000/2001	2001/2002
Project Costs	20.0K	20.0K	20.0K	20.0K

Park Costs	5.0K	5.0K	5.0K	5.0K
PY Support	.15	.15	.15	.15
Support	Waterton Lakes, BNP and MRGNP (Columbia River Basin Project) are also supporting this program.			

**COLLABORATION**

Dr. L. Bernatchez - University of Lavelle; Dr. Eric Taylor - University of British Columbia; scientific advisory panel, Parks Canada - aquatics

Research methodologies have been detailed in a previous proposal developed by Percy Wiebe - Regional Aquatics Biologist, Dr. Bernatchez, University of Laval and C. Pacas (Draft - Terms of Reference - Status of Native Fish Populations).

## PROJECT DESCRIPTION

# THE EFFECTS OF SEWAGE EFFLUENT OF THE BIOTA OF THE BOW AND ATHABASCA RIVERS

The research encompasses the main recommendations (Banff National Park Mgt. Plan) that have been made concerning the mitigation of effects of sewage effluent on the Athabasca and Bow Rivers.

## RESULTS

Study objectives include: identify appropriate bioindicators for assessing eutrophication of the rivers of the mountain parks; determine whether eutrophication changes the species composition of aquatic communities; compare the effects of sewage input measured directly in artificial streams to the changes detected in natural streams.

## JUSTIFICATION

- choice of indicators developed by BBVS, Mountain District - Aquatics Strategy
- to maintain and where necessary and feasible, restore water quality to the highest possible standards (PMP - Strategic Goal - Tertiary Sewage Treatment and Phosphate Removal)

## LINK TO DECISION MAKING

- key actions items 2, 3, 4, 7, PMP - Tertiary Sewage Treatment and Phosphate Removal
- issue of improved sewage treatment addressed in BNP - Business Plan, Section 2.1 - Protection and Presentation and 2.4, Reduce Site Contamination
- the study will link increases in [P] below Jasper, Lake Louise and Banff sewage outfalls to benthic algal biomass accumulation

## COMMUNICATION STRATEGY

FINS brochure and updates, stakeholder meetings and updates, publications in peer reviewed journals, Research Updates, Research Links, etc.

## LEVEL OF INVESTMENT

Year	1998/99	1999/2000	2000/2001	2001/2002
Project Costs	25.0	25.0		
Park Costs	8.4	8.4		
Notes:	Project costs equally split with Jasper, KYLL and Banff Field Units. Project contingent on NSERC and other grant funding. Field logistical and support provided by each field unit.			

## **COLLABORATION**

Michelle Bowman and Dr. Dave Schindler - University of Alberta; Dr. Patricia Chambers - National Hydrology Institute; Parks Canada - Jasper, KYLL and Banff Field Units.

## PROJECT DESCRIPTION

# FISHERIES BROCHURE

Each fiscal year a new summary brochure is produced. In 1999, a new approach will be undertaken by adding more ecosystem messages, science and angler ethics messages and improved color fish identification diagrams.

## RESULTS

Modified and updated fisheries brochure; To produce a angler (user) friendly brochure. The format and contents of the "Summary of Fishing Regulations in the Mountain national Parks" will be reworked to better reflect the Mountain District Aquatic Strategy. Fish pictures will appear in color.

## JUSTIFICATION

Information will be made available to all Canadians, as well as to park visitors, to encourage and assist them in understanding, appreciating, enjoying and protecting their national parks (Parks Canada - Guiding Principles)

## LINK TO DECISION MAKING

- BNP PMP - Strategic Goal - Communicating the Need for Ecological Integrity; to provide the information local residents and visitors need to make informed decisions. This will encourage public support for Parks Canada's management programs.
- Provide public with information on ecology and management of native fish species and fishing regulations.

## COMMUNICATION STRATEGY

Communication would involve collaborators listed above and various user groups. Responsibilities for coordination of changes and liaison with Regional Office Staff and the Canada Communications Group have rested with Communications staff (Heather Dempsey) in Banff national Park.

## LEVEL OF INVESTMENT

Year	1998/99	1999/2000	2000/2001	2001/2002
Project Costs	10.0	8.0	8.0	8.0
Park Costs	2.0	2.0	2.0	2.0
Support	Initial costs are to modify and update brochure. Project costs in 1999 and following are costs attributed to producing annual updates. Significant support will be required from heritage communications.			

## **COLLABORATION**

Mountain District Parks, Aquatic Biologists, Parks Canada Communications Group, Rob Storeshaw, anglers, researchers.

## PROJECT DESCRIPTION

### WATER QUALITY MONITORING - BOW RIVER

To continue to undertake water quality sampling in conjunction with Inland Waters Monitoring Program (1 x per month at two locations on the Bow River. Location 1: Bow River at Hwy #1 above Lake Louise (Site 00AL05BA0011); Location 2: Bow River at Hwy #1, 4.5 km above Canmore (Site 00AL05BE0013). Monitoring at this site has been undertaken from the mid 1970's to 1995.

## RESULTS

To maintain a long-term monitoring program to measure volumes, seasonality of biological and chemical parameters and heavy metals.

## JUSTIFICATION

Joint Federally cost shared program (8.8K) between Department of Environment/Department of Canadian Heritage -Parks Canada.

## LINK TO DECISION MAKING

The following statements are based on the Mountain District Aquatic Strategy.

- Manage point and dispersed sources of human caused water contaminants to minimize detrimental effects on water quality.
- Adopt environmentally based water quality standards that meet or exceed federal and provincial standards.
- Monitor sewage effluent to ensure water quality standards are maintained, especially during periods of peak discharge or other upset events
- Work with other federal, provincial and international government agencies to reduce the sources of long range pollutants.
- Promote awareness and understanding of the impacts of human activities on water quality.

## COMMUNICATION STRATEGY

Monthly and annual reporting. Long term summary reports.

## LEVEL OF INVESTMENT

Year	1997/98	1998/1999	2000/2001	2001/2002
Project Costs	8.8	8.8	8.8	8.8
Park Costs	4.4	4.4	4.4	4.4

## COLLABORATION

Banff National Park and Kootenay, Yoho, Lake Louise Field Units; Inland Waters



Scientific credibility - Annual costs approximate for each of the two sites monitored: Bow River above Canmore, Bow River above Lake Louise.

## PROJECT DESCRIPTION

# BACTERIOLOGICAL WATER QUALITY MONITORING - BOW RIVER

To continue to undertake bacteriological water quality sampling (5 days x 2 x per year) at eight locations on the Bow River between Lake Louise and Castle Junction and 14 locations on the Bow River between Johnston Canyon and the East Park Gate. Monitoring at these site has been ongoing since 1983.

## RESULTS

Sources of bacteriological impacts to the Bow River are monitored. If assessments indicate that total and fecal coliform levels exceed background levels, wastewater systems are upgraded.

