

Grant Eligible Conservation Fund 2012–2013



Annual Report of Activities & Synopsis of Funding Recipient Projects

For the Period of April 1, 2012 to March 31, 2013



Conserving Alberta's Wild Side



Our Vision

An Alberta with an abundance and diversity of wildlife, fish and their habitats; where future generations continue to use, enjoy and value our rich outdoor heritage.

Our Mission

ACA conserves, protects and enhances fish and wildlife populations and their habitats for Albertans to enjoy, value and use.

Alberta Conservation Association
101 -9 Chippewa Road
Sherwood Park, AB, T8A 6J7
www.ab-conservation.com

Amy MacKinnen, Grant Eligible Conservation Fund
Project Administrator
Email: amy.mackinnen@ab-conservation.com

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Front Cover Photo: Photo: Brandon Klug rappelling down to bat hibernaculum in Dinosaur Provincial Park

Photo: Mark Brigham

From the project: 'Identifying habitat requirements for bats in winter.'
(Wildlife Conservation Society, Dr. Lausen, 030-00-90-210)

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Executive Summary

Funded by the province's hunters and anglers, ACA's Grant Eligible Conservation Fund (GECF) supports annually a variety of projects both small and large which benefit Alberta's wildlife and fish populations, as well as the habitat they depend on. Operational since 2002, this Fund has provided more than \$11 million to 651 projects carried out in Alberta by the conservation community. Furthermore the funding provided by the GECF continues to leverage approximately six times its value in conservation dollars, estimated at approximately \$68 million - money that has been directly used for conservation work in Alberta.

This popular grants program received 101 applications (67 to GECF Part A and 34 to Part B) requesting just over \$2 million in 2012-2013. A total of \$799,425 was granted to 60 projects (42 GECF Part A projects and 18 GECF Part B projects). The aim of this report is to document the procedures for 2012-2013 and to provide an overview of activities and results of projects financially supported through the GECF in 2012-2013.



Bat and bird houses, Beaverlodge, June 2012. Photo: Dunvegan Fish & Game Association.

KEY PROGRAM HIGHLIGHTS for the GECF 2012-2013:

GECF Part A: Conservation Support and Enhancement received 67 funding applications requesting a total dollar value of just over \$1.2 million. A total of \$469,526 was granted to 42 projects: 16 small grants and 26 large grants.

GECF Part B: Research received 34 funding applications requesting a total dollar value of just under \$844,000. A total of \$329,899 was granted to 18 projects.

Project budgets ranged from \$600 to \$42,000.

1. Introduction

Alberta Conservation Association (ACA) believes it is our responsibility to join and support the collective effort to conserve, protect and enhance Alberta's biological natural resources. One of the ways in which ACA does this is to make grants to other members of the conservation community. The projects supported by the Grant Eligible Conservation Fund (GECF) are intended to enhance and supplement ACA activities, and aid in the delivery of ACA's Vision, Mission and Strategic Business Plan. ACA has been awarding conservation grants since 1997, with the GECF process starting in 2002-2003. The GECF has granted \$11 million dollars since 2002-2003 to 651 conservation projects implemented in Alberta; these projects have leveraged an estimated \$68 million in conservation work across the province. For 2012-13 a total of \$470,000 dollars were made available for the GECF Part A: Conservation Support and Enhancement and \$330,000 for Part B: Research. After project selection, a total of \$469,526 was granted to 42 Part A: Conservation Support and Enhancement projects and \$329,899 was granted to 18 Part B: Research projects. This document provides an overview of GECF activities for the 2012-2013 funding cycle and a brief synopsis for each of the funded projects carried out between April 1, 2012 and March 31, 2013.

2. The Funding Cycle

The funding priorities, guidelines and application forms were made available to the public September 23, 2011 via the ACA website, by email to existing contacts and by environmental list servers. Details of the 2012-2013 funding cycle are in the table below:

2012-2013 FUNDING CYCLE DATES

Posting of the Guidelines and Application Forms on ACA's website	September 23, 2011
Window to receive completed GECF Part B applications	November 1, 2011 - December 1, 2011
Window to receive completed GECF Part A applications	January 1-31, 2012
GECF Part B adjudication meeting	February 12, 2012
GECF Part A adjudication meeting	March 8, 2012
ACA Board approval and notification of applicants as to funding status	End of March 2012
Cooperative Project Agreements signed, initial payments made, and project work begins	From April 1, 2012
Interim reports due & second payments made (if required)	September 1, 2012
Final report due	March 15, 2013
Projects end & final payments made (if required)	March 31, 2013

3. Funding Eligibility

The GECF supports a wide variety of applicants and project types. Anyone with a suitable project working in Alberta can apply to the GECF for funding, with the exception of ACA staff and ASRD staff. Certain project types and budget items are not covered by the GECF, for example land acquisition, emergency funding or overhead costs. Since fiscal year 2009-10, funding priorities have been used by the GECF to guide applicants in drafting their applications. A new funding priority was added in 2012-13, taking the list of funding priorities to 14 (see Section 4: Major Funding Priorities GECF 2012-13). The GECF does accept applications that do not relate to these suggested areas, however, projects that address one or more of these priority areas have a better chance of being funded than those that do not. The eligibility criteria and funding priorities can be found in full in the document "Project Submission Guidelines for Funding 2012-2013" (this document is available from the GECF Project Administrator).

The GECF Part A: Conservation Support and Enhancement offers small grants for projects with budgets of \$3,000 and under and large grants for projects with budgets over \$3,000. The small grants have a simplified application form; although the eligibility criteria and funding guidelines are the same for both small and large grants.

The GECF is now widely known amongst the conservation community working in Alberta and applications were received from a diverse cross-section of the population including: individuals, community groups, grassroots organizations, provincial and national institutes, as well as leading scientific researchers.

4. Major Funding Priorities GECF 2012 – 2013

This text is taken directly from Section C of the *Project Submission Guidelines for Funding 2012 – 2013*.

All applicants to the GECF should be aware that this grant is fully funded by the hunters and anglers of Alberta. All proposals should be able to demonstrate how the proposed project will aid ACA in meeting its mission of conserving, protecting and enhancing fish, wildlife and habitat for all Albertans to enjoy, value and use. To help direct potential applicants the following list of priority areas has been developed. While the GECF will accept applications that do not relate to these suggested areas, projects that address one or more of these priority areas will have a higher probability of being funded than those that do not.

1. Habitat enhancement activities specifically listed on provincial recovery plans for Alberta's endangered species (to be done in cooperation with recovery teams).
2. Site specific enhancements of habitat, structures and facilities aimed at increasing recreational angling or hunting opportunities, improving habitat or increasing wildlife/fish productivity on the site (i.e. planting/seeding vegetation, development of new fisheries access sites, nest box initiatives, food plot trials and cover plot trials, spawning bed enhancement, culvert removals, etc.).
3. Urban fisheries development, including : initial evaluation of water quality aspects of existing ponds to determine their suitability for fish stocking; purchase of equipment required to ensure suitable water quality for fish stocking (e.g. aeration equipment); fish stocking in public ponds; promotion of an urban fishery (including natural water bodies).
4. Stewardship Initiatives (e.g. on-going maintenance of conservation sites or fisheries access sites; adopt a fence; property inspections for invasive weeds; manual weed control; grass mowing).
5. Impacts of non-native species on the persistence of native species.
6. Improvements and innovation in matching sportsmen with landowners (e.g. facilitating hunter access to depredating waterfowl, elk and deer).
7. Develop and validate inventory tools to determine the relative density and range of ungulate species using innovative techniques such as trail cameras or passive DNA samples.
8. Evaluate the effect of pesticides or herbicides on upland game birds (sharp-tailed grouse, pheasant, gray partridge)

food availability and/or quality in agricultural landscapes.

9. Evaluate the effect of recreational access (mode, timing, duration) on wildlife & fish populations and habitat.
10. Investigation of methods for reducing the spread and/or impact of wildlife or fish related diseases.
11. Evaluate the impact of various harvest management regimes on fish or wildlife populations (e.g. fish size limits, three-point or larger elk requirements, etc.).
12. Evaluate the social demographics of hunting and angling to determine the factors influencing the decision to become involve in hunting or angling and the reasons why people opt out in a particular year.
13. Evaluate the effect of biological solutions of carbon sequestration on grasslands and treed lands.
14. Effects of agricultural run-off on fisheries.

5. Proposal Review Process

The ACA Board of Directors appointed Adjudication Committees for both the GECF Part A: Conservation Support and Enhancement and Part B: Research.

GECF Part A: Conservation Support and Enhancement Review Process:

The GECF Part A adjudication committee consisted of three citizens of Alberta representing conservation organizations in Alberta, one public-at-large member of the ACA Board of Directors, and one ACA staff member. Adjudicators were tasked with providing rankings and making funding recommendations for all GECF Part A applications based on the funding priorities and guidelines provided by ACA.

Proposals were evaluated on their merit and content using a three-tiered ranking system:

- A:** Top proposals; recommend funding in whole or in part.
B: Proposal contains merit, recommend funding in whole or in part if funds available.
C: Do not recommend funding.

The proposal adjudication meeting was held on March 8th, 2012 at ACA's Sherwood Park office, Alberta. The list of funding recommendations made by the Adjudication Committee was then approved by the ACA Board at the March 2012 Board Meeting.

GECF Part B: Research Review Process:

The application deadline for GECF Part B: Research was earlier than that for the GECF Part A to allow for a more rigorous academic review procedure; the same procedure tried and tested for many years by the ACA Grants in Biodiversity Program. All applications were sent out for review by experts in the subject of the research application. An attempt was made to get at least two reviews per application. The adjudication committee consisted of a representative from each of Alberta's three largest universities (University of Alberta, University of Calgary and University of Lethbridge), ACA's Wildlife Program Manager, ACA's Fisheries Program Manager and ACA's Board of Directors Academic Representative. In 2012-13, the Part B adjudication committee

added a member representing industry. Two adjudicators were assigned to review (using the application and academic reviews) and rank application using the three-tiered ranking system. Funding recommendations were then made after the ranking process. The GECF Part B: Research adjudication meeting was held on February 12th, 2012 at the University of Alberta

6. Funding Allocations

For the 2012-2013 funding cycle a total of \$800,000 was made available for project funding via the GECF; \$470,000 for GECF Part A: Conservation support and enhancement and \$330,000 for GECF Part B: Research. Of the 67 applications requesting a total of \$1.2 M to GECF Part A: Conservation Support and Enhancement, 42 were funded (a 63% success rate for applications receiving full or partial funding). Of the 67 applications to GECF Part A, 17 were small grant applications (requests of \$3,000 or under). 15 of the 17 small grant applications were awarded (an 88% success rate), whilst 27 of the 50 large grants (a 54% success rate). Of the 42 GECF Part A projects funded in 2012-13, 22 (52%) had been funded in previous years and 20 were new to the GECF.

GECF Part B: Research received 34 applications requesting a total of \$843,936 for the 2012-13 competition, of these 18 were funded (a success rate of 53% for applications receiving full or partial funding). 11 (61%) of the funded research projects had been funded in previous years and the other 7 were new to the GECF.

One of the approved GECF Part A projects did not use the grant money allocated (Nose Creek Watershed Partnership, Nose Creek rehabilitation project, \$3,000.00), as the GECF funding was not required for plants as specified by the adjudication committee. Several projects were granted extensions due to unforeseen circumstances.

All projects approved for funding signed the Cooperative Project Agreement with the approved proposal and budget appended, with the exception of the project mentioned above (Nose Creek Watershed Partnership). The Cooperative Project Agreement outlines the reporting and payment schedules and other contractual obligations between ACA and the grant recipient. All grant recipients provided project reports. If the project was completed at the time of the interim report (September 1st), then this one report was taken as the final project report.

7. Synopsis of Approved Projects for 2012 – 2013

A summary description of each of the 60 approved projects containing the project's objectives, activities and deliverables can be found in Part II of this report. The list below is in alphabetical order by organization for GECF Part A: Conservation Support and Enhancement and Part B: Research.

GECF Part A: Conservation Support and Enhancement Small grants \$3,000 and under

Alberta Fish and Game Association,
Weed management, \$3,000

Camrose Wildlife Stewardship Society,
Camrose purple martin festival, \$3,000

Cows & Fish - Alberta Riparian Habitat
Management Society, Southern
Alberta Grazing School for Women
- Bringing habitat and grazing
stewardship to livestock producers,
\$3,000

Crowsnest Pass Quad Squad
Association, Salamander Creek trail
realignment, \$3,000

Dunvegan Fish and Game Association,
Bat houses, \$2,000

Edmonton and Area Land Trust,
Nestbox installation in Important Bird
Area with local youth, \$1,000

Edmonton Nature Club, 2012 Snow
Goose Chase, \$1,000

Ellis Bird Farm Ltd, Ellis Bird Farm video
project, \$1,500

Friends of Fish Creek Provincial Park
Society, Amphibian Monitoring
Program and malformation inquiry
in Fish Creek Provincial Park and
watershed public awareness
Campaign, \$3,000

Lone Pine Farming Co, Habitat
restoration project, \$800

Lone Pine Farming Co, Habitat
enhancement project #2 (bluebird
boxes), \$600

Nose Creek Watershed Partnership/
Trout Unlimited Canada, Nose Creek
rehabilitation project, \$3,000
(Grant not accepted)

Society of Grassland Naturalists -
Medicine Hat Interpretive Program,
Bats are welcome here, \$3,000

Trout Unlimited Canada, Stewardship
license/ Brook trout suppression
project, \$1,000

University of Alberta, Management
of earthworm invasions in Alberta,
\$1,500

Weaselhead/Glenmore Park

Preservation Society, Weaselhead
Invasive Plant Program, \$3,000

Large Grants (over \$3,000)

Agroforestry and Woodlot Extension
Society, Raven/Medicine watersheds
reforestation project, \$15,000

Alberta Fish and Game Association,
Operation Grassland Community:
Program evaluation and stakeholder
collaboration toward sustainable land
management solutions for wildlife in
Prairie Alberta, \$36,700

Alberta Fish and Game Association,
Pronghorn antelope migration corridor
enhancement, \$42,000

Alberta Innovates - Technology
Futures, Citizen stewardship in the
Beaver Hills moraine, Alberta, \$5,000

Ann & Sandy Cross Conservation
Area, Wetlands rehabilitation and
reintroduction of beavers to the ASCCA,
\$12,500

Beaverhill Bird Observatory, Beaverhill
Lake stewardship, monitoring and
public engagement, \$15,250

Calgary Bird Banding Society, Cypress
Hill migratory and breeding landbird
monitoring, \$15,000

Castle-Crown Wilderness Coalition,
Inventory mapping and removal of
invasive species in the Castle, \$20,000

Cows & Fish - Alberta Riparian Habitat
Management Society, Westslope
cutthroat trout riparian habitat
improvement action plans, \$18,000

Crowsnest Conservation Society,
Maintaining and restoring Crowsnest
River riparian areas, \$18,000

Delta Waterfowl Foundation, ALUS
demonstration projects in the County
of Vermilion River and Parkland
County, \$20,000

Elbow River Watershed Partnership,
Riparian Health Inventories in the
Upper Elbow Watershed, \$8,000

Friends of University of Alberta
Devonian Botanic Gardens, The ACA
Learning Dock: Outdoor Education
and Wetland Ecology Youth Program,
\$21,000

Lac La Biche County, Lac La Biche
wetland inventory and classification
plan, \$8,000

Lesser Slave Lake Bird Observatory Society, Avian monitoring and stewardship at Lesser Slave Lake, \$26,100

Miistakis Institute for the Rockies, Barriers and fish passage: Aquatic connectivity along Highway 3, \$13,000

Mountain View County, Riparian area management improvements, \$21,000

Nature Alberta, Citizen science opportunities, \$9,000

Nature Conservancy of Canada - Alberta region, Fence markers for species survival in Southern Alberta, \$5,000

North Peace Applied Research Association, Riparian aerial video assessment of the Whitemud River, \$6,000

Northern Alberta Institute for Technology, Sturgeon River watershed habitat enhancement study, \$26,576

Northern Lights Fly Tyers/Trout Unlimited Edmonton, Conserving and restoring arctic grayling in the Upper Pembina River Watershed - Database development, \$10,000

Partners in Habitat Development/ Eastern Irrigation District, Partners in Habitat Development, \$10,000

Red Deer County, Off the Creek Program 2012, \$30,000

Western Sky Land Trust Society, The Bow and Beyond riparian health project, \$10,000

Willmore Wilderness Foundation Willmore Wilderness Park Stewardship Initiative: Increasing hunting and angling access, \$15,000

GECF Part B: Research

Canadian Wildlife Federation/ University of Regina, Using Resource Selection Function models to inform conservation planning in Alberta's Special Areas, \$22,700

Laval University, Populations demography of mountain goats in Alberta, \$14,200

University of Alberta, Eco-evolutionary dynamics of phenology in resident mammals, \$19,574.50

University of Alberta, Edmonton urban coyote project, \$15,854

University of Alberta, Estimating deer contact rates to design a long-term experiment for reducing CWD prevalence in Alberta, \$33,000

University of Alberta, Evaluating the efficacy of setback distances as a tool for understanding critical habitat for ferruginous hawks in Alberta, \$19,800

University of Alberta, Human access management in central-western Alberta: implications for movement and behaviour of grizzly bears (*Ursus arctos*), \$33,050

University of Alberta, Identifying offset opportunities in Alberta: Using Canada warblers to protect passerine diversity in the boreal forest, \$16,500

University of Alberta, Long-term studies and elk calf study at Ya Ha Tinda, \$25,500

University of Alberta, Native plant reproductive strategies and biochar additions affect urban reclamation success in terms of ecosystem function and services, \$17,000

University of Alberta, Regeneration of the endangered whitebark pine in the northern Rocky Mountains of Alberta, \$19,250

University of Alberta, Using wetland-dependent wildlife to monitor landscape change, \$5,270.86

University of Calgary, The threespine stickleback in Alberta: a candidate for eradication or protection?, \$9,500

University of Lethbridge, Examining resiliency of bull trout populations to brook trout invasiveness, \$8,000

University of Saskatchewan, Identifying risks, impacts, origins and movement patterns of infectious pathogens in blue-winged teal (*Anas discors*) in the Canadian prairies, \$20,500

University of Sherbrooke, Experimental management of bighorn sheep, \$9,900

Water Matters Society of Alberta, Determination of pollutant export coefficients from different landbase and landuse types to Alberta Rivers, \$13,000

Wildlife Conservation Society Canada, Identifying habitat requirements for bats in winter, \$27,300



Cypress Hills Landbird Monitoring Project; Wilson's snipe.
Photo: Colton Prins, Calgary Bird Banding Society

8. GECF project contribution to the funding priorities

In total, 60 projects were approved for funding in 2012-2013: 42 Part A: Conservation support and enhancement projects and 18 Part B: Research projects. Again this year funding priorities were set by ACA staff and approved by the ACA Board of Directors. A new priority was added in 2012-13, #14 Effects of agricultural run-off on fisheries. All projects selected were to support ACA with meeting its mission of conserving, protecting and enhancing fish, wildlife and habitat for all Albertans to enjoy, value and use; and the funding priorities were used to further guide and direct applicants by providing priority areas of specific interest to ACA. Proposals did not have to relate to the funding priorities, but applications that address one or more of the funding priorities fare better in the project selection procedure. Whether or not a project relates to a funding priority is to some degree subjective. Some projects clearly addressed one or more of the funding priorities, whilst others only indirectly related to a funding priority. Applicants were asked to specify how their projects related to ACA's mission and funding priorities and this information was used to determine which of the selected projects for 2012-2013 contributed to ACA's funding priorities (see Table 1). Five (three GECP Part A projects and two GECP Part B projects) of the 60 projects did not address any of the funding priorities. For a complete overview of project contribution to the ACA Funding Priorities 2012-2013, see Appendix A.

Table 1: GECF projects in relation to ACA funding priorities since the funding priorities were introduced

Funding Priority	2012-2013 % of projects (52 projects funded in 2012-13)	2011-2012 % of projects (52 projects funded in 2011-12)	2010-2011 % of projects (47 projects funded in 2010-11)	2009-2010 % of projects (68 projects funded in 2009-10)
#1 Habitat enhancement provincial recovery plans for Alberta's endangered species	15	19	21	19
#2 Site specific enhancements of habitat	57	50	53	38
#3 Urban fisheries development	2	8	9	7
#4 Stewardship Initiatives	50	54	51	37
#5 Impacts of non-native species on persistence of native species	25	19	23	18
#6 Matching sportsmen with landowners	0	0	0	1
#7 Develop and validate inventory tools... ungulates	2	6	2	n/a
#8 Evaluate the effect of pesticides or herbicides on upland game birds	0	0	0	n/a
#9 Evaluate the effect of recreational access on wildlife & fish populations	15	10	6	n/a
#10 Investigation of methods for reducing the spread of wildlife or fish diseases	8	4	0	n/a
#11 Evaluate the impact of various harvest management regimes	7	10	2	n/a
#12 Evaluate the social demographics of hunting and angling	0	0	0	n/a
#13 Evaluate the effect of biological solutions of carbon sequestration on grasslands & treed lands	2	2	n/a	n/a
#14 Effects of agricultural run-off on fisheries	0	n/a	n/a	n/a
None of the funding priorities	8	10	9	16

The most cited funding priorities are: #2 Site specific enhancement of habitat... (57%) and #4 Stewardship initiatives (50%); these are both broad funding priorities under which many Part A and Part B projects fit. For 2012-13, the third most cited funding priority was #5 Impacts of non-native species on persistence of native species (25%), followed by funding priority #1 Habitat enhancement provincial recovery plans for Alberta's endangered species (15%) and #9 Evaluate the impact of various harvest management regimes (15%). Funding priorities #2, #4, #1, #5 have been the top four priorities since funding priorities were introduced. The number of funded project addressing funding priority #9 appears to be growing. Four of the 14 funding priorities (#6, #8, #12 and #14) were not addressed by funded projects, this also reflects the fact that very few applications were sent in dealing with these funding priorities. There is yet to be a funded project (or proposal) that addresses these four funding priorities (one project cited funding priority #6 in 2009-10, but the project only indirectly addressed it). There appeared to be a reduction in proposals related to urban fisheries development (#3) and fisheries in general this year. Several funding priorities are better suited to research project, specifically funding priorities #7 - #14.



PART II: GECF Project Summaries

Grant Eligible Conservation Fund Part A: Conservation Support and Enhancement

Plant ID quiz at the Southern Alberta Grazing School for Women, Delia, AB.
Photo: Cows and Fish

Southern Alberta Grazing School for Women - Bringing habitat and grazing
stewardship to livestock producers

Raven/Medicine watersheds reforestation project

Agroforestry and Woodlot Extension Society (AWES)

Grant: \$15,000

Project Code: 015-00-90-188

Project Status: New; Completed

The Raven-Medicine River riparian reforestation project's main objective was the planting of 25,000 tree seedlings along the banks of the two rivers, to establish a forested buffer along parts of the river that have been grazed previously and have erosion problems. The goal is to encourage more land owners to re-establish forested buffers along parts of their streams to improve water quality downstream, improve habitat for aquatic and terrestrial animals, stabilize banks and reduce nutrient and sediment entering the stream. From August 7-10, 2012, 25,000 white spruce seedlings were planted along the North Raven River on two separate sites. These sites were previously grazed. The sites have had fences erected to protect both the seedlings and stream bank from further degradation from cattle. A landowner on the Medicine River who had agreed to plant trees informed AWES he had sold the property to a neighbour two days before the planned planting session. AWES could not find another landowner on the Medicine River with short notice so all the trees were planted on the North Raven.

Deliverables/Results:

25,000 white spruce seedlings were planted along the North Raven River on two separate sites.

An article was published in the April edition of the Red Deer County Newsletter highlighting the project and riparian forest buffers; the article was moved to the spring to take advantage of the season change and people thinking more of planting.

The Media day did not take place as tree delivery and tree planter

availability modified the planting dates and the video was cut as AWES could not get people to the site during a season that would show the benefits of the planting program.

Project highlights will be sent out to partners after the spring survival assessment (survival assessment has been partially completed, results not yet available).

Weed management

Alberta Fish and Game Association

Grant: \$3,000

Project Code: 015-00-90-183

Project Status: New; Completed

The project aimed to control common tansy on two conservation properties, Golden Ranches and Pigeon Lake. Supplies and equipment were purchased for volunteers to effectively remove tansy weed heads on conservation lands. Volunteers were organized for two events on Golden Ranches. The first was in conjunction with the ACA weed and feed. Six AFGA volunteers participated in the event where 44 contractor garbage bags were filled with seed heads. Three volunteers came back the next week to remove remaining stands missed on the first outing. Tansy was also removed on the Pigeon Lake property along Tide Creek. Volunteer participation was important here, as spraying is not an option so close to a waterway. Three volunteers worked over two days to effectively control the spread of tansy in 2013. Supplies purchased through this grant were also used by volunteers on the Atim Creek Conservation Site, properties near Isle Lake, and Kneehills Property. The volunteers were appreciative of supplies and getting to take them home encouraged them to commit to future years of work. Tansy takes several years of seed removal to get under control and volunteers will be required for many growing seasons in order to make a difference.

Deliverables/Results:

Thorough weeding of infected properties (two at Golden Ranches and one at Pigeon Lake) prior to flowers breaking into seed.

Pronghorn antelope migration corridor enhancement

Alberta Fish and Game Association

Grant: \$42,000

Project Code: 030-00-90-160

Project Status: Funded since 2009-10; Completed

Pronghorn antelope reach their northern-most distribution in Alberta and are known to conduct annual migrations averaging hundreds of kilometers often passing through narrow passages en-route to key seasonal ranges. Migratory corridors are critically important in ensuring pronghorn remain at sustainable populations. Several documented accounts describe mass mortalities because of barriers to movement. Fences in particular are known to create great difficulties for pronghorn as they are unwilling to jump over them. As lower strands are generally 12"- 14" above ground, crawling under often results in serious scrapes that can significantly impact the antelope's health. The migration corridor enhancement will remedy this situation by replacing lower barbed wire strands with smooth wire and at the same time raising them to a height easily navigable by the pronghorn. In total, 225 kilometers of fence were re-configured to

wildlife friendly standards.

Deliverables/Results:

The project successfully recruited landowners to participate, and also recruited and trained volunteers to manipulate fences. In total, more than 225 kilometers of fence were re-configured to wildlife friendly standards!

