Grants Fund Annual Report 2018/19

For the period of April 1, 2018 to March 31, 2019

Alberta Conservation Association

wildlife | fish | habitat

Alberta Conservation Association

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ACA's Mission

ACA conserves, protects and enhances fish, wildlife and habitat for Albertans to enjoy, value and use.

ACA's Vision

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

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Front Cover: *Youth learning about outdoor activity: dog sledding*
Photo: *Betina Fillion*

Relating to the project: *AJFWA Pathfinder and Trailblazer North Camp 2019 – "Come to the Real North", Alberta Junior Forest Warden Association, 002-00-90-294*

Grant Program 2018/19

KEY PROGRAM HIGHLIGHTS for the Grants 2018/19:

ACA Conservation, Community, and Education Grants received 130 funding applications requesting a total dollar value of just under $1.9 million. A total of $969,983 was allocated to 79 projects.

ACA Research Grants received 29 funding applications requesting $689,196. A total of $329,724 was allocated to 17 projects.

An evaluation was carried out on ACA's research funding (ACA Research Grants and ACA Grants in Biodiversity) deliverables. 743 publications have resulted from ACA's Research Grants programs between 1997 and 2017.

Project budgets ranged from $800 to $53,500.

Executive Summary

Funded by the province's hunters and anglers, ACA's Grants Program annually supports a variety of both small and large projects. These projects benefit Alberta's wildlife and fish populations, as well as the habitat they depend on. Operational since 2002, the ACA Grants (formerly known as the Grant Eligible Conservation Fund or GECF) as of the 2018/19 funding round has provided approximately $18 million to 1,178 projects carried out in Alberta by the conservation community. Furthermore, the funding provided by the grants continues to leverage more than five times its value in conservation dollars, estimated at approximately $104 million—money that has been directly used for conservation work and, more recently, to support the recruitment and retention of hunters, anglers, and trappers in Alberta.

These popular grant programs received 159 applications (130 to ACA Conservation, Community, and Education Grants and 29 to the ACA Research Grants) requesting just under $2.6 million in 2018/19. A total of $1.3 million was allocated to 96 projects (79 ACA Conservation, Community, and Education Grants projects and 17 ACA Research Grants projects). The aim of this report is to document the procedures for 2018/19 and to provide an overview of activities and results of projects financially supported through ACA's Grants Program in 2018/19.

Annual Report of Activities and Synopsis of Funding Recipient Projects

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 ACA's grants 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 2002/03. As of the 2018/19 funding round, the Grants program has granted approximately $18 million dollars to 1,178 projects implemented in Alberta. These projects have leveraged an estimated $104 million in conservation work across the province. After the 2018/19 project selection process, a total of $969,983 was granted to 79 ACA Conservation, Community, and Education Grants (CCEG) and $329,724 was granted to 17 ACA Research Grants (RG) projects. This document provides an overview of the activities of the CCEG and the RG for the 2018/19 funding cycle.

We have some impressive results and outreach coming in from ACA Grants-supported projects in 2018/19: approximately 4,000 youth and novices participated in fishing, archery, hunting, and trapping activities across Alberta; around 17,000 people were involved in outdoor conservation activities; and outreach activities educating Albertans about conservation-related issues is estimated as at least another 48,000 people. More than 450 teachers were trained to teach archery and programs such as Hunter Education and/or Fishing Education. At least 400 sites have been improved in collaboration with landowners and are now managed with more sustainable practices, thereby improving riparian and ecologically sensitive areas. This year, more than 700 bird or bat boxes were built and installed. Five thousand pounds of wild game were donated to the food bank. Several projects worked to improve habitat for some of Alberta's threatened species, such as Arctic grayling, westslope cutthroat trout, burrowing owls, and northern leopard frogs. The RGs continued to support several research programs looking at wildlife diseases threatening Alberta wildlife such as chronic wasting disease in deer and white-nose syndrome in bats. Two complementary projects looked at Alberta's pollinators, resulting in an unparalleled collection of bumble bees sampled across Alberta in one season, and all housed at the University of Calgary; these two projects contributed to a data set of global significance. These are just a few examples—read about all the achievements of each of the projects that received funding in 2018/19 in the Project Summaries section of this report.

Highway 2 Conservation (H2C) making bat boxes
Photo provided by: *H2C*

Relating to the project: *Alberta Bat Education and Habitat Enhancement - Highway 2 Conservation, 002-00-90-255*

The Funding Cycle

The funding priorities, guidelines, and application forms were made available to the public on Oct. 2, 2017 via the ACA website, and by email to existing contacts. Details of the 2018/19 funding cycle are in the table below:

2018/19 FUNDING CYCLE DATES

Posting of the Guidelines and Application Forms on ACA's website	October 2, 2017
Window to receive completed RG applications	November 1, 2017 – December 1, 2017
Window to receive completed CCEG applications	January 1–25, 2018
RG adjudication meeting	February 11, 2018
CCEG adjudication meeting	February 22, 2018
ACA Board approval and notification of applicants as to funding status	End of March 2018
Cooperative Project Agreements signed, initial payments made, and project work begins	From April 1, 2018
Interim reports due and second payments made (if required)	September 1, 2018
Final reports due	March 15, 2019
Projects end and final payments made (if required)	March 31, 2019

Funding Eligibility

ACA Grants (CCEG and RG) support a wide variety of applicants and project types. Anyone with a suitable project working in Alberta can apply for funding, except for ACA staff, Alberta Environment and Parks (AEP), and individuals without the proper insurance. Certain project types and budget items are not covered by the CCEG and the RG, such as land acquisition, emergency funding, or overhead costs. Since fiscal year 2009/10, funding priorities have been used by the Grants to guide applicants in drafting their applications. The seven funding priorities for the CCEG stayed the same this year. RG had one change to the 12 funding priorities: #8 was reworded. See Major Funding Priorities Grants 2018/19 on page 4 for the full list. These grants do accept applications that do not relate to the 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 documents "Project Submission Guidelines for Funding 2018–2019: ACA Conservation, Community, and Education Grants" and "Project Submission Guidelines for Funding in 2018–2019: ACA Research Grants" (these documents are available from the grants project administrator).

The CCEG 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 CCEG and RG are widely known among the conservation community working in Alberta. Applications were received from a diverse cross-section of the population including community groups, grassroots organizations, provincial and national institutes, as well as leading scientific researchers.

Major Funding Priorities Grants 2018/19

This text is taken from Section 3 of the "Project Submission Guidelines for Funding 2018-2019: ACA Conservation, Community, and Education Grants"

Funding Priorities for the Conservation, Community, and Education Grants

All applicants to the ACA Conservation, Community, and Education Grants 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 ACA Conservation, Community, and Education Grants 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, fishing docks, etc.).

   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).
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. Impacts of non-native species on the persistence of native species.
5. Improvements and innovation in matching sportsmen with landowners (e.g. facilitating hunter access to depredating waterfowl, elk and deer).
6. Projects related to the retention, recruitment and education of hunters, anglers or trappers (including attracting new mentors, training mentors and providing mentors for new hunters/anglers/trappers; sharing information in schools and with the general public about the link between conservation and hunters/anglers/trappers; this category also includes educating new hunters/anglers/trappers; 'Kids Can Catch' and archery events for kids). Generate awareness of the hunting/angling/trapping opportunities available to the public.
7. Projects related to outdoor conservation education.

Funding Priorities for ACA Research Grants

This text is taken from Section 3 of the "Project Submission Guidelines for Funding 2018-2019: ACA Research Grants"

All applicants to the ACA Research Grants 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 ACA Research Grants 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. Funding priority #8 has been replaced this year.

1. Research activities specifically listed on provincial recovery plans for Alberta's endangered species (to be done in cooperation with recovery teams).
2. Impacts of non-native species on the persistence of native species.
3. 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/eDNA samples.
4. Evaluate the effect of pesticides or herbicides on wildlife species' food availability and/or quality in agricultural landscapes.
5. Evaluate the effect of recreational access (mode, timing, duration) on wildlife and fish populations and habitat.
6. Investigation of methods for reducing the spread and/or impact of wildlife- or fish-related diseases.
7. Evaluate the impact of various harvest management regimes on fish or wildlife populations (e.g., fish size limits, three-point or larger elk requirements).
8. Investigate the human dimensions of fish and wildlife management.
9. Evaluate the effect of biological solutions of carbon sequestration on grasslands and treed lands.
10. Evaluate the effects of agricultural run-off on fisheries.
11. Evaluate approaches for improving the abundance of pollinators in agricultural landscapes.
12. Work towards clarifying status of current data deficient species.

Please refer also to the document below for research topic suggestions; however, the above funding priorities have the greatest weighting. "Research needs for fisheries and wildlife in Alberta" available on the ACA website: www.ab-conservation.com/downloads/grants/Research_Needs_Paper_by_Dr_%20Boyce.pdf

Proposal Review Process

CCEG Adjudication:

The ACA Board of Directors appointed the Adjudication Committee for the CCEG. The CCEG adjudication committee in 2018/19 consisted of seven citizens of Alberta representing the province's conservation community, one public-at-large member from the ACA Board of Directors, and two ACA staff members, and was chaired by a member of the ACA Board of Directors. Adjudicators were tasked with providing rankings and making funding recommendations for all CCEG applications based on the funding priorities and guidelines provided by ACA.

Instead of the three-tier A, B, C ranking system used to rank applications in previous years, this year CCEG moved to ranking applications with a 0–5 ranking system, as outlined below. In this system, the 4s and 5s normally all get funded, some of the 3s are funded, and 0–2 are usually not funded. Partial funding can also be assigned to applications with a high ranking if there is a padded budget or budget items that are ineligible. After the ranking, the funding level for each application was determined.

5. **Outstanding application.** Must fund. Highest priority or support. This category reserved only for truly outstanding proposals.
4. **Very good application.** Not first class, but fundable. Should be supported.
3. **Good application.** Worthy of support. Do your best to fund.
2. **Fair application.** Possibly worthy of support.
1. **Poor application.** Not worthy of support.
0. **Do not fund.** This application should not get funding.

Due to the growing volume of CCEG applications, the adjudicators were sent approximately half of the applications at random (excluding any applications for which they had obvious conflict of interest) and were asked to electronically submit their rankings ahead of the adjudication meeting. A compilation of application scores was presented at the meeting, leaving time to focus discussions on those projects with mixed rankings.

The CCEG adjudication meeting was held on February 22, 2018 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 2018 board meeting.

RG Review Process

The application deadline for the RG was earlier than that of the CCEG to allow for a rigorous academic review procedure (the same procedure tried and tested for many years by the ACA Grants in Biodiversity). All applications were sent out for review by experts in the subject of the research application. The academic review process was coordinated by the administrator of the ACA Grants in Biodiversity. 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), an industry representative, ACA's Wildlife Program Manager, ACA's Fisheries Program Manager, and the Chair of ACA's Research Adjudication Committee. Two adjudicators were assigned to review (using the application and academic reviews) and rank a selection of the applications. The RG adjudicators used a five-tiered numerical ranking system (see below), which is the same ranking scale used by the reviewers.

1. **Outstanding proposal.** Must fund. Highest priority for support. This category reserved only for truly outstanding proposals.
2. **Very good proposal.** Not first class, but fundable. Should be supported.
3. **Good proposal.** Worthy of support. Do your best to fund.
4. **Fair or poor proposal.** Possibly worthy of support.
5. **Poor proposal.** Do not fund.

Applications ranked by the adjudicators with 1 and 2 are usually all funded, those ranking a 3 are sometimes funded, and those ranking 4 and 5 are generally not funded. Funding recommendations were then made after the ranking process. The RG adjudication meeting was held on Feb. 11, 2018 at the University of Alberta.

Funding Allocations

For the 2018/19 funding cycle, a total of $1,300,000 was made available for project funding via the grants: $970,000 for CCEG and $330,000 for RG. Of the 130 applications requesting just under $1.9 million to CCEG, 79 were funded (a 61 percent success rate for applications receiving full or partial funding). Of the 79 CCEG projects funded in 2018/19, 49 (62 percent) had been funded by ACA in previous years and 30 (38 percent) were new projects.

The RG received 29 applications requesting a total of $689,196 for the 2018/19 competition. Of these, 17 were funded (a success rate of 59 percent for applications receiving full or partial funding). Eight (47 percent) of the funded research projects had been funded in previous years and the rest were new projects.

To receive an ACA grant, the grant recipient must sign the ACA Cooperative Project Agreement, which has the approved application and budget appended. The ACA Cooperative Project Agreement outlines the reporting and payment schedules and other contractual obligations between ACA and the grant recipient. Grant recipients provide two project reports: an interim report was due Sep. 1, 2018 and a final report was due Mar. 15, 2019. If the project was completed at the time of the interim report (Sep. 1), applicants could submit a final report then.

All applicants accepted the grant money and signed the ACA Cooperative Project Agreement. Two Ann and Sandy Cross Conservation Area fencing grants were merged into one project. Fourteen projects were granted extensions due to unforeseen circumstances. To be granted a project extension, grant recipients had to submit a Request for Extension Form along with their final report, so the extension could be considered. If a project received an extension, it is mentioned in the "Project status" of the Project Summaries section of this report.

Extreme by Nature Shoreline Cleanup
Photo provided by: *Environment Lethbridge*
Relating to the project: *"Extreme by Nature" Environmental Education for 11- to 15-year-olds, Helen Schuler Nature Centre, 030-00-90-240*

Synopsis of Approved Projects for 2018/19

A summary description of each of the 96 approved projects containing the project's objectives, activities, and deliverables can be found on page 11 of this report. The list below is in alphabetical order by organization for CCEG and RG.

ACA Conservation, Community, and Education Grants

Small Grants ($3,000 and under)

Alberta Hunter Education Instructors' Association (AHEIA); 15th Annual O.W.L. Day – "Outdoor Wildlife Learning"; $3,000

Alberta Hunter Education Instructors' Association; AHEIA's Outdoor Bound Mentorship Program; $3,000

Alberta Hunter Education Instructors' Association; Bighorn Sheep Hunting Essentials Course; $2,500

Alberta Hunter Education Instructors' Association; Conservation Education for the Army Cadet League of Canada – AB; $2,500

Alberta Hunter Education Instructors' Association; Mandarin Language Safety Video for AHEIA's Firearms Centres; $2,500

Alberta Hunter Education Instructors' Association; Outdoor Youth Seminar; $3,000

Alberta Hunter Education Instructors' Association; Safety Video for AHEIA's Firearms Centres; $3,000

Alberta Riparian Habitat Management Society (Cows and Fish); Grazing Schools for Women: Promoting habitat and improved grazing stewardship to livestock producers in south and central Alberta; $3,000

Big Country Rod and Gun Club; 2018 Annual Big Country Rod and Gun Club First Time Bird Hunt; $1,500

Calgary Fish & Game Association; CFGA Pheasant Crate Update; $2,948.40

Camrose Wildlife Stewardship Society; 2018 Camrose Purple Martin Festival; $1,350

Castor Fish & Game Club; Evaluation of the Parr Reservoir (Castor Creek) for Fish Stocking Suitability; $3,000

Edmonton Mallards – Junior Forest Wardens; Fall Wilderness Family Camp; $2,125

Edmonton Nature Club; 2018 Snow Goose Chase; $3,000

Edmonton Water Striders – Junior Forest Wardens; Fall Wilderness Family Camp; $2,125

Growing Great Kids Coalition; Family and Community Support Services (FCSS) Hinton; Kids Can Catch with Growing Great Kids; $3,000

Helen Schuler Nature Centre; "Extreme by Nature" Environmental Education for 11 to 15-year-olds; $3,000

Helen Schuler Nature Centre; Community Engagement in River Valley Conservation; $3,000

High River Fish & Game; Sheep River Fencing; $2,749

Highway 2 Conservation County of Barrhead; Alberta Bat Education and Habitat Enhancement; $3,000

Kneehill 4-H Multi Club; 4-H Club Archery Supplies; $2,500

Lesser Slave Watershed Council; Kids Can Catch Lesser Slave Lake Winter; $1,090

Lethbridge Fish & Game Association; Fly Tying Programs; $2,000

Onoway & District Fish & Game Association; Bird/Bat House Project; $800

Onoway & District Fish and Game Association; Salter's Lake Improvements; $2,500

Rocky View School District – Alberta; PISCES' Aquatic Project; $1,772

Safari Club International Red Deer Chapter; Red Deer, Kids Can Fish Event; $2,100

Trout Unlimited Oldman River Chapter; Fly Fishing and Conservation Program; $3,000

Warne in the Wild; American Kestrel Nest Box Program in Alberta; $3,000

Yellowhead County; Kids Can Catch Event; $2,500

Large Grants (over $3,000)

Alberta Fish & Game Association; Increasing Habitat for Species At Risk in Alberta's Grassland Region through Adaptive Management, Habitat Enhancement, and Outreach; $40,050

Alberta Fish & Game Association; Pronghorn Antelope Migration Corridor Enhancement; $36,728

Alberta Hunter Education Instructors' Association; AHEIA Teachers' Workshop; $6,000

Alberta Hunter Education Instructors' Association; AHEIA's National Archery in the Schools Program (NASP); $40,000

Alberta Hunter Education Instructors' Association; Provincial Hunting Day Initiatives; $16,500

Alberta Hunter Education Instructors' Association; Youth Hunter Education Camp (Weeks 1, 2, 3, and 4); $48,000

Alberta Hunters Sharing the Harvest; Wild Game for the Food Bank Program; $8,000

Alberta Invasive Species Council; Expansion and Promotion of the Early Detection and Distribution Mapping System (EDDMapS) Alberta; $13,175

Alberta Junior Forest Warden Association; AJFWA Pathfinder and Trailblazer North Camp 2019 – "Come to the Real North"; $4,850

Alberta Riparian Habitat Management Society (Cows and Fish); Implementing Riparian Habitat Management Improvements for Westslope Cutthroat Trout; $8,500

Alberta Trappers' Association; Trapper Education in the Schools; $15,600

Alberta Trappers' Association; Youth Camp; $10,000

Ann and Sandy Cross Conservation Area; ASCCA Wildlife-Friendly Fencing East (and North) Boundary Fencing Project; $34,478

Ann and Sandy Cross Conservation Area; ASCCA Wildlife-Friendly Fencing North Boundary Fencing Project; combined with above.

Ann and Sandy Cross Conservation Area; Outdoor Education for High Needs Schools at the ASCCA; $7,250

Beaverhill Bird Observatory; Public Engagement, Wildlife Conservation and Monitoring at Beaverhill Lake; $23,750

Bow River Trout Foundation; Bow River Policeman's Flats River Access Upgrade; $27,525

Brazeau County; Sardine Lake Dock; $7,500

Calgary Fish & Game Association; Upgrade and Expansion of Pheasant Facility; $5,000

Camrose & District Fish & Game Association; Making Pleasure Island Accessible: Angler recruitment and retention, and conservation education; $23,585

Canadian Parks and Wilderness Society (CPAWS) Southern Alberta Chapter; Connecting with Conservation: Getting kids and new Albertans outside to experience and value Alberta's wilderness; $20,000

Central Alberta Fish & Game Association (Zone 3); Bennett Pond Aeration Electrical Access Fees; $4,300

Elbow River Watershed Partnership; Streambank Restoration Project on Silvester Creek; $19,385

Ghost Watershed Alliance Society; Bioengineering Workshop in the Ghost Watershed; $10,000

H. A. Kostash School; H. A. Kostash Youth Mentorship Program; $7,700

Lacombe County; Alternative Land Use Services (ALUS); $15,000

Lamont Fish & Game Association; Trout Pond Dock System; $8,000

Lesser Slave Lake Bird Observatory Society; Avian Monitoring and Outreach Education Programs at Lesser Slave Lake; $22,750

Lethbridge Fish & Game Association; LFGA – Conservation Community and Education Project; $14,500

Mountain View County; Riparian and Ecological Enhancement Program; $25,000

Nature Alberta; Important Bird and Biodiversity Areas – Enhanced Awareness and Caretaker Support; $18,500

Nature Alberta; Living by Water; $53,500

Nature Alberta; Nature Kids Family Nature Nights and BioBlitzes across Alberta; $16,180

Northern Lights Fly Fishers Trout Unlimited Canada (TUC) Edmonton Chapter; Riparian Protection on the Raven River (2018); $31,500

Northern Lights Fly Fishers TUC Edmonton Chapter; Conserving and Restoring Arctic Grayling in the Upper Pembina River Watershed – Habitat Restoration Planning; $16,965

Partners in Habitat Development; Partners in Habitat Development; $15,000

Red Deer County; Wildlife and Native Habitat Enhancement in Red Deer County via ALUS (2018); $40,000

Safe Drinking Water Foundation; Operation Water Drop, Operation Water Pollution and Operation Water Biology Kits to be Used by Students in Alberta as Part of Field Trips/Outdoor Education; $3,145

Southern Alberta Sustainable Community Initiative (SASCI); Foothills Restoration Forum Outreach and Extension: Range Health Assessment training and Fall Information session; $8,181

Sustainability Resources; Restoration Program; $22,000

Taber Fish & Game Association; 8th Annual AFGA/ACA Youth Fishing Recruitment Day; $14,800

The King's University; Faith-Based Organizations and Conservation: Engaging volunteers in recovery plans of endangered pines; $4,933

Trout Unlimited Canada; Water Edu-kit; $11,000

Trout Unlimited Canada; East Slopes Strategic Watershed Action Team; $30,000

Trout Unlimited Canada; Yellow Fish Road; $30,000

Trout Unlimited Canada Bow River Chapter; Legacy Island – Habitat Rehabilitation; $3,500

Waterton Biosphere Reserve; Promoting Wetland Stewardship and Improving Wetland Habitat in Waterton Biosphere Reserve; $14,350

Wetaskiwin County; Wetaskiwin/Leduc Alternative Land Use Services (ALUS); $8,750

Wildlife Conservation Society Canada; Going to Bat for Bats: Citizen science in Alberta; $29,994

ACA Research Grants

Avocet Environmental Inc. (Mr. Scobie); Efficacy of Detecting Sharp-tailed Grouse Leks in Fall Surveys; $13,500

Goldstream Publishing Inc. (Dr. Simmons); Using Citizen Science to Enhance Fisheries Data Collection and Monitoring; $23,000

St. Mary's University (Dr. McLean); Evaluating Possible Vectors for the Spread of Invasive Plant *Thesium ramosum*; $9,985

STRIX Ecological Consulting (Ms. Priestley); Canada Warbler Rapid Assessment Protocol – Phase 2; $8,005

Trout Unlimited Canada (Mr. Lindsay); Discovering Didymo Distribution (D3); $8,460

University of Alberta (Dr. Wang); Cyanobacterial Blooms and Their Toxic Effects on Fish Populations; $26,000

University of Alberta (Dr. Boyce); Is Cougar *(Puma concolor)* Habitat Selection on a Reclaimed Mine Based on Prey Availability?; $20,000

University of Alberta (Dr. Merrill); Chronic Wasting Disease in Deer: Modelling transmission from contact rates; $32,400

University of British Columbia (Dr. Burton); Evaluating Camera Trap Surveys as an Effective Means of Monitoring Remote Ungulate Populations; $39,690

University of Calgary (Dr. Galpern); Wild Pollinator Conservation and Restoration in Southern Alberta Croplands IV: Pollinator community responses to prairie habitat restoration; $22,000

University of Calgary (Dr. Cartar); Biogeography of Native Bumble Bee Species in Alberta: The influence of weather; $7,473.34

University of Lethbridge (Dr. Goater); Ecological Epidemiology of Emerging *Ambystoma tigrinum* Virus (ATV) in a Population of Tiger Salamanders in Southwestern Alberta; $6,096

University of Montana (Dr. Hebblewhite); Bull Elk Recruitment, Survival, and Harvest in a Partially Migratory Elk Herd in the Ya Ha Tinda; $30,000

University of Saskatchewan (Dr. McLoughlin); Density-Dependent Habitat Selection of Feral Horses and Competition with Other Ungulates in a Changing Landscape; $30,000

University of Sherbrooke (Dr. Festa Bianchet); Evolutionarily Sustainable Management of Bighorn Sheep; $9,950

Waterton Biosphere Reserve Association (Dr. Morehouse); Optimizing Mitigation Strategies for Reducing Grizzly Bear Agriculture Conflicts; $18,000

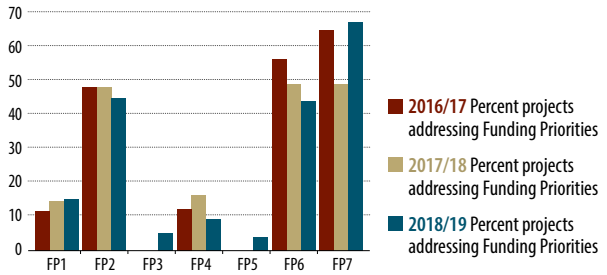
Wildlife Conservation Society Canada (Dr. Lausen); Baseline Population Monitoring and Bioenergetics of Alberta Bat Populations: Predicting risk of White-Nose Syndrome to guide conservation actions; $25,165

Grant Projects' Contribution to ACA Funding Priorities

In total, 96 projects were approved for funding in 2018/19: 79 CCEG projects and 17 RG projects. 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. Funding priorities were used to further guide and direct applicants by providing priority areas of specific interest to ACA. The funding priorities were set by ACA staff and approved by the ACA Board of Directors. As was done for the last few years, two lists of funding priorities were produced, one for the CCEG and another one for the RG. The CCEG funding priority list remained the same for 2018/19. One change was made to the RG funding priority list: #8 was reworded to *"Investigate the human dimensions of fish and wildlife management."* There is some overlap between the two lists. Applications did not have to relate to the funding priorities, but applications that address one or more of the funding priorities should 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 2018/19 contributed to ACA's funding priorities. All the CCEG funded projects indicated they related to at least one funding priority. One funded research project did not mention a link with any of the funding priorities. For a complete overview of which funded projects link to the various ACA funding priorities in 2018/19, see page 61.

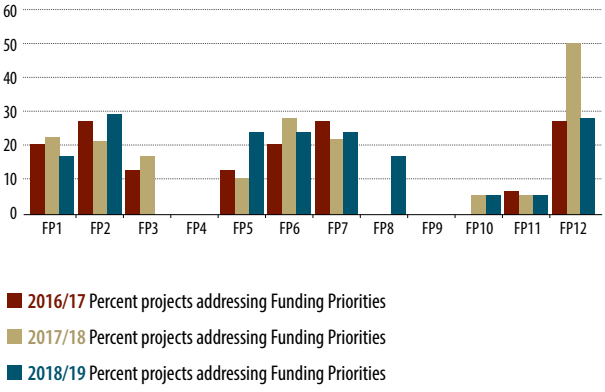
This year the three most cited CCEG funding priorities were (in order): #7 *Projects related to outdoor conservation education* (with 66 percent of projects citing this funding priority), #2 *Site specific enhancement of habitat & stewardship initiatives* (44 percent), followed by *#6 Retention and recruit and education of hunters, anglers and trappers…* (42 percent). Since the funding priorities began, the CCEG funding priority *#5 Relating to matching sportsmen with landowners* has been very rarely cited by projects; this year three projects mentioned a link with this funding priority. For an overview of how CCEG projects relate to the funding priorities, see Figure 1.