## JUSTIFICATION

Manage point and dispersed sources of human caused water contaminants to minimize detrimental effects on water quality.

## LINK TO DECISION MAKING

- Adopt environmentally based water quality standards that meet or exceed federal and provincial standards.
- Monitor sewage effluent to ensure water quality standards are maintained, especially during periods of peak discharge or other upset events.
- Reduce point and non-point sources of phosphorous and fecal coliform.
- Promote water conservation measures.

## COMMUNICATIONS STRATEGY

To be developed.

## LEVEL OF INVESTMENT

Year	1998/99	1999/2000	2000/2001	2001/2002
Project Costs	4.4	4.4	4.4	4.4
Park Costs	1.6	1.6	1.6	1.6
Support	Joint cost shared sampling program with BNP Field Unit. Analysis to be undertaken by Lake Louise Wastewater Treatment Plant staff.			

Note: Recently the Lake Louise Wastewater Treatment Facility was upgraded to allow facility staff to

undertake bacteriological analysis (Protection and Operations staff collect samples, LLWWTP undertake analysis, Aquatic Specialist to prepare reports). Staff at the plant have expressed concerns that this program may not continue. If this occurs, options for consideration include:

- transfer of analytical skills to warden service staff (Aquatics staff),
- analysis conducted by an outside agency

The Investment strategy as proposed in the Mountain National Parks Aquatic Strategy also details that cost recovery be initiated. This should be actively pursued.

New methodologies have also been developed to test coliform levels (e.g., coli-plates). These technologies should be field tested and evaluated as possible alternatives.

## **COLLABORATION**

Banff National Park and Kootenay, Yoho, Lake Louise Field Units - Protection and Operations Staff

## PROJECT DESCRIPTION

### MORAINÉ LAKE NON-NATIVE FISH ERADICATION

There are few self-sustaining populations of bull trout (char) remaining in the Bow River drainage basin. Many stocks have been eliminated (Bow, Hector and Moraine Lake populations among others) or reduced due to hybridization or competition with exotic species and over exploitation by anglers. Moraine Lake offers a unique opportunity for reestablishing a 'safe' bull trout population in the Bow Valley. Because the lake outlet is impassable to fish, bull trout could be reintroduced without concern about immigration of exotic species from Moraine Creek. No bull trout have been captured in fisheries surveys on Moraine Lake since 1953.

Field work began in the summer of 1996. The first three years of this project will be used to remove fish populations from Moraine Lake. Re-introduction will be based on removal success and locating a viable source of bull trout eggs.

### RESULTS

To determine the reproductive success of stocked cutthroat, brook and splake trout. To re-establish phytoplankton, zooplankton and benthic communities. To eliminate non native fishes and reintroduce bull trout back into the system. Products include: baseline data on existing lake communities and restoration of bull trout populations.

### JUSTIFICATION

- Moraine Lake identified as a location to determine the feasibility of eliminating non-native fish and re-introduction of native fish (Banff-Bow Valley Study 1996).
- restoration of native fish species (PMP - Aquatic Ecosystems - strategic goal)
- baseline work undertaken (Parker 1996)

### LINK TO DECISION MAKING

- pursue experimental restoration of native fish and invertebrate populations by reducing or eliminating non-native fish species and introducing native species (PMP- Aquatic Ecosystems)

### COMMUNICATION STRATEGY

FINS brochure and updates, stakeholder meetings and updates, Moraine Lake Lodge, Publications in American Fisheries Science journals.

### LEVEL OF INVESTMENT

Year	1998/99	1999/2000	2000/2001	2001/2002
Project Costs	15.0	15.0	15.0	
Park Costs	.2 PY	.2 PY	.2 PY	
Support	Contract management, field support (aquatic biologist)			

## **COLLABORATION**

**Dr. Brian Parker, Dr. Dave Schindler - University of Alberta, Trout Unlimited, Heritage Communication, Dave Hutton - Moraine Lake Lodge, staff in aquatics field trips, scientific advisory committee. Mr Dave Hutton has indicated a willingness to provide logistical and some interpretive support toward this project. Parks Canada - KYLL and Banff Field Units.**

## PROJECT DESCRIPTION

# AMPHIBIAN AND REPTILE MONITORING

There is currently a shortage of information from the TransCanada transportation corridor in Banff National Park (BNP) with regard to aquatic environments, their water chemistry, and associated fauna (Concord Scientific Report 1989, Canadian Heritage 1995). Baseline water chemistry parameters have not been identified, the contaminating effects of highways in terms of de-icing salts and hydrocarbons and heavy metals from car exhaust emissions have yet to be evaluated, and the current distribution of some key bioindicator species for ecosystem health such as amphibians, is virtually unknown. Previous impact assessments of highway upgrade projects have been hindered by this lack of information and have only been able to speculate on the potential effects to aquatic environments in the transportation corridor. Information of this type essential for properly assessing short-term and long-term impacts, insuring proper mitigation and establishing a standard for future highway projects in BNP and elsewhere.

## RESULTS

Measure water chemistry and contaminant levels from roadside aquatic environments in Phase I and II. Determine pre-twinning baseline water chemistry levels from Phase IIIA and IIIB. Measure post-twinning water chemistry and contaminant levels from Phase IV in 1999. Determine pre-twinning baseline water chemistry levels from Phase IIIA and IIIB. Investigate the potential effects of the TCH in terms of salinity and heavy metal concentrations on aquatic environments and their associated fauna. Conduct a performance evaluation of the storm sceptor installed on Phase IIIA which is designed to prevent contaminant runoff from entering into the Bow River. Inventory of amphibian and reptiles along primary vehicle corridors in the Mountain National Parks (TCH, 93S; 93N, Highway 1A). Long-term studies are needed to distinguish natural fluctuations of populations from human-induced fluctuations. Products include: Distribution of amphibians and reptiles. Baseline water chemistry from Phases IIIA, IIIB, IV. Evaluation of mitigation measures employed in highway construction.

## JUSTIFICATION

- Implement an ecological monitoring system for important elements of the aquatic resources including herptiles (Objective - Aquatic ecosystems PMP).
- determine changes in biota, in both disturbed and undisturbed systems

## LINKS TO DECISION MAKING

- to maintain the biodiversity of aquatic ecosystems
- minimize the effects of transportation corridors
- identify environmentally sensitive areas in riparian zones, assess the direct and cumulative impacts on riparian systems, and implement measures to reduce these impacts
- minimize the effects of transportation corridors and other structures on the volume and seasonal changes in water flows and water levels

## COMMUNICATION STRATEGY

To be developed

## LEVEL OF INVESTMENT

Year	1998/99	1999/2000	2000/2001	2001/2002
Project Costs	15.1 K	15.1 K	15.1 K	
Park Costs	7.6 K	7.6K	15.1	
Note: Project costs are based on assistance of 2 contracted employees working with the BNP and KYLL Field Units in 1998/99 and 1999/2000, 1 contracted employee in 2001 and the support of the aquatic technician BNP for all three years. Project is a joint project with BNP Field Unit.				

