

2001 ACA Annual Report

*Effects of land-use and angling on fish populations
within selected watersheds in the Foothills Model Forest*

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For

The Fisheries Management Enhancement Program of the
Alberta Conservation Association

By

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Alberta Conservation
Association

*Funded by Alberta Anglers, Hunters,
and Other Conservationists*



MODEL FOREST
NETWORK

RÉSEAU DE
FORÊTS MODÈLES

Foothills Model Forest Publication Disclaimer

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Acknowledgments

In 2001, this project was funded through a partnership that included the Alberta Conservation Association (ACA), Weldwood of Canada Ltd. (Hinton Division), and the Canadian Forest Service. The funding from Weldwood was made available through the Forest Resource Improvement Program (FRIP). Additional support for this Foothills Model Forest project was received through Alberta Sustainable Resource Development and Jasper National Park.

Staff members from Weldwood of Canada Ltd. – Hinton Division, including Rick Bonar and Chris Spytz, provided review of project design and support. George Sterling of Alberta Sustainable Resource Development, Edson, also helped to refine overall goals, develop specific methodologies and troubleshoot during the field season. Paul Hvenegaard of the Alberta Conservation Association, Peace River, continued the loan of a fish trap for MacKenzie Creek. Jasper National Park provided an alternate electrofisher and block-nets.

The summer field crew included Jason Blackburn, Cameron Nelin, and Chantelle Bambrick. Mike Blackburn served as field crew leader. The fall field crew included Tyler Muhly, Barb Johnston, Chantelle Bambrick and Jason Blackburn. Craig Johnson, previous manager of the Fish and Watershed Program at the Foothills Model Forest, initiated this multi-year project.

Abstract

The year 2001 was the fourth year in a five-year study, which was initiated in 1998. This report describes the work completed during 2001. This study represents the largest undertaking of the Foothills Model Forest Fish and Watershed Program.

During 2001, extensive literature reviews and field studies were completed to support the analysis and reporting planned for the final year of the project. Literature reviews included a search for all previous fish inventory studies that had been completed by government and industry within the monitoring watersheds. In addition, all fishing regulations for the province of Alberta that were available since 1952 were obtained and regulation changes within each monitoring watershed were documented and recorded into a Microsoft Access database.

Field studies completed during 2001 included re-surveys at locations where historical fish population studies had taken place, enumeration of spawning Bull Trout and Mountain Whitefish in MacKenzie Creek, and float electrofishing in the McLeod River. Population estimates at long-term monitoring sites were also completed. In addition, detailed channel morphology surveys were repeated at six sites in the Tri-Creeks experimental watershed area. Databases were developed for each component of the study to ensure data integrity and facilitate data analysis.

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Introduction

1.1 Foothills Model Forest Goals and Objectives

The mission of the Foothills Model Forest is to work towards achieving sustainable forest management, which includes sustainability of fish populations and aquatic ecosystems. We accomplish this goal by both determining the current status of various aquatic indicators and also by participating in the development of management practices that will help achieve sustainability of both forest and aquatic resources. To accomplish these objectives, the Foothills Model Forest initiated this study in 1998 with the support of the ACA and other Foothills Model Forest partners including Weldwood of Canada Ltd. – Hinton Division (Weldwood), and the Canadian Forest Service (CFS).

1.2 Project Goal

The overall goal of this study was to increase the understanding of direct and indirect relationships between angling, industrial land-use and fish populations within selected basins and the upper McLeod River watershed. The findings from this study were intended to:

- Increase the understanding of the effects of angling and industrial activities on fish populations and fish habitat.
- Provide information on fish and fish habitats for land-use planning.
- Assist provincial managers in evaluating new sport-fishing regulations.

1.3 Overview of Limiting Factors

A number of factors may potentially influence fish populations and the productive capacity of their habitats including: angler harvest; channel disturbance from increased peak flows and sediment loads; habitat isolation due to stream crossings; and watershed and stream characteristics(Figure 1).