Figure 1: *Percentage of CCEG projects per Funding Priority*



The most cited RF funding priorities in 2018/19 were #2 *Impacts of non-native species on persistence of native species* and #12 *Work towards clarifying status of current data deficient species* (each with 29 percent of projects mentioning a link with these funding priorities). Funding priorities #5 *Evaluate the effect of recreational access…*, #6 *Investigation of methods for reducing the spread and/or impact of wildlife or fish related diseases*, and *#7 Evaluate the impact of various harvest management regimes on fish or wildlife populations* were mentioned by four of the 17 funded projects (24 percent). As with last year, these two funding priorities were not mentioned by any of the funded projects: #4 *Effect of pesticides/herbicides on wildlife species' food availability…*, and #9 *Effects of biological solutions on carbon sequestration….* #10 *Effects of agricultural run off on fisheries* and #11 *Evaluate approaches for improving the abundance of pollinators in agricultural landscapes* were each mentioned by one project. Funding priorities #4, #9, #10, and #11 have very rarely been addressed by projects since the introduction of the funding priorities. Funding priority #8 was reworded this year: in 2017/18 this priority was "*Evaluate the social demographics of hunting and angling to determine the factors influencing the decision to become involved in hunting or angling and the reasons why people opt out in a particular year*" and was changed to a broader "*Investigate the human dimensions of fish and wildlife management.*" This year three RG projects cited a link with funding priority #8. For an overview of how RG projects relate to the funding priorities, see Figure 2.

Figure 2: *Percentage of RG projects per Funding Priority*



Research Grants Deliverables 1997–2017

In 2018/19 ACA set up an evaluation of the impact of the RG and the ACA Grants in Biodiversity (GiB; the student research grants administered by the University of Alberta) in terms of deliverables such as publications and theses. The goal was to create an easily accessible database that summarizes and describes the research publications arising from the GiB and RG from 1997 until 2017, although the RG were part of the larger GECF from 2002/03 until 2009/10 and were only dealt with separately starting in 2010/11. Librarians at the University of Alberta were commissioned to create the database and visualizations of the results. An author index was created of all researchers and students who received a RG or GiB between 1997 and 2017. A scholarly publication index was created by searching six databases for mentions of ACA or ACA grants. The six databases used were Scopus, Web of Science, ProQuest Dissertations and Theses Global, ERA (University of Alberta research archive), Prism (University of Calgary research archive), and OPUS (University of Lethbridge research archive). The searches resulted in 1,760 publications. These results were cleaned up for duplicates and checked for alignment with grant recipient names and grant project titles; this left 743 publications which were definitely the product of ACA research grant funding. Another 254 articles mentioned ACA support of the research but could not be directly linked to a grant; these articles were not included in the dataset. A thematic category—such as herbivore, plants/habitat, microbial and so on—was assigned to each article. Below are some highlights of this database project looking at the deliverables from ACA's funding to research in Alberta from 1997–2017.

Grant Insights

Three research topics account for half of the grants awarded by GiB and RG between 1997-2017: Herbivores, Plants/Habitat, and Birds. This is both in the number of grants and the amount of money awarded over that time period.

The RGs have used 17 different funding priorities since they were introduced in 2009/10. The most-funded priorities from 2009–2017 were: as follows:

- *Research activities specifically listed on provincial recovery plans for Alberta's endangered species (to be done in cooperation with recovery teams).* (Research FP #1) – 42 grants
- *Impacts of non-native species on the persistence of native species*. (Research FP #2) – 35 grants
- *Evaluate the effect of recreational access (mode, timing, duration) on wildlife and fish populations and habitat.* (Research FP #5) – 28 grants
- *Evaluate the impact of various harvest management regimes on fish or wildlife populations*. (Research FP #7) – 27 grants
- *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.* (CCEG FP#2; was used by RG a few years ago) – 26 grants

Publication Insights

ACA-funded research has been talked about in social media and the news 2,381 times: 743 Facebook likes, shares, and comments; 1,551 tweets; and 87 news mentions.

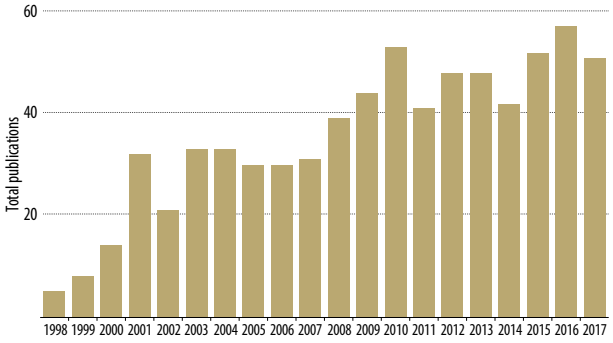
ACA-funded publications have been cited 9,868 times (as of July 31, 2018).

The journal with the highest number of ACA grant-funded publications is *PLoS ONE*, with 17 publications.

The journal with the highest number of citations for ACA-funded publications is *Animal Behaviour* (publisher: Elsevier), with 957 citations.

The journal with the highest average number of citations per ACA-funded publication is *Nature* (publisher: SpringerNature), with 262 citations.

Total publications by year for GiB and ACA RG, 1997-2017



ACA Grants Program Project Summaries

ACA Conservation, Community, and Education Grants

Increasing Habitat for Species At Risk in Alberta's Grassland Region through Adaptive Management, Habitat Enhancement, and Outreach

Alberta Fish & Game Association (AFGA)

Grant: $40,050

Project code: 030-00-90-127

Project status: Funded since 1999 as Operation Grassland Community; Completed

Project website: www.grasslandcommunity.org

Operation Grassland Community (OGC) collaborates with stakeholders across Alberta's prairie region to develop, implement, evaluate, and adapt management actions to protect and enhance wildlife habitats, and support diverse socio-economic interests. The OGC vision is a sustainable prairie landscape where communities thrive, diverse interests are balanced, and wildlife and their habitats are in abundance. The OGC's objectives are to enhance wildlife habitat through sustainable practices by addressing the proximate causes of habitat loss and degradation; this was done by implementing "new" ranch-wide monitoring and adaptive grazing management projects and assessing the 14 existing members who implemented monitoring projects in 2013 through 2018. The project collaborates with OGC members to enhance and/or increase wildlife habitats in areas of high Species At Risk (SAR)/biodiversity values and to develop and implement habitat quality indicators for focal SAR, like loggerhead shrike, burrowing owl, and/or ferruginous hawk. The project also monitors population trends in burrowing owls and loggerhead shrikes. The final project objectives are: 1) to increase awareness of the value of wildlife and their habitats, and the interrelationship between a sustainable environment and sustainable economy; 2) to increase and maintain strong connections with land managers and program partners through one-on-one/group meetings, presentations, participation in community grazing schools, stewardship councils/groups, and agricultural trade shows; and 3) to compliment the one-on-one approach with timely e-news bulletins, print materials, targeted news media, and interactive website.

Deliverables/Results:

- Addressing proximate causes of habitat loss and degradation using ranch-wide monitoring and adaptive management ("Land EKG"): two new "Land EKG projects" have been implemented and installation was completed in October 2018. All 14 ranches have been assisted on-site in this year's monitoring and data entry procedures. Because of OGC's continued support through one-on-one assistance, ranching members have expressed that they feel more confident in the application of these techniques.
- Habitat Enhancements to date include:
  - Ferruginous hawk projects a.) Completed installations of one new Artificial Nesting Structure (ANS) with assistance from ATCO Electric Alberta; b.) 10 ANS that underwent maintenance work in 2016 at Bullpound Pasture were inspected in 2018. (2017 was high fire hazard summer and fall, so inspection was deferred until 2018).
  - Two stock water (one spring improvement and one small water pipeline project) were partially completed, with final work to be completed in spring 2019. SAR suitability, particularly for Sprague's pipit breeding and foraging habitats, was the main goal. Landowners are keen to adjust grazing in support of this species.
- Data previously recorded to determine spatial and temporal differences in bird numbers as well as site specific measurement of the habitat indicators were recorded for all inspected sites in 2018. The habitat indicators assessment is underway and is expected to be completed by March 31, 2019.
- Wildlife observations were completed at all monitoring sites.
- Protect wildlife habitats through five-year voluntary stewardship agreements and renew expiring agreements: 13 new members and 20 renewals have been made to date. New members are stewards to several thousand acres of native prairie habitats.
- One Species At Risk Conservation (SARC) plan completed and delivered to a new member.
- Monitor annual trend and distribution in burrowing owls by involving OGC members in the OGC Burrowing Owl (29th) annual census (NOTE: The next loggerhead shrike census is scheduled for 2020): Burrowing owl numbers are down slightly over the 2016 and 2017 census years, indicating this population is somewhat stable, albeit at very low numbers. A good response rate was recorded.
- OGC website communications have been updated in an ongoing manner by including information on projects and updating social media links. Website update was completed in December 2018.
- Meetings/Conference: OGC staff attended two Prairie Conservation Forum meetings, Chinook Applied Research Association workshop, two watershed council meetings (Oldman Watershed Council AGM and Milk River Watershed Council Canada), Calgary Stampede Cattle Trail exhibit (90–95,000 attendees), and the Medicine Hat Stampede. Educational materials were shared with many rural and urban attendees. The Medicine Hat Pen Show resumed in December 2018 and OGC attended the tradeshow and set up an information venue.

Pronghorn Antelope Migration Corridor Enhancement

Alberta Fish & Game Association (AFGA)

Grant: $36,728

Project code: 030-00-90-160

Project status: Funded since 2009/10; Completed

Project website: www.afga.org/antelope-corridor-enhancement

Migratory corridors are important in ensuring pronghorn remain at sustainable populations. Fences create great difficulties for pronghorn as they are unwilling to jump over them. Traditional barbed wire fences' lower strands are generally very low so that crawling under often results in serious scrapes that can significantly impact the antelope's health. Page wire fencing is also present which does not allow any passage of pronghorn. This project will, in the case of barbed wire fencing, 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. Where page wire fencing is encountered the entire fence will be replaced, again with a smooth wire lower strand at the appropriate height. The project goal was to remove the bottom strand of wire in select locations along fence line and add a fourth smooth wire to the bottom of the barbed wire fence in a prime pronghorn migration corridor as identified by ACA. Bottom wire was set at 18-inch height to facilitate easier movement of pronghorn through fence. The main activities were: to identify antelope migratory corridor pinch points, to identify landholders willing to participate, to organize and orient work crews, and to stage the event making sure that all necessary materials were onsite.

Deliverables/Results:

- This year's wildlife-friendly fencing work was carried out at the following locations: Silver Sage Conservation Properties (July 18 to 22, 2018); Howe Ranching/Laqua Ranching (July 13 to 15 and Aug. 17 to 19, 2018) and Onefour Heritage Rangeland (Sep. 12 to 16, 2018).
- Smooth wire installed: 41.8 km
- Barbed wire manipulated to wildlife-friendly standards: 148 km
- Page wire removed: 0.8 km
- Total length of wire reconfigured to enhance antelope migration:190.7 km

15th Annual O.W.L. Day – "Outdoor Wildlife Learning"

Alberta Hunter Education Instructors' Association (AHEIA)

Grant: $3,000

Project code: 002-00-90-223

Project status: Funded since 2014/15 and previously by ACA Recruitment and Retention fund; Completed

Project website: www.aheia.com

The 15th Annual O.W.L. Day was a full one-day workshop held at the Calgary Firearms Centre complete with only hands-on experiences. AHEIA's O.W.L. Day focuses on youth, with kids aged 6 to 12 in one group and students aged 13 to 20 in another group. O.W.L Day was scheduled to be held in October but was moved up to May 5, 2018 due to inclement weather in the past. Once again, the day proved to be a success with 83 participants attending. There were 20 mentors/instructors who participated in giving instruction and assistance. Activities on offer included: shotgun target shooting, skeet shooting, pellet gun target shooting, waterfowl simulator experiences, how to use blinds, decoys, and scents, etc., and safety in the field. O.W.L Day is an innovative way to target a specific audience who effectively form the stewards of our resources tomorrow. It is a unique opportunity to recruit future hunters. O.W.L. Day is broadly supported by the conservation community and by hundreds of parents who represent a significant force in perpetuating conservation education in Alberta. Most youth attend the event with one or both parents. Very few programs exist to attract elementary school-aged youth to the cause of conservation education. This one-day hands-on session sparks their interest.

Deliverables/Results:

- The event was held May 5, 2018 at the Calgary Firearms Centre with 83 youth participants and 20 mentors/instructors.

AHEIA Teachers' Workshop

Alberta Hunter Education Instructors' Association (AHEIA)

Grant: $6,000

Project code: 002-00-90-248

Project status: Funded in 2016/17 and 2017/18; Completed

AHEIA's Teachers' Workshop encourages those currently involved in Alberta hunting activities to increase their depth of knowledge by offering an all-in-one weekend package to receive certification as an Alberta Conservation and Hunter Education Instructor, Alberta Fishing Education Program Instructor, and the optional International Bowhunter Education Program Instructor. Through a series of workshops, teachers also received training in the following programs: Survival and Camping, Shooting, Compass, Fishing, Archery, and Boat Safety.

Deliverables/Results:

- The Teachers' Workshop was conducted from July 20 to 23, 2018 with six full-time participants completing all the program certifications. Numbers were fewer than expected and down from other years. The reason isn't clear, however AHEIA expect numbers to go back to normal next year given that this course is required to teach the Natural Resource Course – Wildlife Program.

AHEIA's National Archery in the Schools Program (NASP)

Alberta Hunter Education Instructors' Association (AHEIA)

Grant: $40,000

Project code: 002-00-90-239

Project status: Funded in 2015/16, 2016/17 and 2018/19 and by ACA Recruitment and Retention fund; Completed

Project website: www.aheia.com/nasp

AHEIA's National Archery in the Schools Program (NASP) continues to promote instruction in international style target archery as part of the in-school curriculum, the CTS Wildlife Strand, for Grades 4 to 12. This has been facilitated by training schoolteachers who are certified Conservation Education Instructors to deliver the NASP program in their school. AHEIA also encourages participation in the Provincial and National NASP Tournaments sponsored and delivered by AHEIA staff and volunteers. The training sessions have thus opened a whole new audience to archery. The introduction of these training courses is proving to be a gateway to additional recruitment opportunities in hunting and fishing certificate programs offered by AHEIA. AHEIA's NASP program has become the fastest growing element in Conservation Education in North America. AHEIA is very encouraged by the increase in interest; spin-off results of that enthusiasm have carried over to the other programs as a result. Archery is definitely a gateway to outdoor education, especially the pursuit of hunting.

Deliverables/Results:

- In 2018, 26 new schools were added to the roster of Alberta schools delivering the NASP program, bringing the total up to 401 Alberta schools delivering the NASP program at the end of 2018. 26 schools received either equipment or grants to purchase NASP archery equipment.
- 469 new teachers were trained in delivering the NASP program, bringing the total up to 1,712 Alberta teachers trained in NASP delivery.
- 2,000 youth were registered, representing 88 schools from four provinces, for the NASP National Tournament held in Edmonton in 2018.
- 1,600 youth were registered, representing 64 Alberta schools for the NASP Provincial Tournament held in Drayton Valley in 2018.
- 28,000 students have participated in the NASP program, indicating the far-reaching positive effects of the program.

AHEIA's Outdoor Bound Mentorship Program

Alberta Hunter Education Instructors' Association (AHEIA)

Grant: $3,000

Project code: 002-00-90-222

Project status: Funded since 2014/15 and byby ACA Recruitment and Retention fund; Completed

The "Outdoor Bound!" program creates a series of opportunities for youth and adults to participate in a formalized wilderness mentorship program that provides a greater understanding and respect for wildlife and wild places. This mentorship program focused on interpersonal support and growth, guidance, material exchange, sharing of wisdom and experience, coaching, and role modelling. The Outdoor Bound Mentorship Program provided mentorship for 452 youth and novice participants; 256 mentors provided this great learning opportunity over 1,672 hunt days in total during fall 2018. Mentors spent time mentoring these youth and novice hunters and anglers in the field, giving them a great start in their future hunting and angling pursuits.

Deliverables/Results:

- This year the program had 452 participants, 256 mentors, and 1,672 hunt days.

Bighorn Sheep Hunting Essentials Course

Alberta Hunter Education Instructors' Association (AHEIA)

Grant: $2,500

Project code: 002-00-90-295

Project status: New; Completed

Project website: www.aheia.com/alberta_hunter_training

This project was the development and implementation of an online Sheep Hunter Education Course available to all potential and experienced hunters to teach and train them how to have a safe, enjoyable, and successful sheep hunt. Additionally, the objectives were to ensure that course graduates can identify what a legal ram looks like from different viewing angles and conditions in an effort to reduce the number of "short sheep" mistakenly harvested. Substantial course content was directed at helping people identify a mature ram. The course profiles herd benefits of harvesting mature rams versus younger rams. The course covers all aspects of the sheep hunt from preparation and planning before the hunt, equipment necessary for the hunt, safety considerations, tips and techniques, and other aspects specific to sheep hunting which distinguishes sheep hunting from other types of big game hunting.

Deliverables/Results:

- The course is completed and launched as of February 2019.

Conservation Education for the Army Cadet League of Canada – AB

Alberta Hunter Education Instructors' Association (AHEIA)

Grant: $2,500

Project code: 002-00-90-213

Project status: Funded in 2016/17 and 2018/19; Completed

Project website: www.aheia.com

This program was launched to determine the interest and feasibility for the Army Cadet League to send their students to AHEIA facilities in Edmonton, Calgary, and Alford Lake for Conservation Education courses. The program was coordinated through the Governor of the Army Cadet League of Canada and the Brigadier General responsible for Army Cadets. Since the inception of the program, over 3,000 Army Cadets in Alberta have been given courses and some $313,000 in funding has been committed to enable their participation. Recruitment and development of these cadets not only expands the audience but opens new doors of experience for future Canadian military students. This was achieved by providing the Army Cadets with the following courses: Conservation and Hunter Education, Canadian Firearms Safety, Alberta Fishing Education Program, and Outdoor Camp Program.

Deliverables/Results:

- In 2018/19, 36 military cadets were trained in all aspects of the Hunter Education Course, the Fishing Education Course, and the Firearms Safety Course.

Mandarin Language Safety Video for AHEIA's Firearms Centres

Alberta Hunter Education Instructors' Association (AHEIA)

Grant: $2,500

Project code: 002-00-90-287

Project status: New; Extended until July 31, 2019

Project website: www.aheia.com

AHEIA holds major competitions with registered targets each year, as well as several less competitive "Fun Shoots," a Women's League, a Youth League, and many other events open to the public free-of-charge to introduce them to shooting activities in a safe and fun environment. Due to the greatly increasing numbers of Mandarin speakers using both the Calgary Firearms Centre and the Alford Lake Conservation Education Centre for Excellence, AHEIA has seen the need to provide their safety video in the Mandarin language. The project is to produce and translate a short seven to ten-minute video into the Mandarin language informing visitors of all the safety features and safety protocol of the Firearms Centres.

Deliverables/Results:

- A professional seven- to ten-minute safety video with narration in the Mandarin language.

Outdoor Youth Seminar

Alberta Hunter Education Instructors' Association (AHEIA)

Grant: $3,000

Project code: 002-00-90-215

Project status: Funded since 2014/15 and by ACA Recruitment and Retention fund; Completed

Project website: www.aheia.com/youthprograms

The Outdoor Youth Seminar (OYS) took place Aug. 17 to 19, 2018 at the Alford Lake Conservation Education Centre for Excellence. It was very well attended with 105 youth participants in the program, 32 volunteer instructors, and six AHEIA staff. This was the 16th annual OYS, providing a fun-filled weekend of learning for young outdoor enthusiasts and parents/guardians. It was designed to help young people develop basic skills that will help them use the outdoors with confidence. At the seminar, the youth practiced archery, shooting, map and compass, survival skills, wildlife identification, and fishing—to name a few of the sessions available. This project mobilized a large workforce of volunteer coaches, mentors, and instructors. It also acts as an important gateway of introduction into certificate conservation education programs. Large numbers of adults, parents, and supervisors attended and received a positive first-time introduction into the realm of conservation education. The project concluded with a giant pig-roast and a celebration around the two days of learning that took place.

Deliverables/Results:

- There were 105 program participants with 32 volunteer instructors and six staff at the two-day seminar (Aug. 17 to 19, 2018). It remains a popular two-day camp for youth. The students really enjoyed their time learning and improving new skills, such as archery, shooting, map and compass skills, survival skills, wildlife identification, fishing, and other outdoor skills, and left the seminar with a positive attitude toward hunting and the related activities conducted at the camp.

Provincial Hunting Day Initiatives

Alberta Hunter Education Instructors' Association (AHEIA)

Grant: $16,500

Project code: 030-00-90-245

Project status: Funded since 2014/15 and by ACA Recruitment and Retention fund; Completed

Project website: www.aheia.com

The fourth Saturday of September has been designated as Provincial Hunting Day by the Alberta Government. This year marked the 12th anniversary and was an opportunity to remind and involve Albertans in our hunting heritage and the importance of securing a future for wildlife and wild places within Alberta. On this day, Albertans are encouraged to introduce a new person to outdoor sports such as hunting, fishing, trapping, shooting, or archery. Provincial Hunting Day was Sept. 22, 2018. AHEIA hosted events at the Alford Lake Conservation Education Centre for Excellence near Caroline, Alberta and numerous smaller-scale experiences province-wide. Albertans of all ages were invited to try their hand at fishing, target archery, bow hunting, crossbow, firearm basics with handguns, rifles, and shotguns, and much more. These AHEIA events were completely free of charge and were open to Albertans of all ages.

Deliverables/Results:

- Approximately 300 participants, mentors, coaches, volunteers, and staff joined the various education sessions.
- Numerous notifications were posted with various media as well as posted to AHEIA's social media feeds on Facebook, Twitter, and Instagram to publicize the event before, during, and after. Numerous media were invited to participate, and these events received positive media coverage.

Safety Video for AHEIA's Firearms Centres

Alberta Hunter Education Instructors' Association (AHEIA)

Grant: $3,000

Project code: 002-00-90-286

Project status: New; Extended until July 31, 2019

Project website: www.aheia.com

AHEIA holds major competitions with registered targets each year, as well as several less competitive "Fun Shoots," a Women's League, a Youth League, and many other events open to the public free of charge to introduce them to shooting activities in a safe and fun environment. Due to the large number of users who come to both the Calgary Firearms Centre and the Alford Lake Conservation Education Centre for Excellence, AHEIA has seen the need to update and professionalize their current safety video. The project is to produce a short seven to ten-minute video that informs visitors of all the safety features and safety protocol to the Firearms Centres.

Deliverables/Results:

- The project was delayed, as additional footage was required in summer conditions to produce a high-quality video.
- A professional seven to ten-minute safety video to be shown to all newcomers and as a refresher for repeat visitors to the Firearms Centres.

Youth Hunter Education Camp (Weeks 1, 2, 3, and 4)

Alberta Hunter Education Instructors' Association (AHEIA)

Grant: $48,000

Project code: 002-00-90-224

Project status: Funded since 2014/15 and by ACA Recruitment and Retention fund; Completed

Project website: www.aheia.com/youthprograms

The Outdoor Youth Camps are an amazing opportunity for young people to leave their urban lifestyles for a week to experience "roughing it in the bush," all conducted in a safe, supervised, educational, yet fun and challenging program. The popularity of the camps attests to how much youth enjoy this opportunity to be in the natural habitat of Alberta's wildlife and waterfowl. The four Youth Hunter Education Camps were each six days in length, having evolved from a single week camp years ago. These camps filled months before they started and continue to increase in popularity. Even the volunteers submitted their applications early so they wouldn't miss out on the opportunity to assist at these well-received camps. Conservation Education instructors and volunteers shared their knowledge and provided instruction in the Alberta Conservation and Hunter Education Program, the Canadian Firearms Safety Course, the Canadian Boating Safety Course, and several other outdoor pursuits and shooting/fishing/water safety activities.

Deliverables/Results:

- Four Youth Hunter Education Camps had 190 campers, 73 volunteers, and 29 staff were held from July 1 to 27, 2018 at AHEIA's Alford Lake Conservation Education Centre for Excellence near Caroline, Alberta.

Wild Game for the Food Bank Program

Alberta Hunters Sharing the Harvest

Grant: $8,000

Project code: 030-00-90-255

Project status: Funded 2002/03, 2003/04, 2008/09, 2009/10, 2015/16, 2017/18, and 2018/19; Completed

Project website: www.edmontonsfoodbank.com/about/programs/alberta-hunters-sharing-harvest

The Wild Game for the Food Bank project's primary objective is to provide a high-quality food source to those in need. It does this by encouraging hunters to participate by harvesting deer, moose, or elk in dozens of wildlife management units including several where control is needed to reduce crop and habitat damage. Hunters are specifically asked to donate game not only taken with their general tags, but to also fill supplemental tags issued in high density game areas. This program has expanded over the years to include several of those areas through consultation with AEP. The program runs through each hunting season and the project activities include notifying hunters about the program and then administering the program with the Edmonton and Calgary Food Banks and the various meat processors. The program deliverables are threefold: 1) those in need get fed; 2) it is a very positive program for hunters to show up strong in supporting those most vulnerable in the community; and 3) it encourages hunters to harvest game to meet AEP's harvest goals. This was the 22nd year of this successful program that has provided the protein portion for over a half million meals to those in need. This season almost 5,000 pounds of high-quality wild game was donated to this program.

Deliverables/Results:

- The main result from the project is that the hunting community, including ACA, generously participated in supporting this project with another successful season providing a very valuable food source to help the food banks feed Albertans. It is estimated that approximately 5,000 pounds of wild meat was donated this season.

Expansion and Promotion of the Early Detection and Distribution Mapping System (EDDMapS) Alberta

Alberta Invasive Species Council (AISC)

Grant: $13,175

Project code: 015-00-90-266

Project status: New; Completed

Project website: www.abinvasives.ca/invasive-species/eddmaps-alberta and www.eddmaps.org/alberta

The EDDMapS Alberta platform is an invasive species tracking and reporting system that currently tracks 153 invasive species, including terrestrial plants, aquatic plants, and aquatic pests and pathogens in Alberta. The objective to increase the number of invasive species reports and number of users on EDDMapS Alberta was accomplished, as there were 2,378 reports submitted to EDDMapS Alberta in 2018. The EDDMapS Alberta app was downloaded by 3,166 cell phone users. The Executive Director of the Alberta Invasive Species Council (AISC) delivered presentations or had a display booth at more than 20 meetings and events throughout the province in 2018 to promote the education and awareness of invasive species reporting using EDDMapS Alberta. Additionally, EDDMapS Alberta was promoted through AISC's

electronic newsletters and social media. Each time a submission is made to EDDMapS Alberta, the report goes through a verification process. After the report is verified, the map for that particular species is enhanced, and the pertinent legislated authority is notified of the infestation by the AISC.

Deliverables/Results:

- The EDDMapS Alberta app was downloaded by 2,958 iphone users, and 208 Android cell phone users. There were 2,378 reports submitted to EDDMapS Alberta in 2018 and there are currently 5,890 reports in the system.
- A draft communication strategy was created in collaboration with the Invasive Species Centre.
- The Executive Director created a training PowerPoint presentation and delivered it at more than five meetings and events.
- An EDDMapS Alberta business card was created and handed out at meetings, tradeshows, conferences, and other events. EDDMapS Alberta social media posts are being delivered on a frequent and ongoing basis.