## COLLABORATION

Aquatic specialist, TCH coordinator, Heritage Communications, Bow Valley Naturalists, Dr. Larry Powell - University of Calgary.

## PROJECT DESCRIPTION

# HARLEQUIN DUCK RESEARCH

The concentration of harlequin ducks between Castle Junction and Lake Louise is the highest observed on a breeding stream in North America. This is also where the TCH parallels the Bow River in many locations and therefore in an area which has the highest potential to impact harlequin ducks. Thus, the proposed twinning of the TransCanada Highway from Castle Junction to Lake Louise has the potential to significantly impact a large number of harlequin ducks.

The TCH parallels the Bow River at a distance ranging from a few metres to a few hundred metres throughout the Bow Valley. Negative impacts of road building on harlequin ducks are well documented. Habitat degradation in breeding areas include: destruction of riparian habitat, disruption of watershed stability and stream flow regime which can alter the aquatic community structure, decrease in the food base due to water pollution or increased sedimentation, and disturbance from human intrusion. Recently, harlequin ducks were added to the Yellow 'A' list in Alberta, indicating that this species merits extra attention, as they may be in trouble.

Three potential impacts of construction activities include: immediate impairment of foraging ability because of high turbidity levels, immediate and/or extended reduction in food supply, and temporary or permanent displacement of harlequin ducks due to high levels of disturbance to the river during breeding season.

## RESULTS

Distribution, Abundance and population structure of harlequin ducks on the Bow River; survival rates, trends and productivity, habitat selection and site fidelity, identification of critical wintering, molting and rearing habitat; potential threats identified; appropriate conservation measures identified; recommendations to managers on harlequin duck conservation.

## JUSTIFICATION

The harlequin study was proposed as a 5 year study in 1995. Research to date has been sponsored by the Bow-CEA (TCH 111A) study.

## LINK TO DECISION MAKING

BNP - Mgmt. Plan - protection of rare, threatened and endangered animal species, evaluation and monitoring of status, identification of environmentally sensitive areas in riparian zones, assessment of direct and cumulative impacts on riparian systems. Improved links to decision making - BNP Business Plan (decisions founded on science).

## COMMUNICATIONS STRATEGY

Ongoing public presentations to naturalist and recreation organizations. Written materials forwarded to Research Links. BNP website updates. Presentation of results to the Harlequin Duck Working Group. Papers (3) for publication in the ornithological literature. An exhibit created in 1997 is available for display at various venues.



## LEVEL OF INVESTMENT

Year	1998/99	1999/2000	2000/2001	2001/2002
Project Costs	21.0	11.0		
KYLL Unit Costs	10.3	5.5		
Support	Contract Management, review of status and summary reports, field assistance when required.			
Note: Project costs are based on equal sharing between BNP and KYLL Field Unit. Previous project funding - TCH Mitigation. Continued funding from the TCH project should be pursued.				

## COLLABORATORS

Cyndi Smith, M.Sc. Graduate committee (Simon Fraser University); Dr. Ian Goudie, Jasper National Park, Canadian Wildlife Service - Delta, Harlequin Conservation Society, Kananaskis Country, Public Works Canada/Trans Canada Highway - TCH Phase IIIB, Bow Valley Naturalists, Volunteers, Heritage Communications

Scientific credibility - Peer review through academic process, TCH Coordinator, Scientific Advisory Committee

## PROJECT DESCRIPTION

### HUMAN USE BOW RIVER

This river use study would document the activities on major rivers and recreational lakes and the visitor expectations and experience associated with those activities. The study should provide information about the appropriate type and level of visitor activities, and methods of preventing or mitigating their impact. Document the environmentally sensitive areas in the riparian zone and assess the direct and cumulative impacts that may be affecting the riparian system. With stakeholders, develop and implement management options to better manage human use.

## RESULTS

To determine the following: What are the current river use activities, levels of use and timing of use/events; What type of park experience do river users currently receive; Do these activities fit into the Appropriate Activity/Use Framework outlined by the Banff-Bow Valley Study; What are the ecologically sensitive areas along the Bow River; What are the aquatic and riparian indicator species for the Bow River? What are the strategies for long term monitoring of these indicator species; What are the real and potential impacts, both direct and cumulative, of these visitor activities on the aquatic and riparian ecosystems, in particular on indicator species? What are the strategies for long term monitoring of these impacts; What methods do other agencies employ to allocate and monitor river use and associated impacts?

## JUSTIFICATION

The recommendations from the BBVS are being considered in the current review of the Banff National Park Management Plan (PMP). The purpose of the four mountain parks, as defined in the PMP is "to protect and preserve them for the appreciation, understanding and enjoyment of present and future generations of Canadians and for other visitors." The plan further states that: "Use of navigable portions of the North Saskatchewan, Mistaya and Bow Rivers will be monitored..." (p 94). Recreational river activities provide park visitors with an opportunity to experience and learn about the natural environment and our cultural heritage. However, the National Parks Act requires that those activities must be managed such that they do not adversely impact the surrounding ecosystem and its cultural features.

The *Business Unit Plan* for Banff National Park also addresses ecological integrity, requiring the integration of "economic, social and ecological factors into decision making processes."

## LINK TO DECISION MAKING

The information from this study will provide park managers with the necessary baseline information to guide and implement decisions regarding the appropriate type and level of visitor use on the Bow River, and identify methods of preventing or mitigating the possible impacts associated with those activities. While the current Park Management Plan restricts commercial use of the river to one operator below Bow Falls, there has been a dramatic increase in new proposals for commercial canoeing and rafting on this and other sections of the river. Baseline information on current levels and type of use on the Bow River will be needed to guide future allocations and restrictions on human use.

## COMMUNICATIONS STRATEGY

Communication would involve various user groups, some whom have been identified in the previous section. An in-park advisory group could help to identify preliminary visitor activity groups and potential impacts.

## LEVEL OF INVESTMENT

Year	1998/99	1999/2000	2000/2001	2001/2002
Project Costs	20.0	20.0		
KYLL Unit Park	10.0	10.0		
Support	The project will be managed by the Ecosystem Secretariat planner in consultation with the Aquatics Specialist. Contract Management, review of status, summary and final report.			

## COLLABORATION

An advisory group will be struck to direct the study, including finalizing the Terms of Reference. Collaborators within Banff park include the Ecosystem Secretariat, the Aquatics Section of the Warden Service, and the ongoing Harlequin Duck Research Project. Stakeholder collaborators would include, but not be limited to, the Western River Runners, Banff Army Cadets (although the camp is scheduled to be removed, the cadets may still be using the river), British Army, Camp Chief Hector, Calgary Area Outdoor Council, Calgary Bow Waters Canoe Club, local rental companies, local river users, Alberta Fish and Game Association, Trout Unlimited, Upper Bow Valley Fish and Game Association, and the Bow River Water Quality Council.