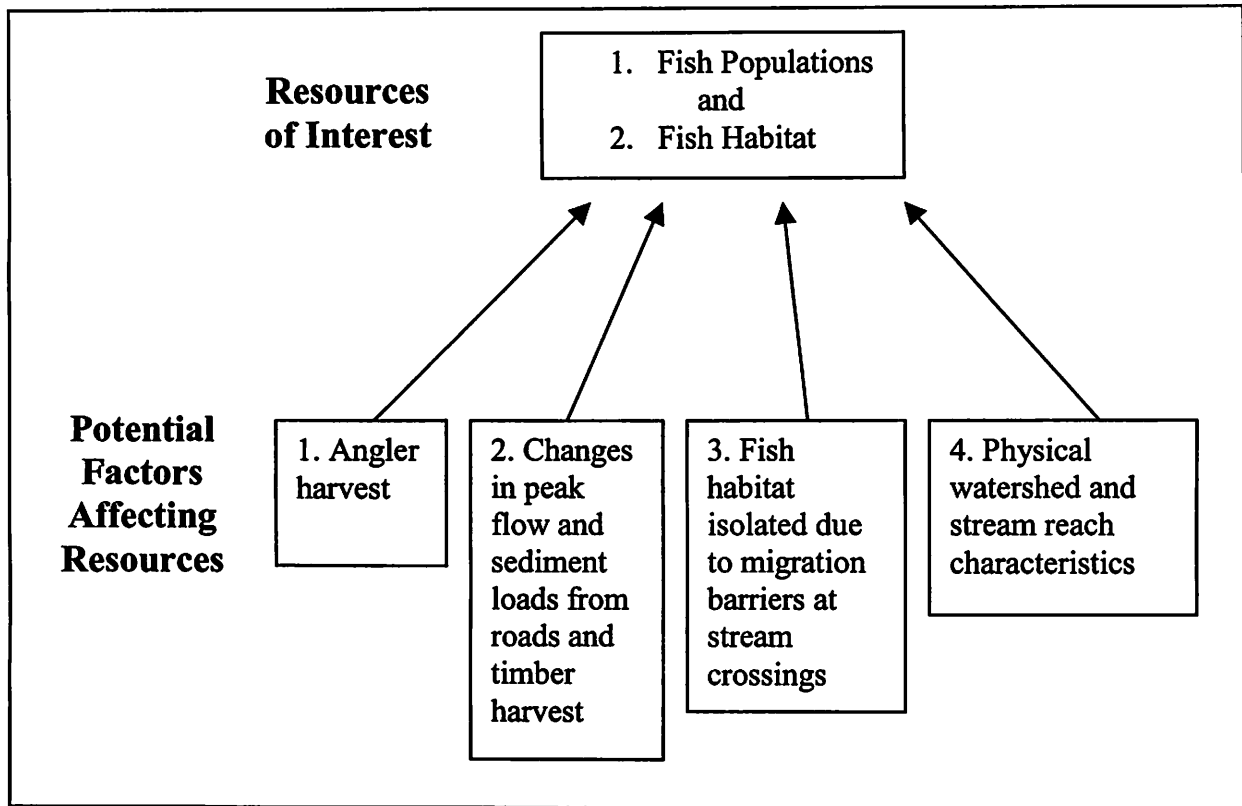


Figure 1. Factors affecting target resources.

In many other areas of western North America this list would also include cattle grazing and logging of streamside forests. However, within this study area, provincial managers have limited cattle grazing to isolated areas (C. Lane, Range Management Specialist, Alberta Sustainable Resource Development, pers. Comm. 2002). In addition, industry standards in place since 1958 have required the maintenance of timber along watercourses during harvest (R. Bonar, Chief Biologist, Weldwood of Canada Ltd. – Hinton Division, pers. comm. 2002). Prior to 1958, some riparian forests in the areas were harvested and floated downstream to sawmills where they were cut into railway ties (Kyba and Ross 2001). This historical activity was likely limited to corridors along the larger rivers away from the smaller streams that have been identified for this study. As a result of these current and historic land-use practices, grazing and riparian logging were not considered limiting factors within the watersheds that were selected for the purposes of this study.

The Foothills Model Forest includes a portion of Alberta's East Slopes. In the East Slopes Region, numbers and sizes of native sport fish have decreased over the last two or three decades (Meredith 1999), indicating that sustainability of these populations is in question. In the

mid 1990's, the provincial government recognized that habitat degradation, poaching, and angling were all likely contributing to the decreases in fish size and abundance (Meredith 1999). Of these factors, legal harvest through angling was thought to be very significant and as a result, the provincial government has made numerous changes to the sport-fishing regulations (Meredith 1999).

2 Results

As the fourth year of the project, 2001 represented the final year of intensive field data collection. Considerable efforts were made in the development of databases for each project component so that all data would be securely stored and suitable for analysis.

2.1 2001 / 2002 ACA Contract Deliverables

Our contract with the ACA for Year 4 of the study stated ten objectives, each with corresponding deliverables (Table 1).

Table 1. FMF Objectives and Corresponding Deliverables.