AJFWA Pathfinder and Trailblazer North Camp 2019 – "Come to the Real North"

Alberta Junior Forest Warden Association (AJFWA)

Grant: $4,850

Project code: 002-00-90-294

Project status: New; Completed

Project website: www.ajfwa.ca

The Alberta Junior Forest Warden Association (AJFWA) hosts two winter programs for the Pathfinder/Trailblazer age groups each year which introduces the younger members to the joys of being outside and learning new wilderness skills. AJFWA aims to create an environment where families can come together and learn about the outdoors in a fun way while meeting and socializing with other like-minded families from other parts of the province. The Pathfinder and Trailblazer North Camp had 91 registered participants with one family cancelling due to illness and two families cancelling due to weather conditions. Even with the cancellations, 90 people (registered participants and instructors) attended and helped run this program which took place the weekend of February 1 to 3, 2019 at Bear Lake Bible Camp located just north of Sexsmith, Alberta. The winter weather was very cold; however, the participants still managed to spend the majority of the weekend out in nature learning skills such as snowshoeing, making and setting snares, shelter building, wood carving and proper care of blades, outdoor cooking and fire starting, learning about ice safety, and making ice fishing rods and ice picks. Saturday evening ended with fireworks on the lake followed by some quiet time indoors. Sunday morning's highlight included a visit from local dog sled teams which took us all on a trip around the lake after we learned about the dog sledding sport. The weekend overall was an excellent experience for all those who attended. In addition to learning numerous winter skills, parents also spent a weekend away from tech with their children and the children met other like-minded children from different areas of the province. Families came from as far away as Calgary to spend the weekend in the north. This was the first time an event such as this was hosted in the north and AJFWA was extremely pleased with the turnout.

Deliverables/Results:

- This project introduced AJFWA younger members and their parents to the type of activities Junior Forest Wardens partake in on a regular basis, for example:
  - 70 wardens participated in shelter building,
  - 70 wardens participated in snowshoeing,
  - 70 wardens trained in setting traps,
  - 80 wardens trained in knife safety and carving,
  - 10 adults trained in building fire starters,
  - 10 adults trained in blade maintenance,
  - 80 wardens made pop can stoves, and
  - 80 wardens made ice picks and ice fishing rods.
- The people who attended take their positive experience back to their local clubs and this encourages similar events to be held locally, although on a smaller scale perhaps. Based on positive feedback received, the event organizers believe that the majority of these individuals will be back for next year's winter campout.

Grazing Schools for Women: Promoting habitat and improved grazing stewardship to livestock producers in south and central Alberta

Alberta Riparian Habitat Management Society – Cows and Fish

Grant: $3,000

Project code: 020-00-90-165

Project status: Funded 2011/12-2015/16, 2017/18 and 2018/19; Completed

Project website: www.cowsandfish.org

The initial success of the Original Grazing School for Women (GSW), now in its 16th year, spawned the Southern Alberta Grazing School for Women (SAGSW), now in its 15th year. The two school committees developed agendas that resulted in a positive learning experience for the women who attended. The GSW was held mid-June in the Two Hills area, while the SAGSW was held in late July at Stavely. Using a well-tested and proven approach, Cows and Fish delivered the school to 92 registrants, primarily livestock managers and landowners, to build core skills and knowledge to support these women's ability to manage lands and livestock most effectively. The schools included presentations and hands-on, outdoor activities, including plant identification, health assessments on range and riparian lands, and grazing management strategies. Both schools incorporated talks by ranching/farming women to share practical, real-world experiences. The school successfully impacted grazing management, with 80 percent of respondents from the two schools indicating that the school will influence their grazing management, and 100 percent of participants from the SAGSW planning to make use of what they learned.

The project's first objective—to 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—has been met, as seen by the many practices that attendees learned about and plan to incorporate. The second objective—to have at least 75 percent 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—has also been met. 98 percent of respondents from the SAGSW listed at least one new thing they had learned.

Deliverables/Results:

- Both schools, each held over two days, had very good attendance (92 registrants) plus 23 committee members and 14 speakers, and high impact with 80 percent indicating that the schools will influence their grazing management.
- In addition, Cows and Fish asked the women attending if they had attended in the past, and if they had implemented changes since attending previously. Of the 37 who had attended previously, 86 percent had implemented changes! This is very positive—not only do participants say they will make changes, but changes have been occurring.
- Blogs and articles written:
  - Oldman Watershed Council Blog: Grazing Schools for Women Deliver More Than Technology. Dec. 20, 2018. www.oldmanwatershed.ca/blog-posts/2018/12/19/grazing-schools-for-women-deliver-more-than-technology
  - Cows and Fish Winter 2018 Newsletter: "Grazing School for Women – About More Than Just Cows!" www.cowsandfish.org/publications/newsletters.html
  - Vermilion Voice, June 4, 2018. "A Grazing School for Women: Multi-tasking Farm and Ranch Style!"

Implementing Riparian Habitat Management Improvements for Westslope Cutthroat Trout

Alberta Riparian Habitat Management Society – Cows and Fish

Grant: $8,500

Project code: 020-00-90-167

Project status: Funded 2011/12, 2015/16 and 2017/18; Completed

Project website: www.cowsandfish.org

This project promoted stewardship and supported site-specific enhancements to improve overall riparian habitat and sport-fishery habitat, focused on areas with westslope cutthroat trout populations (WSCT). In Alberta, WSCT are listed as threatened, and Cows and Fish is working to address impacts to this important sport species which are identified in the Recovery Plan. The Recovery Plan clearly indicates that a combination of impacts has led to habitat degradation and loss and cumulative impacts, including those related to riparian areas disturbance and stream bank structure. Specifically, the WSCT threats that this work aims to reduce are sedimentation and habitat loss and degradation resulting from off-highway vehicles (OHVs), linear disturbance, and poorly managed grazing in riparian areas. By working with the relevant stakeholders, Cows and Fish helps support changes that match Recovery Plan priorities: minimize stream bank erosion and sedimentation; manage grazing timing and use; reduce OHV use of non-designated trails; maintain riparian vegetation; and generally address habitat loss through improved management of human activities and land uses. This included identifying priority areas with expert and stakeholder input and developing site specific plans to address riparian habitat issues and threats. As part of the hands-on volunteer involvement, Stakeholder Workshop (planning), newsletter, online education, and in-person interactions, Cows and Fish has helped engender more knowledgeable stakeholders and encourage stewardship efforts. Finally, the project objective to implement changes that improve riparian areas and WSCT habitat has been met, with improvements implemented at six sites.

Deliverables/Results:

- Riparian site recommended enhancement and improvement plans: Riparian health monitoring information was collected at three sites and also some photos at the restoration planting sites associated with these locations (planted in 2017). Photos of previously restored areas were also captured as part of the monitoring process.
- Riparian management changes and habitat improvements: This project has supported habitat improvements and the recovery of habitat of WSCT at six locations, with active restoration completed including rough-and-loose soil techniques, live staking of willow cuttings, some live pole drains/fascines, and a live silt fence. Cows and Fish assisted at several sites with planting in partnership with other organizations, including Silvester and Girardi Creek; signage at Allison and Smith Creeks was not approved. After the installation of a bridge that previously washed out, live willow staking of 349 willows was completed at Pasque Creek and rough-and-loose soil techniques on a large area was completed along O'Haggen Creek. Approval for this project on O'Haggen Creek was acquired late in the year, and rough-and-loose work was completed; planting will be completed next year. Work to deter cattle use at North Lost Creek was adjacent to and associated with an OHV ford that is recovering.
- Riparian site enhancement and improvement summaries: Each site will have a summary completed, including partner or volunteer involvement, actions, and photographic monitoring. Summaries of the site details have been written for three sites. Baseline riparian health information was collected at one of the sites prior to restoration work (Pasque Creek). Riparian health data collected at the other two sites was done after the restoration work had been completed. Successful regeneration was noted at the South Racehorse Creek site (from planting in 2017). Restoration work at the third site, Silvester Creek, occurred in 2014 and again, adding to the past work and expanding the area, in 2018. As part of the restoration in 2014, brush layering and willow plantings were done and were successfully growing during the riparian health inventory completed in 2018.
- Stakeholder workshop: The workshop was held March 15, 2019. 70 people registered for this event.

Trapper Education in the Schools

Alberta Trappers' Association (ATA)

Grant: $15,600

Project code: 002-00-90-288

Project status: New; Completed

Project website: www.albertatrappers.com

The primary objective of this project is to educate youth on the historical and current importance of the trapping industry. Alberta Trappers' Association's (ATA's) presentations focused on the topics of fur trading, trapping today, and animal damage control, as well as animal habitat and how that has changed over the years. ATA's presentations were used in several schools to enhance their current Grade 4 curriculum on the history of the fur industry. ATA spoke to students, teachers, and other members of the public who were interested in attending about the important role trapping pays in maintaining animal habitat balance and conservation in general. In order to achieve the primary objective, ATA increased their educational tools, including fur kits for school use, as well as sending staff and instructors to schools to do live presentations for students and the general public. Educating our youth is imperative to ensuring the future of conservation in our province. This is achieved by teaching youth the impact that trapping has on conservation of the wildlife population and the importance of the fur industry.

Deliverables/Results:

- Updated and new fur kits were used in 15 locations in Alberta and ATA staff and/or instructors did presentations in 16 locations, with an average of 106 people per presentation.

Youth Camp

Alberta Trappers' Association (ATA)

Grant: $10,000

Project code: 002-00-90-252

Project status: New; Completed

Project website: www.albertatrappers.com

The 2018 Alberta Trappers' Association (ATA) youth camp was attended by 50 very enthusiastic youth between the ages of 12 and 17. These youth, some of whom have never attended such a camp, were able to develop skills, engage in survival building activities, and learn about the benefits of the trapping industry. Level One, with 29 youth participants, covered safety, modern trapping, lures, fire and tinder, reading signs in the bush, survival tips, and trap line stories. The children in attendance left this introductory level program feeling confident in their new skills and excited about all that they had experienced. Level Two, with 21 youth, covered a review of level one, setting and handling traps and snares, ethical responsibility, fur handling, using a small knife, and setting up a simple bush camp. The youth in attendance took pride in their ability to assist the Level One youth as well as leaving this camp with yet more experience. ATA looks forward to having many of these youth attend the 2019 youth camp, where they will move up to the next level and welcome a new group of children into Level One.

Deliverables/Results:

- ATA youth camps were offered at two locations, Alford Lake and Marten Lake, both of which were well attended. In 2019, ATA hopes to offer a youth camp at a third location.
- Both camps were very well attended and had children aged 12 to 17 from all walks of life come together to learn about the trapping industry and survival in the bush. These children left with their confidence boosted and looking forward to the next year's camps.

ASCCA Wildlife-Friendly Fencing East and North Boundary Fencing Project

Ann & Sandy Cross Conservation Area (ASCCA)

Grant: $34,478

Project code: 015-00-90-268

Project status: Funded from 2012-13–2015/16; Completed

Project website: www.crossconservation.org

The Ann & Sandy Cross Conservation Area (ASCCA), 4,800 ac of aspen forests and rolling foothills, exists as vital habitat for native species. A major strategy for keeping wildlife safe is the existence of well-maintained wildlife-friendly fencing to serve as the area's boundary lines. On an ongoing basis, ASCCA has worked to install wildlife-friendly fencing wherever fencing is required and has been proactive in repairing damaged fencing as needed. Wildlife-friendly fencing greatly decreases the likelihood of wildlife injuries or fatalities caused by fences. The goal of this project was to replace 2.8 km of fencing on the east boundary (sections 16 and 9) and 1.2 km of fencing on the north boundary (section 16) with four strand wildlife-friendly fencing.

Deliverables/Results:

- The main outcome of this project was the successful installation of new wildlife-friendly boundary fencing. ASCCA was able to save on the costs of fencing by purchasing the materials themselves instead of having the contractor supply them.
- Completed removal of about four km of old fence and posts, clearing the fencing line and hauling away old material.
- Approximately four km of four strand wildlife-friendly fencing were installed on or before Oct. 31, 2018.
- ASCCA provided an opportunity for 25 employees from Pembina Pipeline, who have supported the education programs over the past several years, to volunteer to take down old fencing. Ten existing ASCCA volunteers also assisted in taking down old fencing.

Outdoor Education for High Needs Schools at the ASCCA

Ann & Sandy Cross Conservation Area (ASCCA)

Grant: $7,250

Project code: 002-00-90-293

Project status: New; Completed

Project website: www.crossconservation.org/education-participants

ASCCA's goal with this project was to provide experiential outdoor conservation programs to high needs schools through covering the costs of transportation (bussing) to bring students from these schools to the ASCCA. The schools impacted by this project would not have been able to participate in these programs otherwise, due to financial constraints. ASCCA contacted the Calgary Board of Education, Calgary Catholic School District, and Foothills and Rocky View School Boards to inform them that ASCCA could offer programs at the ASCCA where bussing would be covered for schools that have financial constraints (high needs). Schools in that category were contacted by their boards, informing them of the opportunity. Over 15 schools responded with their interest, but some were limited by schedules and timing. Ultimately, this project allowed over 800 students from 11 high needs schools to attend conservation education programs at the ASCCA. Nine schools from Calgary were able to attend, as well as two schools from Airdrie. In addition, funding from ACA allowed ASCCA to purchase new program supplies that will be used to enhance and expand their programs. This project has aligned with the overall goal to allow students to experience the benefits of learning in a natural classroom, regardless of their background and challenges or obstacles they may face.

Deliverables/Results:

- Bussing was provided to 11 schools with over 800 students attending. Covering the costs of transportation for these high-needs schools allowed 30 classes to experience hands-on, curriculum-based conservation programming in the natural environment of the ASCCA.
- Due to extreme weather in February, some programs were cancelled; however, all the cancelled programs were rescheduled.
- Feedback from program participants will help further refine and develop these outdoor education programs. The following quotations were gathered that support the need for conservation programs for high needs schools:
  - "It was an amazing day! So great for kids to be outdoors."
  - "I enjoyed that the program was very hands-on learning for the class."
  - "Covered so many curricular content; lots of variations of activities."
  - "Had a variety of activities—very active exploration. You were very flexible in the programming."
  - "Great job! Keep it up! Thank you for your dedication, knowledge and patience with our students."
- An article was submitted to a local newspaper, the High Country News (February 2019 issue), to demonstrate the impact of conservation learning in our community. This same article was included in the ASCCA Winter Newsletter. A thank you article acknowledging ACA support appeared in the January 2019 issue of the High Country News.

Public Engagement, Wildlife Conservation and Monitoring at Beaverhill Lake

Beaverhill Bird Observatory (BBO)

Grant: $23,750

Project code: 030-00-90-124

Project status: Funded since 2006/07; Completed

Project website: www.beaverhillbirds.com

This project continued the Beaverhill Bird Observatory's (BBO's) stewardship of the Beaverhill Natural Area, an internationally recognized wildlife area. The BBO engaged the public about the threat of climate change, the importance of Beaverhill Lake and wildlife and natural areas in Alberta, and continued their long-term monitoring of wildlife while expanding their wildlife conservation activities. Project objectives were met through habitat enhancement initiatives, increasing the public's access to nature and hunting opportunities, hosting events, and other initiatives. Songbird migration was monitored in spring and fall, and breeding birds were monitored in summer. Owl monitoring took place in fall and mammal monitoring took place year-round. Trails were maintained. 500 nest boxes were maintained or replaced as needed and nests were monitored. Bat boxes were also monitored. Off-site presentations/demonstrations were given year-round and several on-site events were held. The perimeter fence was repaired as needed.

Deliverables/Results:

- Spring migration monitoring was conducted from May 1 to June 9, 2018, with standardized banding and census conducted throughout these dates. BBO staff operated thirteen mist nets and recorded 607 captures of 44 species, achieving an overall capture rate of 23.4 birds per 100 net-hours.
- Fall migration monitoring was conducted from July 20 to Oct. 20, 2018. BBO staff operated thirteen mist nets and recorded 2,029 captures of 62 species, resulting in an overall capture rate of 49.15 birds per 100 net-hours.
- Monitoring Avian Productivity and Survivorship (MAPS) program was operated from June 10 to Aug. 8, 2018 to monitor breeding birds in the Natural Area. 593 captures were recorded. 24 natural nests were discovered and monitored this summer.
- Owl migration was monitored from Sep.1 to Nov. 5, 2018. 1991.5 net hours were accumulated and a total of 322 owls were captured (295 northern saw-whet owls, 26 long-eared owls, and one great-horned owl) which resulted in a capture rate of 16.2 owls/100 net-hours.
- All bird sightings and banding captures were reported to eBird.com, which is publicly accessible.
- Several major on-site events were hosted: Big Birding Breakfast June 2 and 3, 2018 (80 visitors), Steaks and Saw-whets Sept. 28 and 29, 2018 (100 visitors), Young Ornithologist Workshop (seven participants), as well as 20 on-site presentations (20 groups with > 600 participants), and at least 80 off-site talks or demos (~20,000 people).
- Hosted public visitors and volunteers (Over 500 visitors).
- Maintained, cleaned, and replaced as needed ~500 bird boxes, and intern reports on breeding birds, tree swallows, and house wrens.
- Installed six new maternity bat boxes and produced two reports on monitoring results of 40 bat boxes.
- Compiled the Annual Report (February 2019), three seasonal reports (spring, summer, and fall) and three newsletters (April, September, January). 2018 Annual Report which summarizes BBO's activities can be found here: http://beaverhillbirds.com/media/1785/bbo-2018-annual-report.pdf
- Cleared and maintained walking trails and repaired fence gaps around the 410 ha Beaverhill Natural Area.
- Supervised 17 student interns to complete research and monitoring projects.
- Replaced one aging bunkhouse with funds from Sherwood Park Fish & Game Association and funds from Bird Studies Canada's Birdathon and private donations.
- Shared data (including trail camera findings) with collaborators.

2018 Annual Big Country Rod and Gun Club First Time Bird Hunt

Big Country Rod and Gun Club

Grant: $1,500

Project code: 030-00-90-265

Project status: Funded in 2016/17; Completed

The Big Country Rod and Gun Club held the 2018 annual upland bird hunt from Oct. 25 to 27, 2018. Eight first-time hunters were mentored on an upland bird hunt in the area northwest of Oyen, Alberta. To qualify, the hunters needed to have successfully completed the Alberta Hunter Education training course and fill out a short application form. The hunt was open to both men and women. From the applications, eight women were offered a spot on the hunt. For the hunt, participants were transported to a camp set up north of Sibbald. Once they got to the camp all accommodation and meals were provided. The hunters were briefed on safe and proper shotgun handling and shooting skills. The rest of the first day was spent practicing shooting clay pigeons. They were also provided instruction for hunting with bird dogs. On the second and third day the hunters were taken to a site where they hunted sharp-tail grouse, gray partridge, and released pheasants. Hunters were paired up, one-on-one, with a mentor, with two to three hunters per trained hunting dog. The hunters were also shown different field dressing techniques for the birds they shot. The hunters arranged to meet the following weekend and have an upland bird supper. All in all, the 2018 annual upland bird hunt was a success.

Deliverables/Results:

- Eight women were introduced to upland bird hunting, all of whom enjoyed the hunt and expressed a desire to continue hunting in the future. Two of the participants expressed interest in becoming mentors once they had become more knowledgeable.
- Another 13 people either mentored, cooked, ran bird dogs, or planted pheasants.
- Of the 30 pheasants released, approximately half were harvested. The rest remained in the area for the rest of the season. Those birds will contribute to the local wild pheasant population.

Bow River Policeman's Flats River Access Upgrade

Bow River Trout Foundation

Grant: $27,525

Project code: 020-00-90-263

Project status: New; Completed

Project website: www.bowrivertrout.org

The Bow River is a world-renowned trout fishery with limited public access between Calgary and Carseland, Alberta. Policeman's Flats River Access Site, one of five access points on the lower Bow River, was devastated by the 2013 flood, rendering it dangerous to use as a boat access point. What was left was a remnant of the previous bank stabilization project with a string of large boulders left in place, the others having been moved into the main river channel. Improvements were needed to make the access site safe and restore parking and staging areas, plus the addition of an amenities module, removal of debris, and a general clean-up of the site. The objective to enhance river access for the fishing community was met. In addition, public access to the site and protection of the adjacent conservation area was achieved by restricting vehicle access to the designated parking lot. Ongoing annual maintenance of the river access site will be needed. Bow River Trout Foundation will continue to support this initiative.

Deliverables/Results:

- Habitat Assessment Report, Engineering Plans, and River Access Permits were submitted to the appropriate provincial and federal authorities and approved before the start of the instream removal of the rocks that impeded safe river access to the site.
- A clear and unobstructed access to the Bow River for public use by boat anglers and other recreational river users was accomplished.
- The re-establishment of a parking lot with garbage containers and portable toilets was well received by the fishing community and recreational users.
- The research component of the project in cooperation with a University of British Columbia graduate student will be published in due course. In addition, the University of British Columbia has documented the project in a number of press releases.
- An interim report was posted on the Bow River Trout website and social media in August 2018: bowrivertrout.files.wordpress.com/2018/08/brt-policemans-report-17-aug20181.pdf
- A final report was published in January 2019.
- On-site signage is in place.

Sardine Lake Dock

Brazeau County

Grant: $7,500

Project code: 020-00-90-262

Project status: New; Completed

Brazeau County purchased and installed a seasonal dock and walkway at Sardine Lake, a waterbody that is stocked with rainbow trout as part of AEP's stocking program. Formerly, access to the lake was a path through a riparian area that users had placed pallets and lumber in to create a makeshift walkway. By installing a dock and walkway Brazeau County was able to greatly improve access to the lake for anglers as well as protect the riparian area from pedestrian traffic. The dock overall enhanced this recreation opportunity for anglers (specifically those with small children, canoers, and kayakers), minimized environmental damage to the riparian area, and also reduced the risk to pedestrian traffic accessing the lake.

Deliverables/Results:

- The dock has been installed, and signage acknowledging ACA's contribution has been installed. The dock has reduced environmental impact to the riparian area of the lake and has enhanced access to the lake for anglers.

CFGA Pheasant Crate Update

Calgary Fish & Game Association (CFGA)

Grant: $2,948.40

Project code: 030-00-90-291

Project status: New; Completed

Project website: www.calgaryfishandgame.com

The Calgary Fish & Game Association (CFGA) has been raising pheasants for release since 1908. The crates used in the pheasant raise and release program were in poor shape and at risk of injuring birds and volunteers should the condition decline further. The goal of this project was to purchase new aluminum game bird crates to continue to raise and release pheasants without risking injury to the birds and volunteers.

Deliverables/Results:

- 50 new crates were purchased.
- There was a minor change in the plan, in that instead of engraving the crates with the ACA and CFGA logos, and numbering them, vinyl stickers were used. There were concerns the engravings would become dirty and not easy to find. The stickers will highlight the ownership and valued sponsorship of the crates, while also providing a numbering system so administrators can track who has which crate.

Upgrade and Expansion of Pheasant Facility

Calgary Fish & Game Association (CFGA)

Grant: $5,000

Project code: 030-00-90-290

Project status: New; Unsuccessful

The purpose of this project was to expand CFGA's current brooding facility for pheasants. With the purchase of a seacan, and the appropriate improvements, chicks will have an increased chance of survival. The seacan was not converted to be used as a brooding facility, as it turned out the club did not have the capacity to do so. The seacan is currently being used as a storage container.

Deliverables/Results:

- There was an unexpected change in the project plan. It became apparent that without insulation, the seacan would become too hot to raise birds. It would require significant work on it to insulate and possibly air condition, in addition to the planned work of adding vents, drainage, watering system, and feed troughs. At this time, the seacan is providing secure storage; however, CFGA acknowledge that storage was not the intention of this grant contract.

Making Pleasure Island Accessible: Angler Recruitment and Retention, and Conservation Education

Camrose & District Fish & Game Association (CDFGA)

Grant: $23,585

Project code: 020-00-90-266

Project status: Completed

Pleasure Island fishpond is a 2.5-acre pond located on 112 ac of land that was purchased by Alberta Fish & Game Association (AFGA) and Camrose & District Fish & Game Association (CDFGA and became part of the Wildlife Trust Fund. This property is managed under an agreement with the AFGA and CDFGA known as the Camrose Property Management Plan. The property is situated three miles east of Camrose and a half mile south off Highway 13. The property basically consists of 30 ac of wetlands and 82 ac of idle native parkland forest and native and delayed hay lands, which are managed for waterfowl protection under agreement with Ducks Unlimited Canada. Fish are provided by ACA and AEP, and the CDFGA invest between three to five thousand dollars a year in maintaining the property, plus hundreds of hours of volunteer time by its members. No improvements have been made to the property since 2013 and the membership felt that it should be more user friendly, not only for anglers, but for the general public to use as a place for nature walks, photographers, bird watching, etc., and to ensure that it will be user friendly for the handicapped, seniors, and children. The CDFGA have partnered with the Battle River Watershed Alliance (BRWA), who will be using the pond, wetlands, and parkland forest to conduct a program called "Discover Your Wetland," which will see children from Grade 5 in the City of Camrose and the area use this property for these classes. The CDFGA will assist the BRWA with their programs and fly-fishing courses. Ice fishing courses for adults and children will be held during the appropriate seasons. The CDFGA also recognize that there is a major problem with noxious weeds on the property and wants to clean it up. The two main activities were to supply floating docks and to improve and enlarge the parking lot which would be beneficial to anglers, students, and all people who wished to enjoy the property. Plans are going forward to have the "Discover Your Wetlands" program. CDFGA is very happy with the project and without this ACA grant, CDFGA's goals would not have been completed.

Deliverables/Results:

- Purchased two floating Candock docks, two fishing benches, and two gangways. These were installed at the appropriate location within the marsh for conservation education programs.
- Purchased a Milwaukee Portable Dissolved Oxygen Meter (model NW600).
- BRWA is in the process of running conservation programs this spring.
- Parking lot has been enlarged, gravelled, levelled, and fenced.
- There has been a notable increase in activity this last summer and CDFGA has received many compliments on the property.
- Plans are in the works for a possible five-day summer camp at the property, which would cover all aspects of outdoor activities such as fishing and canoeing, as well as conservation and environmental education projects.

2018 Camrose Purple Martin Festival

Camrose Wildlife Stewardship Society (CWSS)

Grant: $1,350

Project code: 030-00-90-191

Project status: Funded 2011/12–2015/16 and 2017/18; Completed

Project website: www.facebook.com/CamrosePurpleMartinFestival

The Camrose Purple Martin Festival (CPMF) committee held its 9th Annual Festival on June 16, 2018. The festival was a one-day public celebration of nature, birds, and greenspace, with a focus on purple martins. The CPMF involves a collaboration of city, nongovernmental, education, 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 Camrose Wildlife Stewardship Society (CWSS). The CWSS strives for a greenspace network that enhances community values and quality of life for City of Camrose and area residents. The festival objectives were to: 1) encourage participation in nature activities; 2) raise interest in wildlife conservation; 3) enhance the Purple Martin Nest Box Program; 4) provide conservation research information; 5) showcase recommendations for purple martin landlord work; and 6) highlight the need for habitat protection. The festival included several activities, including demonstrations by purple martin landlords, a keynote address by Dr. Corey Scobie (Assistant Curator of Ornithology at the Royal Alberta Museum), a keynote address by Don Delaney (master wildlife photographer), a purple martin research overview by Dr. Glen Hvenegaard from the University of Alberta, a bus tour and walking tour to active martin colonies, children's activities highlighting purple martin and wildlife natural history, and information booths. The festival attracted ~80 people who provided very positive feedback. The festival also resulted in recruiting additional landlords, more local publicity (at least two local newspaper articles), and one more nesting structure in the community

Deliverables/Results:

- The CMPF attracted approximately 80 people to the festival on June 16, 2018.
- A debrief session was held, evaluations were received from participants, and an evaluation of the event was written up (e.g., likes, dislikes, future interest, and local economic impacts) at the end of June 2018.
- One new nest box was purchased and erected to support the Purple Martin Nest Box Program and the remaining nest boxes were maintained in the program.
- Articles were published about the CPMF and conservation in local newspapers (May to August, 2018).
- Participation was increased in the volunteer Purple Martin Landlord Program by two people.
- The contact list was updated regarding future wildlife stewardship and educational activities.
- The planning manual was updated for future CPMFs.