SCALE - Although many of Banff National Park's rivers offer high visitor use potential, the Bow River is by far the most accessible, most popular and most heavily used by recreationists. The scale of this project is at the landscape level. Trends associated with these activities are important on a regional basis (Central Rockies Ecosystem level). The Jasper River Use Study has just been completed — much of the generic information therein is applicable to the Bow River as well, which will help to reduce the scope of this study. The information from the two studies will help managers with decision-making on a Rocky Mountain District basis.

Duration - This would be a two-year study. The first field season is required for pre-survey work in regards to the methodology. During the second field season the actual visitor use survey would be completed. Biophysical work would occur over both field seasons. The field seasons would be 1998 and 1999, with an interim report after the first season, and a final report by February, 2000.

## PROJECT DESCRIPTION

# PRESCRIBED BURN SUPPORT

This project will allow Lake Louise, Kootenay and Yoho to develop a comprehensive prescribed burn program in support of maintaining ecological integrity and restoration. The project will consist of the collection of relevant literature and the development of several prescribed burn plans. As well, in 1998/99, this project will collect baseline data for an intensive, ongoing study of fire effects on vegetation communities and aspen regeneration in the Kootenay Valley.

## RESULTS

Ensuring that Lake Louise, Kootenay and Yoho has access to all relevant and current literature for ecological restoration using fire. Developing all required prescribed burn plans for boundary anchor units, random ignition zones, burns as well as the development of several other targeted plans for ecological restoration. The results of the Fire effects research will provide high quality scientific evidence of the nature of the effects of fire as a disturbance process in Rocky Mountain ecosystems.

## JUSTIFICATION

Modern vegetation management within protected areas requires fire to be used as a tool for ecological restoration. The development of the necessary planning documents for a professional approach to fire use requires a large investment of time and expertise. This project will allow for a concentrated effort during the first three years of the program that will provide prescribed burn plans for all required burns for an estimated twenty year period.

High Quality, scientific evidence linking fire behaviour, fire effects and vegetation community dynamics in Rocky Mountain ecosystems is sparse. As a result of the complex ecological community found in the Kootenay Valley, an unparalleled opportunity exists for scientific research into this serious gap in our understanding of fire as an ecosystem process.

## LINK TO DECISION MAKING

The Kootenay, Yoho and Banff Management Plans, as well as the Banff Bow Valley Task Force all support the use of fire for the purposes of ecological restoration. This project provides a critical level of support early in the implementation of fire management.

This project also provides for one year of funding to collect critical baseline data for setting ecological objectives for the use of fire. The lack of ecological objectives and the absence of data linking fire behaviour, fire effects and vegetation community dynamics in Rocky Mountain ecosystems has been cited as the most serious omission in our agency's use of fire.

## LEVEL OF INVESTMENT AND DURATION

YEAR	To Date	1997 - 1998	1998 - 1999	1999 - 2000
PROJECT COSTS				
PARK COSTS		10,000	20,000	10,000

## **COLLABORATORS**

The collaborators for this project will include the fire & vegetation specialists in each of the Rocky Mountain National Parks, the Parks Canada National Fire Network and a variety of academic and government researchers.

## **PROJECT DESCRIPTION**

### **SEASON OF BURN**

The season of burn project will provide unique information for the Canadian Rockies on the seasonal distribution of pre-historic fire events within their respective fire seasons. This information will be used to assess changing human land use patterns as a causal factor in present forest stand age distributions. Specifically, the data will allow a comparison of the seasonal timing of pre-historic fires during different eras of human land use as well as with the seasonal distribution of lightning over the last several decades.

The project requires two stages of data collection and analysis. The first stage is to develop a cambial growth phenology for Douglas fir and lodgepole pine in the Canadian Rockies. The second stage is to analyze existing fire scarred trees relative to the cambial growth phenology to determine the timing, within the growth season, of the scarring event.

The project design includes two study sites, one valley bottom and one mid-slope, in each of Banff, Jasper, Kootenay and Waterton Lakes National Parks. Each of these eight sites provides data from ten band dendrometers, monitoring incremental growth during the growing season. In addition, intensive sampling of fire-scarred trees will be conducted throughout the montane ecoregions of the Rocky Mountain National Parks.

### **RESULTS**

By comparing the seasonal distribution of fire scarring events before and after major shifts in human use patterns within the Canadian Rocky Mountains, changes in the relative contribution of human ignited fires can be determined.

### **JUSTIFICATION**

The role of aboriginal burning is an important and unresolved issue in the Rocky Mountain national parks. The causal factors contributing towards the present stand age distribution in the Canadian Rockies, including climate change, changing land use patterns and fire suppression, have been the subject of considerable controversy and debate within both the fire science and fire management fields.

### **LINK TO DECISION MAKING**

The project results will be used to determine appropriate fire management approaches in both the Central and Northern Rockies Ecosystems.

When setting objectives for the ecological restoration of vegetation, based at least in part on pre-historic fire regimes, it is very useful to know what the relative contribution of pre-historic ignition sources were. The nature of human and lightning-ignited fires varies considerably and, as a result of differences in seasonality, intensity and scale, can result in dramatically different vegetation structure and community composition.

## LEVEL OF INVESTMENT AND DURATION

YEAR	pre 1997	1997-1998	1998-1999	1999 -2000	2000-2001
PROJECT COSTS	11,500 (Green Plan)	None	5,000	5,000	25,000
PARK COSTS	---	None	5,000	5,000	9,000

## COLLABORATORS

As a result of the widespread applicability of the results, project funding is being shared with Banff, Jasper and Waterton Lakes National Parks. The lead responsibility rests with the Fire & Vegetation Specialist, Lake Louise, Yoho and Kootenay.

To date, the project has been designed and conducted with widespread consultation. This has included the co-operation and assistance of researchers at the Laboratory of Tree Ring Research, University of Arizona; University of Calgary; University of New Brunswick; University of British Columbia, and; Simon Fraser University. The project has been presented in its design phase to the Human Influence on Mountain Ecosystems Workshop and has received wide support.

## PROJECT DESCRIPTION

### MOUNTAIN PINE BEETLE PALEOECOLOGY

The Mountain Pine Beetle (*Dendroctonus ponderosae*) Paleocology project will determine the occurrence of mountain pine beetle, and the larger, associated Coleopteran assemblage, over the last one thousand years in the Kootenay Valley of Kootenay National Park. This project is one of several conducted to reconstruct the ecohistory of Kootenay National Park and follows a preliminary study that was used to determine whether there was sufficient material to conduct a full scale reconstruction.

Sediment cores of recent sediments will be extracted from Dog Lake during the summers of 1998 and 1999 using a Brown Corer. The number of cores necessary is still to be determined but approximately one litre of organic material per stratum is required for analysis. The use of a Brown Corer will allow for field assessment of the cores and improved efficiency of sampling.