The following pronghorn fencing projects were carried out:

Finstad Ranching, July 18-23, 2012

On July 19 and 20, 12.9 kms of smooth wire was installed at project sites in prime pronghorn migration corridor. Wire was attached at corners and braces and stretched to the appropriate tension. On July 21 and 22, a team of 13 removed staples from existing three wires and re-spaced wires at 18, 24, 30 and 42 inches with the use of 1¾" barbed fencing staples. Old staples were collected and disposed of appropriately.

Project Statistics: Smooth wire installed: 12.9 kms. Barbed wire manipulated to wildlife friendly standards: 38.6 kms.

Ross Ranching, August 15-19, 2012

On August 15, 16 and 17, 3.2 kms of smooth wire was installed at Pearson Ranch in prime pronghorn migration corridor and with assistance of three individuals removed page wire on Ross Ranch and replaced with five strand fence. Wire was attached at corners and braces and stretched to the appropriate tension. On August 18 and 19, a team of 23 volunteers removed staples from existing five wires and removed and rolled bottom strand of barbed wire. A bottom smooth wire was added and re-spaced at 18, 24, 30, 36 and 42 inches with the use of 1¾" barbed fencing staples. Old staples were collected and disposed of appropriately.

Project Statistics: Smooth wire installed: 12 kms; Barbed wire removed: 8.9 kms; Page wire removed: 1 km; Barbed wire manipulated to wildlife friendly standards: 45 kms.

Pearson and J-J Ranching, October 3-7, 2012

On October 3-5, 12.9 kms of smooth wire were installed at Pearson and J-J Ranches. Wire was attached at corners and braces and stretched to the appropriate tension. On October 6-7, a team of 16 volunteers removed staples from existing three wires and re-spaced wires at 18, 24, 30 and 42 inches with the use of 1¾" barbed fencing staples. Old staples were collected and disposed of appropriately. 3.2 kms of page wire was also removed and rolled for recycling and one strand on smooth wire was installed and stapled at 18".

Project Statistics: Smooth wire installed: 14.5 kms; Page wire removed: 3.2 kms; Barbed wire manipulated to wildlife friendly standards: 53.1 kms.

Balog Ranching, August 2012

Installed bottom smooth wire on 2.4 kms of existing three-wire fence with bottom wire set at 18". Seven rolls of smooth wire supplied.

Dykshorn Ranching, August 2012

Installed bottom smooth wire on 7.2 kms of new fence being erected to replace fence lost in fire with bottom wire set at 18". 18 rolls of smooth wire supplied

Fintad Ranching, August 2012

Installed bottom smooth wire on 1.6 kms of new fence with bottom wire set at 18". Five rolls of smooth wire supplied.

Anferchuck Ranching, August 2012

Installed bottom smooth wire on 2.4 kms of existing three-wire fence with bottom wire set at 18". Seven rolls of smooth wire supplied.

Wells Ranching, August 2012

Installed bottom smooth wire on 4.8 kms of existing three-wire fence with bottom wire set at 18". Thirteen rolls of smooth wire supplied.

Hargrave Ranching, August 2012

Owner installed bottom smooth wire and top smooth wire on 3.2 kms of existing three-wire fence with bottom wire to be set at 18" and top wire set at 36" to facilitate elk and pronghorn crossing. Eighteen rolls of smooth wire supplied.

Ducks Unlimited Canada, December 2012

Installed bottom smooth wire on 16.1 kms of existing three-wire fence with bottom wire set at 18".

Press relating to this project:

CTV news October 10, 2012 (calgary.ctvnews.ca/volunteers-remove-pronghorn-migration-barriers-1.990582)

Some example articles:

AFGA News. "The pronghorn enhancement project." Alberta Outdoorsman. April, 2012.

Globe and Mail newspaper. "Pronghorns get free rein on the prairies" August 23, 2012 (<http://www.theglobeandmail.com/news/national/pronghorns-get-free-rein-on-the-prairie/article4283404/>)

Monk, S. "Little fence on the prairie is bad for pronghorn." <http://www.agcanada.com/albertafarmer/2012/09/13/little-fence-on-the-prairie-is-bad-for-pronghorn%E2%80%A9/>

Operation Grassland Community: Program evaluation and stakeholder collaboration toward sustainable land management solutions for wildlife in Prairie Alberta

Alberta Fish and Game Association

Grant: \$36,700

Project Code: 030-00-90-127

Project Status: Funded since 1999; Completed

The goal of Operation Grassland Community (OGC) is to collaborate with stakeholders across Alberta's prairie region to develop, implement, evaluate, and adapt management actions that protect and enhance wildlife habitats, and support diverse socio-economic interests. The project objectives were as follows: to enhance and protect habitat and increase awareness of Sprague's pipet through re-seeding, cross-fencing, SARC plans and general awareness; to maximize OGC program efficacy and develop new sustainable practices through Stakeholder Steering Forum meeting; to carry out ecological & socio-economic evaluation of past programs/projects through 50-60 project assessments (Beneficial Management Plans, SARC plans, and Habitat Enhancement Projects); results to complement Steering Forum & development of new/adaptive management strategies; to protect wildlife habitats through voluntary stewardship agreements; to promote and implement Beneficial Management Practices through SARC plan; to monitor annual trend and distribution in burrowing owl and loggerhead shrike; and affect change through awareness.

Deliverables/Results:

Enhance and Protect habitat & increase awareness for Sprague's pipet (SPPI) through re-seeding, cross-fencing, SARC plans, and general awareness.

- 100 acres native re-seed (numerous SPPI in area).
- 2.7 kms cross-fencing installed (SPPI-benefitting grazing management tool).
- One SPPI-focused SARC plan completed.
- General SPPI info fact-sheet developed; >1,000 distributed.
- Articles submitted to various print media (no articles accepted).

Maximize OGC program efficacy and develop new sustainable practices through a Stakeholder Steering Forum meeting held March 15, 2013 in Brooks, Alberta (18 ranches; 25 ranchers); Dr. Brad Stelfox presented the ALCES model, followed by a professionally facilitated workshop to examine "where we have been, where we are now, and where do we go from here?" Through this forum, OGC will establish how to best address large scale issues on the small (ranch) scale through innovation of management actions. A document: "Prescriptive Stewardship Management Actions for Critical Prairie Habitats and Wildlife" has been completed. OGC has established commitments from three OGC members to implement pilot projects in 2013-2014.

Ecological & socio-economic evaluation of past programs/projects through 50-60 project assessments (Beneficial Management Plans, SARC plans, and Habitat Enhancement Projects):

- 57 socio-economic surveys, and 65 ecological surveys completed, and data analysis in progress.
- Final report: "Evaluation of OGC Habitat Projects (2005-2011): What are our Best Next Steps?" has been completed.
- General trends: outreach highly valued when conducted one-on-one - this type of engagement is proving KEY to success of longer-term ecological results; OGC members doing many of the 'right things' already, and improvements for wildlife, while preferred, are not always economically feasible (issues of market failure).

Protect wildlife habitats through voluntary stewardship agreements (goal: 20,000 new acres protected, 12,500 acres renewed): Eight new members and 17,500 new acres protected; 21 renewals, 13,700 acres renewed.

Promote and implement Beneficial Management Practices through SARC plans: Two SARC plans completed (including SPPI focused SARC mentioned above).

Monitor annual trend and distribution in burrowing owl and loggerhead shrike: 200 OGC members involved annual census of burrowing owl (22nd year), and loggerhead shrike (9th year). Results provided to recovery teams and published in OGC newsletter & other suitable media.

Affect change through awareness: Strengthened existing partnerships and developed new partnerships, promoted OGC programs through multiple news-media (>seven) & presentations (six); launched new website & blog.

Three "Prairie Acres BULLETINS" distributed to more than 700 OGC and non-OGC participants.

New OGC display designed and produced, as well as new OGC power-point designed, promoting OGC and its partners.

Distribution of 15-30 salt blocks to grazing school attendees and active OGC members with instructions on how to use as tool to target intensive grazing away from wetlands/ riparian areas and distribute throughout the upland to create a heterogeneous pasture.

Distribution of binoculars and bird books to 30-50 members.

14 members participated in 'birding walks on the range'.

Attendance and presentations at partner meetings/conferences: Recovery team meetings for burrowing owl and loggerhead shrike, three Prairie Conservation Forum meetings, Sandstone Ranch Stewardship Credit Program meetings, Native Restoration and Reclamation Workshops, 10th Prairie Conservation and Endangered Species Conference (Feb 2013), two municipal grazing schools, targeted municipal councils/representatives, cattle industry groups and trade shows, oil and gas industry gatherings, and watershed council meetings.

Citizen stewardship in the Beaver Hills moraine, Alberta

Alberta Innovates - Technology Futures

Grant: \$5,000

Project Code: 015-00-90-193

Project Status: New; Completed

Citizens can play an important role in science and stewardship projects, and involvement in such activities can generate a culture of caring for the land. Citizen volunteers can contribute to a range of science and stewardship efforts, including data collection, processing, management, and restoration activities such as tree planting or invasive weed control. This project concentrated on the development of modules related to specific activities that could be implemented by organizations or agencies seeking to involve volunteers in data collection or stewardship. Use of a standardized protocol means that data collected by multiple volunteers, in different places, and across time will be more comparable than if every agency developed their own approach. During the project two modules were developed: (1) Winter tracking in the Beaver Hills, and (2) Owl and woodpecker monitoring in the Beaver Hills. Each module includes a PowerPoint presentation for use in training sessions, the volunteer guide for the specific module, a volunteer safety guide, and occupational health and safety assessment of risks and risk management for each activity, volunteer feedback forms for use at the completion of training sessions, and after doing actual field surveys, maps of survey routes, and templates of spreadsheets to manage volunteer feedback and track volunteer hours. All of this material is freely available to organizations, agencies and individuals who would like to set up volunteer monitoring programs in the Beaver Hills moraine or nearby areas.

Deliverables/Results:

Two modules were developed: (1) Winter tracking in the Beaver Hills, and (2) Owl and woodpecker monitoring in the Beaver Hills. The modules were tested by 35 volunteers who attended classroom and field training and did field surveys. There were four classroom and five field training sessions for winter tracking, and five classroom and five field training sessions for owl and woodpecker surveys. Twenty-three field surveys were conducted, amounting to 390 volunteer hours. The modules were revised based on participant feedback.

A series of documents related to each citizen science module has

been developed and is fully available to organizations, agencies and individuals in the Beaver Hills and other areas who want to implement volunteer monitoring and stewardship programs (copies available).

Wetlands rehabilitation and reintroduction of beavers to the ASCCA

Ann & Sandy Cross Conservation Area

Grant: \$12,500

Project Code: 030-00-90-209

Project Status: New; Extended until June 30, 2013; Completed

A healthy population of beavers once lived on the Ann & Sandy Cross Conservation Area (ASCCA). The ASCCA provides a unique opportunity to restore the North and South arms of the wetlands forming the headwaters of Pine Creek through the reintroduction of beavers (*Castor canadensis*). This project will demonstrate that beavers can be relocated to areas where they will provide natural engineering to improve water quantity and quality. Such a study has not taken place in Canada as far as known, but has been undertaken in a number of locations in the USA. The project objectives included: provision of water storage and groundwater recharge from spring run-off when demands are low and provide late season, low temperature flows into the Bow River when the river is stressed from high demands, low flows and high water temperatures; the creation of natural dams which, if adopted widely, may lessen the need for the construction of additional large and expensive storage dams in Alberta; improve water quality and quantity through natural processes and reduction of sediment. Other objectives are: to reduce the impact of climate change; to create riparian habitat for many species such as aquatic insects, song birds, sharp-tailed grouse, mammals such as deer, moose and elk as well as amphibians such as frogs; to demonstrate the role beavers play as a watershed stewardship strategy; and to provide an educational opportunity for the public to observe beaver activity and the physical restoration of the watershed. Thanks to the help of the Alberta Institute for Wildlife Conservation, a beaver family including an adult female and male and their two kits have been relocated to Goodwin Pond on the south arm of Pine Creek at the ASCCA. Three additional beavers have also been relocated on the north arm of Pine Creek at the ASCCA and Cows and Fish carried out riparian health inventories at the ASCCA in July and August 2012. Calgary Science School grade seven and eight students made their initial visits as citizen scientists in the spring and fall of 2012, which entailed water monitoring, capturing photo points and wildlife observations. Students completed riparian health checklists and created permanent vegetation transects adjacent to the site where the beavers will be reintroduced. The Calgary Science School with continue their visits over a three year period to monitor the effect of the beavers on the watershed.

Deliverables/Results:

Two beaver families successfully reintroduced to the ASCCA. Status: three beavers were reintroduced on the north arm of Pine Creek at the ASCCA in Spring 2012. A video of one of the beaver releases can be viewed at www.youtube.com/watch?v=KFBbNVkwgeg0. A beaver family, including an adult female and male and their two kits have been relocated to Goodwin Pond on the south arm of Pine Creek. The reintroduction of the beaver families was a great success.

Cows and Fish carried out riparian health inventories at the ASCCA in July and August 2012.

The monitoring program, carried out by the citizen scientists of the Calgary Science School, will document changes to selected variables over a three year period of study.

The amount of interest and media coverage of the project has exceeded expectations and they look forward to continuing to share the progress of the project.

Project updates have been written and shared in July and October 2012. The presentation will be given at the end of the three-year project cycle, when the results of the Calgary Science School monitoring efforts have been collected and reviewed.

Beaverhill Lake stewardship, monitoring and public engagement

Beaverhill Bird Observatory

Grant: \$15,250

Project Code: 030-00-90-124

Project Status: Funded since 2006-07; Completed

The goal of this project is to continue to work as stewards of Beaverhill Lake Natural Area. Work has been carried out to improve public access and educational values of this important bird area while maintaining the BBO's long-term monitoring programs. This project has two major portions: 1) Stewardship and 2) Habitat enhancement and monitoring. The objectives in 2012 were to: 1) Continue to monitor migrating and resident birds in the Beaverhill Lake Natural Area; 2) Monitor wetland recovery after fencing was completed to protect from cattle and motorized vehicles; 3) Have two major on-site public events and three minor events; 4) Give at least five presentations about the Beaverhill Lake Natural Area, its ecological values and the importance of birds with a particular focus on Alberta species; 5) Replace bluebird nestboxes along a volunteer run trail around Beaverhill and Elk Island, put up nest baskets for long-eared owls, and monitor the 150 tree swallow boxes and 100 saw-whet boxes; 6) Maintain the gravel access road improve access for visitors; 7) Build a roof over the deck and replace the wood stove (15 years old) in the lab (a place open to the public).

Deliverables/Results:

Birds were monitored using Migration Monitoring protocols in the spring and fall and MAPS (Monitoring Avian Productivity and Survivorship) was used during the breeding season. Spring migration was completed May 1 through June 9, 2012. A total of 459 birds were captured during 1,996.5 net hours, resulting in a capture rate of 23.0 birds per 100 net hours. Summer MAPS (Monitoring Avian Productivity and Survivorship) was run June 10 through July 31, 2012. Fall migration was monitored August 1 through October 10, 2012 with 978 captured (26.6 birds per 100 net hours). Fall saw-whet monitoring was conducted September 10 through November 16 (229 saw-whets captured), and a pilot boreal owl monitoring project was initiated on October 20 (five boreal owls were captured). The capture rates for songbirds were low again, most probably due to the low water in the lake and the change in habitat structure. The BBO plans to add some new net lanes in the willows away from the forest to determine whether the habitat structure is the reason for the low capture rates.

Banding data file to Alberta SRD and nest cards to Prairie Nest record scheme (January 2013)

Wetland recovery was also monitored which is progressing, however

until the area floods again there is still evidence of quad and cattle damage.

The annual Steaks and Saw-whets event was held (110 people) as well as the BIG Birding Breakfast (41 people), and numerous groups came out to the site throughout the year.

Beaverhill staff and volunteers gave presentations and demonstrations to ten schools/groups/events around Alberta.

There were 150 tree swallow boxes, 50 mountain bluebird boxes, and 45 saw-whet boxes monitored. Additionally, the ducks boxes and bat boxes were checked but there was no occupancy.

Replace/repair bluebird/tree swallow nestboxes (Spring 2012), this will continue in 2013 with volunteers.

Built and placed ten long-eared owl nest baskets in Natural Area.

The SM2 Bat Detector recorded little brown, hoary, silver-haired, and red bats in the natural area in the fall. The detector will be up throughout the breeding season in 2013. The variety of bat species detected was unexpected. The BBO plans to monitor bats through the breeding and migration seasons in 2013 to determine what species are breeding in the area.

The road was smoothed again for access and will be smoothed again in spring 2013. A roof was built over the deck of the front of the bird lab and replaced the 15-year-old wood stove was replaced.

All public trails were cleared by summer 2012 and two clearings are planned for 2013.

Annual Beaverhill Bird Observatory report was completed March 2013.

Cypress Hill migratory and breeding landbird monitoring

Calgary Bird Banding Society

Grant: \$15,000

Project Code: 030-00-90-188

Project Status: Funded since 2011-12; Completed

In 2010 and 2011 the Calgary Bird Banding Society (CBBS) initiated a pilot project to test the viability of a migratory and breeding landbird monitoring station in the unique Cypress Hills of Alberta. 2012 marked the first standardized year and the third consecutive season of Landbird Monitoring at Cypress Hills with a total of 2,720 new individuals banded. Daily observations were performed concurrently throughout the migration seasons and close to 200 species of birds were detected. The main objective is to facilitate the continuation of two main projects which are effective tools for documenting population status and trends, and habitat effectiveness. Following the guidelines set by the Canadian Migration Monitoring Network (CMMN), results will contribute to Canada's national framework for the Conservation of Species at Risk through reporting on the status of landbird species. Increases and declines of certain populations can be a reliable indicator of the health of not just particular species but also of their ecosystems. Monitoring Avian Productivity and Survivorship (MAPS) is a coordinated long-term program whose goal is to provide data on breeding landbird populations. The banding station also provided environmental education opportunities for school groups and the public. Increasing the public's understanding and appreciation of wild birds and their habitats is essential to the conservation of our resources.

Deliverables/Results:

Spring Migration Monitoring in 2012 at CHIP started on May 15 at the Elkwater Lake location and ran until June 9 for a total of 21 mornings of mist-netting. Up to 12 nets contributed to 342 new birds banded of 43 species and forms. Poor weather and a delay with permitting are contributing factors for the decreased numbers which are the lowest numbers for a spring season. The fall migration ran from August 2 until October 14 for a total of 66 mornings of mist-netting. The fall season banded a total of 1,891 birds which is a new record high for the station. Census was performed every day during the programs, monitoring species that are not usually captured during mist-netting.

The three MAPS stations operated again in 2012: the Rodeo Grounds, Old Baldy, and Spruce Coulee banded 106, 151, and 191 individuals respectively. Each site operated seven nets and was sampled during six sessions in the months of June, July and August. These numbers are exceptional for a breeding site and confirm that the Cypress Hills contain critical breeding habitat for many landbird species.

A number of banding demonstrations were performed for grade school groups, tours and other park programs. The Cypress Hills Visitor Centre treated the migration monitoring as a standing program where they referred interested public to the banding site between 09:00 and 13:00.

Report: Attia, Y. & L. Tirrul. Cypress Hills Interprovincial Park Landbird Monitoring Project. 2012 Progress Report Dec. 2012. Data from this report will eventually be used in the annual technical reports and made available on the CBBS website: www.calgarybirdbandingsociety.org/

A blog for the program at Cypress Hills was initiated in 2012. The blog may be accessed at chipmigration.wordpress.com/

A news clip filmed at Cypress Hills by Chat News in late May 2012 can be viewed here: www.youtube.com/watch?v=wQDB18txkeo&feature=plcp

Camrose purple martin festival

Camrose Wildlife Stewardship Society

Grant: \$3,000

Project Code: 030-00-90-191

Project Status: Funded since 2011-12; Completed

The Camrose Wildlife and Stewardship Society (CWSS) committee held its 3rd annual Camrose Purple Martin Festival on June 17, 2012. The festival was a one-day public celebration of nature, birds, and greenspace, with a focus on purple martins. The festival involved a collaboration of city, nongovernmental, education, university, and wildlife conservation organizations. The festival's mission is to provide a high profile, community-based nature tourism event to showcase the vision and work of the CWSS. The CWSS strives for a greenspace network that enhances community values and quality of life for City of Camrose and area residents. The objectives of the festival were to: 1) encourage participation in nature-based activities, particularly community members, schoolchildren, and nature enthusiasts; 2) raise awareness and develop interest in wildlife conservation, particularly purple martins; and 3) enhance the purple martin nest box program and volunteer participation. The festival included several activities, including nest box demonstrations, keynote presentations by Kevin Fraser from York University and John Tautin from the Purple Martin Conservation Association, panel discussions on attracting and maintaining martin colonies, children's activities, and information

booths. Project deliverables included 95 educated and satisfied festival participants, in-kind support for the Camrose Purple Martin Landlord Program, support for the Purple Martin Migration Study, and positive public press (eg. two articles about purple martin conservation in local newspapers).

Deliverables/Results:

The main results of the project were enhanced understanding and appreciation of nature, purple martins, and greenspace in the Camrose area by Camrose residents and visitors. Key information was learned about how the festival was viewed by visitors (evaluations completed) and how to plan for future festivals. 95 people attended the festival.

An unexpected result was the collaboration with York University, Ellis Bird Farm, the Purple Martin Conservation Association, and the Purple Martin Conservancy. By having the keynote speakers from the Purple Martin Conservation Association and York University on site, CWSS were able to participate in the study on purple martin migration.

Festival evaluations were gathered from participants, regarding likes, dislikes, future interest, and economic impacts. A summary was presented to the CPMF steering committee.

Two articles about purple martin conservation were published in local newspapers.

Participation in the Purple Martin Landlord Volunteer Program was increased.

A list of people to contact regarding future stewardship and educational activities was compiled.

A planning manual for future versions of the CPMF was produced.

Inventory mapping and removal of invasive species in the Castle

Castle-Crown Wilderness Coalition

Grant: \$20,000

Project Code: 015-00-90-189

Project Status: Funded since 2008-09 (not funded 2011-12);

Completed

This project focused on areas identified by AESRD and Castle-Crown Wilderness Coalition (CCWC) staff and stewards to remove invasive species, garbage, and dangerous materials left behind by industry and users in the Castle. CCWC worked throughout the Castle visiting staging areas, areas of high use, and into the backcountry and had the opportunity to reach places that had not been to before. Invitations were posted on town bulletin boards and at campsites throughout the area to encourage volunteers to come out and join in with this work. Over 300 Invasive Plant Surveys were submitted to AESRD for mapping. Invasive species survey forms were also shared with the MD of Pincher Creek and Alberta Parks where applicable. Outreach education was offered at events and presentations hosted by the CCWC. Events hosted by others were attended and a display table set up to showcase CCWC's work and offer information on what invasive species are, best ways to remove them and how they can become a problem for native species. Information was also shared on the need to be good stewards of our public lands. The West Castle Wetland Ecological Reserve weed pull and the Great Canadian Shoreline clean up were successful in bringing other agencies, and the general public together to do restoration work. CCWC staff and volunteers worked

not only in removing invasive species but reclaiming illegal OHV trails, random camp sites, removal of waste, garbage and over 300 metres of old steel cable from the South and West Castle Rivers. A horse trip to remove weeds and garbage from the backcountry was held, with an outfitter volunteering to use his packhorses to get the bags of weeds and garbage brought out. Signs that had fallen down were erected and those in bad repair were reported to the specific land managers for replacement. The CCWC continues to host a summer hiking program and encourage volunteers to complete stewardship reports. Custom stewardship hikes were offered to help educate people on the importance of maintaining the Castle as a critical wildlife zone and for healthy watersheds. CCWC staff and volunteers joined local groups in monitoring northern leopard frogs and boreal toads and to help with their weed pull events.

Deliverables/Results:

Ten staging areas visited; Syncline both trail heads, Middle Kootenay, Table Mtn., North Kootenay, South Fork Lakes, Lee Lake, Carbondale Staging area, Carbondale Fire Tower Look Out, Grizzly Creek on the S Castle River.

319 AESRD Southern Rockies Invasive Plant Survey forms, as well as forwarding 34 to Alberta Parks, 28 to the MD of Pincher Creek.

Over 300 Invasive Plant Surveys submitted to AESRD for mapping project and 30 stewardship reports filed on health and activity in the Castle. CCWC has also informed random campers and OHV users found in closed areas as to why an area is closed and the availability of maps etc.

West Castle Wetland Ecological Reserve Weed Pull held.

Invitation posted throughout area, bulletin boards, stores, etc., requesting volunteers for restoration work in the Castle, sent to members, posted on Facebook.

Great Canadian Shoreline clean-up at Beaver Mines Lake was held in early September.

Information has been shared with AESRD, Alberta Parks and the MD of Pincher Creek on where new signage is needed, or where signage needs to be replaced. CCWC staff has offered to work with these agencies to get signage in place. CCWC staff have fixed signs that have been pushed over or torn off where possible.

Staff closed off some illegal OHV trails but new ones are cropping up very quickly.

Backcountry Horse Trip into South Castle Valley four participants, plenty of SRD infractions witnessed on this trip. A report will be sent to AESRD. Second horse trip to Grizzly and Ruby Lakes, again a good deal of garbage left behind at Grizzly Lake, a local outfitter has agreed to take as much as possible out on his pack horses. There is also a good deal of horse damage at both lakes. Again this information was shared with AESRD.

When refuse left behind has been too large for CCWC staff to handle AESRD has been contacted with GPS locations when possible. One example of this is on the Carbondale River where about 50 meters of old logging cable was found, which will need a winch and cutter for removal. Cable was also found in the West Castle River upstream of the ski hill measuring ten meters and at West Castle Bridge measuring 12 meters. In the grassland above the bridge there was more cable about 117 meters. CCWC staff removed the smaller pieces and the larger cable was removed by a passing crane truck that was flagged down and asked to help.