Connecting with Conservation: Getting kids and new Albertans ouside to experience and value Alberta's wilderness

Canadian Parks and Wilderness Society Southern Alberta Chapter

Grant: $20,000

Project code: 002-00-90-253

Project status: Similar project funded in 2016/17 and 2017/18; Completed

Project website: www.cpaws-southernalberta.org/campaigns/education

Connecting with Conservation is a project designed by the Canadian Parks and Wilderness Society Southern Alberta Chapter (CPAWS SAB) that aimed to get kids and new immigrants outside, educate them about conservation, and promote stewardship in Alberta. To achieve these goals, CPAWS SAB provided high-quality conservation education programs to schools and new immigrant groups in Alberta by hiring highly experienced interpretive guides and training them with the latest science, conservation, and curriculum materials. CPAWS SAB maintained and replenished programming materials and ensured fun and engaging activities. CPAWS SAB operated with the highest safety standards following a robust organizational risk management plan. CPAWS SAB marketed their hikes and the benefits of this project to get Albertans outside and learn about Alberta's wilderness via newsletters, articles, and workshops. Through interpretive hikes and snowshoe treks in Alberta's wilderness, youth and new Albertans were inspired to engage in stewardship and conservation in Alberta. At the end of the project, participant feedback was used for project improvement. By completing these activities, CPAWS SAB met and exceeded their objectives for the project. From April 1, 2018 to March 31, 2019, this project delivered 207 interpretive hikes and snowshoe programs to school groups in Grades 3 to 12 and new immigrants, reaching over 4,812 youth and 270 new Albertans who experienced conservation education in an outdoor setting in Alberta. Project evaluations showed that CPAWS SAB hike participants enjoyed getting outside, have increased knowledge about conservation, and indicated that they will engage in some form of positive environmental conservation as a result of their experience. In fact, 96 percent of participants indicated that their program was interesting, challenging, and fun and that they enjoyed participating in the activities. During these unique wilderness experiences, CPAWS SAB educated participants about conservation and inspired stewardship. By connecting Albertans with nature and educating them about the importance of conservation and healthy ecosystems, CPAWS SAB have increased conservation awareness and helped to build the next generation of conservationists in Alberta.

Deliverables/Results:

- Engaged 4,812 Alberta youth (including new immigrant and Indigenous youth) and 270 adult new immigrants in conservation during 207 interpretive hikes and snowshoe treks (148 youth hikes, 43 youth snowshoe treks, and 16 new immigrant hikes).
- Through program and participant numbers, participant feedback, and action challenge projects completed, CPAWS SAB demonstrated that this project achieved the targets of getting youth and new Albertans outside, educating them about conservation and promoting stewardship.
- Participant feedback showed:
  - 96 percent of participants indicated that they have enjoyed the program and would do it again.
  - 91 percent of participants indicated that they have increased their knowledge about conservation in Alberta.
  - 92 percent of participants indicated that they will engage in some kind of stewardship because of the program.

Evaluation of the Parr Reservoir (Castor Creek) for Fish Stocking Suitability

Castor Fish & Game Club

Grant: $3,000

Project code: 020-00-90-269

Project status: New; Completed

The goal of the project was to conduct a study to determine if fish could survive in the Parr Reservoir (known locally as the Castor Creek). This was to be achieved by evaluating water quality through testing of dissolved oxygen and evaluating fish habitat potential based on waterbody characteristics and historical data. Dissolved oxygen (DO) was measured at various times throughout the year in 2018 and 2019 (February, September, October, January, and March). Measurements were obtained by walking on ice or canoeing to the sample point location, drilling a hole when required, and recording the DO values at various depths with a portable monitor. During measurement times, notes were taken with regards to water temperature, depth, and habitat features as they relate to fish preference and needs. Water samples were also collected at two sample locations and submitted to the laboratory for analysis for salinity, fecal coliforms, phosphorus, and microcystin. Informal interviews were conducted with local residents and members of the Castor Fish & Game Club to determine what the current and historic conditions of the creek were, including fish presence. The Fisheries and Wildlife Management Information System (FWMIS) was also searched to obtain historic fisheries data on the Parr Reservoir. Findings were that dissolved oxygen ranged from lows of 0.5 mg/L in the deepest points during the winter to 11.5 mg/L nearer to the surface during the fall. The deepest point in the Reservoir measured in 2018 was 6.5 m and depths were variable depending on time of year and precipitation. The Reservoir has a great variety of habitat types including deep pools, shallow to moderate vegetated areas, and a bottom substrate of sand and mud. Laboratory results showed nothing significantly outside of normal.

Deliverables/Results:

- The main finding from the project was that suitable conditions for yellow perch exist in the Parr Reservoir. Dissolved oxygen was measured to be at adequate levels at various times of the year and the correct habitat for yellow perch, including deep pockets and shallow vegetated areas, are present. Water chemistry and biology was also found to be acceptable based on water samples collected and submitted to the laboratory.
- Report on the findings from the monitoring and data collection that took place at the Parr Reservoir during 2018 and early 2019 is available on request. Laboratory and field data collected was included in this report.

Bennett Pond Aeration Electrical Access Fees

Central Alberta Fish & Game Association (Zone 3)

Grant: $4,300

Project code: 020-00-90-261

Project status: Funded Bennett Pond projects in 2011/12 (aeration) and 2017/18 (access trail and dock); Completed

The goal is to provide another fishing opportunity in central Alberta for the public. The objective is to maintain the freshwater ecosystem to support trout stocking that will survive over winter ice cover conditions. A six-air station fine-bubble system was set up in 2016 and has been running for most of the time with some exceptions when breakdowns occurred. The electricity fee to run two compressors was being provided by the landowner and other funders from the Zone 3 area clubs but was covered by this grant in 2018. The aeration system was successful in bringing the trout through the heat of 2018 and the very cold winter of 2019.

Deliverables/Results:

- Trout can use the entire pond to feed on the huge minnow population as well as invertebrates. Rainbow trout up to 1.8 kg were being caught in October 2018. The main result is that a good population of trout (700 to 800) of various sizes survived to be caught by the angling public in summer of 2019.

Fall Wilderness Family Camp

Edmonton Mallards – Junior Forest Wardens (JFW)

Grant: $2,125

Project code: 002-00-90-289

Project status: New; Completed

The Edmonton Mallards – Junior Forest Warden (JFW) group hosted their Fall Wilderness Family Camp from Sept.14 to 16, 2018 at the Long Lake Education Centre, with 77 participants. 14 participants (youth/parents/leaders) received their Paddle Canada Lake Tandem Canoe Certification, which was instructed by Wild By Nature Adventures (WBN). Throughout the weekend training campers learned a variety of skills and some even completed the "T-Rescue" component with the snow and rain. Some of the skills covered included basic lake strokes while maneuvering the canoe in the bow and stern, required safety gear for all canoes, and basic knots that are required for securing canoes on trailers as well as their personal gear in the canoes. The other participants at camp got to develop their skills in fire lighting, building various fire starters, compass work, hiking (which included plant identification), fishing, and building underwater viewing tubes. These sessions were led by volunteers of the Edmonton Mallards JFW club. All camp attendees got to benefit from additional instruction from WBN later on Sunday when they facilitated a group game of "Predator and Prey" as well as a voyageur canoe paddle around Long Lake. It was a great weekend for all participants to build on their hands-on, outdoor skill development

Deliverables/Results:

- There were 77 participants who attended the Fall Wilderness Camp. 14 participants (youth/parents/leaders) were successful in receiving their Paddle Canada Lake Tandem Canoe Certification.
- The remaining participants completed the following activities which were led by volunteer leaders of the Edmonton Mallards JFW club: compass skills, plant identification, fire building, making fire starters, building underwater viewers, and exposure to fishing.

2018 Snow Goose Chase

Edmonton Nature Club

Grant: $3,000

Project code: 015-00-90-184

Project status: Funded 2012/13-2015/16 and 2017/18; Completed

On April 28, 2018, Edmonton Nature Club (ENC) volunteers provided hundreds of participants, including low-income inner-city children, First Nations, and recent refugees, with guided bus tours in the Tofield/Beaverhill Lake area to experience the sights and sounds of nature including migrating birds, various conservation-oriented displays, talks, and interactive exhibits. Participants were actively engaged in the learning opportunities and activities. Volunteers have received very complimentary notes and emails from several participants. Some tour guides received applause at the end of the day.

Deliverables/Results:

- The 2018 Snow Goose Chase event was held on April 28, 2018 and more than 350 individuals participated.
- Approximately 80 volunteers worked on this event.
- A written report was published in the *Parkland Naturalist* magazine.

Fall Wilderness Family Camp

Edmonton Water Striders – Junior Forest Wardens

Grant: $2,125

Project code: 002-00-90-292

Project status: New; Completed

This project aimed to provide a weekend family wilderness experience for our families where both kids and parents participated in a variety of outdoor education sessions. Edmonton Water Striders Junior Forest Wardens (JFW) were able to offer programming to 55 individuals to enhance skills they had been introduced to as well as expose them to new skills. The instructors provided expert training in a variety of areas and JFW families went away with many new skills they are eager to share with other members of the JFWs both in their own clubs and regionally/provincially.

Deliverables/Results:

- From Sep. 28 to 30, 2018, 20 families (55 individuals: 30 youth and 25 parents) gathered at Long Lake Centre in Athabasca, Alberta for a weekend of outdoor learning. The number of participants reached was less than planned. Some participants who planned on attending were unable to due to illness/conflicting events.
- Youth and parents participated in outdoor education sessions including: canoeing (offered by Paddle Canada certified instructors), introduction to angling and cleaning/preparing fish, shelter building, plant identification, fire lighting and building, and knife safety and handling (where participants carved a walking stick). Instruction was provided by Wild by Nature Adventures and also Claude Fries, angling guide and instructor.
- An unexpected result of this project is the Edmonton Water Strider JFW club is now planning a summer overnight paddling/outback camping trip where their new skills can be applied.

Streambank Restoration Project on Silvester Creek

Elbow River Watershed Partnership

Grant: $19,385

Project code: 015-00-90-267

Project status: New; Extended until Sept. 30, 2019

Project website: www.erwp.org/index.php/water-management/projects-past-and-present

The goal of the Elbow River Watershed Partnership (ERWP) project is to restore eroded streambanks along Silvester Creek, which were impacted by illegal off-highway vehicle (OHV) use, with the help of volunteers. The objective is to prevent sediment from entering the creek in order to protect fish habitat and to educate volunteers how to undertake restoration through bio-engineering techniques. Silvester Creek is home to one of the last few populations of pure westslope cutthroat trout in Alberta's Eastern Slopes. The ERWP collaborated with the Westslope Cutthroat Trout Recovery Team (WSCT Recovery Team) of AEP, Shell Canada and AEP Lands on this project. The restoration site was chosen by the WSCT Recovery Team. Thanks to the successful collaboration between the ERWP, AEP Lands, the WSCT Recovery Team, and Shell Canada, all necessary permits were in place to undertake the volunteer work by September 2018. Due to getting snowed out for the restoration day on Oct. 3, 2018, ERWP had to reschedule to Nov. 1, 2018. 19 volunteers attended the restoration event including staff from Cows & Fish and Trout Unlimited Canada. Staff from AEP Lands, the WSCT Recovery Team and Shell Canada monitored the volunteer work and helped out guiding the restoration day. Approximately 400 cuttings were planted, despite rather cold weather and already partially frozen ground. Large woody debris and leaf litter were placed along the streambanks. This project was extended to allow for the remaining grant funds to be used for a second volunteer restoration day at the Silvester Creek site.

Deliverables/Results:

- Volunteer restoration day with 19 volunteers took place on Nov. 1, 2018 (to replace original restoration which was cancelled due to 25 cm of fresh snow). ~400 willow stems were planted, large woody debris and leaf litter placed to help re-establish vegetation along the eroded stream banks. Approximately 210 m² restored.
- Achieved a good start re-establishing vegetation along the eroded streambanks of Silvester Creek at the Shell pipeline right-of-way location. This will help to reduce sediment input into the stream. Access control measures have been installed by AEP Lands in the fall of 2018, blocking unauthorized motorized access to the site.
- Organized project and all necessary permits acquired.
- Promoted workday through social media, newsletters (over 160 subscribers), ERWP website, and Eventbrite.
- Reported on the project in a newsletter, on the website, and presented at Bow River Basin.

Bioengineering Workshop in the Ghost Watershed

Ghost Watershed Alliance Society (GWAS)

Grant: $10,000

Project code: 015-00-90-269

Project status: New; Extended until July 31, 2019

Project website: www.ghostwatershed.ca

The project was to provide a workshop for participants to learn about bioengineering techniques from bioengineering specialist, Dave Polster, and to restore streambanks in the Ghost watershed impacted by human land-uses, such as motorized recreational use, under his supervision. These kinds of workshops not only help to restore conditions on the ground, they also raise awareness with participants and build capacity for future work. The activities were to plan and organize the workshop, work with government staff regarding sites and permits, and to carry out the two-day workshop consisting of a classroom session and a hands-on restoration workday as the deliverables of the project. A very successful classroom session was held with Dave Polster on Oct. 1, 2018, with 22 participants in attendance (24 registered, but two people were sick). However, the Ghost Watershed Alliance Society (GWAS) had to cancel the field day due to 25 cm of snow falling the night before. Thanks to an extension being granted by ACA, the field day was rescheduled to May 25, 2019. GWAS were also fortunate to be joined by Trout Unlimited Canada (TUC) and the Backcountry Hunters and Anglers (BHA) on this project. While it was pretty cool and raining on May 25, GWAS successfully completed the field day with 25 enthusiastic volunteers under the guidance of Dave Polster. As Dave Polster said, "it was perfect willow planting weather!"

Deliverables/Results:

- 22 volunteers learned about bio-engineering techniques during the full-day classroom workshop with Dave Polster on Oct. 1, 2018. A lot of positive feedback on the classroom session was received and there is great interest in more workshops in the future.
- Field day on Oct. 2, 2018 had to be cancelled due to severe weather.
- Many participants of the October 2018 workshop joined GWAS for the rescheduled field day May 25, 2019. New connections were formed, especially with the BHA group and GWAS is thankful for TUC's immense support on the project. BHA contributed funding from Patagonia Calgary and undertook rough and loose equipment work on the non-designated trail leading up to the crossing thus diverting run-off from the trail from entering the creek.
- Another positive and unexpected result was the great video Let's Go Outdoors completed and published on the event. See www.youtube.com/watch?v=fQdG75VgqGA
- Promoted workshop through newsletters (120 subscribers), GWAS website, and Eventbrite. The announcement was also sent out with the Bow River Basin Council's weekly news.
- Launch of webpage about the project (rescheduled to after the field day in 2019).
- Presented project at GWAS AGM and Bow River Basin Council's December Quarterly Forum.
- Harvested 350 willows stakes with eight volunteers on May 3, 2019 ahead of the field day. Rough and loose work on trail leading to crossing site completed on May 22 (TUC). Field day took place on May 25, 2019 (rescheduled from Oct. 2, 2018). 25 volunteers joined the field day (26 registered, but one person cancelled due to illness). 200 additional willow stakes were harvested by volunteers during the field day. All stakes were cut into several pieces and then planted, so it is estimated that over 1,200 stems were planted.
- Over 100 photos were taken; some of the photos have been published to the GWAS website: www.ghostwatershed.ca/GWAS/photo-gallery/bio-engineering-2019.html

Kids Can Catch with Growing Great Kids

Growing Great Kids Coalition(GGKC); Family and Community Support Services (FCSS) Hinton

Grant: $3,000

Project code: 020-00-90-265

Project status: New; Completed

The Growing Great Kids Coalition (GGKC) set out to host a Kids Can Catch (KCC) fishing event in the Hinton Community as a community engagement opportunity to promote an appreciation for the environment and local resources and to promote sustainable fishing practice in Alberta. As an early childhood intervention coalition, GGKC's goal was to tailor market this event to promote family engagement, curiosity, and provide the opportunity for adults to support their young children's gross and fine motor skill coordination, promote social competencies, and provide opportunity for families to experience an outdoor exploration experience. The goal was met as approximately 300 people attended the event. Participants engaged in hands-on lakeside experience with knowledgeable professionals and volunteers educating about sustainable fishing practice in Alberta. The event was held at Kelly's Bathtub in Yellowhead County. AEP, Alberta Fish and Wildlife, Alberta Forestry, and Alberta and NWT Lifesaving Society staff were on site promoting environmental conservation, boating and water safety, clean and dry your boat education, and sustainable fishing practices. The Park Information Centre was open during the event to educate families about local wildlife, plants, and what types of fish can be caught in our lakes. The GGKC's goal to promote an interest in sustainable fishing culture in our region was a success. There were many people who participated who had never fished before in Canada and were eager to learn about fishing practice and regulations in Alberta. It is GGKC's hope, in cooperation with other stakeholders, to support an annual event in July for years to come.

Deliverables/Results:

- 300 people participated in the KCC event held July 7, 2018 at Kelly's Bathtub.
- Collaborated with: AEP (collaboration was ongoing during event planning and during the event) and with local businesses (Barrow Safety, Canadian Tire, and High Calibre Sports). The Town of Hinton provided advertising and marketing advice and rented tents at a reasonable price. B.R.I.D.G.E.S. non-profit organization provided loaner tables for the event day. Good Dog Hot Dog vendor provided food service for the day at discounted prices. Volunteers consisting of family members of GGKC members and GGKC members were on site during the day to register families, complete surveys, ensure the loaner rod station operated smoothly, and all trails were kept tidy from litter and participants were safe and aware about on-site activities.
- Photos were taken throughout the day, though no video footage of the event was taken as originally planned. Participant experiences were collected in the form of surveys. The deliverable of a photo collage is in progress and will be used to market next year's event.
- Comments from the participant surveys done the day of the event:
  - "Love the chance to make fishing accessible."
  - "Awesome, loved it! Learned more about bugs!"
  - "This was a great family event, love it!"
  - "Nature=awesome! Get outdoors, explore, learn and protect nature."
  - "Such a fun fishing day!"
  - "Scavenger hunt for the kids was great, learning lots!"
  - "Love that we can fish together as a family and learn together."
- A written report of project deliverables, learnings, and successes will be produced.
- An unexpected outcome: The GGKC voted to contract Good Dog Food Vendor to sell all menu items at 50 percent less than their menu price. This idea was novel, and GGKC had not done this before for any other event, though it was agreed that the time it would take to organize food and to adhere to AHS regulations for event food service would be difficult to organize for an event of this scale. The unexpected result was that participants of the fishing event expressed gratitude for the affordable food venue and purchased more meals and ice cream than projected. They also stuck around to socialize with other families and participants. The socialization aspect was a pleasant surprise for the coalition members as it afforded a great mix of participants to casually socialize at picnic tables and on the grass, which supported their hopes of providing enrichment opportunity for children in the social competency domain.
- Publications included: Event listing on Growing Great Kids Facebook (FB) page, a like campaign on FB, an event boost on FB, signage and posters, bookmarks to school-aged children prior to last day of class, links created on the Town of Hinton website and event calendar, print ads a week before the event, and a big ramping up radio advertising campaign to promote the KCC event sponsored by ACA and GGK. The Town of Hinton Council was also briefed, and the event was submitted on the Alberta Tourism website and connected event through ACA's website.

H. A. Kostash Youth Mentorship Program

H.A. Kostash School

Grant: $7,700

Project code: 020-00-90-209

Project status: Funded in 2014/15, 2016/17 and 2017/18 and previously by ACA Recruitment and Retention fund; Extended until Sept. 30, 2019

With assistance from this grant H. A. Kostash School was able to keep their popular programs going and affordable for all. The school has been able to help students gain an appreciation of the outdoors, develop leadership skills, and build lifelong friendships. These programs reach many age groups, for example the archery program is for students from Grades 3 to 12. A team of 100 archers competed in many archery tournaments this year. Multiple ice fishing and open water fishing trips were planned for Grades 7 to 12, as well as a fish stocking and field study trip to help students gain an appreciation for the outdoors. The Grade 10 two-day fishing trip has been delayed twice but is now scheduled for September 2019.

Deliverables/Results:

- H. A. Kostash School was able to provide an opportunity for many students to participate in programs they may have never experienced otherwise. An appreciation for the various programs has carried on well after graduation, with many students returning to assist with the programing and mentor younger students. Due to the popularity of the archery program many students have enrolled in Bowhunter Ed for credit in high school.
- 100 students registered in archery and participated in six tournaments including Provincials at the Edmonton Boat & Sportsman Show and Nationals in Regina.
- In April, H. A. Kostash School hosted 400 archers for a tournament (close to 300 archers were added from three other countries via skype).
- Over 250 students attended the Aspen View fishing day.
- Grades 5 and 8 participated in fish stocking of local lakes.
- Twelve students obtained their boaters licenses.
- Twenty-six students took part in fly tying and casting instruction.

"Extreme by Nature" Environmental Education for 11- to 15-year-olds

Helen Schuler Nature Centre (HSNC)

Grant: $3,000

Project code: 030-00-90-240

Project status: Funded since 2014/15; Completed

Extreme by Nature (EBN) is an interactive program by the Helen Schuler Nature Centre (HSNC) for youth with the purpose of providing engaging opportunities that connect them to nature and bring them closer to their local natural heritage. HSNC's goal is to encourage youth to find a deeper connection with nature through increased understanding of environmental issues and a commitment to lifelong stewardship and environmental responsibility. This goal was achieved through the provision of monthly programs on a variety of topics that provide outdoor survival skills, traditional knowledge of the land, and a better understanding of what conservation means. In 2018/19 there were 13 EBN programs delivered to 154 youth participants and 16 adult mentors/participants. There was a 16 percent increase in program attendance over last year. This increase is attributable to the "Inspired by Nature – Youth Art Exhibition" that was delivered in tandem with EBN programs.

Deliverables/Results:

- All EBN programs are designed to provide a positive experience for participants to connect with nature. Delivered monthly, programs allow youth to connect with their peers as well as mentors such as Nature Centre staff and volunteers, and volunteers from allied organizations.
- The 13 programs delivered in 2018/19 include (# of registrants):
  - Fly Fishing (ten) – how to tie a fly and how to properly cast when fly fishing
  - Waterworld (nine) – importance of the Oldman River for all species and of taking action to keep waterways clean
  - Wildflowers (five) – discovered the many different types of wildflowers found in Southern Alberta and did botanical sketches
  - Floodplain forests (four) – forest ecology and the unique traits of cottonwood trees
  - Wind Turbines (16) – how wind works and how to capture renewable energy
  - Small Wonders – Microscopy (nine) – using microscopes to look at details and features of natural objects
  - Floodplain forests (ten) – forest ecology and the unique traits of cottonwood trees
  - Inspired by Nature (45) – youth art exhibition on display September and October
  - I Am Root (eight) – learning about root systems and building a root box for display in the Nature Centre's exhibit gallery
  - Archery (11) – how to use a bow and arrow
  - Green Christmas (nine) – exploring sustainable decision making, upcycling, and the importance of long-term thinking
  - Night Skies (five) – astronomy program exploring common sights in the sky and how to minimize light pollution
  - Climbing (13) – rock climbing, bouldering, and safety in outdoor recreation
- One km of river shoreline cleaned.
- Whenever possible HSNC incorporates the assistance of allied organizations in program delivery. In 2018/19 HSNC leveraged mentorship and expert leadership from the following nine community group partnerships: Agriculture-Agri Food Canada (AAFC), City of Lethbridge Waste and Recycling, Department, Coulee Climbing Gym, Lane Archery, Lethbridge Astronomy Society, Oldman Watershed Council, Rotary Club of Lethbridge East, Trout Unlimited Oldman Chapter, and University of Lethbridge.
- HSNC promoted the EBN program with three telephone call outs, 12 Facebook postings, 12 tweets, and 12 Instagram postings.
- In total, 154 youth participated in the program. There were 21 more program participants in 2018/19 than in 2017/18 which represents a 16 percent increase.
- The main demographic of participants is 11- to 13-year-olds. 14- to 15-year-olds continue to be difficult to engage in EBN programs due to part-time jobs, sports teams, and extracurricular activities.
- Overall repeat program participation increased slightly to an average of 2.02 programs in 2018/19 versus an average of only 1.93 in 2017/18. Repeat program participants benefit from a richer mentorship experience as they forge closer connections with EBN program staff and volunteers.

Community Engagement in River Valley Conservation

Helen Schuler Nature Centre (HSNC)

Grant: $3,000

Project code: 015-00-90-254

Project status: Funded in 2017/18; Completed

The Lethbridge river valley is home to hundreds of species of birds, animals, and flowering plants. Each year garbage and debris get caught in the coulees turning these unique, naturally formed features into unsightly spots that have the potential to injure the wildlife species that call them home. Shoreline litter affects water quality for everyone living downstream. Invasive species also pose a threat to the river valley's ecological health and intactness. Conservation projects demonstrate positive action in protecting our natural landscape through education and focusing efforts on improving the local ecosystem—by removing garbage from the river valley coulees (Coulee Clean-Up), by tracking types of garbage found along shorelines (Shoreline Clean-Up), through early detection and rapid response in the removal of invasive species (Weed Pulls), and by increasing awareness on the issue of dog feces left behind in natural areas (Doggy Doo Doo Clean-Up). On the 11th anniversary of hosting conservation projects, HSNC was proud to increase community engagement in conservation projects to their highest level to date—with 1,751 volunteer participants donating over 2,737 hours to take part in conservation projects including Coulee Clean-Up, Shoreline Clean-Up, Invasive Weed Pulls, and a Doggy Doo Doo Clean-Up.

Deliverables/Results:

- Ninety Coulee Clean-Ups (1,575 participants), eight Shoreline Clean-Ups (146 participants), and one Weed Pull (22 participants) were completed.
- Removed over 490 bags of garbage (including 25 bags of invasive plants) from natural areas throughout Lethbridge's river valley.
- Catalogued and recoded 4,410 individual items of trash as part of the Shoreline Clean-Up—confirming that cigarette butts comprise 41 percent of trash collected along Lethbridge's shores, followed by bottle caps (nine percent), and plastic pieces (eight percent).
- Organized the Doggy Doo Doo Crew (eight participants) which removed 40 pounds of dog feces.
- Engaged residents on the issue of dog feces in natural areas through a targeted media and on-site campaign—placing over 500 flags at spots where feces were removed to raise awareness of the prevalence of the problem.
- Engaged 75 community groups to participate in conservation projects.
- Hosted a barbecue for conservation volunteers with 133 in attendance as a thank you and as a way to build community among local stewards.

Sheep River Fencing

High River Fish & Game Association

Grant: $2,749

Project code: 015-00-90-265

Project status: New; Extended until Sept. 30, 2019

The current Sheep River Trust Fund fence has been heavily damaged by flooding over the past 15 years and needed restoration in order to maintain a clear line between private property and trust fund property. High River Fish & Game Association is excited to finally have this project started and to revitalize the area. A path was cleared in order to work safely and efficiently in salvaging the old fence and in order to install the new one. Unexpected delays had the project on hold until spring 2019.

Deliverables/Results:

- Due to unexpected delays, the window was missed for completing the fencing work and the weather pushed the work to spring 2019.