The strata within the cores will be correlated visually by using markers such as tephra layers. The sediment record in Dog Lake is an exceptional one that lends itself well to this correlation. Each of the cores will be sampled, by stratum, for fossil Coleopteran remains. Coleopteran remains will be sorted under a dissecting microscope and prepared for SEM. Sub-fossil remains will be identified by comparing SEM images with reference material and taxonomic keys. Key marker layers will be analyzed via isotopic dating techniques to determine a baseline date and sedimentation rate.

The occurrence and relative abundance of fossil Coleoptera will be reconstructed from the identified specimens. Using mountain pine beetle and other host-specific bark beetle remains in conjunction with the existing pollen records for Dog Lake, a re-construction of pre-historic mountain pine beetle infestations and the underlying vegetation conditions necessary for their development will be created.

## RESULTS

A long-term, high resolution chronology of Coleoptera, with an emphasis on mountain pine beetle infestations, will be constructed that will provide critical ecological information on which to base management decisions. The data will be analyzed and discussed relative to the existing paleoecological data and the existing knowledge of disturbance ecology within the Kootenay Valley. The existing data includes a time-since-fire map, archeological data, tree ring chronologies, and several analyses based on paleolimnological studies using pollen, charcoal, ostracods and diatoms.

The size of the Coleoptera assemblage from the preliminary study was small yet comparable to larger assemblages associated with much larger volumes analyzed as part of other studies. When considered as a whole, Coleopteran assemblages give insight into the ecological processes operating over the landscape. Analysis of a significantly larger volume of sediment will provide reliable and important baseline information of the paleoecology, paleoentomology and paleoclimatology of Kootenay National Park.

## JUSTIFICATION

Forest insects and disease are the second most important source of landscape level forest disturbance after wildfire in Rocky Mountain ecosystems. They are also of considerable concern to the timber industry as a result of their effects on tree growth, mortality and stand yield. A great deal of attention has been focussed on the most recent mountain pine beetle infestation in the Kootenay Valley since its beginning in



1979 This attention has come from provincial agencies from both Alberta and BC, environmental groups, the timber industry as well as political representatives. In fact, the existing mountain pine beetle infestation has been suggested in parliament as evidence of mis-management of forests by Parks Canada.

Two major mountain pine beetle infestations have occurred during historical times within the montane ecoregion of the Kootenay Valley in Kootenay National Park. Prior to the present one, an infestation in the 1930's and 40's killed approximately twice as many trees in the Kootenay Valley around Dog Lake. That this level of infestation occurred before there was any significant history of forest management in the valley has been considered as evidence that large infestations are a natural part of the disturbance ecology of the valley.

If the recent history of mountain pine beetle infestations is representative of long term occurrence patterns, then the mountain pine beetle is a highly significant source of disturbance in this ecosystem. This possibility has important implications for defining the natural range of variation of disturbance processes in Rocky Mountain montane ecosystems. As mountain pine beetle, and other Coleopteran species, are considered forest "pests" in adjacent provincial lands, the long term periodicity of these infestations is of wide interest.

A preliminary study of mountain pine beetle paleoecology was conducted to determine whether a comprehensive reconstruction of the paleoentomology of the Kootenay Valley was possible. Numerous fossil Coleoptera fragments were readily recovered from late Holocene sediments from Cobb and Dog lakes. Characteristic elytral and pronotal micro-sculpturing and micro-ornamentation revealed by Scanning Electron Microscope (SEM) imaging provided evidence of i) the quality with which fragments were preserved within the sediment matrix and ii) the effectiveness of the isolation technique in maintaining the structural integrity of the fragments. As a result, it was determined that suitable material was likely present in the lake sediments within the Kootenay Valley.

Fossil Coleoptera are effective indicators of paleoecological and paleoclimatic conditions. Since Coleoptera are abundant, diverse and occupy a wide variety of specialized ecological niches their remains serve as effective indicators of past ecosystems. Their success in most environments and the resilience of their exoskeletons to sediment compaction are the primary reasons underlying the relative dominance of Coleoptera fossils within most Quaternary sediments. Since Coleoptera species are known to remain evolutionally stable over hundreds of thousands of years, direct comparison with present day populations is possible. Of the Coleoptera, the family Scolytidae (bark and ambrosia beetles) is of particular importance to paleoecology since the majority of its member species are specific to a particular genus or species of host plant.

## **LINK TO DECISION MAKING**

The Draft Vegetation Management Strategy for the Mountain National Parks provides a program goal for the management of forest insects and diseases within National Parks:

**To allow fluctuations of natural, dynamic populations of forest insects and diseases with minimal interference.**

This program goal differs significantly from the goals of neighbouring agencies whose mandate includes protecting the forest as a timber resource. Given this program goal, it becomes important to define existing or potential forest insect infestations as natural or management-induced. When an infestation has been identified as unnatural, control methods would be considered

Given the ongoing high level of interest in the mountain pine beetle infestation in the Kootenay Valley, it is important for Parks Canada to conduct basic research into this phenomenon in an attempt to address our neighbour's concerns. In addition, the presence of large, dynamic bark beetle populations in Kootenay National Park provides a unique scientific opportunity to investigate the ecology of these important forest insects.

#### LEVEL OF INVESTMENT AND DURATION

YEAR	To date	1998 - 1999	1999 - 2000	2000-2001
PROJECT COSTS	5,000 (Prelim study)	30,000	30,000	30,000
PARK COSTS	5,000	25,000	25,000	25,000

#### COLLABORATORS

To date, the project has been designed and conducted with widespread consultation. This has included the co-operation and assistance of researchers at the Canadian Forest Service in both Edmonton and Victoria; British Columbia Ministry of Forests; Alberta Forest Service; University of Alberta; University of Colorado; University of Calgary, and; Simon Fraser University. The project has been presented in both its design and preliminary results stages to the Alberta-BC Intermountain Forest Health Workshops and has been widely supported. The methods of the preliminary study are in preparation for publication in a peer-reviewed journal. Additional collaboration and support is anticipated from the National Sciences and Engineering Research Council of Canada and the University of Lethbridge.



## PROJECT DESCRIPTION

# TERRESTRIAL ARTHROPOD BIODIVERSITY INVENTORY

The Terrestrial Arthropod Biodiversity Inventory project will begin the enormous and highly important task of describing the taxonomic diversity, or species richness, of the most abundant group of animals that exists. Given the importance and enormity of the task, selected groups will provide the initial focus for identification or description. The initial groups selected are the Carabid Beetles and Yellow Jackets.

The project will utilize the sampling techniques recommended by the Biological Survey of Canada for general terrestrial arthropod biodiversity inventories. These techniques will include: malaise traps; flight intercept traps; pan traps; pitfall traps, and; behavioural extractors. These sampling methods will be phased in over several years beginning with the malaise, pitfall and pan traps.