Westslope cutthroat trout riparian habitat improvement action plans

Cows & Fish - Alberta Riparian Habitat Management Society

Grant: \$18,000

Project Code: 020-00-90-167

Project Status: Funded since 2011-12; Completed

The purpose of this project is to identify riparian habitat issues and develop action plans which will lead to improved threatened westslope cutthroat trout (WSCT) (*Oncorhynchus clarkia lewisi*) habitat along southwestern Alberta streams, expanding on initial work completed in 2011. Working collaboratively with experts (including Joint Recovery Team members) on this species, Cows and Fish selected and examined 17 riparian sites along streams with remaining pure populations of westslope cutthroat trout. Using this information, recommended action plans were then developed for each site based on examining current riparian ecosystem condition, identifying the management and land use issues on site, then developing stewardship management recommendations that address both site-specific concerns. To involve experts and stakeholders in the process, and increase commitment to management change and implementation, one field tour was held to discuss the issues and need for the project and the relationship of riparian management and aquatic, fish habitat needs. The tour was very well attended (by 30 individuals) from a diversity of land use and management sectors and generated excellent discussion and questions. An experts meeting was then held, sharing draft results and the group helped determine the priority needs for a stakeholder workshop. The stakeholder workshop, attended by 55 people, included presentations on riparian health results and issues found, showcased numerous sector examples of successful actions already taken, and involved a discussion to identify solutions and garner support for habitat improvements. Group discussions were very valuable, engaged and enthusiastic – there is a lot of interest in working together to address barriers to improvement and help improve riparian habitat for cutthroat trout. The overall project objectives included: Objective 1. Priority areas for WSCT habitat identified, discussed and agreed upon, by a collaboration of experts. Objective 2. Develop site specific and overarching stewardship action plans based on riparian habitat issues and threats on priority reaches. Objective 3. Engender more engaged and knowledgeable stakeholders regarding threats and their roles in human impacts to WSCT habitat, as well as stewardship efforts they can take to improve WSCT habitat, and ultimately, WSCT populations. Objective 4. Garner involvement of stakeholders to identify and commit to actions they can take to improve riparian areas and WSCT habitat.

Deliverables/Results:

Expert input to prioritize site selection and methods: A list of streams, and in some reach locations within those streams, has been completed which are priorities for riparian sampling. In addition, the selected streams have been prioritized as well (sampling also completed).

Stakeholder tour, resulting in increased stakeholder commitment, knowledge and ability to recognise issues and understand options for changes to land use or management activity that they can take. Cows and Fish worked extensively with Fisheries staff (of AESRD) to set this up, identify date and agenda. The tour was held on October 18, 2012. There was a very good diversity of participants, and excellent discussion and feedback. 30 people attended, including community

members, local and regional conservation organizations, government departments (multiple departments and divisions), ranchers, environmental consultants and others.

A Stakeholder workshop, resulted in stakeholders with increased knowledge, interest, stewardship ethic. 55 people, from very diverse sectors, geography, interests and perspectives attended the February 25, 2013 workshop, held at the MD of Ranchland Admin building, Chain Lakes Provincial Park. The workshop included a showcase of speakers sharing their success stories, from the energy, off-highway vehicle, watershed group, and ranching sectors. Round table discussions were held to prioritise and capture ideas and recommendations on how to continue forward, if funding is secured for the coming year(s). Speakers were invited from AESRD and the Oldman Watershed Council to speak about planning initiatives that would be relevant to the stakeholders in attendance. Cows and Fish also presented the results of the riparian health work they had completed, identifying the types of issues in riparian areas that were found, as well as suggesting some potential opportunities to improve riparian health.

Riparian habitat recommended stewardship action plans. Following summer field work to examine the health of these riparian sites, data was analyzed and summarized, leading to individual recommended stewardship action plan for each site, developed to address human-induced riparian habitat loss and degradation. Overall, most of the sites were quite healthy and there were relatively small or localized impacts for which recommendations that could be addressed in future management were made. 17 sites were examined, and riparian health summaries prepared for each site. Where sites were in the same management units (and sometimes on the same waterbody), those summaries (17 in total) were put into the same report, resulting in 12 separate reports with recommendations for action (essentially 17 individual riparian health summaries and recommendations). Because of collaboration with other organizations, Cows and Fish were able to include two additional sites, which were examined as part of another project, but also were done on a pure westslope cutthroat trout stream.

Riparian health overall stewardship management plan report. Summary information of the project was provided in two venues: first, to the experts group, December 2012. This summary included only the 2012 sites. Secondly, Cows and Fish provided a summary, which included results combined from both the 2011 and 2012 work, and this was presented to the Stakeholder Workshop, held on February 25, 2013. That summary identified the common themes, positive aspects and potential areas for improvement. Overall, particularly with the 2012 sites, riparian health sites were quite healthy and there were very limited impacts reducing riparian health. Some limited, localized impacts and impacts outside of the riparian area provide room for improvement. Invasive and disturbance caused plants are relatively widespread issues while physical impacts to sites are generally localized and did not reduce the riparian health of many sites. The more formal report which incorporates this summary is still in draft format and should be completed by the end of March, using the other funding we have to cover that work. When looking at the 37 sites (2011 and 2012 project sites plus additional sites from other relevant projects from 2005 and 2010, as outlined in the 2011 reporting), the overall riparian health was as follows: 25 sites were healthy (67% of sites); 11 of 37 were healthy but with problems (30% of sites) and one site was unhealthy (3% of sites). When looked at the project by area, there is a reduced proportion of the project in the healthy category: 49% of the area was healthy; 38% was healthy but with problems and

13% of the area was rated as unhealthy.

Report: Hull, C and N. Ambrose. 2012 Riparian Health Inventory Project (Year 2): Westslope Cutthroat Trout Priority Streams A Summary of the Riparian Health Status and Habitat Improvement Needs for 17 Priority Westslope Cutthroat Trout Sites in the South Eastern Slopes of Alberta. Alberta Riparian Habitat Management Society (Cows and Fish) Report No. 042

Southern Alberta Grazing School for Women - Bringing habitat and grazing stewardship to livestock producers

Cows & Fish - Alberta Riparian Habitat Management Society

Grant: \$3,000

Project Code: 020-00-90-167

Project Status: Funded since 2011-12; Completed

Cows and Fish successfully delivered this two day grazing school for women in Delia July 25 - 26, 2012. In addition to five speakers and the organizing committee of eight, 26 attendees took part in the event. Mornings were spent indoors, listening to speakers, while afternoons were spent outdoors; learning practical hands-on learning field techniques, all intended to improve skills and management knowledge. The aim was to offer a setting for learning and inquiry, and for hands-on opportunities, so that participants could practice what they are hearing and then apply realistic, practical strategies to improve the sustainability on their own farms and ranches. The project objectives were as follows: 1. Deliver content that has direct value to agricultural producers in understanding their grazing landscape and management options in relation to being more sustainable and contributing to a healthier landscape. This objective was successfully accomplished, since respondents indicated very practical, management-oriented learning when they completed the evaluation, including that that had learned "Plant/Weed ID", "How to better evaluate land and match it to what we are wanting to manage", "Grazing Principles and Practices" and "The need for long term planning". 2. Have 75% of attendees learn new information or skills and identify practices and management they plan to apply on their farm or ranch, by the end of the school. This objective was also successfully met – all of those attending who manage indicated they would incorporate practices they learned about at the school, at home—this is ultimately what Cows and Fish want to achieve—use and application of new information and skills on their farms and ranches. Overall, the ladies who attended were very keen, attentive and interested in learning. They were very willing to ask questions, try new things and take on new ideas. They provided an overwhelmingly positive response, both in the formal evaluations as well as throughout the school, with the genuinely appreciative comments made about the committee's hard work and commitment to provide them a valuable, meaningful opportunity at the school. As a result, attendees left with not only new knowledge and skills, but an overall positive experience which will reinforce the value of the grazing school.

Deliverables/Results:

As indicated in the objectives, the Southern Alberta Grazing School for Women was successfully delivered, with very positive results. All those who manage land indicated that they would incorporate practices they had learned at the school when they went home. Cows and Fish were very pleased with the overall turnout and the types of things the

women indicated that they learned. In total, 39 people attended and participated, with 26 of these being attendees, five being speakers and eight being committee members.

The grazing school had many very interesting and highly rated topics, indoor presentations as well as outdoor, hands-on learning opportunities. In addition to learning about riparian and range health in the field, attendees also did plant identification, and were asked to apply what they learned at the end of one of the afternoons by completing an in-field, plant identification quiz. This was not only something they worked hard to do well at, but it required them to put to practical use the skills and ideas from earlier in the session. Understanding their plant resources better is a very practical way for them to understand the impacts of their management choices as well as of other land use impacts, and to adjust or monitor land use and grazing practices to aim for the most healthy plant communities possible, which in turn support vibrant wildlife communities.

Summary articles promoting the event or reporting on the event carried by local papers and municipal district/county newsletters: these included four counties sending out notices in their ratepayer newsletters, two notices (at least) on websites, one advertisement in a local newspaper and a follow up article; one presentation to a county council; and many mentions before and after at various meetings and conferences.

Maintaining and restoring Crowsnest River riparian areas

Crowsnest Conservation Society (CCS)

Grant: \$18,000

Project Code: 015-00-90-191

Project Status: Funded since 2011-12; Completed

The goal of this multi-year project is to restore and maintain native riparian habitat and improve local water quality, trout habitat and adjacent riverine habitat for game mammals and birds along Crowsnest River and its tributaries, with additional trickle-down benefits to the integrity of the Oldman River watershed. The project objectives include: maintaining a plant monitoring database to track the presence and prevalence of weeds in riparian areas; reducing the number of recorded noxious weeds; tracking the success of planting efforts and reducing river sedimentation. A Crowsnest River Riparian Restoration Action Plan for 2012 was developed to guide weed extraction and planting activities. Riparian Restoration Technician, Heather McCubbin, was hired to undertake weeding, monitoring, planting and educational components of the grant. Due to the late spring, Heather spent time in May preparing educational materials for the community. Monitoring and weed removal began in mid-June and continued until the end of August. Volunteer community weed pulls were organized and each event began with a workshop on invasive species identification and extraction methods. Monitoring and recording of weed cover still in place occurred in September. A staff person from Cows and Fish was contracted to go out in the field with Heather and to revise our sampling method to better quantify weed infestations in riparian areas. Planting of native trees and shrubs to replace invasive species extracted along Crowsnest River and its tributaries occurred from September to November, 2012. The Crowsnest River Riparian Report 2012 was written to update the 2011 report and provide direction for future activities.

Deliverables/Results:

At the end of the second year of this project the number of recorded noxious weeds had decreased, more native trees and shrubs have been planted, monitoring areas were more clearly defined and public education related to invasive plant species increased.

17 transect locations established in 2011 along Drum Creek, Crowsnest River and Lyons Creek were monitored; 22 random polygons established along Drum Creek, Gold Creek, Lyons Creek and Nez Perce Creek were weed cover monitored.

The plant-monitoring database was updated in the fall of 2012.

45 bags of weeds (millions of seeds) removed by volunteers and the Riparian Restoration Technician throughout the summer and at three weed pull events. Four community weed pulls were held on June 28, July 13, July 26 and August 9, a workshop was hosted prior to each weed pull event.

177 trees and shrubs planted along creeks and Crowsnest River at 11 restoration sites; 23 trees and shrubs planted at a community workshop to stabilize erosion along Nez Perce Creek (September 18, 2012); 24 trees and shrubs planted by local Grade 6 students along Crowsnest River (October 9, 2012).

The annual progress report was compiled at the end of the season, summarizing weed removal and native planting activities. – *Crowsnest River Riparian Report 2012*

The progress report was presented to the Crowsnest Pass Municipal Agricultural Service Board on October 12, 2012 by Heather McCubbin and is available on the CCS website crowsnestconservation.ca/wp-content/uploads/2013/04/Crowsnest-River-Riparian-Report-2012-CCS.pdf and a link to the report was posted in the April CCS e-newsletter. Also an update of the program was presented at the Foothills Restoration Forum by Kim Lutz.

An oral report was presented at the Oldman Watershed Council at their Holding the Reins: Landowners Summit in February 2013. A link to the report has been emailed to OWC.

Salamander Creek trail realignment

Crowsnest Pass Quad Squad Association

Grant: \$3,000

Project Code: 015-00-90-194

Project Status: New; Completed

This project was established to mitigate the impact on the habitat of the long-toed salamander, a species which the Endangered Species Conservation Committee has listed as a "species of special concern". Over time OHV traffic has eroded the bridge approaches; by repairing the bridge approaches it will encourage OHV traffic to utilize the bridge instead of crossing the creek. The project objective was to mitigate the disturbance of the watercourse, provide non-destructive repair and maintenance to the bridge approaches to encourage OHV traffic to utilize the bridge to minimize the impact on the long-toed salamander population. A new approach was constructed on the west end of the bridge to make it easier to access the bridge, the east approach was repaired, the bridge was elevated for more clearance and high water, both stream fjords which contributed substantial amounts of sedimentation into the creek were deactivated and erosion control measures were installed; as a result OHV traffic can no longer cross the stream.

Deliverables/Results:

The temporary field authorization for the work was received on September 19, 2012 and the project was completed October 14, 2012. OHV traffic is no longer able to cross the stream as all approaches through the stream have been deactivated. Signage to be completed summer 2013.

An article outlining the project and contributing funders is published on the club's website and in the club's first newsletter of 2013, see <http://www.quadsquad.ca/?q=node/685>.

ALUS demonstration projects in the County of Vermilion River and Parkland County

Delta Waterfowl Foundation

Grant: \$20,000

Project Code: 015-00-90-194

Project Status: Funded since 2010-11; Completed

The Delta Waterfowl Foundation (DWF) continues their efforts to demonstrate the Alternative Land Use Services (ALUS) as a community led and farmer delivered model for environmental goods and services (EGS). While ALUS is active in other provinces, it was first launched in 2010 in the County of Vermilion River (CVR), thanks in part to financial and in-kind support from ACA. It has grown within CVR and has recently expanded to Parkland County and is currently being considered in a third county. Within CVR there are now some 18 landowner agreements signed and 1,500 acres enrolled. In Parkland County two landowner agreements have been signed with 60 acres enrolled.

While DWF continue to add on-farm demonstration projects, this ACA grant was used to help with other important facets of this demonstration effort. Riparian health assessments were conducted in CVR and Parkland County to help establish how on-farm projects improve the health of the land. Communication efforts included the purchase of signs to help promote the program and provide recognition to those supporting the initiative. In addition DWF met with key organizations, made presentations and attended events to promote ALUS to a number of key audiences.

Deliverables/Results:

DWF are excited about the suite of project types they've been able to deliver on the land. This variety shows a new way to deliver conservation by using the community-led and farmer-delivered approach along with annual payments. By working with Cows and Fish, baseline-monitoring protocols are established that will enable us to document environmental benefits of this work. Also DWF have been surprised to see the interest in other counties in undertaking ALUS projects of their own. With Parkland County coming on board, outreach to new audiences was extended and a third county will be launched in April, 2013. The CVR is also now positioning itself to deliver wetland mitigation efforts using ALUS. Continued outreach within the CVR community (such as speaking at and having a display at the Cattleman's Coral in Lloydminster) is leading to new on-farm projects and expanding the support in general.

Cows and Fish conducted six baseline inventories on four ALUS projects this past fall, two in each county. These inventories will help document environmental changes on each project site so that the effectiveness of the improvements done by the producers can be monitored and documented. Several signs were purchased that

will help advertise ALUS and promote it within the community. In addition, ALUS was officially launched with Parkland County and DWF continue to advance their outreach efforts on a local, provincial and national level.

Bat houses

Dunvegan Fish and Game Association

Grant: \$2,000

Project Code: 030-00-90-205

Project Status: New; Completed

Dunvegan Fish and Game Association (DFGA) members have seen fewer bats in recent years. DFGA wanted to undertake a bat house program involving school students and club members. A proven bat house design was found, materials were purchased and prepared, activity days were organized with school groups, and bat houses were assembled and installed in May and June 2012. The schools involved so far include three schools in Whitelaw and Fairview and three schools in Beaverlodge and an art and historical society in Beaverlodge. Each workshop included a presentation on bat biology, bat habitat, benefits of bats, bat house design, and the support provided by ACA. Approximately 45 bat houses have been built so far. There was some bat occupancy observed in summer 2012, and monitoring will continue as more bat houses are built. In addition to the bat habitat enhancement value, the local public becomes more aware of bats and gains a better understanding of bats. The bat house project will be continued by DFGA as a long term, ongoing project involving school and community groups.

Deliverables/Results:

45 bat houses have been built and installed with participating groups. At least one bat is known to have used one of the bat houses in August, and there are likely more that DFGA are not aware of yet.

Four school groups and one community group have constructed bat houses with DFGA. Two more bat house building workshops were held in Fairview during May and June 2013.

A presentation on bat biology and bat behavior was given to each of the five participating groups.

DFGA brings a bat house display to local trade shows and other public events, in order to increase awareness of bats, and to demonstrate the bat conservation project. This generates discussion and awareness of bats.

In addition to the roosting habitat provided to bats, the project has generated more awareness about bats in the community. This project has identified a greater misunderstanding of bats and lack of awareness of bats in the local community than what was thought at the beginning of the project.

DFGA is also in discussions with Fairview High School and the Town of Fairview regarding details on a long term bat house habitat program. This will likely include providing some constructed bat houses, bat house materials, technical support, and labour for field installation of bat houses around Cummings Lake and associated campground, ball diamonds, museum, hiking trails and wetlands.

Nestbox installation in Important Bird Area with local youth

Edmonton and Area Land Trust

Grant: \$1,000

Project Code: 030-00-90-202

Project Status: New; Completed

The objectives of this project were to improve nesting and brooding habitat for waterfowl by installing nestboxes on a property owned by the Edmonton and Area Land Trust (EALT) and to engage local youth in hands-on conservation activities. The property contains several large wetlands suitable for waterfowl and sections of aspen forest. It is located adjacent to the Ministik International Game Bird Sanctuary and within the Cooking Lake Moraine, an area that with many highly productive wetlands for waterfowl. Twenty nest boxes were constructed by four senior boy scouts as part of their environmental badge project, with guidance from scout leaders and by specifications described in ACA and DUC's Nest Box Guide for waterfowl. Nest boxes were constructed to fit the requirements for common goldeneye (eight boxes), bufflehead (seven boxes) and northern saw-whet owl/American kestrel (five boxes). The nest boxes for owls or kestrels were not in the original plan; however the materials purchased stretched farther than anticipated and the scouts were able to construct more boxes than initially anticipated. The senior scouts prepared the materials and assembled the boxes with the assistance of 30 or more additional boy scouts and cubs in their group. Following assembly of the boxes, the scouts were assisted by scout leaders and Rebecca Ellis from the EALT in installing the nestboxes on November 18, 2012. Waterfowl nestboxes were spaced along the margins around several of the large wetlands in large trees, and owl/kestrel boxes were placed in wooded areas in the northeast of the property. Nestbox locations were marked with a GPS and will be included in maps in EALT's management plan for the property.

Deliverables/Results:

The main results were the installation of twenty nestboxes at the Ministik property (common goldeneye - eight boxes, bufflehead - seven boxes and northern saw-whet owl/American kestrel - five boxes), completed by a local boy scouts.

The estimated number of nestboxes in the project proposal was low, and with the budget available, the scouts were able to construct more nestboxes than originally anticipated.

This project has generated further interest and opportunity for the boy scout group to be involved in conservation activities with EALT, including monitoring the nestboxes that have been installed.

Announcements and ACA acknowledgement were made via social media, a news release (see: www.ealt.ca/news/2012/dec/07/nestboxes-ready-spring/) and in the Annual report: Spring 2013.

Monitoring reports will be completed annually by EALT.

2012 Snow Goose Chase

Edmonton Nature Club

Grant: \$1,000

Project Code: 015-00-90-184

Project Status: New; Completed

The Snow Goose Chase is a project that has been successful the past 12 years. Nine buses of inner-city school children and families from various low-income groups were all able to experience local nature and the annual snow goose migration through the Tofield area to the east of the City of Edmonton. "Bringing nature to the people" is a good motto for this event. Various displays and exhibits were set up in the Tofield Community Hall on Saturday April 28, 2012. Walks in local wetlands were also a big success, as well as an owl banding demo out at the local Nature Centre. A beaver walk was also set up in nearby Ministik Bird Sanctuary. In the afternoon, all the buses headed out to spot the many thousands of snow geese, ducks and other waterfowl that the team of scouts had been reporting on throughout the morning when the participants were all busy with the morning activities. Everything went according to plan, all ably marshaled by a team of 70 volunteers. Three buses for the paying public, all sold out as usual!

Deliverables/Results:

Nine buses of inner-city school children, low income family groups and newly-arrived immigrants, plus the usual three buses for the paying public, all had an educational and very memorable day visiting the Tofield/Beaverhill Lake area east of Edmonton. Local Tofield and Ryley schools were also involved in the day's activities on the Saturday. The Community Hall was packed most of the morning and all enjoyed the various displays and exhibits. The Valley Zoo hawks and owls demo was very well received as was the burrowing owl from the Beaverhill Bird Observatory. The Royal Alberta Museum tables had the usual attentive audience, especially the snakes, scorpions and other insects ably handled by Peter Heule who seems to have developed a cult following! Exhibits devoted to local pond life, fossils, trapper pelts and the formation of a watershed all created much interest. The bird slide show put together by Don Delaney was top-notch as was the food, snacks and packed lunches ably provided by Margaret Stutzman.

All 15 participating groups were as enthusiastic as ever, and all want to be back next year.

Riparian Health Inventories in the Upper Elbow Watershed

Elbow River Watershed Partnership

Grant: \$8,000

Project Code: 015-00-90-192

Project Status: New; Completed

The goal of this project was to acquire information that would assist the Elbow River Watershed Partnership (ERWP) and government land managers to: 1) understand riparian health trends in the McLean Creek Public Land Use Zone (PLUZ) and the Elbow River Provincial Recreational Area (the project area), and 2) identify opportunities for maintaining, enhancing, or restoring ecological integrity. The objectives were to: reassess riparian areas that had been assessed in 2007 to identify any trends and determine how beneficial

management practices have been in maintaining the health of these areas; determine whether previous restoration efforts have been successful; conduct riparian health inventories in sites not previously assessed, including identified “hot spots”; contribute to the knowledge base of riparian areas in the Elbow watershed, in accordance with the *Elbow River Basin Water Management Plan*; support informed decision-making by the land manager and provide recommendations to both the land manager and the ERWP on restoring or enhancing sites; identify any areas that would benefit from signage being developed through a joint project between the ERWP and the Ghost Watershed Alliance Society that targets ATV use through creeks. During summer 2012, four riparian health inventories (RHIs) were done at sites previously assessed in 2007, five RHIs were done at new sites, and three OHV stream crossings were monitored. Individual site reports were prepared, as well as a report that summarized all the findings.

Deliverables/Results:

Some findings from this project include: fencing, along with bioengineering, can be successful in restoring an area if there is sufficient native vegetation nearby; OHV use is occurring in prohibited areas, such as pipeline right-of-ways and old cut lines, which is affecting riparian health; and opportunities exist for restoring some of the degraded areas by simply closing them off (i.e., through placing boulders to block entry), enabling natural regeneration to occur. An unexpected result was the discovery of an undesignated OHV crossing along an unnamed tributary to Silvester Creek. The creek has some of the last remaining suitable habitat for westslope cutthroat trout in Alberta. At some sites, beavers are contributing to the health of the riparian areas. Bridges alone do not encourage ATV users to avoid cutting through creeks. Grazing by livestock, moose, and possibly feral horses is negatively affecting the riparian areas. Land-use pressures are increasing.

Seven riparian health inventories were carried out summer 2012

Three stream crossing monitoring assessments were carried out summer 2012

Individual reports on the RHIs and a final summary report entitled ‘Riparian Health Summary Final Report; Elbow River Watershed 2012 Riparian Health Inventory Project Kananaskis Country Alberta’ were completed.

Ellis Bird Farm video project

Ellis Bird Farm Ltd

Grant: \$1,500

Project Code: 030-00-90-208

Project Status: New; Completed

Ellis Bird Farm (EBF) has produced a seven-minute video production about a pair beavers that took up residence at the farm. June and Ward, as they have been named, arrived on the site in 2010. Ellis Bird Farm devised a way to enable the beavers to co-exist on the site by wiring the important trees, providing the beavers with supplemental feed and installing a flood control structure. This video tells the story of June and Ward and shows them going about their daily activities. The video contains original footage of June and Ward, filmed by volunteers (Rick Zemanek and Phil French) who spent hundreds of hours over several months watching and filming them. Phil French, who is a local videographer, volunteered his studio and much of his time to produce the video. The video will be shown in the EBF Visitor

Centre as well as at off-site programs. The goal of the video is to raise awareness about the important role that beavers play in maintaining diverse wetland ecosystems, and how humans and beavers—with some ingenuity and effort—can live side by side. This video, although created on a shoe-string, is very professional product.

Deliverables/Results:

The *Living with Beavers* video, shown at Ellis Bird Farm.

Some of the footage shot by Rick Zemanek and Phil French of June and Ward (the beavers) will be included in a Nature of Things production, *The Beaver Whisperer*, aired March 28, 2013.

Amphibian Monitoring Program and Malformation Inquiry in Fish Creek Provincial Park and Watershed Public Awareness Campaign

Friends of Fish Creek Provincial Park Society

Grant: \$3,000

Project Code: 020-00-90-169

Project Status: Funded in 2011-12; Completed

The Amphibian Monitoring Program is an ongoing volunteer-driven study of amphibian populations in Fish Creek Provincial Park (FCPP) that engages citizens in the appreciation of nature and wildlife. This program contributes to healthy ecosystems by recording changes in population, involving citizens in wildlife monitoring and thereby increasing awareness and stewardship, and sharing data with scientific institutions and interested agencies. This year, the Friends of FCPP contributed to the exploration of amphibian malformations in FCPP by training volunteers to collect dead specimens found for preservation and possible testing through partnering organizations. In addition, over 8,000 people were informed about wetland habitats and wildlife.

Deliverables/Results:

The main results of the project were: collecting presence and occurrence data about the three species of amphibians in the park; educating the general public about habitat protection and amphibians; and contributing to the knowledge base about amphibian malformations in Alberta.

Various media products, such as press releases, Public Service Announcements, articles, posters, and social media outreach will be used to promote watershed campaign messages and events, were completed.

A watershed stewardship brochure and flyer highlighting action residents can take to protect wetlands and the life that depends on them were completed.

A watershed stewardship display, for use at community events throughout the watershed providing information about how we can work together to protect water and also details of monitoring program reports and related upcoming learning opportunities and events, was completed.

Feedback was received from Centennial High School Program participants about the amphibian and wetland studies outing.

Awards to most dedicated Amphibian Monitors were given at Friends of Fish Creek Volunteer Appreciation Dinner and Awards Ceremony.