Alberta Bat Education and Habitat Enhancement

Highway 2 Conservation (H2C)

Grant: $3,000

Project code: 002-00-90-255

Project status: Funded in 2016/17 and 2017/18; Completed

Project website: www.highway2conservation.com/projects

Bats are one of the least studied and most misunderstood animals in Alberta. Highway 2 Conservation's (H2C's) program aimed to address these two issues. It is in the best interest of all Albertans to change this as bats are very beneficial to us economically and to the landscape ecologically. Through H2C's "Save a Barn, Save a Bat" program the rural community was engaged while dispelling harmful misinformation through roosting site visits. On these visits valuable information was collected on bat habitat and information provided on bats in a personal, face-to-face manner to answer any questions or concerns community members had. As a result of these visits, landowners are now taking a personal interest in the bat colonies on their property and will be monitoring them in the future because they recognize the importance of bats and value having them on their land. The information gathered on the colonies and the surrounding habitat was passed on to the Alberta Community Bat Program. The second part of this project involved hosting free bat-house building workshops. These extremely popular workshops were a great way to involve interested people of all ages and backgrounds to engage in habitat creation in their back yards while simultaneously answering questions about bats and informing them about the risks these animals are facing.

Deliverables/Results:

- The main results of the project were the successful delivery of the very popular bat-house building workshops and the identification of 11 new roosting sites.
- Interest in bats and building them a bat house has not declined, despite this being the third year of hosting workshops. Demand is only increasing, which is a testament to the educational efforts H2C have put forth. The enthusiasm for bats and building bat houses is being noted. Counties outside of the H2C area are now asking

for bat house plans and to host workshops due the success of this programing. This was an unexpected outcome, but one that is positive for Alberta's bats.

- This year H2C visited some very interesting bat colonies, some of which could be very important for monitoring going forward due to their size and how long the bats have been using those roosting sites. One of the sites visited was the largest H2C had ever been to in their four years of roosting site visits.
- H2C also sampled some bat houses that had been built during the first year of their bat house building workshops in 2016. Those were very special to H2C, as not only were they seeing their efforts pay off by the bats choosing to use them, but it also verified that their outreach efforts were working because the landowners not only came to build a bat house back in 2016, but they also remembered that it was important to conservation efforts to report a roost, which they did.
- In total 135 bat houses were built at seven events throughout the Counties of Barrhead, Westlock, and Athabasca.
- Eleven "Save a Barn, Save a Bat" program sites were visited.

4-H Club Archery Supplies

Kneehill 4-H Multi Club

Grant: $2,500

Project code: 002-00-90-291

Project status: New; Completed

In its third year of operation, the Kneehill 4-H Multi Club was able to offer archery to all members of the club. From a total of 35 members, 13 joined the archery group. Many were able to join because they could rent the club equipment instead of purchasing their own upfront. Of the 13, three had their own equipment. The Kneehill 4-H Multi Club showed off the bows at local events which generated a lot of interest in future membership in the club and talk about archery in the area.

Deliverables/Results:

- Purchased nine Genesis bows for the club and provided the arrows and targets as well.
- The Kneehill 4-H archery club went from one member in the previous year to 13 in the 2018/19 year (the goal was ten). From recent attendance at community nights, there is a lot of interest from more youth in the nearby communities. The other great thing that happened was some members of the local community who are archers offered to help with the project.
- Several parents came and tried archery after the kids have finished up. Mostly for fun, but it will help kids the kids in the sport and may even convince a few to get their own equipment. The 4-H program year ended in April and the last meeting of the year was a 3D shoot. Kids and parents were excited to go.
- The club attended the Linden Fall Fair and the Acme and Linden Community Nights in March, a great chance to talk to parents about the program while they are signing up for spring sports. It helped to have pictures of the kids doing archery. 600+ people reached.
- The club planned a Try Archery Day with the school (May 2019).

Alternative Land Use Services (ALUS)

Lacombe County

Grant: $15,000

Project code: 015-00-90-264

Project status: New; Partially Complete

Project website: www.lacombecounty.com/index.php/alus-lacombe-county-program

Lacombe County's Alternative Land Use Services (ALUS) program collaborated with the Agroforestry & Woodlot Extension Society (AWES) and a Lacombe County landowner to create a five-row, 1,276 m long eco-buffer. This eco-buffer will create a travel corridor, shelter, and a food source. As it matures the eco-buffer will provide wind protection for surrounding cropland, a visual barrier, and high-quality habitat corridors for wildlife such as birds and deer. To achieve this goal a mix of native trees and shrubs were planted, spaced at 2.75 m to make it easy to rototill. The area was also site prepped, and soil tilled, so that it would create a good environment for trees to grow. Several fast-growing, root-suckering tree species have been included to quickly capture the site and reduce the need for long-term maintenance. Longer-lived species such as white spruce and lodgepole pine will gradually overtake the fast-growing species to make a climax forest.

Deliverables/Results:

- 6,500 seedlings were planted in June 2018 to create the 1.2-km long eco-buffer. Species planted include prickly rose, raspberry, red osier dogwood, poplar, white spruce, chokecherry, as well as 16 other species.
- The eco-buffer has been completely fenced with 2.1 km of fencing.
- Lacombe County hosted an ALUS tour on July 4, 2018 with 52 attendees. This eco-buffer site along with four other ALUS sites were visited.
- Other projects were declined resulting in fewer acres in the ALUS program than projected and requiring less funds (approximately one third of the grant money was used).

Trout Pond Dock System

Lamont Fish & Game Association

Grant: $8,000

Project code: 020-00-90-268

Project status: New; Extended until May 31, 2019

The Lamont fishpond is a fantastic facility located near the local community for use by all age groups. However, access to the pond has been somewhat limited to some, due to the steep banks and poor access to the water. The dock system enhances fishing opportunities and waterfowl enjoyment for members and the local community.

Deliverables/Results:

- The dock system was purchased in March 2019, installed in May 2019, and revealed to the public at the Kids Can Catch event in June 2019.

Avian Monitoring and Outreach Education Programs at Lesser Slave Lake

Lesser Slave Lake Bird Observatory Society (LSLBO)

Grant: $22,750

Project code: 030-00-90-128

Project status: Funded since 1999; Completed

Project website: www.lslbo.org

Dedicated to bird conservation through research and education, the Lesser Slave Lake Bird Observatory (LSLBO) has been operated an an avian monitoring station at Lesser Slave Lake since 1994. The LSLBO is a full member station of the Canadian Migration Monitoring Network. The first goal of this project was to assess the population status of migratory and breeding bird species at Lesser Slave Lake using the following three avian monitoring programs: 1) Spring and Fall Migration Monitoring program incorporated visual counts, passive mist netting, daily census, and incidental observations to determine daily estimated totals for each species during migration. Approximately 128,000 birds representing 165 species were visually recorded, with an additional 3,989 birds banded from 69 species. All migration monitoring data was forwarded to Bird Studies Canada for analysis to detect significant changes in population trends. 2) Monitoring Avian Productivity and Survivorship (MAPS) Program determined the reproductive status of breeding birds at four MAPS stations at Lesser Slave Lake. A total of 380 birds from 31 species were banded, and breeding status was determined for 65 species encountered during surveys. Data has been provided to the Institute of Bird Populations for analysis. 3) Owl Fall Migration Monitoring program operated September to October 2018 and data was collected for 186 northern saw-whet and three boreal owls. This was one of the busiest banding seasons ever at the LSLBO with many species setting banding records. The LSLBO continued work on a collaborative research project with Dr. Natalie Boelman from Columbia University as part of NASA's Arctic-Boreal Vulnerability Experiment (ABoVE) project. Two Songbird Monitoring projects were completed for local forestry companies and two academic journal articles were published with LSLBO co-authorship this year. The second goal of this project was to deliver innovative, hands-on education programs that promote a greater understanding of the importance of the boreal forest for Alberta's wildlife. Through the Boreal Centre for Bird Conservation (BCBC) and project partners, the educators delivered 439 hands-on interactive programs to over 18,800 participants including: LSLBO Banding Lab Tours, school fieldtrips, public outreach programs, citizen science projects, and special community events. The BCBC is a year-round education and research centre that "nurtures stewards of the boreal forest." Exciting, hand-on programs were provided to over 4,400 visitors of all ages on the importance of the boreal forest.

Deliverables/Results:

- Three core avian monitoring programs were successfully delivered: Spring/Fall Migration Monitoring, MAPS Program, and Northern Saw-whet Owl Monitoring Program. Over 128,000 birds recorded during visual counts, and 4,555 birds banded during all monitoring programs. The Fall Migration Monitoring as well as the Fall Owl Monitoring season were some of the busiest ever at the LSLBO. All data has been submitted for species population trend analysis.
- The LSLBO provide field support for the third year of a collaborative research project with Columbia University (New York) based at the Boreal Centre for Bird Conservation field station.
- Two Songbird Monitoring Projects were completed for local forest industry including field surveys, data analysis, and final reports.
- Year-round outdoor education programs were delivered to over 12,000 students and public across the Lesser Slave Lake Region. All program lesson plans and resources are available to other educators (available on request).
- 2018 LSLBO Annual Report.
- Based on LSLBO fieldwork data, LSLBO staff co-authored two peer-reviewed papers published in academic journals this year as well as contributed Canada Warbler Project data to the Alberta Status Report update project.
- Peer-reviewed articles co-authored by the LSLBO:
  - Wilson S, Saracco JF, Krikun R, Flockhart DTT, Godwin CM, Foster KR. 2018. "Drivers of demographic decline across the annual cycle of a threatened migratory bird." Scientific Reports. 8(1): 1–11. doi: 10.1038/s41598-018-25633-z
  - Krikun R, McCune JL, Bayne EM, Flockhart DTT. 2018. "Breeding habitat characteristics of Canada Warblers in central Alberta." The Forestry Chronicle. 94(3): 230-239. doi: 10.5558/tfc2018-036

Kids Can Catch Lesser Slave Lake Winter

Lesser Slave Watershed Council (LSWC)

Grant: $1,090

Project code: 020-00-90-267

Project status: New; Completed

The Lesser Slave Watershed Council (LSWC), with support from partner organizations and community members, hosted a Kids Can catch Ice Fishing Festival in Joussard, Alberta on February 16, 2019. This event was held on Alberta's free fishing weekend and the goal was to promote a love of Lesser Slave Lake, the outdoors, and promote the sport of angling for families in the watershed. The event was hosted at the Joussard Community Association hall at no cost. As families arrived, they signed out ice fishing rods and picked up bait and resources from the LSWC and ACA. Once the anglers had assembled at the hall, a briefing for the kids was held to teach them proper handling of equipment, how to bait a hook, operation of their rods and reels, and how to remove a hook from a fish properly. LSWC introduced their great group of volunteers who would be assisting out on the ice and sent folks out to the fishing area. Out on the ice, people were kept warm in the ice shacks that were rented and the pop-up tents that were borrowed from friends and volunteers. The Tolko staff brought out firewood and there was a bonfire on the ice. The kids loved roasting hot dogs and marshmallows and were kept warm with hot cocoa. The anglers were on the ice from 11 a.m. to 3 p.m. and there were four fish caught! At 3 p.m. everyone headed back to the community hall where folks enjoyed lunch, refreshments, games, and a craft hosted by the High prairie Children's Resource Council. The day ended with a kids draw and everyone got to take home a prize. There was also an adult door prize draw of items donated by generous sponsors. Overall the day was a great success. 45 adults, 55 children and 18 volunteers engaged in a great day out on the lake. Sponsorship was received from Big Lakes County, the Tolko Social Club, and donations of door prizes from a number of businesses and individuals.

Deliverables/Results:

- 100 people (18 adult volunteers, 45 adult anglers and parents, and 55 children) attended the Kids Can Catch event and spent several hours out on Lesser Slave Lake ice fishing. One family travelled from Grande Prairie (250 km away) to join the event for the day. Another woman has lived nearby in Sucker Creek First Nation her whole life and had never tried ice fishing.
- By providing ice fishing rods and bait, it was much easier for folks to come out and enjoy the day without having to buy equipment and supplies.
- Participants learned more about the LSWC and what they do in the watershed, ice safety and proper fish handling for catch and release, and sport fishing regulations in Alberta.
- LSWC received very positive feedback from participants of all ages.

Fly Tying Programs

Lethbridge Fish & Game Association (LFGA)

Grant: $2,000

Project code: 020-00-90-222

Project status: Funded in 2015/16 (but did not proceed); Completed

The project goal was to engage participants with the world of fishing through interactive learning. Lethbridge Fish & Game Association (LFGA) have initiated and have offered a fly-tying program start-up at the LFGA Clubhouse. LFGA had a small supply of hooks and fly-tying supplies that were purchased for these courses in the past, so they were available to all learners at no cost. LFGA have attempted to get this program off the ground several times without success in finding willing instructors/experts. Joel Rigby volunteered to be the Fishing Chair and is committed to continuing programs related to fishing. Through connections with the Chinook Waters Fly Fishing Club, LFGA have access to several experts and volunteer helpers. With these resources, the program has started that included participation in several events like the Fly Fishing Film Tour Film Festivals. Through ACA and LFGA sponsorship, ten sets of vices tools were purchased to teach the art of fly tying. The intention is that by attracting youth to this program the skills and experience will overflow into their families. In the initial offering it has been apparent that parents and youth are interested in doing these activities together. The target audience is 12- to 30-year-old youth and young adults.

Deliverables/Results:

- Equipment and materials have been purchased.
- Fishing Chair has been recruited.
- Volunteer facilitators have been recruited and have engaged in fly tying and video sessions.
- Association with the Chinook Waters Fly Fishing Club has resulted in synergies of purpose and intent along with additional volunteer resources.
- Initial participation has been ten with growing interest, which was lower than anticipated (expected 100+).

Lethbridge Fish & Game Association – Conservation Community and Education Project

Lethbridge Fish & Game Association (LFGA)

Grant: $14,500

Project code: 002-00-90-217

Project status: Funded 2014/15–2016/17 and previous by ACA Recruitment and Retention fund; Completed

Project website: www.lfga.club

LFGA increased the entry points through mentored hunts, public offerings and range-based programs with a focus on urban youth and new adults. Parents or guardians volunteer and accompany the youth so the impact of the programs affects whole families. These programs provide educational support and practice for first-time hunters. LFGA provides all equipment and supplies without cost to participants. Low-income families are a priority and are further subsidized by LFGA to encourage continued participation after completion in the programs. LFGA now has a 24 by 60 foot modular classroom at the range that will be used as a facility to support their educational programs (not funded with this grant). In addition, the classroom will be a home for their new air gun programs. In 2018 LFGA has increased the number of seminars and workshops for archery and have purchased 3D targets. LFGA has completely modified one of the ranges to be used for strictly 22LR programs with reactive fun targets for families to enjoy. LFGA completely revised the Hunter Education and Mentored Hunt program. Collectively LFGA took 18 individuals hunting, 13 first-time hunters, eight minors, and four immigrants. All but one hunter had good shots (inside 200 yards prone at a standing broadside deer). 13 individuals harvested deer and 19 animals were taken home. Tedd Walcott, a volunteer, personally took mentees out 18 days since Sept. 1, with 13 mentees going out in November. Targets were mule does, white tail does, white tail bucks, and one mule buck. Two were archery hunts.

Deliverables/Results:

- LFGA's conservation, community and education project reached 894 participants (duplicate participants are counted more than once) in their core range programs directed at hunting activities. This does not include action shooting, handgun, or other non-hunting related programs. The new mentored hunting program was well received and supported by Tedd Walcott with 18 individuals hunting on mentored hunts.
- The new archery programs have not been counted in these results. Offerings of seminars and workshops by Tom Hopkins and the volunteers were not counted. There were on average 38 participants in their new offerings of weekly 3D shoots. This was facilitated through the addition of the 3D targets. The goal is participation levels over 1,000 participants, and LFGA is approaching that number. The activities are inclusive, free, and are supervised by volunteer range officers and volunteer coaches. The majority of the participants were not LFGA members. Financial support from LFGA and ACA made this possible.

Riparian and Ecological Enhancement Program

Mountain View County (MVC)

Grant: $25,000

Project code: 015-00-90-102

Project status: Funded since 2005/06; Completed

Project website: www.mountainviewcounty.com/agriculture-environment/agricultural-funding-programs

Mountain View County (MVC) has been in partnership with ACA since 2000 and has received an ACA grant since 2005 towards the delivery of a Riparian and Ecological Enhancement Program (REEP). Funding is offered to producers who want to protect, restore, and maintain the health of their riparian and sensitive areas, encouraging biodiversity and maintaining fish and wildlife habitat using the following means: permanent riparian and sensitive area, wildlife-friendly fencing; native grass, tree, and shrub protection and establishment; off-site watering system installation; and approved creek crossings. The funds received from ACA are used to contribute up to 100 percent of the material costs for constructing fences, creek crossings, or the purchase of native seed or seedlings. Off-site watering systems will be funded at 25 percent of the material costs. A riparian or rangeland health assessment is performed on each project in the year of completion and again in five years, once contract commitments are completed. The contract with the County also allows the site to be used for demonstration purposes, and a road-side sign describing the project to be posted. This program encourages Beneficial Management Practices including controlled/rotational grazing, an accessible off-site water supply, nutrient management, noxious and prohibited noxious weed control, chemical application setbacks, and habitat protection and enhancement. The health of the watersheds within the County are improved through this program and there is an increased awareness regarding the importance of riparian and sensitive areas for biodiversity, native plant life, wildlife habitat, and fish distribution and productivity. Ongoing partnerships with technical advisors, extension-focused non-profit specialized groups and government agencies in the environmental and agricultural fields ensure that projects implemented under REEP are beneficial and lasting. This past year saw 28 projects funded through REEP.

Deliverables/Results:

- In 2018/19, 28 projects were funded through REEP: 12 fencing projects, 11 off-site watering systems, three creek crossings, and two planting projects. The total area surrounding water bodies that has been fenced off this year is 130.6 ha with the total length of newly installed riparian fence being 6.2 km. This results in seventeen more producers who are aware of the importance of beneficial management practices and sustainable agriculture. Of these projects, nine producers also signed conservation agreements with Alternative Land Use Services (ALUS) for projects focused on wetland enhancement. Not all approved REEP projects were completed due to unforeseen circumstances and eight projects were carried forward to 2019.
- Focusing on specific watersheds and partnering with other organizations doing work in the watershed has become an important aspect of the program and MVC will continue to build on this momentum in the coming years.
- REEP ads run in the newspaper regularly and a REEP infographic has been completed.
  - Radio: www.ckfm.ca/news/local-news/mountain-view-county-wins-pamz-award-for-participating-in-alus-projects
  - Newspaper Article: www.mountainviewgazette.ca/article/program-wins-blue-skies-award-20180626
  - MVC ALUS Video: www.youtube.com/watch?v=uvnwiRblbxg
  - REEP Producer profiles ran in April and May in the Mountain View Gazette.
- Multiple events have been hosted with an average of 50 attendees monthly at workshops. REEP info is displayed and examples of completed projects are highlighted at workshops and in presentations to encourage more participation. Highlights include the following:
  - Partnered with Rural Routes to Climate Solutions and Organic Alberta to host a Biodiversity Workshop at Little Loaves Farm (June 23).
  - Forage to Beef Demonstration Day hosted with Foothills Forage and Grazing Association and Livestock Gentec at Difficulty Ranch & Whiskey Ridge Cattle Co. in MVC featuring cell, bale and swath grazing, riparian management, drone application (July 11).
  - Riparian Management Course was hosted with Agroforestry & Woodlot Extension Society and Cows & Fish in Bergen area (July 23 to 24).
  - Partnered with Olds College and Legacy Land Trust to host a Wetlands Event promoting current conservation projects at the College and in MVC (Aug. 15).
  - Presented at Cows & Fish annual general meeting on MVC's longstanding partnership with Cows & Fish and the programs they have collaborated on (Sep. 11).
  - Partnered with Ducks Unlimited Canada and AEP to bring a Municipalities and Wetlands Management Course to MVC Council and staff (Oct. 19).
  - Presentation to Olds College Applied Land Use Planning class on Environmental Programs in MVC (Nov. 13).
  - Water and Agricultural Conference hosted with the Red-Bow Agricultural Partnership – a Canadian Agricultural Partnership Environmental Stewardship grant was received for this conference (Nov. 22).
- Project profile sheets are completed for each project that is funded and are available upon request.
- Riparian health assessments on 2018/19 projects are complete and available.
- Five-year follow-up riparian health assessments on 2013 projects are completed; landowners are encouraged by the measure improvements as a result of their projects and this has sparked renewed interest in building on this success and sharing it with others.
- MVC supported Open Farms Days and hosted a bus tour to four of the participating farms; information on REEP was provided at the barbecue hosted at the County office. Additionally, the MVC Ag Service Board toured project sites in October and it was a great opportunity for the board to see the results of the REEP projects and receive feedback from program participants.
- MVC estimates that one-on-one conversations were held with 75+ landowners around beneficial management practices.

Important Bird and Biodiversity Areas – Enhanced Awareness and Caretaker Support

Nature Alberta

Grant: $18,500

Project code: 030-00-90-257

Project status: Similar projects funded 2003/04, 2006/07, and since 2009/10 (except 2012/13 and 2017/18); Extended until Oct. 31, 2019

Project website: www.naturealberta.ca/programs/birds-biodiversity

The intent of the Nature Alberta's Bird and Biodiversity Program is to enhance awareness of the Important Bird and Biodiversity Areas (IBA) in Alberta and to provide resources for individuals to participate in activities associated with IBA stewardship throughout the province. Over the past three years, Nature Alberta has been actively promoting the IBA program at a provincial level by linking to new and existing activities and events including: Migratory Bird Day events, Nature Kids Family Nature Nights, BioBlitzes, IBA Caretaker events, and IBA Webinars. The intent of this active promotion is to create some additional awareness about IBAs and to provide some basic tools that individuals might adopt on their own that could help to enhance habitat and reduce bird mortality within the region of an IBA. The following three initiatives are examples of tools and resources for citizens to use to explore and enhance IBAs: 1) An online checklist of 150 special places to visit, including easily accessible IBAs, as a legacy celebration honouring Canada's 150th anniversary. It is expected that this resource will launch in late spring 2019. 2) A Homeowner's Guide to Protecting Birds of Alberta, either as a downloaded PDF or for free in print. This booklet features beautiful photography as well as valuable "did you know" and "what you can do" information on important topics such as birds and bird feeders, birds and cats, birds and pesticides, and more. 3) Ongoing support nationally, and specifically within the Greater Edmonton region, for the "Keep Cats Safe, Save Birds Lives" initiative. This program focuses on a partnership approach with Nature Canada and local wildlife agencies to educate cat owners about the need to keep domestic cats from roaming, resulting in improved cat health and reduced predation on local birds and other wildlife. The focus for Nature Alberta is to continue to grow the IBA caretaker network in Alberta by developing outreach materials specific to IBAs for each major biome in Alberta, increasing outreach to municipal and provincial planners, and hosting (or attending) regional meetings to help better support and identify caretakers' needs at a local scale. These activities are intended to benefit species of aerial insectivores, grassland birds, shorebirds, upland game birds, and water birds that use IBAs, and will have a direct positive impact on all other biodiversity using the areas.

Deliverables/Results:

- The main results of this project were to develop resource materials that were identified as high priority at the 2017 IBA Caretaker workshop (IBA Checklist and Shorebird Checklist) to help support local caretakers. While the idea of hosting a workshop and webinar series for training and networking was identified as a need at the 2017 workshop, interest in participation was low in 2018/19 and therefore not seen as a cost-effective approach, with more interest expressed recently in hosting localized site visits. This change in direction has required Nature Alberta to explore alternative sources of revenue to support a part-time position dedicated to the IBA program whose short-term focus will be to visit with IBA Caretakers and to assess local needs.
- Digital production of IBA site and access maps for IBAs within the boreal, parkland and prairie biomes: Biome specific maps of IBAs are complete and integrated into the IBA Checklist. Access maps have not been completed and the overall need will be confirmed over the coming months.
- Blog posts and social media posts, including eNews highlights and Nature Alberta magazine profiles, have been completed. Additional material is planned as a result of IBA site visits and interviews with Caretakers.
- Ongoing support for and attendance at four International Migratory Bird Day (IMBD) events across Alberta: attended IMBD events at Beaverhill Lake, Lesser Slave Lake, and Big Lake. A fourth IMBD event is planned for Frank Lake in April 2019.
- Several deliverables were not completed due to reduced staffing capacity: Nature Alberta didn't manage to attend Nature Alberta club and/or IBA caretaker meetings, host IBA caretaker workshops, or IBA webinars. An alternative approach proposed for 2019 includes planned site visits with IBA caretakers to local sites to determine core needs. The proposed site visits will assist with caretaker engagement and identification of key local needs. The alternative approach to the IBA webinars is to focus on marketing of the Canada 150 Story Map to encourage Albertans to explore nature at IBAs.
- The planned BioBlitz events specifically targeted to IBAs in Alberta did not occur. Resources were reallocated to develop and produce the IBA Checklist.

Living by Water

Nature Alberta

Grant: $53,500

Project code: 015-00-90-129

Project status: Funded since 2003/04 (except 2008/09 and 2012/13); Extended until Aug. 30, 2019

Project website: www.naturealberta.ca/programs/living-by-water

Living by Water (LBW) has been a core program of Nature Alberta for more than 15 years, over which time this program has evolved and adapted based on participant feedback and external evaluation. The current LBW program is focused on providing lake level and/or sub-lake level assessments in partnership with Watersheds Canada, utilizing their Love Your Lake assessment protocol. Additionally, the LBW program has been testing the interest for and overall acceptance of providing site-specific shoreline restoration or naturalization plans, coupled with the installation of native plant species, for those lakeshore residents who have expressed an interest in naturalizing and enhancing their shorelines. This targeted approach was developed to test the extension model (Awareness & Knowledge, Persuasion, Decision, Implementation and Confirmation Stages) and to determine if there is enough overall interest within the localized lake community to develop projects that will help enhance overall lake health and improve water quality. During the 2018/19 season, Nature Alberta staff completed the assessment and data input of 1,028 properties (68.77 km) at Lake Isle, Lac la Nonne, and Pigeon Lake, in addition to the 835 properties (49.11 km) surveyed at Wabamun Lake in 2016 and 2017. Over the course of this past year, staff completed 31detailed site assessments (coupled with an additional 62 site visits) on private land plus an additional 11 site assessments on municipally owned lands at Wabamun Lake and Lake Isle. A total of 16 remediation projects were completed prior to an unusually early freeze-up with an additional six planned projects and four potential projects (all at Wabamun Lake) to be finalized and/or implemented in the spring of 2019. Staff also planned and attended 14 meetings, workshops, summer village celebrations, and public events at target lakes, in addition to regular partner meetings with staff from provincial lake and government agencies, local municipalities, and lake stewardship groups.

Deliverables/Results:

- Love Your Lake assessments for Lake Isle, including summer villages and public land parcels (complete).
- Thirteen naturalization projects (initiated and planned in 2017) for Wabamun Lake (complete).
- Follow-up on naturalization projects associated with public land in partnership with Parkland County at Wabamun Lake (incomplete): 11 sites have been identified by Parkland County for inclusion in the overall project; however, Nature Alberta has not been able to complete the plant installations and/or changes to land management practices by County staff during the 2018 field season. Plant materials are ready for installation at two sites in the spring of 2019 and Nature Alberta is awaiting final approval from Parkland County for the additional nine sites. The intent is to also complete these nine sites in the spring of 2019.
- The Love Your Lake Assessment Summary for Wabamun Lake and present summary report to Parkland County Council and Administration, summer villages, and Wabamun Lake Watershed Council (incomplete): The Wabamun Lake Assessment Summary report is complete and has been presented to Parkland County Administration, summer villages, and Wabamun Lake Watershed Council. They are currently waiting for a final date to present to Parkland County Council as well as to hold a workshop with Wabamun Lake Watershed Council to provide program updates, plans for 2019, and to address any questions or concerns as a result of this work.
- Completed an additional approximately 35 site visits to create plans for shoreline naturalization projects at Wabamun and Isle Lakes.
- Plan and initiate an approximately 20 additional shoreline naturalization projects on private, municipal and provincial public lands at Wabamun and Isle Lakes (incomplete): 15 projects have been completed with an additional six projects planned for spring 2019.
- Ongoing support for approximately ten educational events in partnership with lake stewardship organizations (complete).