The project will take advantage of the existence of EMAN/SIMAB plots in Yoho National Park. In the future, the project also will take advantage of the presence of extensively harvested forests adjacent to the field unit for comparative study as well as the experimental opportunity available as a result of the program of montane meadow prescribed burns.

## RESULTS

The project will produce large numbers of specimens from traps. These specimens will then be sorted and prepared for identification. Specimens from the selected groups will be sent to the appropriate systematist for identification. Specimens from other groups will be stored in an appropriate facility until additional systematic support is arranged for that group. Additional systematic support will be phased in over time and any opportunities for additional support will be explored opportunistically.

Information on all identified specimens will be entered into a terrestrial arthropod database. All specimens will be stored at, and managed by, the University of Calgary entomological collections facility.

## JUSTIFICATION

Knowledge of biodiversity is essential for maintaining and restoring ecological integrity. The Canadian Biodiversity Strategy states that comprehensive and reliable biological inventories are a fundamental requirement for the conservation of biodiversity and directs us to increase our understanding of the status of species and populations to improve ecological planning and management.

Terrestrial arthropods (insects and their relatives) are by far the most diverse group of animals and the most important contributors to biodiversity. The sensitivity of many terrestrial arthropod populations to environmental impact, including fragmentation, disturbance, habitat modification, ecological disruption, climate change, and chemical pollution, makes them informative for scientifically-based protected areas management.

Terrestrial arthropods can be easier and less costly to survey than vertebrates as a result of passive sampling technologies. Reference collections of terrestrial arthropods can be maintained indefinitely and inexpensively for future and retrospective studies.

The only data on terrestrial arthropods available in the Lake Louise and Yoho and Kootenay National Parks Field Unit is contained in the Forest Insect and Disease database. This database is restricted to

those arthropods that have traditionally been considered forest "pests" from the perspective of timber harvesting and silviculture. Given the Parks Canada mandate, it is critical to expand our knowledge of the diversity of terrestrial arthropods beyond this utilitarian focus.

### **LINK TO DECISION MAKING**

The diversity and abundance of terrestrial arthropods can provide a rich base of information to aid efforts in the conservation of biodiversity. The terrestrial arthropod biodiversity inventory project will allow park managers to determine critical ecosystem indicators from within the most diverse group of fauna. These indicators can then be used to provide quantitative objectives for and critical assessment of resource management programs.

### **LEVEL OF INVESTMENT AND DURATION**

YEAR	1998 - 1999	1999 - 2000	2000-2001
PROJECT COSTS	\$35,000	\$30,000	\$30,000
PARK COSTS	\$30,000	\$25,000	\$25,000

### **COLLABORATORS**

To date, the project has been designed and conducted with the co-operation and assistance of researchers at the University of Calgary and the BC Conservation Data Centre. Additional support is anticipated from the Biological Survey of Canada, University of Alberta, Provincial Museum of Alberta and the University of Lethbridge.

## PROJECT DESCRIPTION

# NON-NATIVE PLANT CONTROL

This project consists of hand-pulling several high priority non-native plant species, chemically controlling two sites and mechanical control at several sites. Effective control measures for non-native plants are ongoing and species-specific and efforts must be aimed at the control of high priority species.

## RESULTS

This project will result in Lake Louise, Yoho and Kootenay (LLYK) contributing to regional and national efforts to control invasive non-native plants. Several high priority species will have their populations held at present levels or reduced. Through elimination and reduced vigour, non-native plant populations will be less competitive within native plant communities.

## JUSTIFICATION

Numerous non-native plant populations are growing in or have the potential to invade LLYK. Species such as Diffuse Knapweed, Spotted Knapweed, Leafy Spurge, Canada Thistle and Tansy have been identified in both the Western Region Issue Analysis and the Lake Louise, Kootenay and Yoho Interim Non-native Plant Control Strategy as important species for control. These species are also identified by other Federal and Provincial agencies as Noxious Weeds.

## LINK TO DECISION MAKING

Both Parks Canada Policy and the relevant Park Management Plans require that additional non-native plant populations not be allowed to invade and, where they already exist, efforts made to eliminate them.

## LEVEL OF INVESTMENT AND DURATION

YEAR	1997 - 1998	1998 - 1999	1999 - 2000	2000-2001
PROJECT COST	15,000	15,000	15,000	15,000

## COLLABORATORS

The project has been designed and conducted with widespread consultation including: BC Ministry of Forests (Nelson, Golden & Invermere); BC Ministry of Agriculture, Fisheries and Food; BC Parks; Town of Golden; CP Rail; BC Hydro; McMurdo Bench Grazing Association; Windermere Farmers Institute; Golden Farmers Institute; Kootenay Livestock Association; Columbia Shuswap Regional District; East Kootenay Regional District; Alberta Agriculture, and; Municipal District of Rockyview.

## PROJECT DESCRIPTION

### WHITEBARK PINE RESEARCH

This capital submission represents the Lake Louise, Kootenay and Yoho portion of a shared funding project with Banff, Jasper, Waterton Lakes and Mt. Revelstoke/Glacier National Parks. Lead responsibility rests with Banff.

Please see Banff's submission for details.

#### LEVEL OF INVESTMENT AND DURATION

YEAR	To Date	1997 - 1998	1998 - 1999	1999 - 2000
PROJECT COSTS				
PARK COSTS		4,000	4,000	4,000

## PROJECT DESCRIPTION

# FIRE MANAGEMENT COMMUNICATIONS

The Fire Management Communications project is a national program developing Parks Canada specific communications products.

## RESULTS

The project results to date have included: an award winning pamphlet; 4 portable displays covering various aspects of fire management; a fire management poster; information sheets; a media back grounder; an edukit, and; uncountable opportunities to enhance the understanding, appreciation and respect for Parks Canada fire management as it relates to ecosystem-based management.

## JUSTIFICATION

These products allow fire managers to provide consistent, professional information to park stakeholders at a variety of levels of knowledge and expertise. These products have been extremely well accepted at community-based events as well as at international fire management conferences.

## LINK TO DECISION MAKING

As Parks Canada moves more into the realm of stakeholder involvement, it is essential that we provide consistent, professional information to our stakeholders.

## LEVEL OF INVESTMENT AND DURATION

YEAR	To date	1998 - 1999	1999 - 2000	2000-2001
PROJECT COSTS	approx. 115k	approx. 80k	n/a	n/a
PARK COSTS	15,000	10,000	5,000	5,000

## COLLABORATORS

To date, the project has included the Western Fire Centre; Waterton Lakes; Banff, LLYK; Wood Buffalo; Ontario Region; Quebec Region; Atlantic Region, and PHQ Natural Resources Branch. Specific products have undergone substantial review both within Parks Canada and with outside agencies.