The ACA Learning Dock: Outdoor education and wetland ecology youth program

Friends of University of Alberta Devonian Botanic Gardens

Grant: \$21,000

Project Code: 015-00-90-190

Project Status: New; Completed

There has been significant need to have an accessible pond for day programs and week-long field trips to the Devonian Botanic Garden Kids' Programs. The damage that was evident from having thousands of students access the sides of the pond demands that care be taken to prevent degradation of the pond. The platforms assist in both helping kids to get to the water and prevent erosion. Through use of the pond platforms, children are able to access the pond water for wetland studies. Observations of pond critters as well as pond water analysis, both of these activities are enhanced by allowing students to get to the pond. Safety of students as well as the conservation of the pond itself will be evident through use of the platforms installed.

Deliverables/Results:

12 platform sections were built and delivered. Students are now able to get to the pond easily. Many people have commented how natural and well placed the platforms are.

The reclamation work is in process.

ACA learning dock at the UofA Devonian Botanic Gardens

Photo: Friends of the UofA Devonian Botanic Gardens



Lac La Biche wetland inventory and classification plan

Lac La Biche County

Grant: \$8,000

Project Code: 015-00-90-145

Project Status: Funded in 2011-12; Completed (on-going)

Wetlands are an extremely important part of northern boreal ecosystems and provide habitat to a wide range of aquatic and terrestrial wildlife. Wetlands are ecosystems high in nutrients and provide services to 80% of boreal wildlife and deliver one fifth of the habitat for North America's breeding waterfowl. They also provide many ecological services such as water storage, groundwater recharge, flood control, shoreline stabilization, and water treatment/pollutant removal. Not only is Lac La Biche County home to several wetlands, Lac La Biche is also considered an Important Birds Area. This Lac La Biche Wetland Inventory and Classification Plan project strives to recognize and conserve wetlands throughout Lac La Biche County, ensuring that their services are preserved. The project's objectives have shifted from mapping and inventory efforts to wetland classification and conservation efforts, due to last year's advancement on these tasks. New focus will be placed on identifying areas requiring priority attention and putting into action the means necessary to meet conservation and preservation needs of these wetland ecosystems.

The main project activities for 2012-13 included: 1) recruitment of Technical Staff to coordinate project; 2) aerial photograph interpretation; 3) mapping of wetlands using scanning and digitization technology of aerial photographs; 4) classification of wetlands and identifying areas requiring priority attention; 5) ranking system development – scale system which ranks wetlands according to sensitivity and importance; 6) plan implementation; 7) advertising campaign – follow through on current sources of media advertising to take advantage of emerging technology to provide information to the public at large; 8) future project planning – using reports and investigations that have been in place to plan and develop. The results and achievements since last year's final report include the completion of a (draft) detailed Lac La Biche County Wetland Inventory Book, which provides essential information on wetlands in the Lac La Biche County area such as classification type, location, local watershed, total area, and in turn, its importance. The formation of the new Lac La Biche County Environmental Stewardship Advisory Committee (ESAC) has selected the implementation of this Wetland Inventory Project as one of its main objectives of the committee.

Deliverables/Results:

Draft Wetland Inventory and Classification Plan Document – created by Aquality to act as a guide to assess wetland importance using a series of recommended criteria. Allows determination of the sensitivity of a wetland and whether or not development may take place near a given wetland.

Mapping and aerial photography of the wetlands that are included in the document have been processed and interpreted. This data base will continue to expand as needed/requested (on-going).

Prioritization of wetland areas has been completed and discussion regarding prioritization will be continued by the Lac La Biche County Watershed Steering Committee as an on-going project.

The completion of a wetland sensitivity ranking system is on-going

with addition of new wetlands.

The plan will be published, advertised, and fully implemented in the County (not yet occurred). This will also be assisted by the ESAC.

Advertising and Information Campaign – includes articles in the local newspaper (non provided), information brochures, utilization of County media, open houses and workshops, and public/Council presentations.

Publication of the plan has not yet occurred. The plan has been introduced to the ESAC and publication/ communication for the plan will in part fulfill the committee objectives.

The plan will continue to be reviewed as wetland areas are added to the data base (on-going). Review from the ESAC, in addition to County administration, will also continue as local projects or issues arise and are addressed (on-going).

Avian monitoring and stewardship at Lesser Slave Lake

Lesser Slave Lake Bird Observatory Society

Grant: \$26,100

Project Code: 030-00-90-128

Project Status: Funded since 1999, GECF funded since 2004-05; Completed

The primary goal of this project was to provide accurate data for determining long term population trends of migratory and breeding birds at Lesser Slave Lake. This season represented the 19th consecutive year of avian population monitoring by the Lesser Slave Lake Bird Observatory (LSLBO). During this project, the LSLBO collected data through the following core avian population monitoring programs: 1) Spring and Fall Migration Monitoring, 2) Monitoring Avian Productivity and Survivorship (MAPS) Program for breeding birds, and 3) Northern Saw-whet Owl Fall Migration Monitoring. The Spring Migration Monitoring program ran daily from April 23 to June 10, 2012 for 49 days of migration coverage. Daily coverage included visual migration counts, census, incidental observations, and banding. During spring 2012, the LSLBO staff banded 1,936 birds representing 46 species. The Fall Migration Monitoring Program was conducted for 80 days from July 12 to September 29, 2012. Conditions allowed mistnets to be set for 84% of the total possible net hours. A total of 1,588 birds from 56 species were banded. The MAPS breeding bird monitoring program was conducted from June 11 to August 2, 2012 at four MAPS station. A total of 167 birds representing 22 species were banded and the breeding status was determined for approximately 55 boreal forest breeding species. The Northern Saw-whet Owl Fall Migration Monitoring program began on August 29 and ended on October 10, 2012. Banding was attempted on 32 nights and 112 northern saw-whet owls and one barred owl were banded. A final report summarizing the results of all programs was completed and made available to funders, members and public. All data was submitted to government, Bird Studies Canada, as well as the Institute of Bird Populations for population trend analysis. Results and data are available on the naturecounts.ca website. In 2012, a new two-year field study was initiated on the Canada warbler to examine the critical breeding habitat requirements for this threatened species. Work also continues with the University of Alberta on several joint research initiatives. A secondary goal of this project was to increase public understanding of the importance of the boreal forest for migratory

and breeding birds and the conservation issues that impact them.

High-quality education programs were provided to over 5,600 people of all ages including hands-on fieldtrips for regional students, banding lab tours, webinars, and special events at the Boreal Centre for Bird Conservation.

Deliverables/Results:

Successful completion of 2012 Spring and Fall Migration Monitoring (19th consecutive season)

Successful completion of 2012 MAPS Breeding Bird Program (19th consecutive season)

Successful completion of 2012 Northern Saw-whet Owl Fall Migration program (8th consecutive season)

2012 Annual Report completed and distributed. All data submitted for population trend analysis.

Education and Interpretive programming on boreal forest ecology provided to over 5,600 students and public.

The LSLBO welcomed over 4,000 visitors to the Boreal Centre for Bird Conservation.

The Joint Research Project initiative continued with the U of A and Alberta Parks, including the first year of field work completed on the LSLBO Canada warbler research project.

The following reports have now been completed:

2012 Annual Report

Canada warbler research project – summary report of first field season. This is an internal working document to guide second year operations and not for public distribution yet.

Joint Research Project – list of deliverables by U of A using LSLBO isotope data

2012 Summer Warbler – ACA has been recognized as a key funder of our 2012 program.

Note: All monitoring data is available upon request to the ACA. In addition, details of all education programs delivered with ACA support are also available.

Habitat Restoration project

Lone Pine Farming Co

Grant: \$800

Project Code: 015-00-90-185

Project Status: New; Completed

Lone Pine Farming's goal was to further enhance wildlife habitat for bluebirds, American kestrels, buffleheads, common goldeneyes by placing nest boxes and structures around their dugout and planting fruiting trees such as crab apple and hawthorn, Saskatoon and hazelnut.

Deliverables/Results:

Habitat has been restored; trees and shrubs have been planted. Ten large boxes to accommodate ducks, owls and kestrels have been erected, as well as 16 bluebird boxes and a purple martin house.

Habitat Enhancement project #2 (bluebird boxes)

Lone Pine Farming Co

Grant: \$600

Project Code: 030-00-90-207

Project Status: New; Completed

The goal of this project is to enhance the bluebird habitat by replacing the old and fallen down bluebird houses along prime native habitat. In Spring 2012, Lone Pine Farming built and supplies 50 cedar blue bird boxes along Highway #855 secondary and surrounding area.

Deliverables/Results:

50 cedar bird houses have been placed along Highway #855 secondary and surrounding area.

Barriers and fish passage: Aquatic connectivity along Highway 3

Miistakis Institute for the Rockies

Grant: \$13,000

Project Code: 020-00-90-199

Project Status: New; Completed

Aquatic ecosystems are often severely fragmented due to improperly designed or maintained culverts and other structures that allow water to flow under the road. In special cases, aquatic barriers may be advisable to keep populations separate; for example, to protect imperiled native trout species from introgressive hybridization with non-native species. Highway 3, a major east-west transportation corridor through the Canadian Rocky Mountains currently supports over 6,500 vehicles a day and runs parallel to, and often crosses, the Crownsnest River and many of its tributaries. A review and analysis of existing Highway 3 infrastructure is needed to determine the impacts of the highway to aquatic connectivity, species movement and conservation. This assessment will complement the Highway 3 terrestrial study completed in 2010 and ensure mitigation recommendations are conducive to aquatic function. Specifically, the following objectives were completed; a passage assessment of all ten culverts and three bridges along the Highway 3 corridor were identify and the level of connectivity through each structure was assessed; initial assessment of identified conservation support opportunities and mitigation strategies for enhancement of passage and restoring habitat near the structures; and identified conservation opportunities to support protection and enhancement of pure populations of native trout species from introgression with non-native species, and develop a prioritization list of short- and long-term projects. This project, due to budget limitations is only a snap shot in time; it will be used as the background to inform a more detailed assessment of the ten culverts and three bridges. Field work and analysis focused on the ten culverts, each culvert was scored for its ecological value and ease of connectivity. In addition, due to westslope cutthroat trout a conservation score was assigned for culverts acting as a barrier is important for protecting pure strains of native trout from hybridization. The partnership, Western Transportation Institute, Anatum Ecological and Miistakis Institute engaged experts from AESRD, Lotic Environmental and Department of Fisheries and Oceans.

Deliverables/Results:

The main results include a review of all relevant literature and science on fish species in the creeks that cross Highway 3 transportation

corridor. A field assessment of connectivity at the 13 sites where creeks cross Highway 3 and development of a prioritization matrix on opportunities for mitigation along Highway 3.

The final report of this project is entitled 'Barriers and Fish Passage: Aquatic Connectivity along Highway 3' (available). It will be posted on the Miistakis and WTI website.

In addition, a full proposal has been submitted to Alberta Transport and AESRD for a more detailed assessment of fish passage at creeks that intersect Highway 3.

Riparian area management improvements

Mountain View County

Grant: \$21,000

Project Code: 015-00-90-102

Project Status: Funded since 2005-06; Completed

The goal of the Riparian Area Management Improvements Program in Mountain View County (MVC) is to help improve and preserve the health of riparian areas. This project has helped improve water quality and wildlife habitat throughout the County. Producers are becoming aware of the importance of sustainable agriculture and beneficial management practices. Funding is offered to producers who want to protect, restore or maintain the health of their riparian areas, encourage biodiversity and maintain water quality for fish habitat using the following means: permanent riparian fencing, permanent electric fencing, vegetation for buffer strips, off-site watering systems, or creek crossings. The projects are cost shared and ACA funds are used to pay 25-100% of the material costs of building a fence, a creek crossing, native plant seeds and trees. The County puts out a call for applications in the Mountain View Gazette, the local radio and on the County website. Once all of the applications are in, the agriculture staff reviews and rates each project. The rating is based on MVC Environmentally Significant Areas, the effect the project will have on wildlife and fish species, if it is going to be an exclusion or riparian pasture project, and if the project is part of an overall manure management plan. Assistance in completing the application form is available through MVC agriculture staff. A presentation is made on each project to the Agriculture Service Board. Once they have seen all the projects and their rating, the funding for the projects is allocated. A riparian health assessment is done on each project before it is completed and in five years, once their contract commitments are completed. The contract with the County also allows the site to be used for demonstration purposes. This program encourages the principles of Beneficial Management Practices like controlled/rotational grazing, water supply, manure management and chemical application setbacks. As well improves the health of the watersheds within the County and increases the awareness of the importance of riparian areas for biodiversity, wildlife habitat, fish distribution and population. There have been about 80 projects completed throughout the watersheds in MVC. These projects have been very successful, the five year follow-up riparian health assessment was completed on a number of projects in the summer of 2012. All of the project riparian areas came out with a score higher than the initial riparian health assessment that was completed the year the project was completed. These scores are confirmation that the Riparian Area Management Improvements Program is successful in MVC.

Deliverables/Results:

There were six riparian area management projects completed this

year funded by ACA's GECF and five projects funded by MVC. This results in ten more producers who are aware of the importance of beneficial management practices and sustainable agriculture. These projects totaled 4,209 km of finished riparian fence and approximately 161 hectares of riparian area being protected. There were eight riparian fences, three watering systems and one creek crossing completed in 2012. The watering systems and creek crossings were cost shared by MVC and the applicant.

Project Profile sheets are completed for each project that is funded and available upon request.

Riparian health assessments will be available upon request at the end of the summer 2013.

Project areas will be available for tours.

Citizen science opportunities

Nature Alberta

Grant: \$9,000

Project Code: 015-00-90-197

Project Status: New; Completed

Citizen science has long been recognized as a legitimate means of collecting scientific data and can also be used to entice more (and new) Albertans to get engaged in a greater appreciation and the management of our natural heritage. Before moving forward with developing more citizen science programs, Nature Alberta wanted to get a better understanding of what was already available, where there were gaps, and what niche might best be filled. Hence Nature Alberta undertook a search via the internet and through contacts, catalogued over 80 citizen science programs relevant to Alberta (although only about a third of programs originated from Alberta; some were national programs and some were from the United States and elsewhere). One of the biggest gaps identified is that Alberta, compared to other jurisdictions, has been a bit slow to embrace the concept of "crowd-sourcing" – where researchers use social media and volunteers to collect their data. However, ACA has made a start in this direction with its Moose Survey. Alberta is also yet to have an easily accessible website and interactive map where volunteers can share their biodiversity observations (like e-bird but for all species like www.ispot.org.uk). Finally, Alberta does not have a central directory of citizen science programs nor an agency that connects volunteers to the most suitable programs. This is a role Nature Alberta looks forward to filling in the near future starting with the launch of the new website in April and a Blog called "100 Things you can do for nature". This blog will see a different citizen science program highlighted each week. As it is built, it will provide a searchable database of programs that will grow over time. For more about this work, please see the Nature Alberta report – *Citizen Science in Alberta: Why we should engage Albertans in Nature and Science*.

Deliverables/Results:

From the research, it was surprising to learn what innovative things other jurisdictions are doing with crowd-sourcing, downloadable apps, and interactive online biodiversity maps, and a little bit disappointed that Alberta is not as far along. It is heartening to see ACA moving in this direction, but Nature Alberta feels we also need to see other conservation groups supporting such efforts. An opportunity to engage a broader audience was also identified including "anyone out on the landscape" – be they hunters, farmers, rig workers – and by broadening our reach, a lot better data could be

collected than we currently have for many species.

A report entitled 'Citizen Science in Alberta, A look at how and why we should engage Albertans in nature and science' with an analysis of existing programming and gaps to inform future Nature Alberta was completed and is available.

An excel spreadsheet of 80+ citizen science programs has been compiled and appended to the project report. This document will be added to as Nature Alberta learns about new programs relevant to Albertans.

Although hard to quantify, an understanding of what programs are available (and where there are gaps such as youth) as well as what makes them successful was determined to some degree. There are several good papers available on what is needed to make citizen science programs successful.

Nature Alberta will launch a new website in early April. This site will include a blog with a new citizen science program (from the excel spreadsheet) highlighted each week. Currently, programs such as the Great Canadian Backyard Bird Count have been promoted on Nature Alberta's Facebook page.

Three citizen scientists were interviewed and an article was published about citizen science in the Fall Nature Alberta magazine. The magazine will be used to highlight the results of some of the longer running Alberta citizen science program like the May Species Count and Amphibian Monitoring Program.

Fence markers for species survival in Southern Alberta

Nature Conservancy of Canada - Alberta region

Grant: \$5,000

Project Code: 030-00-90-206

Project Status: New; Completed

Fencing is a major barrier for animal movement and a cause of mortality across the prairies. The Nature Conservancy of Canada (NCC) has recognized this threat to be an issue of particular significance in Southern Alberta for the sage grouse and pronghorn antelope. Evidence of species mortality caused by fencing has been recorded on NCC properties and neighboring properties in the area. NCC has identified several key properties in southeastern Alberta that are most critical to the protection of the sage grouse and pronghorn. The key objectives for the project include the installation of fence markers and smooth wire for species protection and outreach efforts to engage local ranchers in modifying their own fencing. To meet these objectives, NCC installed wildlife-friendly fencing and fence markers on its Haugan Property located in southeastern Alberta. Thanks to the support of ACA, volunteers and other funders to this project, NCC have successfully installed smooth-wire fencing to allow pronghorn antelope movement under the fence line as well as successfully installing 5,000 fencing markers at the property to reduce sage grouse fatalities related to fencing. NCC aims to educate local landowners and community members about the need for wildlife-friendly fencing in southeastern Alberta. The Haugan Property will be utilized as an outreach site where NCC can showcase different wildlife-friendly measures that can be employed on properties across Alberta.

Deliverables/Results:

To complete the fencing project NCC enlisted the help of local community members who volunteered an entire day of labour to

complete six km of fence work. NCC staff and volunteers were able to install 5,000 vinyl markers and smooth wire fencing to allow for safe pronghorn movement as they frequently move across the property. Thanks to their volunteer efforts and the support of ACA, pronghorn antelope and sage grouse will be more able to safely travel across the Haugan Property, which is a high traffic area for the two species.

The fencing work that was completed has had a number of tremendous results that were made possible thanks to the support of ACA. With your support, NCC staff and volunteers were able to install 5,000 vinyl markers along six km of fencing on the Haugan property allowing for safe pronghorn movement as they frequently move across the property.

The results of the outreach efforts were also very beneficial as the 12 local community members that attended the event on August 11, 2012 first learned about the importance of wildlife-friendly fencing before helping to make it possible.

An article was posted on the NCC website which profiled the event and ACA's support of the project, see: www.natureconservancy.ca/en/where-we-work/alberta/stories/fences-gone-vinyl.html.

The ongoing use of the Haugan fencing as an example for wildlife-friendly measures will greatly benefit species in Alberta in the future. NCC intends to use the site as an example for landowners on the need for wildlife-friendly fencing and the solutions that are available to them.

Riparian aerial video assessment of the Whitemud River

North Peace Applied Research Association

Grant: \$6,000

Project Code: 015-00-90-196

Project Status: New; Completed

The overall goal of this project is to develop a watershed monitoring plan for the Whitemud River. Alberta Fish and Wildlife (F&W) have indicated Arctic grayling populations are threatened in this watershed due to land use activities (agricultural, forestry, and oil/gas industry) and other environmental factors. The objective of this project is to visually document and assess the Whitemud River riparian habitat in the agricultural areas of the watershed via aerial video survey. The riparian health report will be used to support public awareness/education, and aid the development of publically driven management plans to start remediation process of those habitats found to have a "high impact" on the watershed. A riparian video was produced providing visual results of the left and right riparian zone health. The video was used to conduct an assessment of the Whitemud River shoreline with the resultant scorecard: 65% of the Whitemud River shoreline is considered healthy or "good", 14% was scored having moderate levels of impairment or "fair", and 21% of the riparian area was scored as "poor", or having high levels of disturbance. This permanent visual record of shoreline conditions of the Whitemud River can be used to provide landowners in the Whitemud River watershed an opportunity to visually see the condition of those areas adjacent to the streambanks. Knowing the status of the Whitemud River's riparian habitats will allow for intelligent discussions about how to manage this important public resource.

Deliverables/Results:

Aerial videography of the Whitemud River was captured on August

16th, 2012, using a helicopter combined with a handheld Sony digital camera and Geo Mapping hardware. The riparian video provides visual results of the left and right riparian zone health of the Whitemud River.

Subsequent assessment information derived from the videography were mapped as individual Geographic Information Systems (GIS) data layers. These layers were then exported to ESRI ArcGIS software and included with other base information provided by the Government of Alberta.

Using the low-level video footage, the riparian management areas along the Whitemud River were examined and assessed: The 2012 riparian management area assessment found 65% of the Whitemud River shoreline is considered healthy or "good", 14% was scored having moderate levels of impairment or "fair", and 21% of the riparian area was scored as "poor", or having high levels of disturbance.

Report and video completed. Further information regarding the video assessment can be found in the document User's Guide to the Whitemud River Riparian Management Area Health and Integrity DVD.

Public Awareness & Stewardship – reports and video to be shared with industry, municipalities and land owners.

Sturgeon River Watershed habitat enhancement study

Northern Alberta Institute for Technology (NAIT)

Grant: \$26,576

Project Code: 015-00-90-144

Project Status: Funded since 2010-11; Completed

In 2010, NAIT initiated a long-term study of the Sturgeon River Watershed. The main goals of this study are to assess riparian health and to bring together multiple stakeholders to develop and modify best management practices to improve the health and ecological function of the watershed. To date, the project has: assessed water quality and biodiversity at 22 permanent sampling sites over three years; evaluated over 100 stream crossings (bridges or culverts) throughout the watershed; assessed riparian health, biodiversity and water quality throughout the Carrot Creek sub-basin; conducted an on-line survey, stakeholder Focus Group events, one-on-one landowner interviews, and Open Houses to gauge how stakeholders understand and value their watershed, and to direct future research priorities for the Sturgeon River Research Project (SRRP); engaged local school and community groups in hands-on watershed activities; and, promoted the importance of healthy watersheds within the community. This year's project objectives and activities were to: 1) continue to involve NAIT students, research staff, and the community in assessing water quality and aquatic biodiversity at permanent sampling sites throughout the watershed; 2) assess sex ratios and deformities, erosions, lesions, and tumours (DELTs) in fish populations, as an indicator of toxins and/or endocrine disrupting substances (EDS) in the water; 3) assess riparian habitat throughout the Carrot Creek watershed and at water quality sites; 4) work collaboratively with a broad range of stakeholders to help facilitate the adoption of better technologies and best management practices to provide both ecological and economical benefits; 5) engage communities within the watershed by providing opportunities to participate in environmental education programs focusing on wetland ecology and reclamation of wetland habitats; and 6) use participatory methodologies to engage local stakeholders, collect information,

and facilitate networking that will help to develop the SRRP's future research agenda that will benefit Albertans and protect and improve riparian environments. Since its inception in 2010, the SRRP has provided opportunities for NAIT students and graduates to be involved in applied research through courses (+65 students), and paid student research positions (30 students). To date, close to 1,000 elementary and secondary students and community members within the watershed have participated in presentations by NAIT staff. Biodiversity data was compared with water quality data for the 22 sample sites throughout the watershed to determine relationships and to help fill data gaps for a future watershed management plan. The high level of interest and concern by stakeholders who participated in the surveys and conversations about their watershed suggests that stakeholders recognize many of the key issues / activities that are impacting the health of the watershed including: agricultural and storm water runoff, inadequate landowner/user responsibility, and lack of riparian buffers. Stakeholders identified ecological and aesthetic values as the two most important uses/values of the watershed, and are eager to engage in collaborative watershed management planning and restoration activities.

Deliverables/Results:

Water quality data has been evaluated for three years. Three-year averages for the Sturgeon River indicate: spring temperatures are higher at headwater sites than at sites closer to the mouth of the Sturgeon River; there is a significant drop in temperature upstream of Onoway sewage lagoons, regardless of the season, possibly as a result of groundwater inflow; dissolved oxygen concentrations (DO) are at or below the one-day acute level for the protection of aquatic life at some sites on some sampling dates, but the three-year mean at most sites is greater than 5°C during spring, early, mid and late summer. Exceptions include early and late summer upstream of Lac Ste. Anne, mid-summer downstream of Lac Ste. Anne, and late summer near Hoople Lake and downstream of the Onoway lagoons. The mean total phosphorus concentration (TP) is high along the length of the Sturgeon River in spring; TP is lower and relatively constant at most sites during the summer months. The mean chlorophyll concentration is high in spring from the Onoway lagoons to the confluence with Riviere Qui Barre and through the City of St. Albert; mean concentrations are lower at most sites for much of the summer except during late summer, when it is high at all sites downstream of Riviere Qui Barre. The mean ammonia concentrations are relatively low throughout the Sturgeon River during all seasons, except upstream of Lac Ste. Anne in mid- and late summer.

Biodiversity data for 2012 includes: 16 species of macrophytes found in the watershed; 53 taxa of aquatic invertebrates collected; over 5,300 individuals from ten species of fish identified, weighed and measured using minnow traps or electrofishing techniques.

Citizen Surveys / Focus Groups / Landowner Interview data revealed: stakeholders have an understanding that water quality and quantity within the watershed are fair to poor, and that conditions are declining; recreational opportunities and activities (including fishing and hunting) within the watershed are reported to be declining, with the exception of bird watching and hiking; stakeholders recognize key issues / activities that are impacting the health of the watershed including agricultural and storm water runoff, inadequate landowner/user responsibility, and lack of riparian buffers. Ecological and aesthetic values were identified as the two most important uses/values of the watershed, while agriculture was rated as moderately important; business and industrial/commercial use was rated as the least important use/value of the watershed. This suggests that

participants place a high value on the ecological services provided by the watershed. Stakeholders recognize many of the challenges that exist within this heavily impacted watershed, and are eager to engage in collaborative watershed management planning and restoration activities.

A summary of water quality and biodiversity data collected 2010-2013, to be included in the future development of a Watershed Management Plan. Data has been analyzed and researchers are finalizing revisions to the report. The final report will be completed summer 2013.

Two focus group sessions with stakeholders were facilitated (June 21 and 22, 2012). A report summarizing information collected from the focus group sessions is completed entitled 'Stakeholder perspectives of ecological change and environmental management in the Sturgeon River watershed'. Three Open Houses were held in municipalities within the watershed (Morinville, Onoway, and St. Albert) to share study results (January/February, 2013).

Also summer research staff provided presentations at nine community events and six school events between May and August of 2012.

Currently, the SRRP is working on river restoration initiatives with three junior/senior high school groups

Collection of historical local knowledge and natural history of the Sturgeon River Watershed is ongoing. Researchers are exploring opportunities to compile this information in a video that can be accessed online by educators and community members.