Nature Kids Family Nature Nights and BioBlitzes Across Alberta

Nature Alberta

Grant: $16,180

Project code: 002-00-90-264

Project status: Nature Kids funded since 2014/15 and previously by ACA Recruitment and Retention fund; Completed

Project website: www.naturealberta.ca/nature-kids

The Family Nature Night (FNN) events hosted by the Nature Kids program has proven over the course of seven years to be a successful and sustainable project in Edmonton. The average attendance has been 75+ people/event/year in each of the seven years FNNs have run (2012 to 2018). FNNs reached a new level of popularity in the last couple years, averaging 121 people/event in the summer of 2017 and an average of 104 people/event in the summer of 2018 and an average of 38 people/event during the winter FNNs. This year Nature Kids also decided to host seven BioBlitz events in the non-Edmonton chapters, where participants identified a number of different species within their local parks with local experts. Nature Kids had a total of 691 people attend the FNNs in the summer and winter and 391 people attend the BioBlitz events, for a total of 1,082 participants. All of these events aim to get families outside and learning about nature that exists just outside their front door. Every year, FNNs are hosted with varying themes at different parks across the City of Edmonton and this year BioBlitz events were held in the other chapters across the province. FNNs and BioBlitzes are grand in scale, free to the public, attract large audiences, and feature local experts; therefore, they address the problem that children today do not have enough access to nature-based activities. Throughout the course of 2018/19 Nature Kids brought themes such as butterflies and spiders, urban critters, birds, trees, water, fungi and lichen, and arctic adaptations to the families of the City of Edmonton. During the BioBlitzes, Nature Kids collaborated with several organizations from across the province to bring these species identification events to the families of Alberta. This project was a huge success and Nature Alberta is happy to continue to offer these types of events to the families of Alberta.

Deliverables/Results:

- The main results of this project were that over 1,000 people attended the 14 various events and 107 volunteers helped with the Nature Kids FNNs and BioBlitz events through 2018/19 across the province. Nature Kids was also successful in piloting the BioBlitz events to the various chapters, which meant that they reached more families across Alberta by bringing free public events to parks in their local area.
- This project includes all six locations in Alberta where Nature Kids chapters currently exist (Calgary, Edmonton, Grande Prairie, Lakeland, Morinville, and Red Deer) as well as the two new locations where Nature Kids chapters are currently being established (Erskine/Stettler and Athabasca).
- Six summer FNNs were held in Edmonton with a total of 624 participants and 63 volunteers participating throughout the summer. A BioBlitz event was hosted in Grande Prairie where 30 people attended as well as five volunteers and 35 species were identified. In Calgary at Carburn Park, 38 people attended the BioBlitz event with four volunteers and 20 different species were identified. A Morinville BioBlitz event was hosted at Cardiff Park where there were 100 participants, five volunteers, and a live porcupine. Nature Kids hosted a BioBlitz event in Red Deer in conjunction with the Bug Jamboree at Ellis Bird Farm where over 300 people came and at least 150 people participated in the BioBlitz event. Nature Kids had nine volunteers at this event. Nature Kids Lakeland Chapter hosted a BioBlitz event at Cold Lake Provincial Park with approximately 40 participants and four volunteers. A BioBlitz event was hosted in Athabasca, where Nature Kids was hoping to start a new chapter but the attendance at this BioBlitz event was not very high at only about 20 people and six volunteers (they have since decided to not continue with the chapter in Athabasca due to low interest). The Erskine/Stettler BioBlitz was held at Rochon Sands Provincial Park where there were 13 participants and six volunteers. The Winter FNN in Edmonton was the most successful Winter FNN to date with 67 people in attendance, three experts, and five volunteers.

Riparian Protection on the Raven River (2018)

Northern Lights Fly Fishers Chapter, Trout Unlimited Canada

Grant: $31,500

Project code: 015-00-90-247

Project status: New; Completed

The objective of this project was to compliment ACA's Riparian Conservation Program by protecting riparian land along the 2,630 m of the Raven River flowing through the MacCharles property near Caroline, Alberta. This river provides the finest brown trout angling opportunity in the province, but riparian land and water quality were being adversely affected by the farmed livestock, primarily cattle, on this quarter section. To achieve the objective, the Northern Lights Fly Fishers Chapter of Trout Unlimited Canada (NLFF TUC) successfully applied for a grant to contract the installation of wildlife-friendly exclusion fencing along each side of the Raven River that runs through the MacCharles property and provide an alternative, portable watering system for the farmed livestock that otherwise would utilize the river. Once an agreement was finalized with the landowner, a 12-volt solar-powered Classic Trailer watering system was purchased and placed on site to provide alternative watering for the landowner's livestock. Fence line mulching and fence installation were completed as soon as the ground was dry enough. In addition, walk-in access points were created for anglers and others to gain access to the primarily mature spruce covered riparian land along the river. Signage will soon be provided by ACA. The project has provided protection for 33 ac of riparian land. By excluding farmed livestock from the river and providing alternative watering access, riverbanks have been stabilized, siltation reduced, habitat for fish improved, aquatic organisms and wildlife habitat created, and increased recreational opportunity for anglers and those interested in experiencing nature in a more pristine setting established. This project has unexpectedly encouraged a neighbouring landowner to show interest in riparian protection on his property and ACA is in early stages of negotiating an agreement with him. Also, based on the success of the project on the MacCharles property, ACA staff are considering this as a possible demonstration site for future bioengineering projects. The project has exceeded expectations and has already received acclaim from anglers.

Deliverables/Results:

- The project has provided protection for 33 ac of riparian land along 2,630 m of the Raven River, a trout fishery which attracts anglers from across the province and beyond. Approximately 2.5 km of wildlife-friendly fencing and five gates together with a solar-powered watering system have become the property of the landowner who has assumed responsibility for ongoing maintenance.
- A summary of the project has been published on the NLFF TUC website (www.nlft.org) and was made available to TUC for publication on TUC's "News Room."
- A neighbouring landowner has shown interest in a riparian protection agreement and ACA is in early stages of negotiating a potential project on his property. Also, based on the success of the project on the MacCharles property, ACA staff are considering this as a possible demonstration site for future bioengineering projects.

Conserving and Restoring Arctic Grayling in the Upper Pembina River Watershed – Habitat Restoration Planning

Northern Lights Fly Fishers, (TUC) Edmonton Chapter

Grant: $16,965

Project code: 020-00-90-197

Project status: Funded since 2012/13; Completed

Project website: www.nlft.org/grayling

In 2018, Northern Lights Fly Fishers, Trout Unlimited Canada (NLFF TUC) Edmonton Chapter continued to collect data in support of a multi-year initiative (2011 to 2018) to study Arctic grayling populations and habitat conditions in the Upper Pembina River watershed. The data collected will be used to identify habitat concerns and conservation opportunities to help re-establish Arctic grayling populations and angling opportunities for future generations. Specific activities in 2018 included: 1) installation of temperature data loggers to record water temperatures at 20 locations in the Upper Pembina Watershed; 2) inventory of habitat conditions at key locations using a camera equipped drone; 3) capturing evidence of non-conformance to angling regulations or other land use concerns; and 4) assisting AEP to sample grayling populations at midpoint of stream closures related to the recovery rest period. NLFF TUC findings confirm that Arctic grayling numbers in the watershed have declined drastically. Many stream populations appear to be extirpated, but there are remnant populations in Dismal Creek, Rat Creek, and Nelson Creek. Many streams that formerly supported grayling are no longer suitable due to high water temperatures and other factors. However, Dismal Creek still provides suitable water temperatures and habitat for Arctic grayling. NLFF TUC are supportive of AEP initiatives and will continue to work with AEP in a stewardship role regarding opportunities for habitat restoration or other activities to help conserve and restore Arctic grayling populations in the Upper Pembina watershed.

Deliverables/Results:

- All objectives were completed with the exception of some signs that will be physically installed after the snow melts and the ground defrosts.
- In addition to the stated objectives, a streambank remediation project was undertaken by club volunteers in May 2019 and approximately 700 willows were planted.
- Photos were captured at 15-minute intervals at each site. Several instances of non-conformance to angling regulations were recorded and shared with AEP. At one site, the still images were combined to create a time-lapse video of rapidly rising water conditions resulting in changes to the riverbank.
- Water temperature data was recorded and provided to AEP for continued historical analysis.
- Video data captured, with particular interest in areas damaged by off-highway vehicle usage and potential areas for other remediation.
- Crews consisting of AEP biologists and club volunteers caught over 70 fish during the sample angling week. Multiple species were caught; almost all were grayling with the occasional pike and whitefish. There were multiple age classes as well; some of the bigger grayling exceeded 40 cm total length.
- A streambank remediation initiative was undertaken in early May. 700 willows were planted along a section of Dismal Creek near site DC14. Over a dozen volunteers assisted with collecting, preparing, and planting willows that will help stabilize an eroding streambank that appears to have been induced by land clearing (likely an old bridge crossing).
- Additional video was captured. Sample video can be found on NLFF TUC's YouTube page.

- This is a time-lapse video (www.youtube.com/watch?v=SE_t1LRNN6k) of a high-water event at one of the sites.
- This video (www.youtube.com/watch?v=cQ1ySwYZZLI) shows a tributary to Wolf Creek where grayling were captured. The site is outside the closure area, but in close proximity to existing sites.
- This video (www.youtube.com/watch?v=ZJkll9J5Sho) shows the site on Dismal Creek where the willows were planted as part of streambank remediation.
- A PowerPoint presentation will be updated and delivered to the NLFF club in April.

Bird/Bat House Project

Onoway & District Fish & Game Association (OFGA)

Grant: $800

Project code: 030-00-90-102

Project status: Funded 2006/07–2009/10, 2013/14, 2016/17, and 2017/18; Completed

Project website: www.ofga.ca

The goal with this project each year is to provide safe housing for bats and birds, as well as educating and providing awareness to members and the public at large. As Onoway & District Fish & Game Association (OFGA) work with youth to build these houses, the youth also learn valuable woodworking skills along the way. OFGA successfully built and distributed over 400 houses. This has been a very successful project to date, and OFGA plans to continue this project on an annual basis.

Deliverables/Results:

- A late spring cutting bee was held where volunteers prepared the wood for building into birdhouses. Two of the workshops occurred with members of the public to put birdhouses together and to learn about the importance of safe habitat for birds. Over 400 birdhouses were built. Attendees of the workshops took home their own birdhouse to mount in a suitable location. The OFGA Youth Club also held a workshop for the youth members of the club.
- Number of volunteer hours: approximately 240 hours.
- Workshops were held at the Cabela's South Edmonton location, which were well attended, as well some volunteer member workshops to work with the youth to prepare the materials for building the bird houses.

Salter's Lake Improvements

Onoway & District Fish & Game Association (OFGA)

Grant: $2,500

Project code: 020-00-90-270

Project status: New; Partially complete

OFGA was partially successful with the Salter's Lake Improvements project. A bear-resistant garbage can was purchased and installed at the picnic area at Salter's Lake, which has not been the destroyed/vandalized, and this has helped to maintain a clean area for people coming to the lake. Unfortunately, no oxygen tester was purchased as members were unsure where to source the tester from. The lake has been stocked recently, and OFGA does plan to pursue obtaining an oxygen tester in the future when someone is able to research sourcing one.

Deliverables/Results:

- The bear resistant garbage can was purchased and installed at Salter's Lake; the can is working very well.
- OFGA is working on determining where to purchase an oxygen tester. Unfortunately, OFGA was unable to obtain an oxygen tester. Although research had been done regarding price, OFGA did not have an opportunity to properly source where to obtain a tester and still plan to purchase an oxygen tester at a later date.

Partners in Habitat Development

Partners in Habitat Development (PHD), Eastern Irrigation District

Grant: $15,000

Project code: 015-00-90-103

Project status: Funded since 2005/06; Completed

The Partners in Habitat Development (PHD) program, founded in 1998, is a long-term habitat program that has been developed to create, restore, and protect wildlife habitat within the farming region of southern Alberta. The PHD program is an initiative developed to mitigate the loss of wildlife habitat in the agricultural areas of southern Alberta due to irrigation infrastructure improvements, agricultural intensification, and industrial activities. The PHD program works with landowners to create, and when possible, preserve wildlife habitat. The program's focus is on the creation of shelterbelts and block plantings to provide critical winter habitat for upland game birds. In 2018, 6,638 trees and shrubs were planted in the Eastern Irrigation District on ten new habitat sites and nine existing habitat sites. The PHD program also assists with fencing livestock out from existing and newly created habitat sites. In 2018, 1.2 km of fence material was distributed to fence out one new habitat site and one site with existing pheasant habitat.

Deliverables/Results:

- 3,226 trees and shrubs were planted, and fabric mulched applied on ten project sites in the spring of 2018. A fabric mulch was applied around the trees and shrubs to aid in weed control and moisture retention. Maintenance activities occurred on 2017/2018 PHD projects. 2,940 replacement trees and shrubs were planted on nine project sites from 2017 where they failed to survive. 472 trees and shrubs were replanted in 2+ year old PHD sites. Planning is underway for 2019 PHD sites.
- In the spring of 2018 approximately 1.2 km of fencing material were purchased by the PHD. 400 m was to be installed by the landowner on one new PHD project and 800 m was installed by the landowner to protect existing pheasant habitat.
- No opportunities for wetland habitat creation were present this year. Discussions with Irrigation District engineering staff will continue in the winter to identify potential projects for the coming years.
- Sharp-tailed lek surveys were completed in April, ring-necked pheasant crowing counts were started in April, but unsuitable weather and road closures meant only six transects were completed. Eleven late summer upland bird brood surveys were completed in August.
- Additional steps have been taken in the coming years to better evaluate the successfulness of the PHD program. There was only one rain day this year for summer staff to do drive-by inspections of old PHD sites, so only ten sites were inspected.
- Over the coming year, it is hoped the staff time will allow for the creation of up-to-date promotional materials for the PHD program to assist with future fundraising activities.
- PHD staff or contractors met with landowners interested in new, or additional, PHD projects and inspected the potential sites. Plans for the 2019 and 2020 seasons were also formalized.
- Publication of 2018 PHD Annual Report (April 2019).
- PHD Brochure and PHD Landowner package.

Wildlife and Native Habitat Enhancement in Red Deer County via ALUS (2018)

Red Deer County (RDC)

Grant: $40,000

Project code: 015-00-90-128

Project status: Funded similar projects since 2006/06; Completed

Project website: www.rdcounty.ca/207/conservation

The project goal is to work with landowners who wish to implement actions on their land, which conserve or improve riparian and native range habitat in Red Deer County (RDC). The project objectives are to: 1) support RDC 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 and native range habitat through fencing, off-stream watering, establishing buffer zones, and other riparian and native range management projects completed by participating landowners; and 3) assist landowners in developing an informal "Management Plan" for each of the completed projects. The project will also conduct baseline Riparian (or Range) Health Assessments to determine baseline ecosystem function, which will allow RDC to measure ecosystem function improvement over time. The project activities are as follows: Step One "Call for Participants": promote the Alternative Land Use Services (ALUS) initiative, asking interested landowners to contact the County's Conservation Coordinator. Project Plans developed for each project. Step Two "On-the-Ground Action": RDC reviews submitted Project Plans, to make decisions regarding funding for projects. With the ALUS Program, projects are reviewed by County staff and the County's ALUS Partnership Advisory Committee, made up of producers and technical advisors with expertise in enhancing habitat in agricultural areas. ACA funding goes towards a portion (up to 85 percent for highest priority projects, more commonly 75 percent) of the costs associated with each project. The individual landowners are responsible for any other costs to construct, and subsequently maintain/repair their project(s). RDC and other partners, as appropriate, contribute technical expertise to planning the projects, developing ongoing project management plans, etc. Step Three "Monitoring/Evaluation": RDC (via Cows and Fish) conducts Riparian or Range Health Assessments, and/or establishes formal Photo Monitoring Points, at the beginning of the on-the-ground project. Follow-up assessments come four to five years later, to compare to the baseline condition. RDC works with the landowners during project planning, project construction/installation, and regularly afterwards, to develop, evaluate, and adapt the landowners' project management plans over time. This resulted in 299 ALUS projects, initiated by 27 landowners, throughout RDC.

Deliverables/Results:

- 27 RDC landowners have been supported with financial and technical resources for their 299 on-the-ground riparian and/or native range habitat enhancement/stewardship projects on their land. The impacts of these 299 projects: 686 ac of riparian and/or native range habitat, ~21 km of river and stream, and 346 ac of waterbody will be conserved and/or enhanced through sustainable management. Approximately 1,956 animal units will be impacted in the new livestock management regimes provided by the 299 projects.
- These projects include the following: 18 off-site watering systems, 50 riparian or range management fencing projects, four riparian tree/shrub plantings, one creek crossing, two waterfowl nesting projects, two alternative beaver management projects, and 222 waterbody, riparian, or upland wildlife habitat improvement-through-management change projects.
- Ten articles in the County News mentioned or were about the ALUS Program (each edition has about 10,000 copies produced and distributed). Most of these articles were also re-printed in the Grey Wooded Forage Association's monthly newsletter (distribution unknown, but estimated at several hundred).
- Information about the project was communicated "live" at 11 workshops/tours/field days (total attendance about 415). Three of the 11 events mentioned above were tours: a) Grade 5 Farm Tour – about 150 students learned about ALUS while visiting an ALUS Farm and seeing their projects; b) Enterprising Ag Tour – about 80 people drove by and learned about two ALUS Farms and their projects; c) Prairie Conservation Forum – 20 PCF members visited an ALUS Project and learned about it and the neighbouring ALUS Projects.
- In December 2017, RDC co-hosted a "Digital Storytelling Workshop." Four RDC ALUS farmers participated and developed Digital Stories. These digital stories were showcased at a public event in April 2018, and made public on the internet after that event (they can be found on the Cows and Fish YouTube page, at www.youtube.com/playlist?list=PLmgphavt-3YM4tyVXtiOpXZSQHB1frad3).
- The Digital Stories were featured in two different Red Deer Advocate articles: www.reddeeradvocate.com/news/digital-storytelling-in-red-deer-county and www.reddeeradvocate.com/news/local-stewards-of-the-land-share-their-stories-at-digital-storytelling-event

PISCES' Aquatic Project

Rocky View School District – Alberta

Grant: $1,772

Project code: 002-00-90-290

Project status: New; Completed

The Fish in Schools (FinS) program of Alberta for Early Childhood through Grade 12 provides an opportunity to raise trout in the classroom. Ecole Manachaban Middle School's name for this program is the PISCES project. Each school year, over a five- to six-month period, students and teachers maintain and monitor the development of trout—from egg to fry—in their classroom aquarium. This project involves the importation of fish eggs from the Calgary-Inglewood fish conservation location at the end of January. These eggs then hatch and mature into adult trout by school year's end (June). The fish are released in June, under supervision, to the fish sanctuary (the Bow Habitat Station). For the 2018/19 school year, Ecole Manachaban Middle School needed to upgrade the system in which the fish were housed for the six-month term. The fish containment and space infrastructure needed modernization. All necessary equipment and supplies were purchased and are currently in the final stages of setup and installation. The fish viewing station is accessible to all school students, staff, teachers, parents, and visitors, as it is in an open, bright area of viewing and observation without disturbance of the fish environment.

Deliverables/Results:

- Students from all grades have full access to the Learning Hub aquarium setup. They become conversant with the development process as they witness the various stages of egg through fry growth and their patterns of activity. Question sessions are held in class and

ad hoc at the viewing station with the habitat coordinator/teacher. Classes are asked to have students capture their impressions and experiences in written essays and submissions.

- Students are involved with the hands-on care and maintenance of the aquarium system and the feeding of the fish, under teacher supervision, instruction, and guidance.
- Students participated first-hand in the transition of the fry into a larger ecosystem (provided by the Bow Habitat Station) as the fish are released to the fish sanctuary in June 2019.
- Web live streaming access was set up for the school.
- Pictures and videos (while respecting student FOIP issues) of the weekly progression of the fish in terms of growth and activity were taken and accessible for school intranet upload.

Red Deer, Kids Can Fish Event

Safari Club International Red Deer Chapter

Grant: $2,100

Project code: 020-00-90-234

Project status: Funded in 2016/17 and 2017/18; Completed

Safari Club International Red Deer Chapter (SCI Red Deer) held the Red Deer Kids Can Catch event on July 8, 2018 at the Barry Mitchell Pond located at Heritage Ranch in Red Deer. The main objective of the event was to introduce and promote active outdoor recreation and conservation to local youth who would otherwise not have the opportunity. A total of 85 youth and approximately 150 adults participated in the activities over the course of the day. The event was free of charge and encouraged the young anglers to engage in hands-on participation in a fun and accessible atmosphere. Each youth was partnered up and offered one-on-one instruction and guidance from a SCI Red Deer volunteer; this included everything from discussions on fish conservation and responsible angling to the basic setup and most importantly the operation of the fishing equipment. This event for many was an introduction into the sport. All fishing rods, tackle, and bait were supplied on a loan basis. Each individual participant was also given a small take home tackle box with the fishing basics. Complimentary beverages and a barbecue was also included and viewed by all in attendance as a huge success. Representatives from local organizations such as Big Brothers and Sisters, Junior Forest Wardens, and Women's Outreach Centre were in attendance.

Deliverables/Results:

- In total, 85 youth participated in the day with associated adults. The age group associated with the event continues to be young (four to six years old) with many of the adults having little to no fishing experience. SCI Red Deer needs to have more volunteers available to spend the proper time with each child.
- The event was advertised with posters that were displayed at 25+ locations throughout the Red Deer area, and postcards were dispersed at local sports outlets.
- The event had some coverage in the local Red Deer Express News.
- Pictures of the event were shared on Facebook and social media platforms.
- An article went out to all SCI membership and was mentioned at the SCI fundraising event in March 2019.

Operation Water Drop, Operation Water Pollution and Operation Water Biology Kits to be Used by Students in Alberta as Part of Field Trips/Outdoor Education

Safe Drinking Water Foundation (SDWF)

Grant: $3,145

Project code: 002-00-90-235

Project status: Funded in 2015/16 and 2016/17; Completed

Project website: www.safewater.org

The project goal was to provide Alberta teachers with water testing kits for them to use with their students during field trips. The Safe Drinking Water Foundation (SDWF) has had an excellent year in terms of being able to provide educational materials for students to enable them to conduct hands-on analyses of water samples. By the end of this school year, SDWF will have provided Canadian schools with approximately 512 sponsored Elementary Operation Water Drop (EL OWD) kits, 221 sponsored High School Operation Water Drop (HS OWD) kits, 181 sponsored Operation Water Pollution (OWP) kits, and 169 sponsored Operation Water Biology (OWB) kits. Therefore, since the goal was to send 700 sponsored water testing kits to Canadian schools each school year, and this school year SDWF sent approximately 1,083 sponsored kits to Canadian schools, SDWF has been quite successful in terms of finding organizations willing to sponsor these educational kits for the schools. For this funding, SDWF worked with the teachers and students at École Lacombe Junior High School, Chestermere Lake Middle School, Maryview School, Captain Nichola Goddard School, and Wilson Middle School in order to provide them with educational kits. These kits enable schools to conduct water analyses as part of activities in which students go outdoors and learn more about rivers, creeks, ponds, and wetlands.

Deliverables/Results:

- Penny Gratton at École Lacombe Junior High School was provided with four HS OWD kits, one OWP kit, and three OWB kits. Andrew Kunz at Chestermere Lake Middle School in Chestermere received four EL OWD kits and four OWB kits to use on field trips. Tammy Davis at Maryview School in Red Deer received three EL OWD kits and one OWP kit. Charlotte MacPherson-Levesque at Captain Nichola Goddard School in Calgary received one HS OWD kit. Leo Lacourciere at Wilson Middle School in Lethbridge received one OWP kit.
- Alberta experienced an extremely long, cold winter this year; therefore, many of the teachers have not had an opportunity to use the water testing kits on a field trip yet. However, the Captain Nichola Goddard School had the chance for 180 students to use their kit on a field trip and reported the following: "The field trip went very well. We visited two local storm drain ponds where we used the equipment to determine the storm water quality. These results were compared with our city tap water and tap water from a small town about 50 km outside of our city. We also tested water from one of our city's rivers and compared this data as well. Students learned a lot about water quality and they also learned about the importance of being responsible citizens and the need to become caretakers of our waterways. We discovered how poor the water quality is in storm ponds and the importance of plants and other devices used to clean the water in the ponds. A big thank you for supporting our students in the quest to learn more about water quality and becoming better stewards of the environment."
- Other schools planned to use the tests in May or June 2019 and will send results in once they have happened. Results and reports will be sent on to ACA as they are received.
- The project was mentioned in SDWF's summer 2018 newsletter, which was sent out to over 20,000 e-mail contacts and placed on SDWF's website during the last week of June 2018. SDWF's website received over 432,000 unique visitors last year.

Foothills Restoration Forum Outreach and Extension: Range Health Assessment training and Fall Information session

Southern Alberta Sustainable Community Initiative

Grant: $8,181

Project code: 002-00-90-243

Project status: Funded in 2015/16 & 2017/18; Completed

Project website: www.foothillsrestorationforum.ca

The goals of the Foothills Restoration Forum (FRF) are to promote the restoration of ecological health, function, and operability of native grassland plant communities in Alberta through education, outreach, and research to improve reclamation practice and foster stewardship. The conservation and restoration of healthy, intact native grassland landscapes are critical to maintaining habitat, biodiversity, and ecosystem function. The objectives of the FRF Outreach and Extension Project are to educate and train planners, decision makers, and reclamation practitioners; promote maintenance of intact native grasslands; and improve reclamation practice to foster restoration of fragmented and disturbed grasslands. The key activities for the FRF to educate and influence conservation and reclamation outcomes on native grassland are: 1) Range Health Assessment training and 2) information sessions. Range Health Assessment training is field-based training for regulators, ecologists, planners, and practitioners on the application of range inventory and assessment tools as they apply to reclamation practices. An understanding of how to use Alberta's range plant community guides and range health assessment manuals are important for planning reclamation to facilitate restoration of native grassland. The deliverable for this activity is an increase in awareness and skills in the use of range assessment tools important for restoration of native grassland habitats. This course was delivered to 44 participants, including 14 subsidized registrations, on Sep. 13, 2018. The FRF Annual Fall Information Session gathers a variety of grassland stakeholders for one day to listen to presentations on grassland restoration and exchange current information through "open mic" project updates and mini presentations. The deliverable for this activity is an increase in awareness and knowledge, transfer of current and emerging restoration efforts, and techniques available for restoration of native grassland habitats. This event was held Nov. 15, 2018 and attended by 128 people, including 20 subsidized registrations.

Deliverables/Results:

- Both these events help support FRF's goals to provide an open and inclusive forum for diverse stakeholders to work together to promote the restoration, stewardship, and conservation of Alberta's rangeland working landscapes.
- A successful Range Health Assessment training event for 44 participants, including 14 subsidized registrations on Sep. 13, 2018.
- The Fall Information Session was held Nov. 15, 2018, and attended by 128 people, including 20 subsidized registrations.