## PROJECT DESCRIPTION

### DOUGLAS FIR POPULATION DYNAMICS

This capital submission represents the Lake Louise, Kootenay and Yoho portion of a shared funding project with Banff, Jasper, Waterton Lakes and Mt. Revelstoke/Glacier National Parks. Lead responsibility rests with Banff.

Please see Banff's submission for details.

#### LEVEL OF INVESTMENT AND DURATION

YEAR	To Date	1997 - 1998	1998 - 1999	1999 - 2000
PROJECT COSTS				
PARK COSTS		5,000	5,000	

## **PROJECT DESCRIPTION**

### **CEAA TRAINING AND INFORMATION**

The efficient administration of the CEAA (and development review) would be enhanced if staff, managers, and environmental interests better understood the requirements of the Act, how it is applied by Parks Canada, and how the results intended can be assured through follow-up programs. This project envisions three information/training modules being developed (two in year 1 and one in year 2) that would present to Parks Canada staff and external environmental interests. Internal modules would centre on information required by managers to understand CEAA and the application of surveillance and monitoring. The 'external' module would serve to educate environmental interests as to how Parks Canada applies the CEAA legislation and how to effectively participate in the over all process.

### **RESULTS**

Basic modules developed for both internal and external clients over a two year time frame for delivery on a seasonal basis or as required. Will increase efficiency, quality, and credibility, of CEAA administration while reducing error and controversy.

### **JUSTIFICATION**

Managers still somewhat uncertain as to their role with respect to CEAA administration and the requirement to ensure that mitigations for projects are implemented and reported. The CEAA process continues to fall short of the expectations envisioned by environmental interests often as a result of either misunderstanding how Parks Canada applies the legislation or how they can participate with its' application.

### **LINK TO DECISION MAKING**

Links to the spirit and intent of CEAA legislation, the Procedures of the DCH for complying with CEAA and will improve transparency, function, and delivery of Development Review.

### **LEVEL OF INVESTMENT AND DURATION**

A 'bare bones' two year program is proposed although an accelerated 1 year expenditure would be appreciated. Two modules in year 1 (CEAA for Managers and CEAA for Environmental Interests) and one module in year 2 (Surveillance and Monitoring).

98/99 = \$10.0 20/01 = \$5.0

### **COLLABORATORS**

No collaboration envisioned. Stand alone product. Possibility of environmental interests participating in development of their particular module. No funding expected



## PROJECT DESCRIPTION

### CLASS SCREENINGS / PEER REVIEW

These two categories of projects were combined as a single category after close budgetary scrutiny during the final approval phases of last years' business plan. The effect was to recognize the utility of both concept categories and allow for some flexibility in response to needs that cannot always be anticipated.

Peer review recognizes the occasional need for expert input from the academic community, other agencies, and internal sources in order to make informed recommendations with respect to environmental assessments. Class Screenings recognize the value of proactively developing 'generic' environmental assessments that can be used repeatedly for similar projects at different times and locations (eg. annual road maintenance, right-of-way clearing, housing renovations, etc.).

### RESULTS

Class Screenings will developed as encountered and as needed, particularly with respect to community development requirements (Field and Lake Louise), certain ski area projects, utility and road corridor maintenance, and for some projects repeated by Parks Canada operational staff. Peer Review will increase the confidence level of managers in certain 'high profile' assessments and improve the credibility of controversial decisions.

### JUSTIFICATION

The adoption of Class Screenings will serve to reduce, over time, the amount of effort and resources required to satisfy CEAA requirements for projects that trigger the act. It will also obviate the necessity to post routine and relatively inconsequential assessments for public review. Peer Review is sometimes a necessity where definitive expertise is not readily forthcoming or available internally from within Parks Canada or from a proponent, or in situations where argument of equal weight requires an independent adjudication.

### LINK TO DECISION MAKING

Links to the spirit and intent of CEAA legislation, the Procedures of the DCH for complying with CEAA and will improve the transparency, function, and delivery of the Development Review Process and the maintenance of ecological integrity and sustainable development.

### LEVEL OF INVESTMENT AND DURATION

A three year time frame that anticipates 'build out' of Field, Lake Louise, OCA's, and other situations alluded to within the context of the current BNP management plan. Funding requested for this program is considered low in light the past years' experience. Peer Review of any major proposal is easily between 5 to 10k while a 'minor' EA for a class screening would easily be 3 to 5k.

99/20=\$15.0	20/01=\$15.0	98/99=\$15.0
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## **COLLABORATORS**

Internal and external proponents would be able to collaborate with both Class Screenings and Peer Review. In some cases, funds would 'seed' the participation of other agencies by covering expenses apart from regular salaries and in others, particularly internal proponents, match other cost centre funding for the production of a superior assessment that could be used again with the benefits outlined above.

## PROJECT DESCRIPTION

# ARCHAEOLOGICAL RESOURCE INVENTORY RESOURCE INVENTORY / ARCHAEOLOGICAL RESOURCE DESCRIPTION AND ANALYSIS, YA-HA-TINDA RANCH

The Ya-Ha-Tinda Ranch crown leasehold is remarkably rich in archaeological resources. Recent archaeological research on the ranch has established a complex human history of occupation going back nearly 10,000 years. Thus, in addition to the area's unique local environment within the surrounding Rocky Mountains, Ya-Ha-Tinda Ranch contains an extraordinary record of human occupation that provides a rare opportunity to look at the human factor in the evolution of an ecosystem over a 10,000-year period.

As only about 10 per cent of the ranch had received any sort of assessment for archaeological resources, this project was initiated in 1997 to systematically survey the entire leasehold. Selective subsurface testing will be an integral part of the field work beginning in 1998-99. On the basis of surface evidence alone, 17 new sites were added to the inventory while assessing the ranch's northeast landforms for archaeological potential. The ranch must be viewed as a resource with extraordinarily high archaeological potential.

## RESULTS

This project will produce two important results:

- a baseline inventory and significant assessment of the archaeological resources from all parts of the leasehold;
- an Archaeological Resource Description and Analysis (ARDA) management document for Ya-Ha-Tinda Ranch will be completed in the final year of the project.

## JUSTIFICATION

This resource inventory project that is proposed for the 1998-99 fiscal year is the second of a five-year inventory programme. This project addresses specific objectives and targets identified in Section 5.2 (Program Accountability) of the Parks Canada National Business Plan and represents a Stream 1 Investment. The project is integral to producing an Archaeological Resource Description and Analysis (ARDA) document for the management of the extraordinary cultural heritage resources on the ranch.

## LINK TO DECISION MAKING

Given the unique vegetational regime found within the Ya-Ha-Tinda, this project is providing information about long-term human occupation and exploitation of the valley. The predominant grassland environment suggests an anthropogenic basis for its unusually large areal extent (i.e., through prescribed burning practices). The long-term effects of the human factor in the Ya-Ha-Tinda ecosystem must be considered when undertaking ecosystem-based management of the ranch.