Conserving and restoring arctic grayling in the Upper Pembina River Watershed - Database development

Northern Lights Fly Tyers/Trout Unlimited Edmonton

Grant: \$10,000

Project Code: 020-00-90-127

Project Status: New; Completed

Northern Lights Fly Tyers/ Trout Unlimited Edmonton (NLFT/TUC) has embarked on a multi-year program to conserve Arctic grayling in the Upper Pembina watershed. This watershed is roughly defined as the main river and tributaries upstream of Highway 16, but with a greater focus on waters upstream of Cynthia and Lodgepole. Historically, streams in this area provided high-quality sport fishing for residents of central Alberta. For a variety of reasons, many of the grayling populations have been extirpated and those that remain are in a precarious state. In 2011 (the first year of the program), volunteers from NLFT/TUC undertook an angling survey at 23 sites and temperature data loggers were deployed at 13 sites. Although angling took place on several tributaries formerly occupied by Arctic grayling, anglers were successful on only one system (Dismal Creek). The results confirmed that the status of grayling had declined markedly relative to previous times. In 2012-13, anglers re-surveyed some of the 2011 sites to provide additional confirmation and investigated several new sites. Pelvic fin tissue samples were collected as a contribution to a graduate research program on grayling genetics at the University of Alberta. The number of temperature data loggers was doubled in order to include tributaries in the upper reaches and additional sites on the main Pembina River. Volunteer anglers were successful in capturing grayling in Dismal Creek and Rat Creek.

Deliverables/Results:

The main results can be summarized as follows: confirmation that grayling no longer inhabit many formerly occupied streams/reaches in the Upper Pembina River watershed; confirmation of the presence of localized, remnant populations in Dismal Creek and Rat Creek; water temperatures during the summer months appeared to be unsuitable for grayling in many streams/reaches, particularly low-gradient, low elevation settings. Based on the 2011 survey results it appeared that of the major tributaries only Dismal Creek supported a measureable population of grayling. The observation of Arctic grayling at a single location on Rat Creek was particularly good news, given that upstream and downstream of this site grayling were not captured. Another finding was that water abstraction for industry and road maintenance was widespread and frequent.

Progress report filed after completion of field activities; report includes a summary of angler catch and effort; water temperature sampling locations and tabular data were also summarized.

Completed angler catch forms, habitat descriptions, site coordinates and water temperature data was forwarded to AESRD for detailed analyses and reporting.

A PowerPoint presentation of the key findings of the project was presented to the NLFT/TUC meeting on February 13, 2013.

A PowerPoint presentation of describing the volunteer aspects of the program was given at the February 4 – 6, 2013 Great Plains Fishery Workers Association annual meeting and workshop in Winnipeg.

Two articles have been published: 'Angler science in the Pembina River watershed' by Alberta Outdoorsman (April 2013) and 'Conserving Arctic grayling in the Pembina River watershed' in Fly Fusion magazine (Vol 10, Issue 3 Summer 2013).

Partners in Habitat Development

Partners in Habitat Development

Grant: \$10,000

Project Code: 015-00-90-103

Project Status: Funded by GECF since 2005-06; Completed

The Partners in Habitat Development (PHD) program is an initiative developed to mitigate for the loss of wildlife habitat in Southern Alberta agricultural regions due to upgrading the irrigation infrastructure, more intensive agricultural practices and increases in industrial activities. The Partners in Habitat Development program works with private landowners to create, preserve and restore critical wildlife habitat areas. A total of 17,985 trees and shrubs were planted by the PHD program in the spring and fall of 2012. These trees and shrubs were planted in multi-row shelterbelts, in riparian areas, in block planting formations or along drainage ditches. The PHD program assists in fencing existing habitat areas and newly created habitat from livestock access. There was a total of 2,500 meters of fencing distributed and installed to protect existing habitat and a newly planted habitat project site from livestock access.

Deliverables/Results:

17,985 trees and shrubs were planted on nine project sites during the spring of 2012. These trees and shrubs were planted in multi-row shelterbelts, in riparian areas and as block plantings.

There were 2.5 km of fence installed to protect two habitat sites from livestock access. One fence was installed to protect a newly planted

site from livestock access and the second project was completed that will protect existing trees and shrubs from livestock access.

A number of landowners interested in initiating future habitat projects have been met by PHD Technicians.

Off the Creek Program 2012

Red Deer County

Grant: \$30,000

Project Code: 015-00-90-128

Project Status: Funded since 2006-07; Completed

The goal of the Off the Creek Program 2012 was to work with interested landowners who wanted to implement actions on their land, which conserve or improve riparian and wildlife habitat in Red Deer County. The objectives of the Off the Creek Program 2012 were to: 1) Support Red Deer County landowners in enhancing and stewarding riparian and/or native range habitat on their land, by providing financial and technical resources for their on-the-ground projects. 2) Enhance riparian habitat in Red Deer County. This enhancement will come about through fencing, off-stream watering, establishing buffer zones, and other riparian and native range management projects, completed by participating landowners. 3) Assist landowners in developing an informal "Stewardship Plan" for each of the completed projects. Activities of the Off the Creek Program 2012 included: Promoting the program, recruiting landowners to develop project plans / applications; reviewing projects and implementing projects (County reviews landowner applications, decides on funding; Landowners implement projects); monitoring and evaluation: County conducts Riparian or Range Health Assessments in 2012 for baseline conditions, and again in 2016/2017 to assess changes. County also works with landowners to develop, implement, and monitor "Stewardship Plans" for each completed project.

Deliverables/Results:

19 projects were initiated by 16 landowners, throughout Red Deer County. Two of these projects were in the Raven/North Raven watershed.

263 acres of riparian area, 214 acres of native range area, six acres of wetlands/sloughs/lakes and 3 kms of river and creek are now being protected or restored by these 19 projects.

1,223 Animal Units are now "under new, sustainable management approaches", when it comes to their access or use of these riparian acres.

In addition, one of these projects is helping protect shallow groundwater.

For every Off the Creek program dollar that went to voluntary, on-the-ground action by landowners, landowners and other partners contributed over \$0.94 (in cash, time, and equipment).

Between April 1, 2012 and March 15, 2013, Off the Creek Program advertisements have appeared in the County News three times, and seven articles in the County News have discussed the Off the Creek Program (County News circulation ca. 10,000, published once per month)

Articles discussing the Off the Creek Program appeared in a provincial Growing Forward publication and in the Mountain

View Gazette (www.mountainviewgazette.ca/article/20130108/MVG0801/301089998/-1/mvg/rd-county-agriculture-service-board-outlines-plans)

Three new videos featuring Off the Creek Program projects have been published on line (see rdcounty.ca/News/Media-Gallery/Videos)

Between April 1, 2012 and March 15, 2013, the Off the Creek Program has been displayed/featured/presented about, with staff, at the following public events: Grazing Day at UFA – Display (Apr), Clearwater County's Cows Creeks and Communities Workshop – Display and Presentation (Apr), Grey Wooded Forage Association Annual General Meeting - Display (May), RDC's Pasture School for Acreage Owners (May), RDC's Controlled Grazing School - Display and Presentation (June), Alberta Water Council Water Advisory Committee – Presentation (Oct) Agri-Trade – Display (Nov), Working Well Workshop – Display (Nov), Western Canadian Grazing Conference – Display (Dec), Eagle Creek Community Information Meeting – Display and Presentation (Jan)

The Off the Creek Blog (<http://offthecreek.blogspot.ca/>) continues to publicize information about the Off the Creek Program to its target audience.

Bats are welcome here

Society of Grassland Naturalists - Medicine Hat Interpretive Program

Grant: \$3,000

Project Code: 030-00-90-200

Project Status: New; Completed

The Medicine Hat Interpretive Program, managed by the Grasslands Naturalists, based in Police Point Park Nature Centre in Medicine Hat completed the successful "Bats Are Welcome Here". The project successfully provided basic information to thousands, more detailed information and involvement to about 2,500, and resulted in about 100 new bat houses in the community. Furthermore, the materials, information, and programs will continue to be offered for years to come.

Deliverables/Results:

The interest amongst visitors was very high. The attendance at the public program last summer was satisfying and 60+ participants were very enthusiastic. The bat display and the bat cave were visited by about 1,600 people. Many families came back through the fall, and asked about the bats and the bat cave. Through school programs, public programs, and the Family Day Event, about 2,500 people learned more about bats in our region, and many of them are helping provide habitat for our bats. About 100 bat houses have been built and will be ready for the bats as they arrive this spring.

The display can be reused as well, and Medicine Hat Interpretive Program will certainly be encouraged to re-establish the bat cave.

Another public program is planned for late this summer, with a bat researcher who has been studying their bats.

A new program for school and community groups was completed by fall 2012, and is available for booking now and in the future.

Basic information and awareness was also achieved through TV spots with their Nature Break feature on their cable channel, and in their regular teachers' newsletter.

Stewardship license/ Brook trout suppression project

Trout Unlimited Canada

Grant: \$1,000

Project Code: 020-00-90-196

Project Status: New; Completed

Brook trout are not native to Alberta. They were initially introduced across the province in the mid 1900's, and since then they have become well established throughout the Eastern Slopes. An unintended consequence is that brook trout readily out compete some species in the areas they have been introduced, and therefore they are a threat to these native populations. Quirk Creek only possessed cutthroat and bull trout in 1948. However, by 1996 their numbers made up only 6% of the fish population, with brook trout comprising the remainder. Since 1998, anglers who have qualified by writing a fish identification test have successfully harvested brook trout (over 9,500 to date), from Quirk Creek thereby reducing brook trout to less than 50% of the population within ten years. This approach is now expanding to additional streams where native populations are threatened by the presence of an introduced species. TUC believes these results demonstrate that it may be possible to maintain native trout populations and these recreational fisheries in these systems that would otherwise be lost. To expand upon this project TUC increased the scope of testing in 2012 to with 146 tests being written, of which 96 obtained individual stewardship licenses. They collectively volunteered 1,105 hours of angling effort which is up from the 286 hours spent angling in 2011. In 2011 there were 560 brook trout removed during these outings and this increased to 2,093 removed through the stewardship license in 2012.

Deliverables/Results:

The results were that uptake in the program was increased (2,093 brook trout removed) and greater numbers of outings were undertaken in 2012 than anticipated (14) and a large number of volunteers hours involved with the project (1,105 angler hours).

Data is being put together in a formal report that will be available shortly on the TUC website or a hard copy will be provided to those which request it. This will be completed early this summer (2013)

The support of the GECF was highlighted during the supervised outings, as well as on TUC website describing the project. Michael Short visited one of the creeks in the project and he taped an episode discussing the project and talked about the GECF's support during this taping as well.

Nose Creek rehabilitation project

TUC/Nose Creek Watershed Partnership

Grant: \$3,000

Project Code: 015-00-90-137

Project Status: Funded in 2010-11 and 2011-12; Grant not accepted

Nose Creek has been identified by the Bow River Basin Council (the Watershed Planning and Advisory Council (WPAC) for the Calgary area based on the Alberta Water for Life Strategy) as a priority tributary to the Bow River. Historically Nose Creek was a productive fishery but due to cumulative effects of development and agriculture in the watershed, water quality has declined so dramatically that sportfish are present only at the mouth and select locations upstream. The

Nose Creek Rehabilitation project was designed and implemented by Trout Unlimited Canada (TUC) biologists and the Nose Creek Watershed Partnership (NCWP) to aid in the recovery of Nose Creek to previous conditions suitable for sportfish and to enhance prime brown trout spawning areas at the confluence with the Bow River. The NCWP, in cooperation with many other agencies, developed the Nose Creek Watershed Water Management Plan (NCWWMP) as a mechanism to protect riparian areas and improve water quality in the Nose Creek watershed. The Plan outlines the responsibilities of municipal governments (policy changes) and local residents (volunteer stewardship) to improve conditions. In order to observe improvements in water quality and therefore the effectiveness of the NCWWMP, a comprehensive water monitoring project was developed in 2009. The program measures water quality and quantity and includes riparian health assessments and fisheries monitoring.

Deliverables/Results:

The grant was not used as it was determined that the funding for the plants was not required by the project.

Management of earthworm invasions in Alberta

University of Alberta

Grant: \$1,500

Project Code: 020-00-90-198

Project Status: Funded in 2009-10; Completed

Earthworms can have significant negative impacts on forests when introduced to systems previously devoid of earthworms, as is the case in Alberta. Dr. Bayne's previous research identified bait abandonment by anglers as a key pathway by which earthworms are introduced and led them to create an education program to increase angler awareness of earthworm invasions and promote proper disposal of bait. Pre- and post-surveys of anglers were conducted to evaluate the program and found limited effects of mass media (e.g., tv, radio). It therefore appears necessary to target anglers more directly. The objective of this project was to test whether stickers on earthworm bait containers result in an increase in awareness and change in angler behaviour. 5,000 stickers were placed on bait containers, which were delivered to 12 stores across Alberta in cooperation with Walleye Master Tackle and Bait. The majority of these stickers were placed on bait sold at stores in Edmonton, where cashiers collected names and email addresses of customers buying bait. These anglers were then surveyed two weeks after their purchase and 75% stated they saved their bait or put it in the trash, compared to 51% in surveys of anglers at boat launches. Unfortunately, the response rate was extremely low with only 12 people responding to the survey, although a greater number left their email addresses.

Deliverables/Results:

They found that fewer anglers abandoned bait (25% vs. 49%) when bait stickers were placed on bait containers. This result suggests this is a more effective method of communication than our previous education program which involved TV commercials, magazine articles, a website, and posters in bait stores.

A journal article was submitted about this research to *Neobiota* (a peer-reviewed journal) in February (available). This was the main deliverable, besides the design of the sticker. An article for the public is in the works to be published in the summer, likely in the *Alberta Outdoorsmen* magazine.

The project website (worms.biology.ualberta.ca) will also be updated

with study results after once the journal article is accepted.

Weaselhead Invasive Plant Program

Weaselhead/Glenmore Park Preservation Society

Grant: \$3,000

Project Code: 015-00-90-127

Project Status: Funded since 2009-10; Completed

The ultimate goal of this project is the maintenance of biodiversity and naturally functioning ecosystems in the Weaselhead Natural Environment Park (204 ha riparian area of white spruce and balsam poplar where the Elbow River flows into the Glenmore Reservoir, Calgary). The goal of this project is to prevent non-native plant species interfering with ecosystem function and reducing biodiversity (the Weaselhead wetlands are important to the maintenance of water quality in the adjacent reservoir and provide important habitat for terrestrial and aquatic wildlife.) The objectives are: to raise public awareness of invasive species and how to prevent their introduction and spread; to prevent the establishment of invasive plants that reduce biodiversity and interfere with ecosystem function; to reduce the abundance of invasive plants already established that reduce biodiversity and interfere with ecosystem function; to ensure native vegetation recovers after weeding; and to increase our knowledge of invasive plants in the Weaselhead. The main activities were: Invasive species learning included in Society outdoor education programs, presentation delivered, Program publicised on website and at events; Invasive plants located and removed before they establish in the Park; Weeding workshops held to remove invasive plants already established; Collaboration with the City of Calgary to control species where manual methods are ineffective; Data collected on native vegetation recovery after weeding; Invasive plant distribution and abundance tracked over time on a GIS.

Deliverables/Results:

Over 4,000 people introduced to the issue of invasive species and how to prevent their introduction/spread.

226 people learnt about invasive plants through direct involvement in volunteer activities (1,190 hours contributed).

Two patches of scentless chamomile and one of black henbane found and removed (both species only occur sporadically in the Park – neither are established). Volunteers looked for but failed to find other invasive plants on the 'watch list'.

Abundance of Peking cotoneaster and tartarian honeysuckle (already well established non-natives) was reduced by 900 and 300 plants respectively.

Seeds of yellow clematis, creeping bellflower and other species (already established) were removed to slow down their spread. (Manual removal of these species is ineffective).

City of Calgary started control of common buckthorn with herbicide and collected data on biocontrol of leafy spurge (started in 2010).

Second year of data was collected from sample plots on native vegetation recovery after weeding. Six additional similar sites where no weeding has taken place are sampled for comparison.

GIS updated (new occurrences of non-native plants, results of weeding activities, changes in size of colonies etc).

25 wallet-sized information cards on three wetland species to look out for produced in-house for wetland plant ID workshops

Three posters on the theme of invasive species commissioned and available for display on Park notice-board.

No new invasive plant species have established in the Park.

Weed Management Plan updated for 2013 using experience gained in 2012; proposed activities for 2013 discussed and accepted by City Natural Areas management.

The Bow and Beyond riparian health project

Western Sky Land Trust Society

Grant: \$10,000

Project Code: 015-00-90-195

Project Status: Funded in 2009-10; Completed

Through The Bow & Beyond Riparian Health Project, Western Sky Land Trust (Western Sky) seeks to improve riparian health and enhance habitat of the Bow River corridor from Calgary to The Siksika First Nation while also further engaging interested landowner about perpetual conservation options offered by Western Sky Land Trust. The Riparian Health Project resulted from the positive feedback they had during their initial conservation outreach of the "Bow & Beyond Initiative". During the outreach, five landowners approached Western Sky with concern over the health of their riparian areas. The landowners wanted help with assessment and recommendations on how to maintain and enhance the riparian habitat of their properties. To facilitate the five riparian health inventories (RHIs), inventories and recommendations, Alberta Habitat Management Society (Cows and Fish) agreed to partner on this project. Cows and Fish provided 50 percent of the funding to cover the RHIs for five properties while ACA contributed the other 50 percent of funding. This project included landowner meetings with a representative from Western Sky and Cows and Fish, the RHI inventory from Cows and Fish, the delivery of individual RHIs and a Community RHI Summary giving an overall assessment of riparian health for the entire stretch of the project area. For Western Sky this was an opportunity to build upon the relationships with landowners that began during initial outreach and further engage landowners on conservation options, while providing a needed service. Of the five landowners worked with, Western Sky feel there is an opportunity for conservation agreements on four properties. Two of these will likely take place within the next year while the other two may take considerable time and negotiation.

Deliverables/Results:

The main results of the projects are the landowners have an assessment of the riparian health inventories in hand with management recommendations from Cows and Fish and Western Sky.

Two landowners have committed to making improvements to riparian area management which may include a different grazing regime,

fencing, bio engineering, and revegetation along the river. One has agreed to undertake this in partnership with Western Sky.

Willmore Wilderness Park Stewardship Initiative: Increasing hunting and angling access

Willmore Wilderness Foundation

Grant: \$15,000

Project Code: 015-00-90-138

Project Status: Funded in 2008-09, 2010-11 and 2011-12; Completed

The winter of 2011-12 brought a lot of harsh winds, resulting in heavy blow down on most of the major trail systems along the Smoky and Sheep Creek Valleys. The Willmore Wilderness Foundation concentrated its efforts during the 2012 summer trail clearing initiative on the main trails along these two valleys, making the area accessible for many hunters, anglers and trappers. This grant supported one ten-day trip from July 9-20, 2012 and one 21-day trip from July 27 to August 16. Outfitter Basil Leonard and Outfitter Ed Regnier mentored five youth during the projects. Basil and Ed have over 100 years combined outfitting and trail experience, so the youth had excellent teachers. They cleared the main CAT trail along the Smoky River and over to the Sheep Creek Trail through the burn to Casket Lake. Work continued over the Divide to Morkill Pass and down to the Jackpine River and back over to the Smoky River and CAT trail. More work still needs to be done on re-routing the muskeg areas between Casket Lake and Morkill Pass. Also there is three km of bad muskeg from Donald McDonald Meadows down Basil Creek that needs significant work. Initially they had hoped to concentrate on re-routing the trail in this area, but heavy blow down along the main trail systems took more time than anticipated. The youth mentored were taught packing, trail skills and trail maintenance and much more. The Foundation also cleared trash, which was packed out to Grande Cache by packhorse. Obstructed trails were cleared and made passable. Extensive video and pictures were taken of both expeditions.

Deliverables/Results:

The heavy downed timber maintenance necessitated more work for the main trails. The three km of bad muskeg from Morkill Camp to the Jackpine River still need major work.

Cleared trails; clearing of fluorescent ribbon from pine beetle work; cleaning up of campsites; stocking campsites with wood; some re-route trail work (more work needs to be done); five youth mentored; filming, journaling and photographs taken of entire work. GPS coordinates are available on trails cleared.

The Willmore Wilderness Foundation posted a 12:56 minute vignette of a Bighorn Sheep Hunt in Willmore Wilderness Park. Credit was given to ACA. Trail clearing effort is mentioned in the short documentary film. There have been 1,415 plays of the film during the past seven months.

A movie called Riding the Rockies premiered in April 2012 and credit was given to ACA for their generous contribution over the past two years. A trailer can be seen at vimeo.com/41208846 or by going to People & Peaks Productions or to the Willmore Wilderness Foundation website.



Coyote at the Valley Zoo, Edmonton Urban Coyote Project. Photo: Jesse Hill

Grant Eligible Conservation Fund Part B: Research

Using Resource Selection Function models to inform conservation planning in Alberta's Special Areas

Canadian Wildlife Service/University of Regina (Dr. S. Davis)

Grant: \$22,700

Project Code: 015-00-90-198

Project Status: Funded since 2010-11; Completed

Concern over the continent-wide population declines of grassland birds has stimulated a variety of conservation plans, many of which explicitly promote a landscape approach to conservation. Current population trend data for grassland birds suggest that the causes of declines are not locally isolated phenomena but likely involve the cumulative loss and degradation of grassland habitat throughout the Americas. Approximately 85% of the native cover of the world's temperate grassland biome has disappeared since the late 1800's including a loss of 15% over a recent span of 40 years (1950-1990) (Millennium Ecosystems Assessment 2005). This substantial rate of conversion to grassland habitats has reduced the capacity, or ability of natural areas to provide vital ecosystem services (Millennium Ecosystems Assessment 2005). Efforts to either stabilize or increase

local grassland bird populations may be possible once we have a clear understanding of resource selection and habitat suitability throughout their range. All organisms require adequate quantities of usable resources to survive. The fundamental understanding that all animals select an area to live based on such resources as food, water, and shelter have led conservation practitioners to develop a number of ways to identify and prioritize areas that meet a given species basic requirements. Determining which resources are selected at a higher propensity than others is of particular interest because it provides insight into which resources are required for survival and reproduction. Resource selection functions (RSFs) are a common method used to make inferences between a species and their habitat (a resource) and have been applied to many taxonomic groups. By linking robust RSF models with Geographic Information Systems (GIS), powerful tools for natural resource management, landscape planning, and cumulative effects assessment can be generated. Using data from point-count surveys conducted in 2012, a suite of spatially explicit RSF models have been produced for grassland birds in Alberta's Special Areas. An independent data set collected in 2011 will be used to assess model validation and assist in determining habitat suitability thresholds.

Deliverables/Results:

This project is still in the statistical analysis stages. Preliminary maps generated for Baird's and Vesper sparrows to date appear to reflect the known distribution of the species in the region. Formal testing will allow us to determine the usefulness of the models.

At this time, the RSF models are still being evaluated. Once each species model is finalized, the researchers will continue with the

following deliverables:

- Information (GIS shapefiles, reports, publications, presentations) from the study will be shared with the Special Areas board, ACA, Province of Alberta and Federal government branches to use for conservation planning purposes.
- Results will be submitted to peer-review journals (Fall 2013) and presented at scientific conferences.
- All SAR sightings will be provided to the FWMIS (Fall 2013).
- Preliminary and final results will be used by the associated recovery teams to assist in establishing criteria for selecting critical habitat.

Populations demography of mountain goats in Alberta

Laval University (Dr. S. Côté)

Grant: \$14,200

Project Code: 030-00-90-117

Project Status: Funded since 2004-05; Completed

Research on the ecology, population dynamics, and management of mountain goats (*Oreamnos americanus*) on Caw Ridge was initiated following a decline in goat populations in west-central Alberta during the 1980's. The project objectives are: 1) to measure variation in individual survival and reproductive success in both sexes using marked animals, 2) to identify the causes of this variation, particularly in regard to the marked recent decline and 3) quantify variation in population sex-age structure among years, and identify factors that affect population size. The researchers combine the continued monitoring of life-history traits of marked individuals with field observations of behaviour to determine the factors influencing population size and recruitment. Some of the main findings of the study so far are summarized here. Kid production increases with female age from three to six years, peaking at about 80% at eight -12 years and decreasing afterwards. Because of the late age of primiparity and increasing kid production with age, much of the recruitment in the population is contributed by females aged eight to 12 years. Kid survival averages 60% and is negatively influenced by harsh conditions during winter, but is strongly positively influenced by kid mass. Both kids' development and maternal care have a direct and strong positive impact on offspring survival. Adult survival is greater for females than for males. Some males dispersed in mountain goats, especially those with higher genetic diversity. For both sexes, survival is lower for two-year-olds than for older goats. Survival shows clear evidence of senescence, for females beginning at ten years of age and for males from eight years of age. Survival of adult females is similar to that of other female ungulates of similar body size but survival of adult males appears lower. Predation seems to play a limited role on population dynamics. Predation on small, isolated populations of mountain ungulates could vary with the behavior of individual predators in a density-independent manner, and therefore may be highly unpredictable. Native mountain goat populations are sensitive to overharvest if adult females are shot. They have a low natural recruitment rate and show little evidence of density-dependence or of compensatory responses to hunting. Hunting mortality thus appears additive.

Deliverables/Results:

The summer field season was very productive; all data necessary to

meet the objectives was collected. In 2012, the researchers caught, marked and released four previously unmarked goats (four yearlings) and recaptured three marked goats, for a total of seven captures. In total, 441 mountain goats have been marked since 1988. In September 2012, there were 77 goats in the population of which 64 (83%) were marked. If kids are excluded because they are only marked when they are at least one-year-old, 98% of the population was marked.

Recently, five papers have been published on the mountain goat study in high-profile International scientific journals, including three papers currently in press (see list below). Also two papers have been submitted that are currently under review. Six presentations were given on the mountain goat project this year, including four invited seminars.

Scientific publications published or submitted in 2012-2013:

St-Louis, A., S. Hamel, J. Mainguy and S. D. Côté. 2013. Factors influencing the reaction of mountain goats towards all-terrain vehicles. *Journal of Wildlife Management*, in press.

Martin, J. G. A., M. Festa-Bianchet, S. D. Côté and D. T. Blumstein. 2013. Detecting between-individual differences in hind foot length in populations of wild mammals. *Canadian Journal of Zoology*, in press.

Godde, S., L. Humbert, S. D. Côté, D. Réale and H. Whitehead. 2013. Correcting for the impact of gregariousness in social network analyses. *Animal Behaviour*, in press.