FMF Objective:	Deliverable:
1. Within selected watersheds and the mainstem of the McLeod River, define fish species distributions and relative abundance.	<ul style="list-style-type: none"> • 1999 ACA Annual Report • 2000 ACA Annual Report • 2001 Fish and Stream Inventory – Site Summaries
2. Establish population trends at selected sites within various basins in the McLeod River watershed.	<ul style="list-style-type: none"> • Report 1.2.1 – Changes Between Historic and Current Fish Relative Abundance and Size within Selected Foothills Model Forest Watersheds • Report 1.2.2 – Long-term Changes in Relative Abundance of Rainbow Trout at Selected Sites within the Foothills Model Forest
3. Classify all stream channels within the study watersheds based on an existing morphological stream classification system (Rosgen and Silvey 1998) to Level I and representative sites to Level II. Level I classification is an office exercise that utilized GIS to determine stream class. Level II is a field exercise that incorporates additional physical features.	<ul style="list-style-type: none"> • Report 2.4.1a – Level I Classification: Basin Characteristics • Report 2.4.1b – Level I Classification: GIS-based Stream Reach Characteristics • Report 2.4.2 – Level II Stream Classification Project, 1999-2002 • Comparison Between Field Surveyed and GIS-Derived Descriptors of Small Streams within the west-central Foothills of Alberta

FMF Objective:	Deliverable:
<p>4. Complete Level III channel stability classification at a selected number of sites within the study watersheds. The rating system should be based on a visual survey of features such as stream bank stability and instream gravel bars using methods such as the Channel Assessment Procedure (Forest Practices Code of British Columbia 1996) or Stream Reach Inventory and Channel Stability Evaluation (Pfankuch 1978).</p>	<p><i>In Progress</i></p>
<p>5. Complete Level IV channel stability classification at selected sites within the Tri-Creeks watershed study area. A Level IV channel stability classification is based on an elevational re-survey of channel cross-sections and downstream profiles that were completed in past decades. It is the most expensive and intensive channel survey and is intended to illustrate how specific fish habitat features in a particular reach, such as pools and streambanks, have changed over time with differing land-use practices.</p>	<ul style="list-style-type: none"> • Report 2.4.4 – Level IV Channel Classification
<p>6. Calculate indices of land-use within study watersheds using GIS. These indices will include road density, road crossing density, seismic line density and a measure of timber harvest.</p>	<ul style="list-style-type: none"> • Report 2.2 – Overview Assessment of Historic and Current Land-use Activities in Selected Foothills Model Forest Watersheds • Report 2.3 – Overview Assessment of Fish Passage at Stream Crossings in Selected Watersheds • Poster – Identifying Priorities for Remediation From: Overview Assessment of Fish Passage at Stream Crossings in Selected Watersheds
<p>7. Using roads as an index for angler access, calculate a rating of angler access for study watersheds and selected sub-basins where appropriate.</p>	<ul style="list-style-type: none"> • Report 2.1 – A Summary of the Alberta Fishing Regulations from 1952 – 2002 in Selected Watersheds of the Foothills Model Forest
<p>8. Provide a measure of the strength of any relationships that exist between relative abundance of native sportfish and physical factors. The physical factors to be examined include stream channel type (based on Rosgen and Silvey 1998); stream channel stability; land use indices; and index of angler access</p>	<ul style="list-style-type: none"> • Report 1.2.1 – Changes Between Historic and Current Fish Relative Abundance and Size within Selected FMF Watersheds • Report 1.2.2 – Long-term Changes in Relative Abundance of Rainbow Trout at Selected Sites within the Foothills Model Forest

FMF Objective:	Deliverable:
9. Based on the findings, make recommendations to help achieve the sustainability of fish and aquatic resources within the study area.	<ul style="list-style-type: none"> • Summary of Key Findings to date from a Multi-Year Study to Determine the Effects of Human-use Activities on Fish and Fish Habitat
10. Communicate the findings of the report to program partners, stakeholders, and land managers in both the public and private sectors.	<ul style="list-style-type: none"> • Summary of Communications listed below

2.2 ACA Goals / Priorities

The Foothills Model Forest has also helped the ACA to meet some of their goals / priorities as described in the ACA Annual Operating Plan (Table 2).

Table 2. ACA Goals and Corresponding FMF Activities.

ACA Goals / Priorities	FMF Activity
Develop and implement cost efficient program areas that address regional fish and wildlife habitat needs and priorities.	<ul style="list-style-type: none"> • Completed Slope / Sinuosity study as per request of Area Biologist • Undertook float electrofishing on McLeod River to provide information on the status of sport fishing in that basin
Work with ASRD, other conservation organizations, and stakeholders to continue to support existing and future initiatives geared towards collecting biological data for fish and wildlife management purposes.	<ul style="list-style-type: none"> • Continued inventory of fish biological and habitat data in streams within the FMF. • Collected detailed data on spawning Bull Trout and Mountain Whitefish in MacKenzie Creek using a fish trap. • Collected water temperature data in several streams within the FMF.
Work with ASRD, other conservation organizations, and stakeholders to develop biological / management programs and habitat maintenance, enhancement and securement programs that promote or enhance the sustainable use of fish and wildlife resources.	<ul style="list-style-type: none"> • Stream crossing assessments to determine barrier status of crossings on fish bearing streams • Land-use assessment including road/seismic line density and harvest area changes over time • Stream classification project: 4 levels of qualifying fish habitat (watershed, stream reach, channel stability, channel profile)
As a means of establishing more funding partnerships, develop marketing strategies and supporting materials that highlight the natural resources benefits of ACA programs and projects being carried out in the region.	<ul style="list-style-type: none"> • Attended biological conferences, developed oral presentations and displayed posters for interested groups