Restoration Program

Sustainability Resources

Grant: $22,000

Project code: 015-00-90-262

Project status: New; Completed

Project website: www.sustainabilityresources.ca/resources/community-learning-events/riparian-restoration-conservation

Sustainability Resources worked with communities to identify projects to bring more native plant communities into river valleys, parks, pastures, and around infrastructure because native forests and grasslands are essential for ecosystem quality, and subsequently fish and wildlife. Landscapes with prolific native plant communities absorb more rain and snow than disturbed landscapes; they restore that moisture to the water table. The water table is what keeps rivers flowing when there is no rain. Native grasslands and woodlands even absorb carbon dioxide (on average, if undisturbed), which otherwise contributes to climate change. In 2018, Sustainability Resources planted 11,020 trees and shrubs on 6.4 ha of land in eight locations, and employed four to six youth tree planters per site (13 youth in total) through Youth Empowerment and Support Services, Paul First Nation, and Samson Cree Nation. Four youth support workers were hired to supervise youth and help with planting and planning. Eight workshops reached 100 decision makers, non-profit staff, and individuals from varied backgrounds who can adjust their practices or policies to support watershed and wildlife health. Youth tree planters and staff lead volunteers in real-time impact by planting future forests.

Deliverables/Results:

- Decision makers and individuals were educated on climate change, watersheds, and select topics related to these, through workshops across Alberta. Reconciliation through understanding natural law was also a theme that tied into the value of riparian land for all wildlife.
- 100 people engaged through eight workshops: Sapling Transplanting – Beaver County (7 future employees volunteered); Climate Solutions Workshop – Leduc County (7); Permaculture Design Workshop – Parkland County (14); Youth Environmental Career Training – City of Calgary (15); Watersheds for Wildlife Workshop – Town of Okotoks (15); Traditional and Contemporary Environmental Management – Piikani Nation (19); Planning Outside the Box – Stony Plain (nine); andTree Planting Workshop – Piikani Nation (12).
- Youth were employed on tree planting projects where they camped overnight near work sites. Improvements in confidence, initiative, friendships, and knowledge about tree planting were observed. Youth expressed pride in earning income.
- 6.4 ha planted and/or modified management with 11,020 trees and shrubs planted, distributed as follows: Leduc County (1,009); County of Wetaskiwin (1,444); Parkland County (651); City of Calgary (944); Town of Okotoks (1,409); Piikani Nation (1,981); MD of Bonnyville (2,058); and Samson Cree Nation (1,274).
- Volunteers and staff made valuable connections with each other.

8th Annual AFGA/ACA Youth Fishing Recruitment Day

Taber Fish & Game Association (Taber FGA)

Grant: $14,800

Project code: 020-00-90-207

Project status: New, previously funded via Lethbridge Fish & Game Association; Completed

On June 2, 2018, the 8th annual youth fishing day was held at Payne Lake. Taber Fish & Game Association (Taber FGA) took over the organization of this year's fishing event from Lethbridge FGA. 398 kids attended this year, accompanied by at least one parent/guardian each. Many of the little anglers were camping the week before getting the prime spots by the water for the big day. 45 fish were measured, all over 14" in length. All youth in attendance received a catch-and-release pail, an ACA take-home bag, an ACA barbless fishing hook, and a tape measure. It was a great day and much fun was had by all. No fish casualties were recorded, and the aeration tank worked well.

Deliverables/Results:

- Taber FGA was just under the goal of 400 youth, with 398 in attendance. All youth were given fishing equipment and take-home packages. All youth who caught fish were taught hands on how to catch and release their fish correctly.
- The Facebook page is at 400 likes after the event, and many participants showed interest in attending again.

Faith-Based Organizations and Conservation: Engaging volunteers in recovery plans of endangered pines

The King's University

Grant: $4,933

Project code: 015-00-90-263

Project status: Funded 2013/14–2015/16; Extended until June 30, 2019; Completed

Volunteer-based conservation efforts are critical for cost-leveraging the recommended recovery actions for the endangered limber pine in Alberta. The King's University, a Christian post-secondary institution, provided a volunteer-based endangered pine recovery initiative for students and church youth groups who want to practically express their stewardship values. This report represents the culmination of a five-year initiative that annually enhanced one population of limber pine in the Crowsnest Pass lacking adequate natural regeneration. The long-term objectives were to: 1) implement recommended recovery actions for the endangered limber pine; 2) promote, educate, and engage faith-based organizations in local conservation activities; and 3) test whether cattle disturbance versus seedbed type, and white pine blister rust infection, influences seedling survivorship. Activities included: 1) site visits with landowners; 2) a seedling survivorship survey of the 2018 planting at the Ducks Unlimited (DU) Ranch; 3) one educational field tour; and 4) a restoration planting of seedlings grown by a contracted tree nursery. The project involved 45 Grade 10 students in replanting the 2018 planting, owing to poor survivorship following planting. 1,080 two-year-old seedlings were planted, enhancing two ha of limber pine habitat on the DU Ranch, a unique property with a MULTISAR Habitat Conservation Strategy. A scientific paper summarizing the results of the seedling survivorship and grazing study on the project's planting sites is currently being worked on. In 2019 a paper was published on natural limber pine regeneration in Alberta, which showed the inadequacy of natural regeneration from existing seed sources at sites selected for planting, and the importance of restoration with disease-resistant seedlings. AEP partnered with the project to link this restoration work with community outreach and education activities of the provincial recovery plan. This project was presented at a King's University conference and for the Friends of Wagner, as an example of how to engage diverse audiences in field education and restoring protected areas.

Deliverables/Results:

- The project extension enabled the project team to monitor their 2018 planting, which showed only four percent seedling survivorship over the year following planting. This was surprising and disappointing, as most of the project activities between 2014 and 2019, were guided by the first planting in 2013, which had 37 percent survivorship, two and a half years post-planting. It is suspected that the summer drought of 2018 had an important effect, as grazing and white pine blister rust had not played important roles in the first-year survivorship on other sites.
- The two-year-old seedlings that were planted in 2019, overseen by Conifera Consulting, and grown by Mountain View Growers, were as large as three-year-old seedlings that were planted in 2013/14, and it is hoped they will show good establishment success.
- Consulted with Alberta's limber pine recovery team regarding recovery planting. The number of seedlings planted, volunteer planters, individuals attending educational field tours, and monitoring results were reported annually to the Wildlife Policy Branch, AEP for inclusion in the Species At Risk website for limber pine under the heading of "citizen science" and "research."
- Enlisted Clare Koistra, of Conifera Consulting, to arrange seedling germination, rearing, and cold storage of seedlings with Mountain View Growers in Summerland, B.C.
- Shipped 1,080 two-year-old seedlings from Mountain View Growers.
- Planted 1,080 seedlings May 7, 2019 on the U Ranch, a property with a MULTISAR Habitat Conservation Strategy. This helped restore two ha of habitat.
- Grew 1,080 seedlings through year two, preparing them for planting in 2019.
- Education field tour and restoration planting of seedlings and seed for Lethbridge Christian (two Grade 10 science classes, 45 students total) (May 7, 2019).
- Delivered one conference presentation at The King's University featuring the limber pine restoration work with communities (June 3, 2019).
- Monitoring of first year seedling survivorship on 2018 planting. Only four percent survivorship was found, thus leading to the decision to replant the site in 2019

East Slopes Strategic Watershed Action Team

Trout Unlimited Canada

Grant: $30,000

Project code: 015-00-90-270

Project status: New; Completed

Project website: www.tucanada.org/alberta-swat-program

Many of Alberta's East Slopes salmonid populations have declined in numbers and range over several decades. Through the Strategic Watershed Action Team (SWAT) project, Trout Unlimited Canada (TUC) collaborated with industry and government partners and TUC chapters and volunteers to achieve the following objectives: 1) restore degraded habitat and/or improve connectivity of fragmented habitat to benefit native East Slopes salmonids including Athabasca rainbow trout, Arctic grayling, westslope cutthroat trout, mountain whitefish, and bull trout; and 2) engage and educate the angling community and the public at large in the recovery of East Slopes salmonids through volunteer workdays, educational signage, and through social media, web, and in-person communications (i.e., presentations). To achieve these objectives, TUC implemented strategic habitat restoration projects along the Eastern Slopes at project sites on streams with native trout, char, whitefish, or grayling. Projects ranged from large-scale habitat reconnection using heavy machinery to install a riffle crest along an unnamed tributary of Anderson Creek in the McLeod River watershed, to bioengineering treatments of decommissioned off-highway vehicle (OHV) fords along Rocky Creek and Fall Creek in the Clearwater River watershed with the help of TUC volunteers. Educational signage was installed at several project sites to inform outdoor recreationists about native salmonids in Alberta and what is being done to help recover their populations. TUC also communicated to the public via the TUC website, News Stream newsletter articles, and through project-related posts on social media. In total, TUC hosted 11 volunteer workdays engaging 85 volunteers in habitat rehabilitation projects from the Crowsnest Pass to west-central Alberta at project sites along an unnamed tributary of Anderson Creek, Dismal Creek, Fall Creek, Rocky Creek, Hidden Creek, and Girardi Creek. In addition to leading projects at several sites, TUC supported Cows and Fish on a riparian rehabilitation project along an unnamed tributary of North Lost Creek and assisted with a volunteer workday hosted by the Elbow River Watershed Partnership on a riparian rehabilitation project on Silvester Creek. Hidden Creek, Girardi Creek, North Lost Creek, and Silvester Creek are all listed critical habitat streams for westslope cutthroat trout under the Species At Risk Act.

Deliverables/Results:

- TUC led habitat rehabilitation efforts along six streams of the eastern slopes in the McLeod, Pembina, North Saskatchewan, Clearwater, Oldman, and Crowsnest River watersheds at sites along an unnamed tributary of Anderson Creek, Dismal Creek, Fall Creek, Rocky Creek, Hidden Creek, and Girardi Creek.
- Eleven volunteer workdays were hosted and attended by 85 volunteers.
- Over 9,200 live stakes and plugs of native woody species such as willow, dogwood, and poplar were planted.
- Eighty-five OHV crossings and 74 km of OHV trail decommissioned and reclaimed.
- Five hundred rack cards printed and distributed for the Fall Creek and Rocky Creek habitat rehabilitation projects.
- Four project signs installed, with another four signs planned for installation in the near future.
- Twelve km of habitat reconnected for bull trout and Athabasca rainbow trout in the McLeod River watershed.
- Major restoration project involving heavy equipment: Construction at the unnamed tributary of Anderson Creek crossing was completed in September 2019. Construction of the riffle crest feature backwatered the culvert eliminating the vertical passage barrier and restoring connectivity to approximately 12 km of fish habitat in the watershed.
- TUC established photo points at restoration sites which can be used for future photo monitoring to help gauge success and change over time.
- TUC published four News Stream articles regarding SWAT projects, each of which was distributed to an audience of approximately 6,000 people:
  - Dismal Creek: www.tucanada.org/dismal-creek-restoration
  - Fall Creek: www.tucanada.org/making-a-difference-for-bull-trout-in-the-ram-river
  - Rocky Creek: www.tucanada.org/rocky-creek-restoration-completed and www.tucanada.org/restoration-work-begins-along-albertas-rocky-creek
  - Summary News Stream article: www.tucanada.org/alberta-swat-program
- Project summary report completed March 2019 and provided to ACA (available on request).

Water Edu-Kit

Trout Unlimited Canada (TUC)

Grant: $11,000

Project code: 002-00-90-265

Project status: Funded in 2017/18; Completed

Project website: www.tucanada.org/water-edu-kits

Trout Unlimited Canada (TUC) has been building on the momentum and expanded on the well-received pilot of the 2017 Alberta Water Edu-Kit (WEK) program. This program is an invaluable educational resource towards water literacy and the exploration of the science and challenges of water issues in Alberta. The 2018 program garnered an excellent reception from over twenty educators and community group leaders, watershed alliances, and municipalities. Interest was seen throughout the province with the kits reaching eight different communities throughout Alberta. As the program continues to expand, TUC continues to evolve the program according to the needs and interests of the users and interested parties. The WEK program was promoted and made available across Alberta to all schools and community groups with a focus to reach new and isolated communities. With the ACA funding, TUC was able to offer the kits at a discounted cost so that the program was attainable and accessible to all interested parties. This program engages and inspires a new generation of voices for the protection of our freshwater resources. Youth learn about water quality parameters and what stewardship opportunities are available to them to preserve and protect their local waters.

Deliverables/Results:

- Purchased the materials, assembled, and packaged 60 WEKs for distribution to schools and community groups throughout the province, enabling them to become active science citizens.
- Feedback of the program from a survey that was recently sent to the program's participants will help TUC ensure that the kits remain a valuable education resource.
- TUC anticipated more interest for the program given how successful the pilot program was in 2017. However, as part of the developmental process, TUC has consulted with educational and technology professionals and has identified gaps which will be addressed in 2019.
- Produced and made available online a comprehensive Teacher's Manual to be used in conjunction with the kit materials.
- Provided 12 different tools for water quality analysis including seven chemical (pH, temperature, etc.), nine biological (invertebrates), and seven physical (riparian) parameters.
- Promoted the new program to existing and new schools, community groups, and partners throughout Alberta using Constant Contact, social media, and print medium.
- Online sale and distribution of the WEKs through TUC website began.
- Provided youth across the province with the improved program, ensuring the kits reaches a geographically and demographically diverse audience.
- Continually monitor program uptake so that improvements and modifications can be made efficiently and effectively. Compiled the program evaluations into a comprehensive report for ACA.
- Participants Survey Feedback:
  - "It just fits the curriculum really well in Grade 8 and that's who I teach. I think it can be appropriate for many grade levels."
  - "Great kit, super fun and wonderful teacher's resource material for understanding healthy waterways. Thank you!"
  - "I love the way you put the kits together, with more than just the water testing unit. It was a really nice starter kit."
  - "Our Science teachers and Outdoor Ed. teacher teamed up to use the kit at a couple of different sites. It is a great resource."

Yellow Fish Road

Trout Unlimited Canada (TUC)

Grant: $30,000

Project code: 020-00-90-211

Project status: Funded since 2014/15; Completed

Project website: www.tucanada.org/yellow-fish-road

Trout Unlimited Canada's (TUC's) education programs reach youth and adults in classrooms and communities across Alberta, providing environmental education on how to protect our waters. Yellow Fish Road (YFR) is TUC's premiere environmental education program that engages participants about storm water pollution prevention and the importance of water conservation. The need for this program has never been stronger as water pollution, increased urbanization, over-use, and poor water management has led to increased nutrient load, contamination, and erosion into our waterways. The specific objectives are to change attitudes and behaviours surrounding storm water pollution for the protection of our freshwater ecosystems. Due to increasing demands, YFR is not sustainable in its present format. The funding from this grant was used to create, deliver, and manage a new self-delivery model to accommodate the growing need while advancing the program with the newest technological standards. The success of YFR is its ability to link environmental learning to stewardship action. The new program model was launched to Alberta schools and community groups in the spring of 2018 and provided specific tools and technology to four different identified packages including schools, community groups, families, and individuals. With the support of ACA, the new program model directly reached 6,000 participants through TUC's programming and further reached 14,550 Albertans through 20 community events.

Deliverables/Results:

- Overall in 2018/19 the YFR program held 140 workshops/ presentations and had 2,500 storm drains painted, with 6,000 program participants.13,500 door hangers were distributed. TUC participated in another 20 events reaching 14,550 people.
- Launched the online self-delivery model of YFR on Earth Day (Mar 22, 2018).
- Created three distinct program packages for differing group/class needs and sizes.
- Created two infographic videos and included them on the webpage to be downloaded by users.
- Promoted the program through TUC's website, social media, emails, flyers, and at events.
- Developed a Program Guide with curriculum and badge links related to the "Frankie the Fish" activity.
- Ensured that St Albert, Calgary and Edmonton have the new program supplies and kits.
- Continued to support provincial partners with supplies and services and promoted new relationships.
- Some Program feedback from participants from this past year:
  - "The inclusive kit and on-line materials I found were terrific."
  - "The hands on activities with Frankie the Fish were excellent."
  - "No need for improvement, the students and I loved the program!"
  - "Our kindergarten students have mentioned that it was one of the highlights of the year. The in-class workshop and the practical component of painting the yellow fish worked very well together. I really liked when the model of the community was part of the presentation as well. It clearly showed the students what happens when chemicals, oil, bacteria, etc. go down the drains."

Fly Fishing and Conservation Program

Trout Unlimited Canada (TUC) Oldman River Chapter

Grant: $3,000

Project code: 020-00-90-264

Project status: New; Extended until May, 31; Completed

The objective of this project is to develop and offer a fly fishing and conservation course to southern Alberta youth and adults with the potential for three or five credits toward high school completion. Trout Unlimited Canada (TUC) Oldman River Chapter was very successful in meeting their primary objective. With the proceeds of this grant, a class set of high-quality fly-fishing rods (complete with reels and lines) and complete fly-tying setups were purchased. Course presentations and materials were also developed. During the funding period, over 100 youth and adults were instructed in how to fly fish and be good environmental stewards.

Deliverables/Results:

- A total of six sessions were offered with ~120 participants.
- Two Fly Fishing and Conservation courses (spring/summer 2018) were held at the Helen Schuler Nature Centre (HSNC); one with 12 youth participants and the other with 16, open to the public.
- In June 2018, TUC Oldman River Chapter participated in Lethbridge's Nature Play Day at Henderson Lake Park. This event is organized by HSNC and the City of Lethbridge. Dozens of individuals attended the booth for casting instruction and information on TUC Oldman River Chapter's conservation projects. > 50 attended.
- Three more Fly Fishing and Conservation Courses were held at HSNC on April 8, 15, and 29, 2019. These courses covered several aspects of fly fishing including casting, fly tying, fish species and entomology in Alberta, etc. They focused on instilling a conservation ethic through fly fishing. In total, 48 people attended (spread equally over three sessions).

Legacy Island – Habitat Rehabilitation

Trout Unlimited Canada (TUC) Bow River Chapter

Grant: $3,500

Project code: 015-00-90-238

Project status: Similar projects funded in 2016/17 & 2017/18; Completed

Project website: www.bowriver.org/2016/10/25/2016-legacy-island-riparian-restoration-project

The intent of this project was to continue rehabilitation of the riparian and forested areas on Legacy Island. The Trout Unlimited Canada Bow River Chapter (TUC BRC) has implemented many projects focused on improving riparian habitat, weed removal, and vehicle deterrence on the island to improve its suitability as quality habitat. The intent of this specific project was to improve the riparian forest habitat conditions by increasing the native species biodiversity, particularly in the shrub layer by planting red-osier dogwood, saskatoon, and silverberry, as they are notably absent in the island's current vegetation coverage. A working group, led by TUC BRC, and consisting of approximately 30 people, comprising volunteers, staff members from Nature Conservancy Canada, and board members from TUC BRC, successfully planted, staked, wrapped, and watered 250 native shrubs on Legacy Island. This work was conducted in July 2018. The Chapter intends to monitor the Conservation Lease over the next 12 months to determine the efficacy of the work done over the previous three years and assess whether supplemental work will be required.

Deliverables/Results:

- The main result of the project was an improvement in the riparian shrub layer by the planting, protection, and watering of native shrub species, which will in turn support native animal species that reside in the area. This project was completed on July 14, 2018, using a volunteer group of ~35 volunteers coordinated by the TUC BRC with significant assistance from the Nature Conservancy of Canada.
- The following is a list of the native shrubs which were planted on the island: red osier dogwood (84), native saskatoon (83), silverberry/wolf willow (83).
- An additional workday with six volunteers was carried out in November 2018. Additional tree protection was conducted after it had been observed that beavers had re-colonized the island.

American Kestrel Nest Box Program in Alberta

Warne in the Wild

Grant: $3,000

Project code: 020-00-90-240

Project status: Funded in 2017/18; Completed

Project website: www.warneinthewild.com/american-kestrel-nest-box-program

The Alberta American Kestrel Nest Box Program involved installing numerous nest boxes throughout Alberta with a focus on the north, central, and southern portion of the province in 2017/18 (200 boxes). The west central and east central portions of the province will be the focus of the program in 2018/19 (115 boxes proposed, now approximately 155 boxes), along with some boxes for expansion in areas already covered where more interest occurs from local groups or individuals. The goals for the program are to: 1) Provide safe and secure nesting sites for kestrels particularly in areas with a mix of ranching and farming. Ideally this would help their populations stabilize or even begin to recover, at least in localized areas while monitoring the nest box use trend. 2) Engage landowners and the public using citizen scientists to monitor and maintain the kestrel nest boxes. 3) Band chicks and/or adults when possible (banders required). 4) Provide feather samples for summer of 2019 as part of the continent-wide genoscape project (www.fullcyclephenology.com). Ideally this program would slow or stop the downward trend of kestrel populations in Alberta and would provide a means of inferring the population trend of kestrels in Alberta once the program has installed the majority of the boxes and annual checks are conducted. The nest boxes will be annually checked for maintenance while being cleaned out with fresh wood chips installed. Banding and feather samples will occur on nest boxes where personnel with the appropriate permits can check the boxes during the summer. Based upon this summer's findings there will be a report available on the website in the winter of 2019/20 showing the kestrel nest box use and then annually after that with updates from each season.

Deliverables/Results:

- The main result is an expansion of the program, with approximately 525 kestrel nest boxes being spread across a large portion of Alberta (170 of which are from other funding sources). An additional 40 boxes on top of the proposed 115 boxes were completed in 2018/19, combined with the previous years' boxes. The trend of kestrel nest box use over time will be the main result and will start to become available in the winter of 2019/20.
- The boxes from 2017/18 have all been installed or distributed for installation and large areas of the province have been completed with installation or distribution. The remaining areas are the Edmonton region and east of the Queen Elisabeth II highway around Red Deer. The north, west, and southern portions of the province have been completed, with the remainder planned to be completed between mid-March and late-April, 2019.
- All nest boxes have volunteers/landowners. There were more people interested in the nest boxes, which meant more boxes being made and distributed so the program is behind schedule for finalization but on schedule for the proposed number of boxes.
- Waiting until all nest boxes are distributed and then any banders and banding stations not already involved in the program will be contacted. The aim is to band mid-May once the project has received responses from the majority of volunteers about whether they are open to banders banding chicks in their box(es).

- Annual report is not completed because the program is still in the implementation phase but once completed annual reports will be completed and posted on the website after information is submitted by the volunteers. The first annual report should be produced in the 2019/2020 winter based upon the summer 2019 data.
- Website updates have occurred with continued improvement to the website.

Promoting Wetland Stewardship and Improving Wetland Habitat in Waterton Biosphere Reserve

Waterton Biosphere Reserve (WBR)

Grant: $14,350

Project code: 015-00-90-250

Project status: Funded in 2016/17; Completed

Project website: www.watertonbiosphere.com/projects/northern-leopard-frog

The overall goal of this project was to build wetland stewardship and improve wetland habitat in the Waterton Biosphere Reserve (WBR). There were three primary objectives during 2018 that built on past efforts in the area, and these have been successfully completed. The first objective was to improve the stewardship of water and wetland resources in WBR by hosting a workshop for area residents to share information about amphibians and best management practices to improve wetland habitats. This year, the workshop was in Magrath, Alberta in the eastern region of the WBR where a new audience was reached. The workshop was well attended and included presentations from four different speakers on a range of topics related to amphibians, particularly northern leopard frogs (NLF) and wetland stewardship. The second objective was to identify locations with NLF and/or locations that have suitable NLF habitat on private lands that would improve regional population connectivity with recently re-established NLF populations in Waterton Lakes National Park (WLNP) and Beauvais Lake Provincial Park (BLPP) and discuss wetland stewardship with these targeted landowners. To this end, field visits of 20 wetlands were completed. In addition to visual surveys, eDNA samples were collected. WBR are pleased to report that NLF presence was detected at four different wetlands in the BLPP area that were previously undocumented; several other amphibian species were also detected at most sites that were sampled. Additionally, through this objective WBR connected with 13 different landowners, which provided an opportunity for one-on-one conversations about wetland stewardship. The final objective focused on soliciting information from the community regarding NLF to identify areas of potential survey and future stewardship work, as well as engaging in conversation regarding the importance of amphibians and their habitats in the WBR. The outreach campaign that began in 2016/17 was continued, which included the distribution of printed materials; promotion via email and local and regional media; a project page on the WBR website; and a social media campaign.

Deliverables/Results:

- The main results of the project are an increased awareness about wetland stewardship for amphibians, in particular NLF; identification of local landowners who have knowledge of historical NLF populations and whose lands host wetlands that may play key roles in providing habitat connectivity for the species; detection of NLF at four different wetlands where they had not previously been documented; detection of several additional amphibian species at numerous wetlands within the WBR; and successful completion of a workshop on NLF and wetland habitat stewardship in Magrath, Alberta.
- Provided an opportunity for elementary school students to get out into the natural world where they can experience a wetland first-hand and learn about stewardship of healthy wetlands (Wetland Field Day): not completed; this portion of the proposal was removed due to lack of funding.
- Organized a workshop in Magrath, with four invited speakers who gave excellent presentations. 25 people participated in the NLF workshop and field tour on Oct. 18, 2018. The workshop was featured in an article in the Western Producer as well as the Westwind Weekly: www.producer.com/2018/11/video-have-leopard-frogs-changed-their-spots. Additionally, a youth attendee of the workshop went on to compile a NLF entry for a local science fair.
- Identified locations with NLF and/or locations that have suitable NLF habitat on private lands that would improve regional population connectivity with newly established NLF populations in WLNP, and discuss wetland stewardship with these targeted landowners: worked with WLNP staff to select sites to visit in the field, conducted visual surveys at 20 wetland site visits.
- Completed field sheets for each site visited in 2018, including amphibian observations, habitat documentation, and maps.
- Collected 36 eDNA samples for analysis by the University of Washington. The lab tested for the presence of six native amphibian species including striped chorus frog, Columbia spotted frog, northern leopard frog, western toad, long-toed salamander, and tiger salamander. The lab also tested each sample for the presence of the chytrid fungus, a widespread amphibian disease.
- Shared results of visual and eDNA surveys with participating landowners.
- FWMIS data sheets completed for all amphibian and wildlife observations (visual observations and eDNA) and submitted to AEP.
- Solicit information from the community regarding NLF to identify additional areas of potential interest for NLF work as well as promoting conversations regarding the importance of amphibians and their habitat in WBR: An email on the NLF project was sent to the WBR distribution list (>600 members) on May 16, 2018, which gave rise to an article about the project in the Pincher Creek Echo. Additionally, a local newspaper (Pincher Creek Echo) featured this NLF project in an article: www.pinchercreekecho.com/2018/05/29/waterton-biosphere-reserve-to-support-frog-conservation/wcm/1c436135-d2be-f427-f8a2-72d77620597e.
- Displayed materials about amphibian habitat stewardship and NLF to raise awareness and gather interest from the local community were presented at seven public events attended by 263 people (May 8 to 10, 2018 – 60 people; June 16, 2018 – 15 people; June 22, 2018 – 25 people; Oct. 18, 2018 – 25 people; Feb. 27, 2019 – 26 people; Feb. 28, 2019 – 47 people; March 1, 2019 – 50 people).
- ACA's *Amphibians on my Land* booklet (18 copies) were given to landowners interested in the NLF project.
- Facebook posts about the NLF project since April 2018 reached more than 1,450 people.
- The NLF project webpage (www.watertonbiosphere.com/projects/northern-leopard-frog) received 240 unique page views during the 2018/19 project period. The website information was recently updated with project results (www.watertonbiosphere.com/northernleopardfrogupdate). Subsequent sharing via social media and email will drive further traffic to the project webpage.