Shafer, A. B. A., J. M. Northrup, K. S. White, M. S. Boyce, S. D. Côté and D. W. Coltman. 2012. Habitat selection predicts genetic relatedness in an alpine ungulate. *Ecology* 93: 1317-1329.

Shafer, A. B. A., C. W. Fan, S. D. Côté and D. W. Coltman. 2012. (Lack of) Genetic diversity in immune genes predates glacial isolation in the North American mountain goat (*Oreamnos americanus*). *Journal of Heredity* 103: 371-379.

Côté, S. D., S. Hamel, A. St-Louis and J. Mainguy. Do mountain goats habituate to helicopter disturbance? *Journal of Wildlife Management*, revised version submitted March 2013.

Théorêt-Gosselin, R., S. Hamel and S. D. Côté. Why care? The role of maternal behavior and offspring development in the survival of mountain goat kids. *Journal of Animal Ecology*, submitted January 2013.

Scientific communications presented in 2012-2013:

Shafer A. B. A and S. D. Côté. 2012. The Caw Ridge long-term study. Juneau, AK, USA. (invited presentation)

Shafer A. B. A. 2012. Mountain goat population genetics. Juneau, AK, USA. (invited presentation)

Côté, S. D. 2012. The king of the mountain or is it the queen? Life-history strategies and conservation of Rocky mountain goats. NTNU Universitet, Trondheim, Norway. (invited presentation)

Côté, S. D. 2012. The king of the mountain or is it the queen? Life-history strategies and management of mountain goats. Texas A & M University, Kingsville, TX, USA. (invited presentation)

Théorêt-Gosselin, R., S. Hamel and S. D. Côté. 2012. Why care? The role of maternal behavior and environmental conditions in the survival of mountain goat kids. 31st Annual meeting of the Centre d'études nordiques, Université du Québec à Rimouski, QC, Canada. (poster)

Shafer A. B. A., S. D. Côté and D. W. Coltman. Genetic analyses of

the North American mountain goat (*Oreamnos americanus*). 2012 Northern Wild Sheep and Goat Council Symposium. Kamloops, BC. Copies of all reports, popular and scientific articles are available.

Eco-evolutionary dynamics of phenology in resident mammals

University of Alberta (Dr. S. Boutin)

Grant: \$19,574.50

Project Code: 030-00-90-213

Project Status: Funded in 2011-12; Completed

The emerging study of eco-evolutionary dynamics aims to understand the interplay between ecological and evolutionary processes. By examining both categories of process on a consistent timescale, insight can be gained into how selection-induced changes in heritable traits (i.e., microevolution) affect ecological dynamics and, in turn, how these dynamics feed back to influence the genetic makeup of populations. As wild populations are increasingly subject to anthropogenic pressure, such relationships are becoming all the more relevant. The researchers examined the eco-evolutionary dynamics of a heritable life history trait, hibernation phenology, in Columbian ground squirrels. The overwhelming majority of ecological responses to climate change have been phenological advances. In contrast, this project has observed an increasing likelihood of late-season snowstorms producing phenological delays. This has resulted in significant declines in individual fitness and population growth rate. The researchers took advantage of natural and experimentally-induced phenological variation to better understand these demographic consequences. Climate change-induced fitness declines are hypothesized to result from populations becoming temporally desynchronized with their primary food sources. Food supplementation was undertaken and energetic expenditure (i.e., body temperatures) during hibernation is being measured to determine their influences on the population dynamics of two populations exhibiting natural phenological variation. This study provided both important insight into how climate change is affecting the population viability of a resident mammal and key tests of the eco-evolutionary framework.

Deliverables/Results:

The primary result of the project, to date, is a better understanding of the influence of climate change on a wild hibernator. Although phenological shifts are the most often reported response to climate change, among vertebrates, these results have primarily been obtained from migratory birds. The researchers' previous analyses revealed that, unlike the vast majority of accounts of phenological advances in response to climate change, the emergence dates of Columbian ground squirrels have been delayed by ~0.5 day/year over the past 20 years. This result is due to an increasing prevalence of late-season snowstorms and corresponding delay in snowmelt. Importantly, delayed emergence leads to reduced fitness and the fitness of individuals and viability of the population has thus been declining for the past 20 years. As increased winter precipitation is projected over much of North America (due to elevated moisture flux as a consequence of climate change), these results could be general. Data from the temperature-recording collars and on the survival/fitness of fed vs. control animals will be collected and analyzed during the summer of 2013.

The anticipated deliverables from this project are publications in

refereed scientific outlets. Specifically, three manuscripts are planned:

1. Natural and experimental variation in hibernation phenology of Columbian ground squirrels across elevations. Field data collection for this manuscript is complete and preliminary analyses are underway. Anticipated submission: 2013.
2. Torpor profiles of Columbian ground squirrels across elevations. Data for this manuscript are currently being recorded by temperature-recording collars. Collars will be collected in Spring/Summer 2013 and data subsequently analyzed. Anticipated manuscript submission: 2013.
3. Fundamental and realized metabolic niches of Columbian ground squirrels: the influence of resource abundance across two populations naturally varying in hibernation phenology. Supplemental food was provided to individuals across two elevations in Summer 2012. The torpor profiles, over-winter survival and reproductive success of these animals will be determined in Spring/Summer 2013 and data subsequently analyzed. Anticipated manuscript submission: 2013.

Edmonton urban coyote project

University of Alberta (Dr C. Cassady St. Clair)

Grant: \$15,854

Project Code: 030-00-90-168

Project Status: Funded in 2010-11; Completed

The Edmonton Urban Coyote Project addresses the increase in coyote abundance and reports in Edmonton, a phenomenon observed across North America. As coyote reports continue to increase, managers are also under pressure from the public to reduce lethal management, creating an urgent need to better understand urban coyote ecology and factors that promote human-coyote conflict. To enable managers to predict where, when, and why human-coyote conflict is likely to occur, data has been collected on coyote movement, habitat selection, diet, and health. Since 2009, 29 coyotes have been GPS-collared and their diet analyzed using stable isotope analysis, collected and analyzed 531 scats, visited over 200 bed and foraging sites, visited over 200 road crossing sites, collected over 35,000 photographs of coyotes using remote cameras, and collected 60 hair samples using hair snag stations. Through these analyses the researchers have found that poor body condition, mainly through infestation by Sarcoptic mange, appears to promote the use of human food and developed area by coyotes. GPS-collared coyotes with mange had home ranges four times larger than healthy coyotes, used significantly more residential area, assimilated three times more human food, and were not nocturnal like their healthy counterparts. Remote camera data revealed that areas with anthropogenic food were used by more individual coyotes and these coyotes were more likely to have advanced stages of Sarcoptic mange than urban natural areas. Further, scats collected in areas with anthropogenic food tended to contain higher loads of enteric parasites. The researchers also found that coyotes wearing GPS collars crossed major roads mainly at night and in areas with less cover and selected for backyards without fences, with more vegetative cover, and sources of food like compost, garbage, bird seed, or fruit. Lastly, scat analysis revealed that coyotes in Edmonton mainly prey on small rodents and leporids (57% and 38% of scats, respectively) and garbage and pets were found less frequently (18% and 7% of scats, respectively).

Deliverables/Results:

The researchers found that poor body condition, mainly through

infestation by Sarcoptic mange, appears to promote the use of human food and developed area by coyotes. GPS-collared coyotes with mange had home ranges four times larger than healthy coyotes, used significantly more residential area, assimilated three times more human food, and were not nocturnal like their healthy counterparts. Further, areas with anthropogenic food were used by more individual coyotes and these coyotes were more likely to have advanced stages of Sarcoptic mange than urban natural areas and scats from these areas had higher loads of enteric parasites.

These results were unexpected at the outset of the Edmonton Urban Coyote Project but corroborate many anecdotal reports from city officials, ranchers, and the public that mangy coyotes tend to be less wary of people than healthy coyotes. These results will have far-reaching implications for the non-lethal management of disease dynamics in urban adapted species such as black bears, raccoons, and red foxes.

Scientific publication(s):

Submitted one manuscript to a peer-reviewed scientific journal and anticipate submitting three more in 2013.

Scientific presentation(s):

Four oral and four poster presentations have been given at national and international conferences.

Presentations also given to the City of Edmonton, the Edmonton Nature Club, the Edmonton Master Naturalist Program, the Edmonton Young Naturalists Club, the John Janzen Nature Centre, the Royal Alberta Museum, the Edmonton Humane Society, the Valley Zoo, Grant MacEwan University, and the Friends of Kinnaird Ravine Society.

Estimating deer contact rates to design a long-term experiment for reducing CWD prevalence in Alberta

University of Alberta (Dr. E. Merrill)

Grant: \$8,850 (originally granted \$33,000)

Project Code: 030-00-90-203

Project Status: New; Completed

The researchers have developed related models for the transmission of chronic wasting disease (CWD) in a mule deer (*Odocoileus hemionus*) population to assess possible mechanisms of disease transmission and optimal harvest strategies for the Alberta mule deer population. The project was a continuation of these efforts with two main objectives: (1) to analyze assumptions in CWD management model created in previous publications with respect to deer grouping behavior and male harvest; and (2) to create a computer interface allowing people not familiar with R programming to run the model, change the basic parameters, analyze output and try harvest management scenarios. The modeling results show that deer social groups play important role in CWD transmission. If average group size depends on deer density, such dependence increases population resistance to extinction due to CWD and makes density reduction a possible tool for CWD management. Different harvest intensities on the age classes of males may reduce CWD prevalence compared to equal harvest across age classes provided one class is less involved in disease transmission because of possible mechanisms like behavioural segregation or dying faster of CWD, but the generality of these results depend on the relative intensity of harvest on each class. The CWD model implemented in R and a user-friendly dialogue for parameter inputs and output both in graphic form and an Excel file

is provided. The R code allows the user to fit transmission coefficients to Alberta CWD data and then to implement various management scenarios.

Deliverables/Results:

The role of deer social groups in disease transmission and disease management: The results show that most intensive disease transmission occurs within sexually segregated groups. This comes both from attempts to explain higher CWD prevalence in males and in fitting CWD dynamics to Alberta CWD hunter harvest data. The intensity of frequency-dependent transmission depends on deer group size. There is evidence that the group size may be density-dependent. The actual type of dependency is not known, one of the hypotheses is that it is power law with the exponent between 0 and 1. This dependence is implemented in the CWD R code. This power may significantly change the modeling results. Implementing of Habib's law with power 0.5 shows that the deer population becomes resistant to extinction due to CWD. Harvest density management becomes more efficient as a control tool in contrast with the case of density-independent group size.

Age distribution of breeding males: The model was implemented in two categories of adult males, young (approximately three-points or less antlers) and older males, and different intensity of their harvest. If both male classes have equal CWD-related mortality and contacts, the management strategy giving the least CWD prevalence is equally intensive harvest of both categories. However, if older males isolate themselves, or gather in groups with only older males, or die faster of CWD than young males, differential harvest of antlered age classes might have more effect on prevalence. It was found that harvesting young males only may be almost as efficient as harvesting all males. In this case harvest of young adult males could be a possible management alternative if the goal is to retain older males.

User-friendly interface: The CWD model is now incorporated into an interface with R programming that is freely available. A manual of use has been provided such that new management scenarios can be assessed.

Scientific publications:

Two papers that describe the results and one preliminary write-up on group-density relationship.

Potapov A, Merrill E., Pybus M., Lewis M.A. Chronic wasting disease: transmission mechanisms and the possibility of harvest management. Submitted to Ecological Applications.

Potapov A, Merrill E., Pybus M., Lewis M.A. Empirical estimation of R0 for unknown transmission functions: The case of chronic wasting disease in Alberta. Submitted to PLOS One.

Scientific presentation(s):

Possible mechanisms of CWD transmission: Implications for sex-based harvest management of mule deer in Alberta. Evelyn Merrill, Alex Potapov, Mark Lewis and Margo Pybus

Special symposium Current Science of Chronic Wasting Disease: What

Have We Learned in the Last 5 Years?

Annual Meeting of The Wildlife Society, Milwaukee, WI 7 October 2013

Evaluating the efficacy of setback distances as a tool for understanding critical habitat for ferruginous hawks in Alberta

University of Alberta (Dr. E. Bayne)

Grant: \$19,800

Project Code: 030-00-90-178

Project Status: Funded in 2011-12; Completed

The objective of the Ferruginous Hawk Research Program at the University of Alberta is to inform critical habitat designations while also evaluating the efficacy of setback distances as a tool for conserving ferruginous hawks. The researchers are critically evaluating whether management options other than setbacks may provide greater return on conservation investment. Simultaneously, this research provides crucial data for informing discussion around what is critical habitat for a species that can use both prairie and agricultural lands, how destruction of critical habitat may occur of this species, and the spatial scale at which meaningful protection must occur. A defensible, scientifically-rigorous quantification of critical habitat and how industry influences ferruginous hawk ecology is needed to enable truly fair and effective risk-management. This year was the second of three years of data collection. Four graduate students and one postdoctoral fellow are working on different aspects of this project. Janet Ng, a Ph.D. student, continues to examine how cumulative effects of industrial development and agricultural conversion influence ferruginous hawk (hereafter referred to as FEHA) home range habitat selection and reproduction. Cameron Nordell, a new M.Sc. student, is studying the potential effects of human and industrial disturbance on nest attendance, flushing behaviour, and reproductive outcome. Jesse Watson, a new M.Sc. student, is studying how landcover and industrial features influence FEHA movement and habitat selection within home ranges. Dr. Ryan Fisher, a postdoctoral fellow, is quantifying how weather and climate influence reproductive success for FEHA. Janet's work on habitat selection has resulted in a robust second selection model that defines the vegetation, soil, climate, sensory disturbance, and industrial development correlated with hawk presence in Alberta. Jesse and Cameron have each completed one field season and will be collecting additional data in 2013. Dr. Ryan Fisher has begun analyzing the impact of various phenomena, including extreme weather, in ferruginous hawk nestling survival.

Deliverables/Results:

A habitat model was developed to determine broad environmental and anthropogenic drivers of home range habitat selection for FEHA in southern Alberta and Saskatchewan. Landscape characteristics surrounding >1,000 known active nest locations were compared from 2000 to 2010 to available points across the study area. Preliminary results suggest that FEHA are more likely to place home ranges in areas with high proportions of grassland, near gas wells and roads, but far from oil wells. The next steps are to examine the individual influence of each variable and how they interact with other factors to influence habitat selection.

The research team will continue to refine the model of environmental and anthropogenic factors that influence FEHA home range selection using improved spatial data and modeling techniques. They will

also collect additional validation data to test the predictive ability of the models and to identify information weaknesses, allowing us to identify where additional data is needed to improve the model. Their historical habitat model that tracks change of FEHA distribution through time is in preliminary stages and on-going. See the ACA final report for more detailed results.

Scientific presentation(s):

Preliminary results were presented (as described in their 2011-2012 final report) at the North American Ornithological Conference (NAOC) in Vancouver, BC in August, 2012 and at PTAC's Ecological Issues Forum in Calgary, AB in November, 2012.

Progress and preliminary results were also shared at a steering committee meeting which was attended by representatives from AESRD, AltaLink, Nexen, Cenovus, and Shell.

Janet Ng was an invited researcher at the Peregrine Fund headquarters in Boise, Idaho where she presented this research in January, 2013.

Additionally, presentations and posters were given at the Prairie Conservation and Endangered Species Conference (PCEC) in Red Deer, AB.

A newsletter was released to stakeholders and partners in February 2013 that summarized the project's research goals, preliminary findings, and future directions.

Human access management in central-western Alberta: implications for movement and behaviour of grizzly bears (*Ursus arctos*)

University of Alberta (Dr. M. Boyce)

Grant: \$33,050

Project Code: 030-00-90-211

Project Status: New (similar project funded previously); Completed

The main goal of this project is to increase our understanding of human-use of the landscape and how this influences grizzly bear movement and behaviour. This is to be achieved by monitoring the type and magnitude of human-use through remotely triggered trail cameras and movement of grizzly bears using satellite GPS radio collars. Additionally, human attitudes to access management in the context of grizzly bear conservation are to be assessed with the use of survey methods. The study area chosen to tackle the above objectives spans the eastern slopes and foothills of the Rocky Mountains in west-central Alberta, surrounding Whitehorse Wildland Park and the hamlet of Cadomin. A total of six bears were captured and fitted with radio collars, amassing over 14,000 one-hour GPS locations. 42 trail cameras were deployed and monitored 113 trails for a minimum of 20 days each. 94,500 images were taken, with 65,000 consisting of 22 different species and six types of human-use. Preliminary analyses of the human-use data show that type and magnitude of human-use varies significantly both temporally and spatially, with OTV's being the dominant form of recreational human-use. Frequency of hikers was much less than anticipated, and was almost entirely restricted to the OTV-free areas, such as Whitehorse Wildland Park, Jasper National Park and the hiking trails found on the reclaimed mine land. LiDAR data is being used to identify characteristics of trails that are likely to influence the associated magnitude and type of use, which when combined with the camera data, will allow the modeling of trail use across the entire landscape. Multiple years of data will be

collected and analyses will combine the above datasets within a statistical modeling framework to identify thresholds for human-use in bear habitat beyond which behavioural responses by grizzly bears might be observed. Images of the many species will be used to investigate the potential for trail cameras in monitoring trends in species' abundance and distribution. Survey data was not collected this year and has been postponed to the upcoming 2013 and 2014 field seasons.

Deliverables/Results:

Bear movement data: This year a total of six bears were captured and fitted with GPS Iridium Satellite collars (three in Spring, three in Fall), totalling approximately 14,000 one-per-hour GPS locations to date. These collars will continue to collect GPS locations until the battery life is depleted (approx. one year) where they will be remotely dropped from the animal, collected and refurbished to go out later in the field season or the following year.

Trail camera data: A total of 94,500 images were taken using 43 cameras spread over a 5,000 km² area, of which 65,000 include wildlife or human use. The images document 22 species and six human-use types. Where each hexagon contained multiple trails, the camera was moved approximately every 20 days to cover three different trails so that a total of 113 trails were monitored for at least two separate periods during the field season.

Human use of trails: Human-use types identified using trail camera images included OTVs, hikers, dog-walkers, horseback riders, cyclists and trucks. The frequency of human-use types varied significantly, with almost half of the total events being OTVs. Frequency of hikers was much lower than expected and was restricted to Jasper National Park and Whitehorse Wildland Park, with OTV use dominating Crown land. Future analyses will investigate human use at not only a spatial, but also a temporal scale. Human-use in the area varies dramatically not only from month to month, but weekly.

Animal use of trails: The majority of grizzly bears were found at low human-use areas (< 100 human use events over the entire monitoring period). This is confounded by a large number of zeros for grizzly bear events, most likely due to low detection probabilities at these sites due to, for example, the type of habitat (open areas). There are also a number of high-use locations for both grizzly bear and humans. These have been identified as passes, where wildlife and people have few other options regarding movement. Future analyses will investigate this relationship within a more complex framework, incorporating a number of other variables that affect both human and grizzly bear use. The researchers will also investigate whether there are any temporal changes to grizzly bear movement in high-use habitats. For example, bears might choose to travel in these areas at times when human use is low, such as at night.

Model human use using remote sensing data: LIDAR data will be used to identify trail characteristics (for example vegetation height, soil wetness index, number of stream/river crossings, terrain ruggedness) predicted to influence the probability of human use. These will then be incorporated into a logistic regression model with human use frequency identified using trail cameras as a response variable, creating a predictive model of human use across all trails within the study region.

Scientific publication(s):

This is a three-year field effort, and publications will be submitted using all collected data.

Scientific presentation(s):

Preliminary results have been shared at the Canadian Parks and Wilderness Society: Northern Alberta Chapters AGM, as well as through a poster presentation at both the Alberta Chapter of The Wildlife Society and Canadian Society for Ecology and Evolution in March and May 2013 respectively. The project will also be displayed at the 22nd International Bear Association Conference in September 2013.

Identifying offset opportunities in Alberta: Using Canada warblers to protect passerine diversity in the boreal forest

University of Alberta (Dr E. Bayne)

Grant: \$16,500

Project Code: 030-00-90-212

Project Status: New; Completed

In an effort to mitigate the effects of various types of industrial development and demonstrate responsible stewardship, there has been an increasing discussion about the value of offsets and mitigation banking. The idea behind offsets is that habitat can be bought in areas outside where industry is active in an effort to mitigate their impacts via habitat protection. This project has developed a density map for Alberta for the endangered Canada warbler to help decision makers discuss the concepts of offsets and mitigation banking using an endangered bird species as the model system. Field data was collected in 2012 at 1,176 sites across the boreal forest of western Alberta with an emphasis on sites close or owned by ACA. The researchers then generated a detailed map based on density modeling for the entire province of Alberta. This map is intended to provide a tool to identify those areas that might best protect this species. Using the optimization program Marxan it was identified how addition of land around existing protected areas, including ACA conservation areas, might be done to protect 30% of the existing Canada warbler habitat in the Lower and Upper Peace region. The research team are now in the process of evaluating the biodiversity benefits of this single-species approach to offsets by determining the number of individuals of other species of birds that would be protected using such a strategy and evaluating the economic implications of such a strategy.

Deliverables/Results:

The researchers used 43,927 point count survey visits from two large data sets and directed field studies to model the habitat associations of Canada warblers at the local (150 m) and landscape (451 m) scales. It was found that suitable Canada warbler habitat was broadly distributed across Alberta's boreal region with a general increase in suitability from west to east and from south to north. Local concentrations of suitable habitat were associated with old growth deciduous forests, particularly near small, incised streams at the local scale, and a deciduous forest matrix at the landscape scale. Current forestry practices in the province do not sufficiently protect these habitats. The researchers suggest that conservation efforts aimed at Canada warblers focus on retaining large stands of old-growth deciduous forest, specifically forests adjacent to streams, by increasing the width of retention buffers during harvest. Increasing the size and number of old growth residual patches in harvested stands and ensuring harvest practices promote regrowth of dense shrub habitat may encourage the use of early seral habitats and would help ensure

a deciduous matrix is maintained on the landscape.

In the Upper and Lower Peace regions of the province, an additional 20,000 km² of protected areas would be required to protect 30% of the Canada warbler population. These areas are available and often quite close to existing protected areas providing a very reasonable path forward for considering the utility of offsets for protecting this species in perpetuity in Alberta.

A predictive map of Canada warbler density in Alberta: a report outlining how the model was developed and its key assumptions.

Completion of ~500 point counts in Alberta that will be added to the Boreal Avian Modelling database has been completed and results for ACA lands have been provided.

Meetings with various partners to discuss offset strategies: project staff have met with representatives of Weyerhaeuser and Canfor multiple times.

MARXAN analysis, report, and maps showing the most cost-effective areas to preserve for Canada warblers. This has been completed for one sub-objective. Maps have been completed and MARXAN planning is ongoing to complete the economic assessment.

Report outlining other birds protected by the various offset strategies is ongoing. Model construction will occur throughout this summer for as many species as possible.

Electronic newsletter to various industry, conservation, and government organizations to inform of results of project: a notice was sent out to various partners about the status of the project's new website (www.borealbirds.ca).

The model summary is available on the project website: www.borealbirds.ca/avian_db/accounts.php/Cardellina+canadensis/den_by_age_type

A meeting with partners to discuss the results has been delayed while the research team complete the models and planning scenarios for multiple species.

Scientific publication(s):

A scientific paper will be submitted to Avian Conservation and Ecology.

Long-term studies and elk calf study at Ya Ha Tinda

University of Alberta (Dr. E. Merrill)

Grant: \$25,500

Project Code: 030-00-90-204

Project Status: Funded in 2003-4, 2008-09 and 2009-10; Completed

The Ya Ha Tinda (YHT) elk herd has declined over the past decade with a reduction in elk migrating westward to summer in Banff National Park (BNP) and an increase in elk remaining on the YHT winter range year-round or more recently migrating to the east of YHT. The researchers continue to monitor the long-term survival and movement of the elk relative to habitat changes. Vegetation in the Dogrib burn east of YHT was resampled to determine if vegetation recovery after the fire may be influencing elk use of the burn and newly observed migration to this general area. In 2012, total biomass was the greatest in the burned sites, followed by post-fire logged, and then cut and burned sites, whereas in 2003, total biomass was greatest in cut and burned sites, followed by burned, and then post-

fire logged sites. Burned sites had the greatest amount of grass/sedge biomass, and shrubs made up the least amount of biomass in all three treatment types. Total densities of (> 1m) shrubs and trees were greater in post-fire logged sites in 2012 than in 2003. Pellet groups were counted in 55 plots in the Dogrib burn that were also sampled in 2003. Compared to the period 2003, the number of feral horses pellet groups increased in the burn much more than the other wildlife species. A detailed analysis of collared elk use of the burn and surrounding area is in progress. 26 elk were collared to monitor adult elk survival, movements and initiate a calf mortality study. Pregnancy rates of rectally palpated elk (n=23) was 91%. Using the absence/presence of their telemetry signal in June–August, 15% (9) are residents, 10% (6) are partial migrants, and 75% (45) were migrants. Of the migrants 51% migrated eastwards, whereas the remaining elk migrated into Banff National Park. Summer (July–August) population ratios of adult bull:adult cow:calf ratios were 1:100:16 (n=259). Winter (Feb–Mar) herd composition counts in 2013 of bull:adult cow:calf ratio was 13:100:8. There were a total of 13 mortalities (collared and opportunistic): six were attributed to wolf predation, two to hunters, one elk fell off a cliff in Bighorn Canyon, and one mortality was capture-related. The three remaining mortalities are unknown. In addition, a mortality signal has yet been investigated near Hat Mountain, north of YHT, and an additional dropped collared was retrieved in BNP and the animal's fate is unknown.

Deliverables/Results:

Major findings: - Total forage in the Dogrib burn has increased since 2003 but increases are largely due to increasing shrub densities not herbaceous forage. Horse use of the burns seems to have increased more than wildlife use.

- The Ya Ha Tinda elk herd remains low at about 300 elk in winter.

- Although pregnancy seem high (91%, n=23) only ~eight calves are observed per 100 cows in winter, which reflects very low recruitment into the population.

- Known mortalities were related primarily to predation by wolves and First Nations.

- 85% of the marked elk migrated off the winter range (10% partial migration), with approximately equal numbers migrating into Banff National Park and to the east of Ya Ha Tinda.