The Foothills Model Forest has communicated the results of this project using several venues including field presentations, oral presentations, and poster presentations. In 2001, over 10 different presentations were given (Table 3).

Table 3. Summary of Communications in 2001.

Date	Activity	Title	Audience	Objective
February	Presentation and Field Tour	Applications of watershed classification	ASRD	Knowledge / Technology Transfer
May 10	Presentation and Field Tour	Applications of watershed classification	ASRD, Weldwood, ACA, Sunpine, forestry contractors	Knowledge / Technology Transfer
June 29	Field Tour	Bull Trout biopsies and electrofishing demonstration in Luscar Creek	NRS	Communications & Outreach
July 01	Field Presentation	Overview of Fish and Watershed Program and current research initiatives	Switzer Park, general public	Communications & Outreach
August 21	Field Tour	Bull Trout biopsies in the McLeod River	NRS	Communications & Outreach
September 13-15	Field Tour	Fish / Forestry Issues (Stream Crossings, Land-use, Riparian Management), Electrofishing demonstration	Lakeland College	Communications & Outreach
September 19	Field Tour	Fish / Forestry Issues (Stream Crossings, Land-use, Riparian Management), Electrofishing demonstration	NAIT Forest Technology	Communications & Outreach
September 21	Field Tour	Fish / Forestry Issues (Stream Crossings, Land-use, Riparian Management), Electrofishing demonstration	NAIT Forest Technology	Communications & Outreach
September 29	Field Tour	Bull Trout and Mountain Whitefish enumeration at the MacKenzie Creek fish trap	Weldwood FRAG	Communications & Outreach
October 12	Field Tour	Bull Trout and Mountain Whitefish enumeration at the MacKenzie Creek fish trap	Student Ambassador Program	Communications & Outreach
October 19	Field Tour	Bull Trout and Mountain Whitefish enumeration at the MacKenzie Creek fish trap	GYRD	Communications & Outreach

Appendix 1.

2001 Financial Account of ACA Funds

Table 4. Summary of time allocation for fulfilling objectives as stated in 2001 Project Proposal.

FMF Objective	Months of work	Time spent fulfilling objective (%)
Objective 1	25.7	59 %
Objective 2	1.0	2 %
Objective 3	9.0	21 %
Objective 4	1.5	3 %
Objective 5	4.0	9 %
Objective 6	0.75	2 %
Objective 7	0.5	1 %
Objective 8	-----	-----
Objective 9	-----	-----
Objective 10	1.3	3 %
Total	43.75 months	100 %

Table 5. Summary of how ACA allocated funding was spent in 2001 for each of the FMF objectives.

FMF Objective	Materials and Supplies			Salaries and Wages (\$)	Travel (\$)	Office / Camp Operation (\$)
	Rentals (\$)	Repairs & Maintenance (\$)	Supplies (\$)			
Objective 1	4,661.00	5,546.00	1,475.00	27,494.00	885.00	885.00
Objective 2	158.00	188.00	50.00	932.00	30.00	30.00
Objective 3	1,659.00	1,974.00	525.00	9,786.00	315.00	315.00
Objective 4	237.00	282.00	75.00	1,398.00	45.00	45.00
Objective 5	711.00	846.00	225.00	4,194.00	135.00	135.00
Objective 6	158.00	188.00	50.00	932.00	30.00	30.00
Objective 7	79.00	94.00	25.00	466.00	15.00	15.00
Objective 8	-----	-----	-----	-----	-----	-----
Objective 9	-----	-----	-----	-----	-----	-----
Objective 10	237.00	282.00	75.00	1,398.00	45.00	45.00
TOTALS	\$7,900.00	\$9,400.00	\$2,500.00	\$46,600.00	\$1,500.00	\$1,500.00

Table 6. Summary by category of how ACA allocated funding was spent.

Category	Total Expense (\$)
Materials and Supplies	\$19,800.00
Salaries and Wages	\$46,600.00
Travel	\$1,500.00
Office / Camp Operation	\$1,500.00
*TOTAL	\$69,400.00

*As per audited financial statements