## LEVEL OF INVESTMENT AND DURATION

**Capital Program Cost:** 1997-98: \$7.5;  
\$10.0 per year is requested for 1998-99, 1999-2000 and 2000-01.

**Staff:** Archaeologist (Dr. P. Francis), Assistant Archaeologist (J. Porter), and student assistants to be drawn from the Federal Student Work Experience Programme.

**Estimated Time:** 1998-99: 4 weeks of field work; estimated 10 weeks of pre- and post-field activities, including preparation, analyses, cataloguing artefacts, reporting, and publication.

**Duration:** The proposed research for 1998-99 is the second year of a proposed five-year basic inventory project, begun in the 1997-98 fiscal year. In addition to continuance of the field work, an Archaeological Resource Description and Analysis (ARDA) management document will be completed during the final year of this project.

## **COLLABORATORS**

Interdisciplinary collaboration between Parks Canada archaeological staff (Cultural Resource Management, Calgary Office) and the Archaeological Survey of Alberta (Provincial Museum of Alberta) has been developed over recent years as the latter institution has undertaken archaeological research within the nearby James Pass area. Cultural Resource Officer D. Mickle (BNP) will also be a principal collaborator with this project.

## PROJECT DESCRIPTION

# MOUNTAIN PASS ARCHAEOLOGICAL SURVEY, YOHO NATIONAL PARK

Except for the Kicking Horse River valley, much of Yoho National Park (YNP) has not been surveyed systematically for archaeological resources. This fact presents clear difficulties for the effective management and protection of heritage resources in the national park. On the basis of current information, there is no credible way to assess the number, density, type, or the geographical potential of Level 1 and 2 cultural resources. These problems and specific information gaps have been identified in the YNP Archaeological Resource Description and Analysis document.

In 1998-99, Parks Canada archaeologists under the direction of Dr. P. Francis propose to undertake a basic resource inventory through archaeological reconnaissance and survey to determine the distribution and potential for archaeological resources in selected mountain pass areas within Yoho National Park. Three mountain pass areas are proposed for basic resource inventory field work; these include the Amiskwi, Goodsir, and Kiweetinok passes. No archaeological field work has been conducted previously within these areas.

## RESULT

This project will provide archaeological resource inventory knowledge for high potential areas within Yoho National Park that currently have none.

## JUSTIFICATION

The proposed Mountain Pass Archaeological Survey is a basic resource inventory project that is of fundamental importance in identifying the number, density, and type of cultural resources in YNP. It will address the specific objectives and targets identified in Section 5.0 (Program Accountability) of the Parks Canada National Business Plan and represents a Stream 1 Investment. This project is integral to fulfilling the goals identified in Sections 3.0 (Protection and Management of Heritage Resources) of the YNP Management Plan as well as addressing the information gaps identified in the Archaeological Resource Description and Analysis management document for Yoho National Park.

Information derived from this basic resource inventory survey of Montane and Subalpine ecoregions within the national park will provide the basis for more in-depth multi-disciplinary research into human exploitation and effects on mountain ecosystems. Research into longer-term patterns of environmental or ecosystem change will have a direct bearing on current management decisions regarding prescribed burning programmes and wildlife control.

## LINK TO DECISION-MAKING

- Capital Program Cost: \$10.0 for 1998-99.
- Staff: Archaeologist (Dr. P. Francis) and Assistant Archaeologist (J. Porter); assistants may be drawn from the Federal Student Work Experience Program.



- Estimated Time: 2-3 weeks fieldwork; 4-5 weeks pre- and post-field activities, including preparation, analysis, reporting, and publication.
- Duration: This basic archaeological resource inventory project will be completed within the 1998-99 fiscal year. The results of the fieldwork will be incorporated into the scheduled revision and update of the Yoho Archaeological Resource Description and Analysis (ARDA). Additional inventory research may be identified for fiscal year 1999-2000.

### **COLLABORATORS**

Interdisciplinary collaboration between Parks Canada archaeologists (Cultural Resource Management, Calgary Office) and ecosystem and cultural resource management staff (D. Mickle) in the Kootenay-Lake Louise-Yoho field unit.

## PROJECT DESCRIPTION

# RESEARCH ACTIVITY PROPOSAL BANFF, KOOTENAY AND YOHO CAMP AND PICNIC GROUND BUILT HERITAGE RESOURCE DESCRIPTION AND ANALYSIS

Survey, research and evaluate cultural landscapes in campgrounds and picnic areas in Banff, Kootenay and Yoho national parks. Reports would be prepared for each surveyed area and would include heritage character statements and identify historically significant features such as buildings and shelters.

## RESULTS

- Areas will be researched in 1997-98
- Areas will be surveyed in 1997-98
- Evaluation will be carried out and BHRDA reports written in 1999-00
- Resources will be described and any threat to the cultural landscapes will be noted.

## JUSTIFICATION

- This project is part of a larger objective of surveying the cultural resources in the mountain parks with the objective of identifying Level I and Level II resources.
- Inventories of cultural resources require research and evaluation in order to apply principles of cultural resource management identified in the Parks Canada policy, specifically principles of value, understanding and integrity.
- This project will contribute to the objective described in Parks Canada's Response to the Bow Valley Study which is an integrated approach to decision making which considers cultural factors along with ecological factors.
- This project will contribute to another objective outlined on the response to the Bow Valley Study which is that Parks Canada personnel will be able to communicate an understanding of the history of the parks.

## LINK TO DECISION- MAKING

- The results of this project will contribute to decisions made by the Federal Heritage Building Review Office.
- The product will assist the planning and development of the campground and picnic areas in the mountain parks.

## LEVEL OF INVESTMENT AND DURATION

- |           |                            |        |
|-----------|----------------------------|--------|
| - 1997-98 | Site survey and research   | \$20.0 |
| - 1998-99 | Site evaluation and report | \$ 6.0 |

## **COLLABORATORS**

- Don Mickle will be project supervisor
- Don Mickle will hire seasonal staff to survey sites. Jim Taylor will provide professional advice to this employee.
- Jim Taylor will carry out the research either personally or through contract.
- Jim Taylor will evaluate the resources and prepare the BHRDA reports.

## PROJECT DESCRIPTION

# COMMEMORATIVE INTEGRITY STATEMENTS

Completion of Commemorative Integrity Statements for all of the National Historic Sites in Canada is a goal for the sustainable development strategy of the Department of Canadian Heritage.

The CRM Advisory Committee has prioritized the completion of the Commemorative Integrity Statements for National Historic Sites for Alberta Region.

Twin Falls Tea House and Abbott Pass Refuge Hut are scheduled for completion in 1998/99. Kicking Horse Pass should be completed in 1998/99 also if possible.

The CIS statements will likely need to be completed by contract rather than "in-house" because of the Down-sizing at the Calgary Field Unit.

\$7.0 should fund the completion of Twin Falls Tea House and possibly the Abbott Pass Refuge Hut with a combination of Parks Historians and Private Contractors.