The YHT website was set up in December 2013. Past reports have been up loaded. Revision is on-going. See: yahatinda.biology.ualberta.ca

Scientific presentation(s):

Several talks were provided: - Peril of elk at YHT: Special Symposium at the Annual Meeting of The Wildlife Society October 2012 in Portland, Oregon: Dr. Evelyn Merrill - Persistence of the Ya Ha Tinda elk herd. Alberta Chapter of The Wildlife Society, March 2013 in Canmore, AB: Jodi Berg

Scientific publications:

Thesis by Scott Eggeman (University of Montana) on migratory patterns and predation rates on YHT elk was completed in May 2012 and publications are expected in summer 2013.

Analysis of elk selection of burned areas is expected to be completed and a manuscript submitted by 31 June. Final report summarizing long-term data will be completed by 31 March 2013.

Native plant reproductive strategies and biochar additions affect urban reclamation success in terms of ecosystem function and services

University of Alberta (Dr. D. Mackenzie)

Grant: \$17,000

Project Code: 015-00-90-182

Project Status: Funded in 2011-12; Completed

The Larch Park storm water management facility is an 8,800 m² urban development site in Edmonton where both wetland (1,200 m²) and terrestrial (6,600 m²) areas were rebuilt in 2010 with salvaged soils and native plants to emulate Rough-Fescue Prairie and the native wetlands nearby. The researchers are continuing to monitor whether plant reproductive traits affect reclamation success by examining a randomized block design experiment where each block contains one community of plants that reproduce vegetatively, and one with plants that reproduce by seed alone. Reclamation effectiveness will be determined by comparing the level of ecosystem functioning and services of these two different grassland communities to reference sites at urban storm water ponds surrounded by turf grass, and undisturbed Rough Fescue Grasslands. This year a biochar component was added to replace a substrate legacy (charcoal) in grassland ecosystems and examined how soil and microbial processes interacted with this substrate. Differences between rhizomatous and non-rhizomatous vegetation continued into the third year of the experiment in 2012. This year it was found that below-ground biomass was higher in the rhizomatous vegetation communities, similar to 2011. Biomass of invasive species appears to be highest in the rhizomatous treatments, as does survivorship. Data analysis is on-going for below-ground and above-ground biomass, and litter C:N:P; shoot and root biomass; inflorescence counts as an indicator of seed reproduction; arthropod communities; survivorship; and percent cover. Biochar amendments to soil caused a reduction in the amount of available nitrogen and slight decrease in plant productivity in the lab. In the field, at both the reclaimed site and the target ecosystem, biochar resulted in decreased available N and microbial activity, but this might be good for N retention in the heavily disturbed system, where last year very high N levels were seen (120 times higher) than native prairie soils. Disturbance in the native prairie grassland also caused an increase in N availability which was significantly reduced by biochar additions; however biochar in the field had no effect on N availability at Larch Park or any of the microbial parameters tested at either site.

Deliverables/Results:

Higher below-ground biomass was found in rhizomatous treatments compared to non-rhizomatous treatments, which was a continuation from 2011 to 2012. Below-ground biomass, presumably both rhizomes and roots, drove this difference between vegetation in the upper ten cm of the soils, but not below that. Currently, the researchers are statistically analyzing whether native above-ground biomass is equivalent between treatments (first looks suggests correct), and that the non-rhizomatous species continue to reduce the invasive species biomass (this pattern also appears to continue). Next steps are to complete data analysis on the on soil, below-ground, above-ground and litter biomass C:N:P, and carbon storage estimates; shoot and root biomass; inflorescence counts as an indicator of seed reproduction; arthropod communities; survivorship; and percent cover. Ecosystem Service translation from the ecosystem function data will be the main focus in 2013, but that will build on this data. For

more detailed results, see the final report submitted to ACA.

Field data collection completed as planned.

Laboratory analysis of vegetation and soils data completed.

Statistical analysis is currently ongoing: statistical analysis is not completed, because of the size of the dataset. This is expected to be completed in 2013.

This project earned an Emerald Award Nomination – Emerald Challenge Award for Water.

Project website: www.urbanecologycommittee.com, and on Dr. Michael Clark's website: www.clarkecoscience.com

Scientific publication(s):

Work continues for scientific publications and additional public interactions. First publication submission of one vegetation publication and one soil publication are to be submitted summer 2013, and a vegetation-soils publication is targeted to be submitted by March, 2014. Ecosystem service articles will be submitted in 2014, but this is being developed.

Presentation(s):

Dr. M. Clark presented research to Melcor and IBI Group (industry partners), with the University of Alberta collaborators Dr. D. MacKenzie, Dr. C. Paszkowski, and Arezoo Amini (M.Sc. student) - August, 2012

Dr. M. Clark presented to the Vegetation Identification course at NAIT to Dave Critchley's class - October 15, 2012

Dr. M. Clark presented a poster at the Crafting Water-sensitive Communities in Cold Climates conference, Edmonton, put on by Alberta Low Impact Development Partnership event. >130 people - November 6 to 8, 2012

10th Prairie Conservation and Endangered Species Conference. Inter-provincial meeting that spans Manitoba, Saskatchewan and Alberta governments, industry, citizen groups, academics and others. > 500 people, Red Deer. - February 19 – 22, 2013.

Arezoo Amini (M.Sc. student) presented an oral entitled: "Restoring native grassland function in urban environment: implications for soil-plant relations" 50th Anniversary of the Alberta Soil Science Workshop at the annual meeting in Lethbridge, AB. Feb. 19-21, 2013

Dr. M. Clark presented at the Canada Landscape Reclamation Association Alberta Conference & Annual general meeting with industry experts, government, non-profits, academics, citizen groups and others. 500 people, Red Deer- February 27 – March 1, 2013

Arezoo Amini defended her thesis, "Restoring native grassland function in urban environment: implications for soil-plant relations". March 27, 2013

Regeneration of the endangered whitebark pine in the northern Rocky Mountains of Alberta

University of Alberta (Dr. E. Macdonald)

Grant: \$19,250

Project Code: 015-00-90-187

Project Status: New; Extended until August 30, 2013

Whitebark pine (*Pinus albicaulis*) is a long-lived high elevation five-needled pine that is *Endangered* in Canada and Alberta due to

rapid declines (78-97%) in the population. The introduced white pine blister rust (*Cronartium ribicola*) is the primary cause of decline but other factors include mountain pine beetle, climate change, and fire exclusion (at least in parts of the range). These declines are being experienced at a global level but some of the healthiest populations in North America occur in Alberta. Whitebark pine is considered to be a keystone species in subalpine ecosystems because it serves as the primary food source for the Clark's nutcracker and is an important food source for red squirrels, grizzly and black bears. It also plays a role in watershed protection. Its decline is therefore expected to have a cascade effect in these ecosystems. Ensuring whitebark pine remains on the landscape requires development of *ex situ* and *in situ* conservation strategies that encompass a variety of scales from protection of mature seed-bearing individuals through to management of habitat and identification and protection of (or creation of) regeneration sites (AB Recovery Team 2011).

Understanding conditions under which whitebark pine regenerates is a prerequisite for making informed land management decisions, particularly when there is a legal requirement to ensure conservation of other listed species such as mountain caribou and grizzly bear, within the same landscape unit. In addition, definitions of 'critical' or 'essential' habitat under federal and provincial endangered species legislation must also take regeneration sites into account and the information to inform such definitions is currently lacking. Effective conservation of whitebark pine is therefore reliant on gathering information that can help characterize regeneration sites to inform restoration and habitat conservation and management programs for whitebark pine under current and future climate change scenarios and to assist with delineation of critical/essential habitat as currently required under federal and provincial endangered species legislation. The project objectives are: to document the regeneration niche of whitebark pine in the northern Rockies by examining regeneration densities, health and population age structure of whitebark pine in relation to microsite conditions, canopy closure and competing vegetation in and within 300m of healthy stands; and to test the importance of fire for regeneration of whitebark pine by quantifying regeneration densities, health and population age structure of whitebark pine in burned sites as compared to unburned sites.

Deliverables/Results:

The project is proceeding as planned. The 2012 field work was delayed, as the researchers were not able to access helicopters from Grande Cache during the summer (they were fully booked up with oil and gas companies). Thus a two week long field work campaign began on August 30, 2012. The field work was conducted by Ellen Macdonald, Joyce Gould, Karen Anderson (Alberta Parks), and several others who were there as volunteers (Matthew Gelderman (now MSc student at UofA), Alana Clason, PhD student at UNBC, Richard Caners (Royal Alberta Museum), Duke Hunter (Alberta Parks). Five different sites were visited. At each of these the health transects were re-surveyed (five health transects in total) and transects in different mesohabitats were sampled for whitebark pine density and to determine the regeneration niche of whitebark pine. In total 13 transects were sampled. The project was extended through summer 2013 to allow for sampling of additional sites in Willmore in late July, 2013. In particular, sites will be sampled where burns have occurred.

Preliminary results suggest that whitebark pine seedlings are distributed more abundantly in microsites with less canopy cover within forested mesohabitats. Whitebark pine seedlings also seem to be co-occurring with subalpine fir seedlings within forested mesohabitats. Whitebark seedlings in this scenario are unlikely to

out-compete subalpine fir seedlings which are better adapted to the mesic conditions found in the understory. These results tentatively suggest that prescribed burning will create conditions that facilitate greater whitebark regeneration success.

Additional information on the ecosystem role that whitebark pine may play in Alberta that will feed in to recovery planning is in progress.

Scientific presentation(s):

Gelderman, M., Macdonald S.E. and J. Gould. 2013. Pattern and process of whitebark pine regeneration – restoring an endangered species. Alberta Parks Forum, March, 2013; Canmore, A.B. poster presentation

Gould, J. and S.E. Macdonald 2012. Health and regeneration of whitebark pine in Alberta. Whitepark Pine Ecosystem Foundation meeting, Sept., 2012; Kimberley, B.C. oral presentation

Presentation to Alberta Parks staff, including Visitor Services (by Joyce Gould). A presentation to Parks staff in 2011 resulted in development of a program that won Interpretation Canada's gold award.

Using wetland-dependent wildlife to monitor landscape change

University of Alberta (Dr. C. Paszkowski)

Grant: \$5,270.86

Project Code: 030-00-90-187

Project Status: Funded in 2011-12; Completed

Amphibians and songbirds which vocalize for the purposes of finding mates and advertising are most likely to be affected by the severity and timing of noise pollution nearby to their habitats. The objectives of this project were to 1) examine the influence of noise on amphibian and songbird calling, 2) evaluate alternative techniques to survey for rare and elusive species, 3) examine the influence of upland vegetation on the phenology of breeding activity for amphibians, and 4) maintain an Alberta based node within the Terrestrial Wetland Global Change Research Network (TWGCRN). Amphibian and songbird calling phonologies were examined across a gradient of soundscapes (acoustic environments) and wetlands (Objectives 1 & 2): natural forested, natural open, pasture, rural, suburban, urban, and along roadways, both gravel and paved highway; all of which differ in a type and degree of anthropogenic noises. This project is part of a larger initiative (TWGCRN), which monitors the phenology of amphibians and songbirds at wetlands and address how they are impacted by climate/global change (Objectives 3 & 4). A total of 21 wetlands were surveyed in 2012, wherein amphibian phenologies differed with location. Daily calling phenologies for wood frog and chorus frog differ between urban and natural sites, with urban populations peaking later in the evening and with greater number of individuals calling at natural protected sites compared to urban and suburban locations. Both Canadian toad (May Be at Risk – Status of Alberta Wildlife) and Western toad (Sensitive – Status of Alberta Wildlife) were each recorded at three out of 12 urban locations (one site in common) and only Western toads were recorded at natural protected Beaver Hills sites (six out of nine). Detecting these "rare" species demonstrates the effectiveness of recorders at detecting species which would have been missed during rapid biodiversity surveys. Over 30 songbirds and waterfowl have been identified from recordings in 2012. Species lists show slight shifts from urban

wetlands to natural protected wetlands, but data analysis is still underway. Analysis of song characteristics for two songbirds revealed that song sparrows had longer vocalizations at sites near roads, and American robins had higher amplitude (louder) vocalizations at sites near roads.

Deliverables/Results:

Song meters (Wildlife Acoustics) are effective at capturing phonological data that would otherwise be impossible to collect at multiple locations simultaneously. Data on phenology of amphibians and songbirds in response to anthropogenic noises continues to be collected, but the researchers have found preliminary data suggesting that songbirds respond to differences in the acoustic environment by increasing their volume and in some cases the frequency (Hz) at which they call. The researchers have not conducted similar analysis on anuran calls, but it does not appear that the anurans respond by changes in frequency as do birds.

All four calling anuran species were detected within the research area (wood frog, chorus frog, Western toad and Canadian toad). 35 different songbird and waterfowl were detected and identified at wetlands.

Daily phenology of wood frog and chorus frog differed between urban wetlands with peak calling occurring later in the evening whereas peak calling in natural protected Beaver Hills sites occurred in the late afternoon or early evening. Relative abundance of calling anurans was greater at protected natural sites compared to urban locations, which may be related to age of wetlands, connectedness of wetlands or other factors not accounted for in the study design.

Other results expected after analysis are differences in seasonal phenology of calling for amphibians based on upland/wetland conditions (i.e. ice-off, snow melt, and leaf out).

The song meters have generated recordings of frog and bird calls. In addition mammals that vocalize may also have been recorded (e.g., red squirrel, coyote, fox, elk, moose). All recorders have been removed from wetlands and data storage is nearly complete. Data are stored on external hard drives and are awaiting analysis.

Technicians and undergraduate students will interact with Songscope Software, “training” it to recognize commonly encountered amphibian and bird calls (ongoing). The recognizer that is part of the song scope program has proven ineffective at recognizing species calls and listeners are being used to identify calls.

Report to Alberta Monitoring Institute was submitted in July, 2012 providing suggested protocol on surveying for amphibians and on the success of recorders at detecting amphibian species in the aspen parkland. Report to ASPRWF was completed winter 2012 prior to this year’s grant.

Scientific publication(s):

Publication on the timing of amphibian emergence related to vegetation and climatic characteristics, likely co-authored by Walt Sadinski of the USGS and other TWGCRN participants, is unlikely before this year as only two years of data have been collected. This deliverable still requires more data before a statement on trends can be determined.

Presentation(s):

Presentation to Renewable Resources NAIT students. Described the funding and support for the project during a presentation of techniques used to monitor amphibians and wetland dependent

songbirds. September, 2012.

Parks Day Presentation – What’s croaking – tour in Elk Island National Park. July 16, 2012.

The threespine stickleback in Alberta; a candidate for eradication or protection?

University of Calgary (Dr. S. Rogers)

Grant: \$9,500

Project Code: 020-00-90-200

Project Status: New; Completed

Alberta’s freshwater fish fauna is the most depauperate in Canada, and thus its conservation is of crucial importance. Nelson and Harris (1987) commented on a recently observed threespine stickleback population in Hasse Lake, Alberta. This population had only recently been documented, and it was suggested that it was the result of a recent introduction that had occurred in the late 1970’s from Brannen Lake on Vancouver Island. Since then, the species has been reportedly spreading in Alberta and has now been documented in at least five areas of the province, although information on how the species is spreading is lacking. The project’s results have shown that: (1) threespine stickleback are now seemingly located in a single stormwater pond in Edmonton. The species is breeding as juvenile young-of-the-year fish were captured last August. (2) The researchers have completed the construction of a threespine stickleback phylogeny using DNA sequences for two mitochondrial genes. The results have confirmed a West Coast origin for the inland Albertan stickleback population but not enough data are yet available to disentangle evolutionary patterns within the British Columbia and Alaska data sets. Additional genetic information from these samples have been collected and is currently being added to the analysis.

Deliverables/Results:

The researchers have successfully sequenced two mitochondrial genes, including 610 base pairs of each the cytochrome oxidase I gene and the cytochrome b gene. Samples included those from the Alberta site, six sites in British Columbia, and one site in each of Alaska, Eastern Canada, and Norway. DNA was sequenced from eight-ten individuals per site.

Thus far, the research team have identified a West Coast origin for the inland Albertan stickleback population. Not enough data are yet available to disentangle evolutionary patterns within the British Columbia and Alaska data sets. Additional genetic information from the samples available will provide the researchers with better phylogenetic resolution.

Scientific publication(s):

Two manuscripts are planned for publication, one documenting the fine-scale structure and one documenting the broad-scale phylogeny.

Presentation(s):

This work will be presented at scientific conferences.

Examining resiliency of bull trout populations to brook trout invasiveness

University of Lethbridge (Dr. J. Rasmussen)

Grant: \$8,000

Project Code: 020-00-90-156

Project Status: Funded since 2009-10; Completed

Brook trout invasiveness has been identified as a major threat to native fish assemblages in Alberta mountain streams. Habitat features of streams are variable, and certain habitats may facilitate successful establishment of brook trout populations, with resulting displacement of native trout species. By examining these root causes of invasiveness, and how native fishes may naturally resist such invasion, we may be able to better predict or manage the spread of this exotic species; as well as strategically restore areas already invaded. This project used a combination of field observations and laboratory experiments to examine the underlying factors that influence brook trout invasiveness into native bull trout streams of the Alberta Rockies. Three years of field data collection was conducted on streams that are, or once were important bull trout habitat, but have been invaded by brook trout. The results of this study suggest that water temperature, physical habitat structure and fish community composition influence the success of brook trout invasion into these important bull trout habitats. Brook trout preferentially invade warm bull trout streams with simple fish communities. In addition, bull trout resist invasion in streams with a large amount of stream-bottom cover (cobbles and boulders). Laboratory experiments suggest that this may be due to bull trout competitive superiority in this type of habitat. When juvenile bull trout and brook trout were placed in direct competition with one another, bull trout were able to outcompete brook trout for food in habitats with a large amount of cover, but not in simple habitats devoid of cover. In addition, bull trout from a migratory population competed more successfully against brook trout than those from a resident population. Climate change and landscape practices (logging, stream-side grazing, agriculture etc.) may increase stream temperatures, or alter stream habitat. This may indirectly facilitate the spread of brook trout in some areas. The results of this project outline what areas may be sensitive to brook trout invasion, as well as how the stream environment may be strategically restored or conserved for native bull trout.

Deliverables/Results:

Field observations have revealed that physical habitat structure, water temperature and fish community are all associated with brook trout invasiveness into bull trout streams. Laboratory experiments of competition between the two species experimentally demonstrated that bull trout compete more successfully against brook trout when habitats are complex, and when bull trout came from a migratory population. These results may be used to understand the patterns of brook trout invasion into bull trout streams, and be used to prioritize and direct recovery efforts for bull trout facing brook trout invasion.

Scientific publication(s):

Warnock W.G., and Rasmussen J.B. In Press. Abiotic and biotic factors associated with brook trout invasiveness into bull trout streams of the Canadian Rockies. *Canadian Journal of Fisheries and Aquatic Science*.

Warnock, W.G. and J.B. Rasmussen. Comparing competitive ability and associated metabolic traits between two populations of bull trout against an invasive species. In review.

Warnock, W.G. and J.B. Rasmussen. Assessing the interacting effects of fish density and habitat on interference competition between bull trout and brook trout in an artificial stream. In review.

Presentation(s):

Warnock, W.G. and J.B. Rasmussen. 2012. Testing abiotic and biotic factors that affect competition between bull and brook trout in an artificial stream. Presented at: the Canadian Conference For Fisheries Research, Moncton, NB.

Identifying risks, impacts, origins and movement patterns of infectious pathogens in blue-winged teal (*Anas discors*) in the Canadian prairies

University of Saskatchewan (Dr. C. Soos)

Grant: \$20,500

Project Code: 030-00-90-177

Project Status: Funded in 2011-12; Completed

The project's aim is to improve understanding of the ecology of infectious pathogens in migratory waterfowl, by identifying demographic and environmental determinants of infection (risk factors), and sources, impacts, and movement patterns of pathogens in the prairie provinces. The prairies are potentially a key area for mixing of pathogens of birds that have come from numerous locations, and for subsequent dispersal of pathogens throughout the western hemisphere. The research team have evaluated determinants of infection or exposure to avian influenza virus (AIV), West Nile virus (WNV), and Newcastle disease virus (NDV) in relation to host demographic and other ecological factors including pond density, population density, and spatiotemporal variables (year, season, flyway, latitude) in blue-winged teal (*Anas discors*, BWTE), sampled throughout Prairie Canada, as well as throughout Canada and the US (AIV only). In prairie BWTE, the risk of AIV infection increased with population density of breeding BWTE, and was highest in hatch year birds and birds without evidence of previous exposure. The risk of WNV infection increased with increasing pond density (important for mosquito vectors), and adults were more likely to be seroconverted compared to hatch year birds. Annual and spatial trends for WNV exposure in BWTE reflected those observed in humans in the three prairie provinces. For NDV, adults were more likely to have antibodies compared to hatch year birds, exposure varied among years and provinces, but there were no associations with population or pond density. To examine spatiotemporal trends in AIV infection at the continental scale, results from >13,500 BWTE across Canada and the US were analyzed. During late summer staging (August) and fall migration (Sept-Oct), hatch year birds were more likely to be infected than after hatch year birds, however there was no difference between age categories for the remainder of the year (winter, spring migration, and incubation). Probability of infection increased non-linearly with latitude, and was highest in late summer, corresponding with staging prior to fall migration when densities of birds and the proportion of susceptible hatch year birds in the population are highest. Birds in the Pacific, Central and Mississippi flyways were significantly more likely to be infected compared to those in the Atlantic flyway. Geographic and temporal variation in AIV infection was driven primarily by hatch year birds. Ongoing studies will provide further information on sources and movement of infectious pathogens through migration, the role of stress on infection, and the role of stress and sub-lethal infection on host survival. The project's results provide new insight into determinants of disease in a long-distance migratory host at

individual, population, and continental scales. This information will inform models predicting spread and movement of new emerging diseases of concern if they were to enter our migratory bird populations.

Deliverables/Results:

Field season for 2012 successful; samples collected from >500 blue-winged teal in Alberta, Manitoba, and Saskatchewan in August 2012, all swab and serum samples analyzed for AIV infection and serum antibodies.

Scientific publication(s):

Draft MSc thesis (Rodolfo Nallar) submitted to supervisors, entitled 'The ecology of infectious pathogens in a long distance migratory bird, the blue-winged teal (*Anas discors*): From individuals to populations. Thesis defence took place in April 2013.

Manuscripts not yet submitted:

Nallar, R., Soos, C., Papp, Z., Leighton, F.A., Epp, T., et al. Ecological and demographic factors associated with avian influenza virus, West Nile virus and avian paramyxovirus infection in blue-winged teal (*Anas discors*) in the Canadian prairies (to be submitted to Journal of Wildlife Diseases in April 2013)

Nallar, R., Soos, C., Papp, Z., Leighton, F.A., Epp, T., et al. Demographic and spatiotemporal patterns associated with avian influenza infection in blue-winged teal (*Anas discors*) at the continental scale (to be submitted to PlosOne in April 2013)

Papp, Z., Soos, C., Parmley E.J., Leighton F.A. et al. Ecological determinants of avian influenza infection in waterfowl across Canada (2005-2011) (to be submitted to PlosOne in April-May 2013)

Soos, C., Papp, Z., Parmley E.J., Leighton F.A. et al. Effect of low pathogenic avian influenza virus infection on migration and survival in wild waterfowl (to be submitted in July 2013)

Fairhurst, G., Soos, C., Nallar, R.N., Wilson, A., Hobson, K. et al. The relationship of stress, infectious pathogens, and migration in blue-winged teal (*Anas discors*) in the Prairie Provinces (to be submitted in 2013)

Origins and movement patterns of blue-winged teal and their pathogens (to be submitted in 2014)

The role of sub-lethal infection with avian influenza virus, West Nile virus, Newcastle disease virus, and hemoparasites, in survival of blue-winged teal (*Anas discors*) in the Prairie Provinces (to be submitted in 2014)

Other deliverables:

Annual report to DU-Canada's IWWR and other funding partners

Reports/presentations at division/departamental meetings

Presentation(s):

Soos, C., Papp, Z., Parmley, E.J., and Leighton, F.A. and Canada's Inter-Agency Wild Bird Influenza Survey. Ecological determinants of avian influenza infection in waterfowl across Canada (2005-2011). Wildlife Disease Association Annual Conference, Lyon, France, July 2012.

Experimental management of bighorn sheep

University of Sherbrooke (Dr. M. Festa-Bianchet)

Grant: \$9,900

Project Code: 030-00-90-174

Project Status: Funded in 2011-12; Completed

In Alberta, unlimited harvest of bighorn rams, based on minimum horn curl, protects subadult rams and maximizes recreational opportunities. That regulation, however, leads to the harvest of rams with rapidly-growing horns when aged four to six years, before they obtain the high reproductive success associated with large horns at ages seven to 12. At Ram Mountain, decades of unlimited trophy hunting artificially selected for small rams with slow-growing horns. Over the past 12 years, the population has failed to recover despite being at very low density. The poor demographic performance is partly linked to lower genetic variability, possibly including the loss of alleles removed through selective hunting. To test that hypothesis, the researchers are monitoring the genetic and demographic effects of introduced sheep from Cadomin, concomitant with a four-year moratorium on trophy sheep hunting. This study of how ram morphological (horn and body size) and genetic (heterozygosity, inbreeding, presence of specific alleles) characteristics may affect reproductive success, including growth and survival of their lambs has been initiated. The researchers are monitoring the survival, body and horn growth, and reproduction of individually marked rams of known origin (native, immigrant and hybrids) and genotype. The introduction of new genetic variability should allow the Ram Mountain population to both restore historic levels of horn size and recover numerically, after 12 years of stagnating population size. This experimental study will inform management of bighorn sheep by quantifying how different levels of harvest affect both trophy availability and evolutionary impacts on hunted populations. This is the second year of a proposed five-year program within the long-term study of bighorn sheep ecology, evolution and management on Ram Mountain. Monitoring of reproduction, survival, body and horn growth of bighorn sheep at Ram Mountain in 2012 was successful. All resident sheep except for two rams were captured at least once, and most were caught at least three times. The population increased from 70 sheep in 2011 to 74 in 2012. Within the population, six sheep are introduced from Cadomin and 18 have at least one ancestor from the Cadomin supplementation. A third of the population therefore carries 'Cadomin' genes. The population is increasing very slowly despite improved lamb survival (58% over the last six years, compared to 19% over the previous ten years), mostly because of mortality of two to three ewes each year. This mortality appears random and is the classic stochasticity problem of small populations. The number of adult ewes increased from 22 in 2008 to 28 in June, 2012, but at least three adult ewes disappeared during the summer. Improved growth in both mass and horn size over the last few years also suggests that the population is recovering, but it remains at a low level where unexpected events such as renewed cougar predation may cause a rapid decline. The four year moratorium of trophy ram hunting began in 2011 and should allow a greater spread of introduced 'Cadomin' genes than if the imported rams had been at risk of hunting mortality.

There was no hunting season on Ram Mountain in 2012, although one Cadomin ram was harvested by a native in January. In 2011, three rams were classified as 'legal' under the 4/5 criterion, including two of the three imported rams. No ram fit the definition of 'full curl'. Hunting will reopen in 2015. There are currently 14 rams aged three

to eight years, which would be aged six-11 years in 2015. Assuming that 60% of rams aged six years and older will be legal under the 'full-curl' definition, and an optimistic expectation of 85% natural yearly survival; there may be five to six legal rams when the hunt reopens.

Deliverables/Results:

The results are summarized in the Final Report to ACA.

Scientific publication(s):

Martin, A.M., H. Presseault-Gauvin, M. Festa-Bianchet and F. Pelletier. 2013. Male mating competitiveness and age-dependent relationship between testosterone and social rank in bighorn sheep. *Behavioral Ecology and Sociobiology*, in press.

Pelletier, F. and D. Garant. 2012. Potential population consequences of individual variation in behaviour. In: *Behavioural responses to a changing world*. Eds: Candolin, U and Wong, B. Oxford University Press.

Martin, J.G.A., M. Festa-Bianchet, S.D. Côté and D.T. Blumstein. 2013. Detecting individual differences in hind foot length of wild mammals. *Canadian Journal of Zoology*, in press.

Engen, S., B.-E. Sæther, K.B. Armitage, D.T. Blumstein, T.H. Clutton-Brock, F.S. Dobson, M. Festa-Bianchet, M.K. Oli and A. Ozgul. 2013. Estimating the effect of temporally autocorrelated environments on the demography of density-independent age-structured populations. *Methods in Ecology and Evolution*, in press.

Poissant, J., D. Réale, J.G.A. Martin, M. Festa-Bianchet and D.W. Coltman. 2013. A quantitative trait locus analysis of personality in wild bighorn sheep. *Ecology and Evolution*, 3: in press.

Poissant, J., C.S. Davis, R.M. Malenfant, J.T. Hogg, D.W. Coltman. 2012. QTL mapping for sexually dimorphic fitness-related traits in wild bighorn sheep. *Heredity*, 108: 256-263

Festa-Bianchet, M. 2012. The cost of trying: weak interspecific correlations among life-history components in male ungulates. *Canadian Journal of Zoology*, 90: 1072-1085.

Pelletier, F., M. Festa-Bianchet and J.T. Jorgenson. 2012. Data from selective harvests underestimate temporal trends in quantitative traits. *Biology Letters*, 8: 878-881

Martin, J.G.A. and M. Festa-Bianchet. 2012. Determinants and consequences of age of primiparity in bighorn sheep. *Oikos*, 121: 752-760.

Determination of pollutant export coefficients from different landbase and landuse types to Alberta Rivers

Water Matters Society of Alberta (Dr. W. Donahue)

Grant: \$13,000

Project Code: 015-00-90-186

Project Status: New; Extended until October 31, 2013

The goal of this project was to model and produce non-point source nutrient and total suspended solids (TSS) loading coefficients of use in freshwater and land-use modeling and management from the subcatchment to regional scales. The aim was to provide critical methods for determining nutrient export and loading rates, to enable informed development and remediation decisions that enhance the protection and health of Alberta's rivers. The objective of this project was to attempt to develop methods to calculate nutrient and TSS

export coefficients and loading rates from different landscape and land-use types in Alberta watersheds, based on readily available water quality and land-use data, including Alberta Government and Water Survey of Canada water quality and flow data, and GIS-based land-use data. Draft methods and a draft report have been completed, describing the current state of understanding of non-point source pollution dynamics in Alberta, the inherent problems with approaches typically applied thus, rationales for departing from such approaches, proposed new methods for quantifying export coefficients, and detailed analyses of available provincial and federal data that demonstrate the advantages of using this new approach to estimate land-based export of nutrient and TSS to aquatic systems. Because of data limitations and underlying problems with the techniques normally used to quantify non-point source pollution loading rates, a different approach was pursued than originally proposed. Typically, landscape-scale studies of non-point source pollution assessment rely on detailed land-use, land-cover, and water quality data, and produce discrete coefficients (kg/ha/yr) for each relevant land-use. However, this approach does not generally account for hydrologic dynamics and change. For example, agricultural land may have very low loading rates for nutrients during dry years and very high loading rates during wet years, which is typically presented in the ecological literature as a confounding factor in any assessment. However, there is a large body of engineering-based literature on non-point source pollution loading determinations in relation to municipal water quality treatment and management that does account for hydrologic dynamics. Inspired by that approach, relationships were developed for ecozones, land covers, and land uses that determine nutrient and TSS loading potential based on annual precipitation and/or areal runoff, capturing up to 89% of variability in nutrient exports represented in government monitoring and assessment data. Significant improvements in the ability to predict nutrient and TSS loading were achieved that may be relatively easily imported into landscape-scale models, thereby significantly expanding their utility in watershed planning initiatives.

Deliverables/Results:

As described in the summary above, the approach to this problem that was ultimately adopted was not that initially proposed or anticipated, because of the failure of techniques normally used to determine loading coefficients that are described in the ecological literature. Instead, engineering-based approaches were attempted and developed, based on a substantial body of literature that describes the use of "event-mean concentrations", which dynamically describe and predict nutrient and TSS concentrations based on precipitation or flow. In that way, hydrologic variability and its critical role in determining loading rates can be captured. For more detailed results, see the Final Report prepared for ACA.

Initial pollutant loading & export coefficient calculation structures has been completed.

Testing and refinement of models; draft modelling methods, calculations and outputs.

Preliminary vetting of modelling methods and coefficient-determination techniques using ALCES.

Scientific vetting of modelling methods and outputs via Science Assessment Workshop (to be held in September 2013).

Final draft describing pollutant loading and export coefficient modelling methods, outputs, and test applications in landscape – water quality modelling (not yet completed).

Identifying habitat requirements for bats in winter

Wildlife Conservation Society Canada (Dr. C. Lausen)

Grant: \$27,300

Project Code: 030-00-90-210

Project Status: New; Completed

The spread of white-nose syndrome (WNS), a deadly fungal disease of hibernating bats, has given new urgency to identifying and characterizing winter bat habitat. The disease is associated with increased frequency of arousal from hibernation, winter flight outside of cave hibernacula, starvation from prematurely depleted fat reserves, and dehydration. Bat-to-bat transmission has been a major mode of spread. Whether WNS will decimate populations in the West, as it has in the East, is difficult to predict because winter bat ecology in western North America is poorly understood. Preliminary data suggest that hibernacula in the prairies are smaller, drier, and less thermally-stable than known cave hibernacula. Given that winter flights by bats are associated with low fat reserves, and that roosting in arid conditions increases water loss, increases in arousal frequency as a result of WNS infection would increase the risk of starvation and dehydration. However, a lack of clustering and the use of cold, dry roosts may be less ideal for the growth and spread of *Geomyces destructans*, the fungus that causes WNS. Therefore, the roosting ecology of bats overwintering in the prairies may limit the spread of and geographically constrain WNS. The project goal was to determine habitat requirements of bats overwintering in a prairie landscape and to investigate reasons for mid-winter flight, which will facilitate WNS risk-assessment. Big brown bats (*Eptesicus fuscus*) were captured during mid-winter flights in Dinosaur Provincial Park. To identify and characterize roosting requirements and collect thermoregulation data to determine trends in arousals, bats were tagged with temperature-sensitive radio transmitters and tracked back to their hibernacula. To monitor roost-switching behaviour, individuals were marked with passive integrated transponder (PIT) tags and recorded when bats entered or left each hibernaculum. To look for physiological signs of dehydration and evidence that bats use a heated water source spiked with deuterium, blood samples were taken and blood parameters and deuterium concentrations were measured. The researchers found that male bats used one of three crevices identified as hibernacula and did not switch roosts throughout the winter. Thermoregulation data and isotope samples have yet to be analysed, but preliminary haematological data suggest that bats flying mid-winter are dehydrated and may be seeking water. The researchers suggest that bats roosting in the prairies are at elevated risk of WNS-related dehydration, but their roosting ecology (e.g., limited clustering in cold, dry roosts) may limit rapid spread of the disease.

Deliverables/Results:

Three hibernacula were found in Dinosaur Provincial Park, Alberta. All three hibernacula are located in narrow crevices in a sandstone layer of a south-facing cliff in close proximity (<50m) to the Little Sandhill Creek, the only permanent water source in the park besides the Red Deer River. Despite the apparent suitability of other crevices in the area, and even along the same cliff, all bats returned to one of these three crevice-roosts. Bats did not switch between roosts, despite leaving the hibernaculum multiple times throughout the winter. The researchers did not expect bats to remain in a single hibernaculum throughout the entire winter. They found that the temperature within the hibernacula fluctuated between -1°C and +6°C, which was more stable than expected and much more stable

than random crevices, which fluctuated between -30°C and +11°C. However, relative humidity within hibernacula and random roosts fluctuated considerably, ranging from 25 to 100% RH. Data from cave hibernacula outside of the park has not yet been retrieved. Preliminary data suggest that bats overwintering in the prairies are choosing roost based on specific microhabitat and landscape features, and that bats roost in small groups, which they associate with for the entire hibernation season. Bats in this area may be at greater risk of WNS-related dehydration, but roosting ecology may impede the rapid spread of WNS between individuals. Bats caught during mid-winter flight showed evidence of dehydration, which was expected. Blood samples consistently showed high haematocrit (Hct; 55%-61%) and elevations in the concentrations of the three ions tested (K⁺, Na⁺, and Cl⁻). Although these levels are elevated compared to normal levels reported in the literature (e.g., Hct of 49%), the researchers will capture and test bats in the study area during the summer months to determine the normal range of values for these blood parameters at the study site. Preliminary data suggest that bats flying mid-winter in the study area are dehydrated and may be seeking water.

Scientific publication(s):

No manuscripts have been prepared yet for publication in scientific journals, as only data from the first season is available. The anticipated papers resulting from this study are:

1. Habitat and roost selection of bats in non-mountainous areas, contrasting with what is known about cave hibernacula, the typical hibernaculum of bats in eastern North America;
2. Describing for the first time details of winter bat ecology of western bats, specifically describing activity and arousal patterns and reasons for winter flights;
3. Stable isotopes providing insight into the use of a water development by resident bats overwintering in Dinosaur Provincial Park; and
4. Comparative maintenance of muscle tone in experimentally overwintered bats.

The research team have also prepared yearly reports that update findings for Dinosaur Provincial Park, Alberta Sustainable Resource Development, and the Alberta Conservation Association (interim and final reports).

Presentation(s):

Presentations have been given on the topic of WNS to the general public.

APPENDIX A

Projects in relation to GECF Funding Priorities 2012-2013

FUNDING PRIORITY #1 9 Projects

Habitat enhancement activities specifically listed on provincial recovery plans for Alberta's endangered species (to be done in cooperation with recovery teams).

Part A: 5 Projects

Alberta Fish & Game Association, Operation Grassland Community: Program evaluation and stakeholder collaboration toward sustainable land management solutions for wildlife in Prairie Alberta, \$36,700

Cows & Fish - Alberta Riparian Habitat Management Society, Westslope cutthroat trout riparian habitat improvement action plans, \$18,000

Lesser Slave Lake Bird Observatory Society, Avian monitoring and stewardship at Lesser Slave Lake, \$26,100

Northern Alberta Institute for Technology (NAIT), Sturgeon River watershed habitat enhancement study, \$26,576

Western Sky Land Trust Society, The Bow and Beyond riparian health project, \$10,000

Part B: 4 Projects

Canadian Wildlife Federation/ University of Regina, Using Resource Selection Function models to inform conservation planning in Alberta's Special Areas, \$22,700

University of Alberta, Evaluating the efficacy of setback distances as a tool for understanding critical habitat for ferruginous hawks in Alberta, \$19,800

University of Alberta, Human access management in central-western Alberta: implications for movement and behaviour of grizzly bears (*Ursus arctos*), \$33,050

University of Alberta, Regeneration of the endangered whitebark pine in the northern Rocky Mountains of Alberta, \$19,250

FUNDING PRIORITY #2 34 Projects

Site specific enhancements of habitat, structures and facilities aimed at increasing recreational angling or hunting opportunities, improving habitat or increasing wildlife/fish productivity on the site (i.e. planting/seeding vegetation, development of new fisheries access sites, nest box initiatives, food plot trials and cover plot trials, spawning bed enhancement, etc.).

Part A: 28 Projects

Agroforestry and Woodlot Extension Society, Raven/Medicine watersheds reforestation project, \$15,000

Alberta Fish & Game Association, Operation Grassland Community: Program evaluation and stakeholder collaboration toward sustainable land management solutions for wildlife in Prairie Alberta, \$36,700

Alberta Fish & Game Association, Pronghorn antelope migration corridor enhancement, \$42,000

Alberta Innovates - Technology Futures, Citizen stewardship in the Beaver Hills moraine, Alberta, \$5,000

Ann & Sandy Cross Conservation Area, Wetlands rehabilitation and reintroduction of beavers to the ASCCA, \$12,500

Beaverhill Bird Observatory, Beaverhill Lake stewardship, monitoring and public engagement, \$15,250

Camrose Wildlife Stewardship Society, Camrose purple martin festival, \$3,000

Cows & Fish - Alberta Riparian Habitat Management Society, Southern Alberta Grazing School for Women - Bringing habitat and grazing stewardship to livestock producers, \$3,000

Cows & Fish - Alberta Riparian Habitat Management Society, Westslope cutthroat trout riparian habitat improvement action plans, \$18,000

Crowsnest Conservation Society, Maintaining and restoring Crowsnest River riparian areas, \$18,000

Crowsnest Pass Quad Squad Association, Salamander Creek trail realignment, \$3,000

Delta Waterfowl Foundation, ALUS demonstration projects in the County of Vermilion River and Parkland County, \$20,000

Dunvegan Fish and Game Association, Bat houses, \$2,000

Edmonton and Area Land Trust, Nestbox installation in Important Bird Area with local youth, \$1,000

Elbow River Watershed Partnership (ERWP), Riparian Health Inventories in the Upper Elbow Watershed, \$8,000

Lone Pine Farming Co, Habitat enhancement project #2 (bluebird boxes), \$600

Lone Pine Farming Co, Habitat restoration project, \$800

Mistakiss Institute for the Rockies, Barriers and fish passage: Aquatic connectivity along Highway 3, \$13,000

Mountain View County, Riparian area management improvements, \$21,000

Nature Conservancy of Canada - Alberta region, Fence markers for species survival in Southern Alberta, \$5,000

North Peace Applied Research Association (NPARA), Riparian aerial video assessment of the Whitemud River, \$6,000

Northern Lights Fly Tyers/Trout Unlimited Edmonton, Conserving and restoring arctic grayling in the Upper Pembina River Watershed - Database development, \$10,000

Partners in Habitat Development/ Eastern Irrigation District, Partners in Habitat Development, \$10,000

Red Deer County, Off the Creek Program 2012, \$30,000

Society of Grassland Naturalists - Medicine Hat Interpretive Program, Bats are welcome here, \$3,000

Weaselhead/Glenmore Park Preservation Society, Weaselhead Invasive Plant Program, \$3,000

Western Sky Land Trust Society, The Bow and Beyond riparian health project, \$10,000

Willmore Wilderness Foundation, Willmore Wilderness Park Stewardship Initiative: Increasing hunting and angling access, \$15,000

Part B: 6 Projects

University of Alberta, Eco-evolutionary dynamics of phenology in resident mammals, \$19,574.50

University of Alberta, Estimating deer contact rates to design a long-term experiment for reducing CWD prevalence in Alberta, \$33,000 (actual \$8,500)

University of Alberta, Evaluating the efficacy of setback distances as a tool for understanding critical habitat for ferruginous hawks in Alberta, \$19,800

University of Alberta, Long-term studies and elk calf study at Ya Ha Tinda, \$25,500

University of Alberta, Native plant reproductive strategies and biochar additions affect urban reclamation success in terms of ecosystem function and services, \$17,000

University of Alberta, Using wetland-dependent wildlife to monitor landscape change, \$5,270.86

**FUNDING PRIORITY #3
1 Project**

Urban fisheries development, including : initial evaluation of water quality aspects of existing ponds to determine their suitability for fish stocking; purchase of equipment required to ensure suitable water quality for fish stocking (e.g. aeration equipment); fish stocking in public ponds; promotion of an urban fishery (including natural water bodies).

Part A: 1 Project

Western Sky Land Trust Society, The Bow and Beyond riparian health project, \$10,000

**FUNDING PRIORITY #4
30 Projects**

Stewardship Initiatives (e.g. on-going maintenance of conservation sites or fisheries access sites; adopt a fence; property inspections for invasive weeds; manual weed control; grass mowing).

Part A: 25 Projects

Alberta Fish & Game Association, Weed management, \$3,000

Alberta Fish & Game Association, Operation Grassland Community: Program evaluation and stakeholder collaboration toward sustainable land management solutions for wildlife in Prairie Alberta, \$36,700

Alberta Innovates - Technology Futures, Citizen stewardship in the Beaver Hills moraine, Alberta, \$5,000

Beaverhill Bird Observatory, Beaverhill Lake stewardship, monitoring and public engagement, \$15,250

Calgary Bird Banding Society, Cypress Hill migratory and breeding landbird monitoring, \$15,000

Camrose Wildlife Stewardship Society, Camrose purple martin festival, \$3,000

Cows & Fish - Alberta Riparian Habitat Management Society, Southern Alberta Grazing School for Women - Bringing habitat and grazing stewardship to livestock producers, \$3,000

Cows & Fish - Alberta Riparian Habitat Management Society, Westslope cutthroat trout riparian habitat improvement action plans, \$18,000

Crowsnest Conservation Society, Maintaining and restoring Crowsnest River riparian areas, \$18,000

Crowsnest Pass Quad Squad Association, Salamander Creek trail realignment, \$3,000

Delta Waterfowl Foundation, ALUS demonstration projects in the County of Vermilion River and Parkland County, \$20,000

Elbow River Watershed Partnership (ERWP), Riparian Health Inventories in the Upper Elbow Watershed, \$8,000

Lac La Biche County, Lac La Biche wetland inventory and classification plan, \$8,000

Lesser Slave Lake Bird Observatory Society, Avian monitoring and

stewardship at Lesser Slave Lake, \$26,100

Mountain View County, Riparian area management improvements, \$21,000

Nature Alberta, Citizen science opportunities, \$9,000

Nature Conservancy of Canada - Alberta region, Fence markers for species survival in Southern Alberta, \$5,000

North Peace Applied Research Association (NPARA), Riparian aerial video assessment of the Whitemud River, \$6,000

Northern Alberta Institute for Technology (NAIT), Sturgeon River watershed habitat enhancement study, \$26,576

Partners in Habitat Development/ Eastern Irrigation District, Partners in Habitat Development, \$10,000

Red Deer County, Off the Creek Program 2012, \$30,000

University of Alberta, Management of earthworm invasions in Alberta, \$1,500

Weaselhead/Glenmore Park Preservation Society, Weaselhead Invasive Plant Program, \$3,000

Western Sky Land Trust Society, The Bow and Beyond riparian health project, \$10,000

Willmore Wilderness Foundation, Willmore Wilderness Park Stewardship Initiative: Increasing hunting and angling access, \$15,000

Part B: 5 Projects

Canadian Wildlife Federation/ University of Regina, Using Resource Selection Function models to inform conservation planning in Alberta's Special Areas, \$22,700

University of Alberta, Edmonton urban coyote project, \$15,854

University of Alberta, Evaluating the efficacy of setback distances as a tool for understanding critical habitat for ferruginous hawks in Alberta, \$19,800

University of Alberta, Native plant reproductive strategies and biochar

additions affect urban reclamation success in terms of ecosystem function and services, \$17,000

University of Alberta, Using wetland-dependent wildlife to monitor landscape change, \$5,270.86

**FUNDING PRIORITY #5
15 Projects**

Impacts of non-native species on persistence of native species.

Part A: 9 Projects

Alberta Innovates - Technology Futures, Citizen stewardship in the Beaver Hills moraine, Alberta, \$5,000

Castle-Crown Wilderness Coalition, Inventory mapping and removal of invasive species in the Castle, \$20,000

Crowsnest Conservation Society, Maintaining and restoring Crowsnest River riparian areas, \$18,000

Elbow River Watershed Partnership (ERWP), Riparian Health Inventories in the Upper Elbow Watershed, \$8,000

Miistakis Institute for the Rockies, Barriers and fish passage: Aquatic connectivity along Highway 3, \$13,000

Trout Unlimited Canada, Stewardship license/ Brook trout suppression project, \$1,000

University of Alberta, Management of earthworm invasions in Alberta, \$1,500

Weaselhead/Glenmore Park Preservation Society, Weaselhead Invasive Plant Program, \$3,000

Western Sky Land Trust Society, The Bow and Beyond riparian health project, \$10,000

Part B: 6 Projects

Canadian Wildlife Federation/ University of Regina, Using Resource Selection Function models to inform conservation planning in Alberta's Special Areas, \$22,700

University of Alberta, Native plant reproductive strategies and biochar

additions affect urban reclamation success in terms of ecosystem function and services, \$17,000

University of Alberta, Regeneration of the endangered whitebark pine in the northern Rocky Mountains of Alberta, \$19,250

University of Calgary, The threespine stickleback in Alberta; a candidate for eradication or protection? \$9,500

University of Lethbridge, Examining resiliency of bull trout populations to brook trout invasiveness, \$8,000

Wildlife Conservation Society Canada, Identifying habitat requirements for bats in winter, \$27,300

FUNDING PRIORITY #6 0 Projects

Improvements and innovation in matching sportsmen with landowners (e.g. facilitating hunter access to depredating waterfowl, elk and deer).

FUNDING PRIORITY #7 1 Project

Develop and validate inventory tools to determine the relative density and range of ungulate species using innovative techniques such as trail cameras or passive DNA samples.

Part B: 1 Project

University of Alberta, Human access management in central-western Alberta: implications for movement and behaviour of grizzly bears (*Ursus arctos*), \$33,050

FUNDING PRIORITY #8 0 Projects

Evaluate the effect of pesticides or herbicides on upland game birds (sharp-tailed grouse, pheasant, gray partridge) in agricultural landscapes.

FUNDING PRIORITY #9 9 Projects

Evaluate the effect of recreational access (mode, timing, duration) on wildlife & fish populations and habitat.

Part A: 3 Projects

Cows & Fish - Alberta Riparian Habitat Management Society, Westslope cutthroat trout riparian habitat improvement action plans, \$18,000

Elbow River Watershed Partnership (ERWP), Riparian Health Inventories in the Upper Elbow Watershed, \$8,000

North Peace Applied Research Association (NPARA), Riparian aerial video assessment of the Whitemud River, \$6,000

Part B: 6 Projects

Laval University, Populations demography of mountain goats in Alberta, \$14,200.00

University of Alberta, Estimating deer contact rates to design a long-term experiment for reducing CWD prevalence in Alberta, \$33,000 (actual \$8,500)

University of Alberta, Human access management in central-western Alberta: implications for movement and behaviour of grizzly bears (*Ursus arctos*), \$33,050

University of Alberta, Long-term studies and elk calf study at Ya Ha Tinda, \$25,500

University of Alberta, Using wetland-dependent wildlife to monitor landscape change, \$5,270.86

Wildlife Conservation Society Canada, Identifying habitat requirements for bats in winter, \$27,300

FUNDING PRIORITY #10 5 Projects

Investigation of methods for reducing the spread and/or impact of wildlife or fish related diseases.

Part A: 1 Project

Friends of Fish Creek Provincial Park Society, Amphibian Monitoring Program and malformation inquiry in Fish Creek Provincial Park and watershed public awareness Campaign, \$3,000

Part B: 4 Projects

University of Alberta, Edmonton urban coyote project, \$15,854

University of Alberta, Estimating deer contact rates to design a long-term experiment for reducing CWD prevalence in Alberta, \$33,000 (actual \$8,500)

University of Saskatchewan, Identifying risks, impacts, origins and movement patterns of infectious pathogens in blue-winged teal (*Anas discors*) in the Canadian prairies, \$20,500

Wildlife Conservation Society Canada, Identifying habitat requirements for bats in winter, \$27,300

FUNDING PRIORITY #11 4 Projects

Evaluate the impact of various harvest management regimes on fish or wildlife populations (e.g. fish size limits, three-point or larger elk requirements, etc.).

Part B: 4 Projects

Laval University, Populations demography of mountain goats in Alberta, \$14,200.00

University of Alberta, Estimating deer contact rates to design a long-term experiment for reducing CWD prevalence in Alberta, \$33,000.00

University of Alberta, Long-term studies and elk calf study at Ya Ha Tinda, \$25,500.00

University of Sherbrooke, Experimental management of bighorn sheep, \$9,900.00

FUNDING PRIORITY #12 0 Projects

Evaluate the social demographics of hunting and angling to determine the factors influencing the decision to become involve in hunting or angling and the reasons why people opt out in a particular year.

FUNDING PRIORITY #13 1 Project

Evaluate the effect of biological solutions of carbon sequestration on grasslands and treed lands.

Part B: 1 Project

University of Alberta, Native plant reproductive strategies and biochar additions affect urban reclamation success in terms of ecosystem function and services, \$17,000

FUNDING PRIORITY #14 0 Projects

Effects of agricultural run-off on fisheries.

NONE OF THE FUNDING PRIORITIES 5 PROJECTS

Part A: 3 Projects

Edmonton Nature Club, 2012 Snow Goose Chase, \$1,000

Ellis Bird Farm Ltd, Ellis Bird Farm video project, \$1,500

Friends of University of Alberta Devonian Botanic Gardens, The ACA Learning Dock: Outdoor Education and Wetland Ecology Youth Program, \$21,000

Part B: 2 Projects

University of Alberta, Identifying offset opportunities in Alberta: Using Canada warblers to protect passerine diversity in the boreal forest, \$16,500

Water Matters Society of Alberta, Determination of pollutant export coefficients from different landbase and landuse types to Alberta Rivers, \$13,000

Notes: The link between the project and the funding priority is taken from the application form. Projects can relate to multiple funding priorities.

Excluded as grant was not accepted: Nose Creek Watershed Partnership/Trout Unlimited Canada, Nose Creek rehabilitation project, \$3,000



101 – 9 Chippewa Road, Sherwood Park, AB T8A 6J7

Tel: 780-410-1999 • Fax: 780-464-0990

Toll Free: 1-877-969-9091

ab-conservation.com