Wetaskiwin/Leduc Alternative Land Use Services (ALUS)

Wetaskiwin County

Grant: $8,750

Project code: 015-00-90-261

Project status: New; Completed

Project website: www.county.wetaskiwin.ab.ca/526/ALUS

The project goal is to engage Wetaskiwin and Leduc County farmers through the ALUS Program to conserve, enhance, and restore wetland and upland habitats which restore and conserve species and their habitats on private land. The project objectives are to: 1) increase the number of acres enrolled in wildlife habitat stewardship (reforestation, riparian area enhancement, and pollinator habitat); 2) raise the profile of the ALUS program and raise awareness of the benefits of ALUS to all of society; 3) increase wildlife habitat/ecosystem services education among the farmer and rancher community and general public; 4) increase the awareness of the benefits of working with private landowners to improve wildlife habitat conditions for the enjoyment of the general public; and 5) provide multiple ecosystem services including habitat for fish and wildlife, flood mitigation, erosion control, biodiversity, and cleaner water. ACA funding supported 38 ha of enhanced riparian, wetland and upland areas, and an upland tree planting associated with six ALUS participant projects. Now that projects are in place, riparian and upland habitats should improve over time with reduced access, increasing their functionality and allowing for more habitat and biodiversity. Water quality should also improve, especially for those downstream of creek projects. Two participants are avid hunters, one by bow, and they particularly appreciate the opportunity to protect and improve habitat for wildlife. Gate signs were provided to participants upon project completion.

Deliverables/Results:

- Completed projects of enhanced riparian, wetland and upland areas and an upland tree planting associated with 38 ha and improved riparian health and water quality will increase the biodiversity of project sites and encourage the establishment of native species. This is achieved in part through 3.24 km of riparian fencing.
- Six new ALUS participant projects were supported:
  - Pipestone Creek Watershed: an indirect watering system and electric riparian fence along Pipestone Creek was completed.
  - Leduc County Environmentally Significant Area #91 – Saunders Lake: A wildlife/eco-buffer upland planting and indirect watering system was completed.
  - Leduc County Environmentally Significant Area # 110 – Looking Back Lake: A wetland and native tree enhancement fencing project was completed.
  - Leduc County Environmentally Significant Area # 17 – Strawberry Creek: An indirect watering system and upland-riparian fence along Strawberry Creek was completed.
  - Modeste Sub-Watershed: An indirect watering system was completed, with wetland enhancement.
  - Coal Lake Sub-Watershed: A wetland fencing and native woodlot enhancement (used electric fencing on hand for woodlot) was completed.

Going to Bat for Bats: Citizen science in Alberta

Wildlife Conservation Society Canada (WCS Canada)

Grant: $29,994

Project code: 030-00-90-284

Project status: Funded in 2017/18; Completed

Project website: www.albertabats.ca and www.batcaver.org

Wildlife Conservation Society Canada (WCS Canada) has been leading efforts to prepare for the arrival of white-nose syndrome (WNS) in western Canada. This is being accomplished by improving public perceptions and awareness of bats, better understanding western bat ecology, and improving management of bat populations. In Alberta, WCS Canada administers two projects designed meet these goals: the Alberta Community Bat Program (ACBP) and BatCaver. The Alberta Community Bat Program (ACBP) uses public outreach and education to improve public awareness of the importance of bats and important conservation challenges. During the 2018/19 grant period, the ACBP delivered over 57 events around Alberta, which included bat walks, school talks, public presentations, information booths, workshops, and conference presentations. Educational resources are aimed at improving management of bats to ensure high reproductive success in the province. Resources include several popular guides and information resources, as well as a highly active social media campaign. The ACBP also responds to hundreds of public questions through its toll-free number, email, and social media messaging. In conjunction with other activities, a citizen science program is managed with the goal of identifying and monitoring bat roost in Alberta. Knowing the locations of these resources are critical for monitoring populations, and potentially, for the future delivery of potential treatment options for white-nose syndrome which are currently in development. The BatCaver program continues to engage the community of cavers to locate and describe winter hibernation sites for bats; monitor for signs of WNS; decontaminate gear between expeditions; and assist in establishing baseline data, including measuring cave microclimates to predict the risk that WNS poses to hibernating bats. During 2018/19, cavers deployed 25 acoustic roost loggers to monitor for bats in 20 Alberta cave and mines. Although most of the equipment is not retrievable from the field until after spring melt, five roost loggers were retrieved in 2018, and two additional bat hibernacula were located. Collaborative efforts with the Alberta Speleological Society enabled guano sampling and genetic testing, confirming that one of the new bat hibernacula hosts the endangered little brown myotis. This cave is thought to be a significant site for bats and follow-up monitoring will take place to estimate bat population numbers.

Deliverables/Results:

Alberta Community Bat Program (ACBP):

- Facebook, Twitter, blogs: The ACBP is experiencing great success with its social media platforms, and this public engagement initiative is currently exceeding deliverable targets. Facebook "likes" increased by 88 percent (a total of 1,752 likes) from Apr 1, 2018 to Feb 28,

2019. During the same time, there were 365 Facebook posts, with an average reach of 1,279 Facebook users (post reach ranged up to >68,000 Facebook users). Cumulative reach of posts on Facebook was >467,006 user views, which is a 113 percent increase over the prior year. Individual event postings on Facebook reached up to >91,000 Facebook users. From April 1, 2018 to Feb. 28, 2019 there were also 519 posts on Twitter (many cross-posted from Facebook), averaging 1,017 impressions each (527,807 cumulative impressions). Cumulatively, social media content from the ACBP will have been delivered to users over a million times during the grant period.

- Website update: The ACBP website (www.albertabats.ca) continues to experience strong web traffic levels. From April 1, 2018 to Feb. 28, 2018, web traffic averaged 2,585 hits/day, which is a 5 percent increase from the prior year. During the summer months, over 2,000 unique visitors have been accessing the website every month. Additional content added during the grant period include species profiles for the bats of Alberta and updated information on managing bats in buildings.
- Written guides and brochures: The ACBP released a new guide in April 2018 on Building Bat-Friendly Communities, which has been downloaded 2,546 times from April 25, 2018 to Feb. 28, 2019. In February 2018, WCS Canada released an updated bat house guide (and updated it again in April 2018), which has been downloaded over 5,996 times from April 1, 2018 to Feb. 28, 2019. In collaboration with AEP, the program also released a Bats Astray poster, alerting people to the importance of preventing the accidental transport of bats across the continent. The ACBP also worked in collaboration with the Alberta government to develop a bat poster (Alberta's Amazing Bats), which is currently being printed. A program brochure was released in October 2018. A draft update to the Managing Bats in Buildings guide has been completed and was released end of March 2019; this guide includes an information page for pest control. An older version of the guide has been downloaded 1,647 times from April 1, 2018 to Feb. 28, 2019. Alberta's guides have been also used as a template in other jurisdictions around Canada. Many of these resources are available at www.albertabats.ca/resources.
- Bat-houses and bat condos: Downloads and website traffic statistics demonstrate that bat houses continue to be the most popular component of the ACBP. A major ACBP activity is to promote properly designed and installed bat houses where natural roosting habitat is no longer available. The guide to building bat houses is the most popular download (with over 5,996 downloads). To improve recommendations, the ACBP has begun test sites to look at occupancy and microclimates of various bat houses design, which has provided some important insights into their use as a mitigation tool (e.g., single-chamber designs are prone to overheating). Recently, two test sites were established: one near Cooking Lake in collaboration with the Friends of Blackfoot society, and another near Red Deer. In 2019, the ACBP plans to collaborate with the Edmonton Area Land Trust to more closely examine bat house use in the Edmonton area. In April 2018, participants of the ACBP ran a bat house building workshop at the Kerry Wood Nature Centre in Red Deer, constructing 21 bat houses. A condo is currently being installed at a site southeast of Edmonton (as a partnership between a private landowner and the ACBP), where it is being used as mitigation for a planned exclusion of >1,100 little brown myotis.
- Events: From April 1, 2018 to March 31, 2019, over 57 successful ACBP events were held. These include ten bat walks (field trips with experienced bat biologists), ten oral presentations, thirteen booths, nineteen school visits (included 35 classes/799 students), two conference presentations (Alberta Chapter of the Wildlife Society Conference and Edmonton Citizen Science Conference), and three bat house building workshops. Approximately 10,000 people have been reached by public events. The number of events greatly exceeded the 20 events originally targeted.

Batcaver:

- Management tool: Development of the predictive model for identifying underground bat habitat is ongoing, and a preliminary model using 39 variables that can be measured or described by cavers has been developed. The next step will be to validate the model with ground-truthing in addition to acquiring more microclimate data for hibernacula versus caves not used for hibernation.
- Website updates: website updates are ongoing, but the bulk of the updates will occur in spring 2019 after the 2018 dataloggers are retrieved.
- Informational signage and brochures: WCS Canada engaged with Alberta Speleological Society and AEP to discuss cave management for the newest bat hibernaculum discovered. All stakeholders agree that the remoteness of this cave will protect it during winter, though this will be reviewed in 2019 once there is an estimate of the number of bats present and summer use can be examined. Signage is being considered.

Kids Can Catch Event

Yellowhead County

Grant: $2,500

Project code: 020-00-90-260

Project status: New; Completed

This was Yellowhead County's first year hosting a Kids Can Catch event at Millers Lake. The goal was to recruit/introduce new anglers to the sport, as well as bring experienced fishers back to our lakes. With over 100 attendees of all ages and fishing experience levels, the event was considered a great success. Activities included catch-and-release fishing, education provide by local Fish and Wildlife officers (safe handling, regulations and licences, fish species, etc.), fishing rod raffles, and a free barbecue. Fishing rods were on site for those without their own equipment to use during the event, and then they were raffled off at the end of the evening. Based on the high attendance and positive feedback from participants, Yellowhead County plans on offering this event in the years to come.

Deliverables/Results:

- The Kids Can Catch event was held on July 5, 2018 at Millers Lake with over 100 participants (this was double the anticipated attendance numbers). The main result was the introduction of new anglers to the sport. Of the 100 people in attendance, about half were new to fishing and expressed interest in continuing the sport in the months to come.

ACA Research Grants

Efficacy of Detecting Sharp-Tailed Grouse Leks in Fall Surveys

Avocet Environmental Inc. (Mr. Scobie)

Grant: $13,500

Project code: 030-00-90-279

Project status: Funded in 2017/18; Completed

In addition to the 40 Autonomous Recording Units (ARUs) that were deployed in 2017, a total of 51 ARUs were set up in the fall of 2018 at leks that had grouse displaying in the spring. Seven ARUs were set up in provincial grazing reserves (PGR) north and west of Edmonton (Connor Creek PGR and Jack Pine PGR) and nine were set-up in CFB Wainwright. Another 35 ARUs were set-up at sharp-tailed grouse leks in southern Alberta, ranging from the Red Deer River, to the United States border. The ARUs were programmed to record sound for two minutes every 15 minutes from one hour before sunrise to three hours after sunrise (same timing as the Government of Alberta Sensitive Species Inventory Guidelines). Twelve of these ARUs were set up in synchronization with trail cameras that were programmed to turn on and take pictures or record video when the ARUs were recording. The nine ARUs in CFB Wainwright were set up during the second week of September, while the rest were set up at the end of August. All ARUs were retrieved during the third week of October. All acoustic data from the ARUs were downloaded and the sharp-tailed grouse recognizer the project team developed in Song Scope (Wildlife Acoustics) was used to identify probable sharp-tailed grouse "gobble" lekking sounds. The process of verifying the detections by manually listening to a subsample (every fifth day) of the sharp-tailed grouse detections identified by the recognizer has begun. Subsampling acoustic data from 11 of the ARUs from 2017 has been completed. Data was analyzed from these 11 ARUs and grouse vocalizations in relation to date, time, temperature, precipitation and wind speed were examined and confirmed. All 11 sharp-tailed grouse leks with subsampled ARU data had confirmed grouse "gobbles," meaning all leks examined so far had grouse displaying. There was a total of 938 confirmed grouse gobbles in the 8,891 sounds detected by the recognizer as potential sharp-tailed grouse sounds. All verified sharp-tailed grouse gobbles occurred when the wind speed was less than 22 km/h and the temperature was less than 16.5 C, and over 99 percent occurred within one hour (before and after) of sunrise. The preliminary results are very promising and when the remaining audio data has been verified, the researchers are confident that they will be able to propose a survey protocol that will result in high probability of detecting sharp-tailed grouse leks during the fall.

Deliverables/Results:

- Last year, a sharp-tail grouse "gobble" call recognizer in Song Scope (program from Wildlife Acoustics) was developed, with a cross training accuracy of 72.2 percent + 5.5 percent. All the acoustic data (2017 and 2018) was processed through the recognizer, resulting in an average 2,586 detections per lek for a total of 235,377 detections.
- Due to the large volume of data, Avocet Environmental decided to subsample and verify sharp-tailed grouse auditory detections from every fifth day. From the 11 sites that are completed (all from 2017), 8,891 sharp-tailed grouse detections were verified and only 983 (11 percent) were actually sharp-tailed grouse. Half of the false detections were wind (4,463), while the majority of remaining false detections were Canada geese (9.8 percent), common ravens (4.5 percent), coyotes (4.4 percent), machinery (4.0 percent), cattle (3.2 percent) and American crows (2.2 percent).
- The researchers were very excited to see that all eleven sharp-tailed grouse leks with verified ARU data had confirmed grouse "gobbles." This means that every lek from which audio data was examined so far had grouse vocalizing. While examining the raw data, the researchers were interested to discover that all sharp-tailed grouse gobbles occurred when the wind speed was less than 22 km/h and the temperature was less than 16.5 C, and over 99 percent occurred within one hour (before and after) of sunrise. There also seems to be a pattern of increased sharp-tailed grouse vocalizations towards the end of September, although date was not a significant variable in their regression model. ARUs were deployed through most of October in 2018, so analysis of those data should help identify when peak attendance on the leks occur during the fall.
- All sharp-tailed grouse leks surveyed (active and inactive) and any other grouse observed while working on this project has been submitted to Fisheries and Wildlife Management Information System (FWMIS).
- A report outlining the results of these fall sharp-tailed grouse lek surveys: The original design of this project did not include the use of ARUs, so the researchers did not anticipate the huge amount of processing that would be required to extract the data needed for the final analysis. The rest of the acoustic data will hopefully be verified by the end of 2019 and a manuscript draft completed in 2020.
- Presentation of the results at a conference, preferably in Alberta: The final results from this project will be presented at the Alberta Chapter of The Wildlife Society conference in March 2020.
- A manuscript will be prepared from the results from this project and submitted to a peer-reviewed journal: The researchers hope to prepare and submit a manuscript on the final results of this project to a peer-reviewed journal by December 2020. They anticipate being able to write several papers from the large volume of high-quality data collected for this project.

Using Citizen Science to Enhance Fisheries Data Collection and Monitoring

Goldstream Publishing Inc. (Dr. Simmons)

Grant: $23,000

Project code: 020-00-90-259

Project status: New; Completed

Project website: www.anglersatlas.com/research/using-citizen-science-to-enhance-fisheries-data-collection-and-monitoring

This project aims to compare data collected from the Angler's Atlas app (MyCatch) and website with conventional survey data to evaluate the validity of using crowdsourced data as a tool for fisheries monitoring. Two main hypotheses were tested: 1) Crowdsourced data collected through an angler app can produce catch and effort estimates that are correlated with corresponding estimates from conventional survey techniques; and 2) Citizen science can greatly enhance the spatial and temporal scope of data available to fisheries biologists to inform conservation and management decisions. The project launched in May 2018 and collected data through the remainder of the year. In 2018, a total of 1,664 trips reports, corresponding to 6,917 hours fishing and

9,534 fish caught, were collected by the MyCatch app and website. A total of 313 individual anglers were identified, accounting for 67 percent of the trips reported in 2018. In addition, 341 waterbodies were identified (99 percent of trips) in 2018. The researchers compared the MyCatch data with three different types of surveys; creel, gillnet, and mail surveys. The MyCatch data was compared with creel survey data from the Bow, and Upper Oldman/Livingstone system to determine the similarities/differences between catch rate and species composition. Summary data from Fall Index Netting (FIN) surveys in the province was obtained and compared with catch information from MyCatch. Finally, MyCatch data was compared to mail survey data collected by Fisheries and Oceans Canada (DFO) on the regional distribution and fishing practices of Alberta anglers in 2015. The DFO survey theoretically provides a representative sample of anglers fishing in the province. Survey comparisons were done using three different analytical methods: Bayesian negative binomial models, Chi-squared tests, and linear regression. Although sample sizes from MyCatch were smaller than for creel surveys, strong correlations between the creel surveys and the MyCatch data was observed. Results from the netting survey comparisons were less promising, with only weak correlations between MyCatch catch rates and fish abundance metrics. However, the MyCatch data was able to predict the relative regional distribution of anglers in the province and where they fished, when compared with the unbiased DFO survey. Overall, this pilot project was able to demonstrate that crowdsourced data from Angler's Atlas users provided similar catch rates and species compositions to creel surveys. Furthermore, the researchers were able to demonstrate the scalability of this approach across the landscape, opening up new opportunities for high-resolution monitoring of Alberta fisheries using this approach.

Deliverables/Results:

- This project demonstrates the potential for self-reported angler data collected through a mobile phone app and website to be a complementary tool that can be used by fisheries biologists to better understand the regional distribution of anglers and their use of fisheries resources in the province. It also has the potential to provide catch rates and species composition data on individual waterbodies that can be used as indices to better manage and conserve Alberta's fish resources. This sort of data, however, was not generally a good predictor of fish abundance and thus has its limitations.
- A presentation was given at the Alberta Fish and Game Association (AFGA) annual conference in February 2019.
- A presentation of initial results was given to Clayton James and his team at AEP, as they provided the data for the Bow River creel.
- The peer-reviewed publication is in preparation and will be submitted this year.
- This project was in a poster promoted on social media and has been mentioned in two podcast interviews. It was also mentioned at various conferences, such as the American Fisheries Society annual conference in Atlantic City during a presentation and panel discussion (August), the Canadian Conference for Fisheries Research in London, Ontario (January 2019), the Alberta Fish & Game Association annual conference in Calgary, Alberta (February 2019), and the Citizen Science Association conference in Raleigh, North Carolina (March 2019).

Evaluating Possible Vectors for the Spread of Invasive Plant *Thesium ramosum*

St. Mary's University (Dr. McLean)

Grant: $9,985

Project code: 015-00-90-260

Project status: New; Extended until Aug. 31, 2019

Project website: www.stmu.ca/invasive-species-thesium-ramosum

The hemi-parasitic plant *Thesium ramosum* is native to southwestern Eurasia. It was first observed in Fish Creek Provincial Park (FCPP) in Calgary, Alberta in 2001 and has spread significantly through the park since then. Its rapid spread has caused concern among park staff and municipal and provincial weed specialists. Virtually nothing is known about this plant, including how it got to Fish Creek Park, how it spreads, or its impact on native hosts, since in its native habitat it has not been studied, being neither rare nor a weed. It has been suggested that probably all species of *Thesium* are spread by ants since the flower stalk grows into a fleshy nutrient-rich elaiosome, which attracts ants who collect the seeds to feed the elaiosome to their larvae, and dispose of the seed in a midden or on the soil surface where it germinates. This may be the mechanism for spread of this exotic plant. The main objective of this project was to understand the role of ants in the spread of *T. ramosum*, specifically: 1) which species harvest *Thesium* seeds?; 2) do ants preferentially forage for these seeds?; 3) what do ants do with the seeds inside the colony?; and 4) does ant use of the seeds affect germination of these seeds? These questions were addressed in a series of lab and field experiments and observations. The four lab species all collected *T.* ramosum seeds but at different rates. In the field ten species were observed collecting or carrying the seeds, which is almost 40 percent of the ant species (27) found. In seed preference trials, all four species preferred *T. ramosum* seeds and mealworms equally over other seeds. Many seeds (30 to 60 percent) were not recovered from the lab colonies. *Formica obscuriventris* consumed 60 percent of the elaisomes, while *Formica aserva* only consumed 22 percent of the eliaosomes. Both large (*F. obscuriventris*) and small species (*Leptothorax athabasca*) collected the seeds. Although the researchers expected subterranean ants to differ from mound-building ants in their seed preferences due to their differing lifestyles, they were surprised to see significant differences within each of these lifestyles. That some species were willing to carry *Thesium* seeds, which are half their size, for at least 18 m suggests these seeds are valuable to them.

Deliverables/Results:

- Researchers discovered that all four species selected as lab colonies collected *T. ramosum* but did so at different rates. *F. obscuriventris* and *F. argentea* collected all or most of the seeds, while *Formica podzolica* and *F. aserva* were much more irregular, with some colonies collecting some of the seeds and some colonies refusing to touch them at all. *F. obscuriventris* collected almost all of the seeds within the first hour, while *F. argentea*'s tended to collect the seeds over longer periods of time.
- Out of four types of food offered to them, all of which are found in the park, the ant colonies generally preferred mealworms and *Thesium* seeds to the two other seeds that they were offered (crested wheatgrass and stinkweed), both of which grow in the park. The species varied in their removal rates of each type of seed and the mealworms.

- The fate of the seeds that were removed to the colonies was quite variable. Generally, ants placed seeds both inside and outside of the nest structure; middens were not large, usually with <ten seeds clustered together. Many (30–60 percent) seeds were not recovered; perhaps they were deeply buried in debris that couldn't be fully sorted through, or the ants may have eaten the entire seed, or simply sucked all the fluids from the eliaosome as was observed in lab colonies. Elaiosome consumption varied between species: *F. obscuriventris* consumed 60 percent of the elaisomes, while *F. aserva* only consumed 22 percent of the eliaosomes.
- In the field, researchers observed ten different species from four different genera collecting the seeds. Overall, there are 27 species found in the park based on their surveys, indicating that close to 40 percent carry the seeds. Since this is not an exhaustive survey of all *Thesium* patches in the park but rather focused on several select patches, this proportion could be much higher, given the broad range of diversity of seed-collectors found. Size did not seem to be a factor determining which species collected the seeds—researchers saw *Leptothorax athabasca* collecting the seeds, whose workers are roughly the same size as the seeds. *Formica* species collected the seeds most frequently and would go the furthest to collect them; up to 18 m. *F. obscuriventris* and *F. neoclara* collected the most seeds in the Formica genus, and *Myrmica incompleta* carried the most in the *Myrmica* genus. *Myrmica* species carried seed for much shorter distances, likely reflecting body size; on average, they are much smaller than *Formica* species. It is likely that the range over which *Formica* species could forage these seeds is at least 20 m, and some may be able to go much further than that; many larger *F. obscuriventris* colonies form long foraging trails and the researchers found *F. obscuriventris* carrying seeds in these trails.
- The most surprising results to the researchers were that there were such differences in seed preference and foraging distance between apparently similar native ant species. For lab observations two subterranean *Formica* species and two mound-building *Formica* species that had been observed carrying seeds in the park were selected. It has been assumed that if there were any differences, it would likely be between the subterranean and mound-building groups due to differences in life habits. However, this was not the case—the two species that preferred the seeds the most were a mound-building and a subterranean species. Additionally, the two subterranean species *Formica podzolica* and *F. argentea* are extremely similar, both in their morphology and their life habits, so much so that they are regularly mistaken for one another in the field. However, they showed a clear difference in their preference for seeds. Additionally, the foraging distance was quite far for some of these species.
- The preliminary results of this project were shared at the annual meeting of the Entomological Society of Alberta in Edmonton in September 2018. These data were well received, and useful feedback was obtained from the audience.
- Currently statistical analysis of the lab data is underway, which will be submitted to either *Environmental Entomology* or *Ecological Entomology* in May 2019.
- The results of the fieldwork this summer will be incorporated into the results from last summer to form the second journal article for submission late this year.
- Since the field component (observations and experiments) of this project have been extended through the summer of 2019, the help of the project ant researcher is required to train the new students in ant identification. This was a major part of the original grant, since without the knowledge of how to identify ants, these experiments could not be conducted. It is particularly important to be able to identify ant groups in the field. Completion of the field experiments and observations will allow for another journal article.

Canada Warbler Rapid Assessment Protocol – Phase 2

STRIX Ecological Consulting (Ms. Priestley)

Grant: $8,005

Project code: 030-00-90-276

Project status: Phase 1 funded in 2017/18; Completed

The Canada warbler was designated *Threatened* by COSEWIC (February 2010) and, was classified *Threatened* under the Species At Risk Act. The Canada warbler was listed as *At Risk* in Alberta in 2016. Research is needed to identify habitat components that increase chances of survival and successful reproduction, to inform beneficial forest management strategies. At the Canada Warbler International Breeding Grounds workshop it was recommended future research and monitoring needs on the breeding grounds for the Canada warbler should include: more breeding bird surveys in the northern parts of the range (particularly western) to strengthen the long-term population data, collecting breeding data including nesting, survival estimates, phenology, demographic models, habitat patch clusters, and age classes of breeders. The objective was to collect data on habitat use, survival estimates, and breeding evidence in the Grande Prairie region, which is at the western range limit of the species in Alberta. STRIX Ecological completed year two of the rapid assessment which uses a combination of mist netting, call playback, and area surveys to collect information on the density of breeding Canada warblers, nesting success, and habitat associations. Four areas were chosen in the Weyerhaeuser Grande Prairie Forest Management Area (FMA) to conduct the rapid assessment project: one site north in the Saddle Hills, and three sites south of Grande Prairie. The researchers mist netted for Canada warblers on June 15 and 16, July 15 and 16 and July 24 in six areas where Canada warblers were found. Four males were captured and banded, all were second year birds. Sites were revisited where Canada warblers were banded in 2017 and found no evidence of returning individuals. No evidence of fledglings was found in any of the sites they worked in. Further three Audio Recording Units (ARU) were set up in other Canada warbler sites to collect information on singing phenology. Canada warblers were present at all sites. Singing males were detected from May 25 through July 17. The researchers also detected 52 other species of birds in or near Canada warbler territories. Species that were correlated with the presence of Canada warbler included American redstart, fox sparrow, magnolia warbler, and rose-breasted grosbeak. STRIX Ecological plan to follow up the rapid assessment and ARU programs with one more year, as recommended by Environment and Climate Change Canada (ECCC), and will also be investigating harvest retention patches to determine if Canada warblers return after tree harvesting.

Deliverables/Results:

- Mist netting was conducted on two days in June and three days in July at four Canada warbler sites. Four males were captured and banded; all were second year birds. The density of Canada warblers across the FMA ranged from 0.0019 to 0.0095 birds/ha per year (COSEWIC status report shows Alberta average is 0.11). Within suitable habitat the calling male density range from 0.08 to 0.16 calling males/ha, which is lower that what was expected. Suitable habitat was patchy and were small areas. No fledglings were found during surveys. Four areas that were trapped at in 2017 were revisited to attempt to recapture previously banded Canada warblers, but none of the previously banded Canada warblers were found, and no band encounters from the Bird Banding Office were received. Habitat data was collected at all Canada warbler sites found in 2018. All Canada warbler trapping sites were deciduous or deciduous dominated. Shrubs were one to three m in height and were very dense (50 to 80 percent). Hazelnut was present at two sites, honeysuckle and alder were at all four sites. Ferns were observed at two sites. Downed wood was prevalent at all sites (20 percent cover). Standing water was present at two sites, and all sites were considered moist. Sites had between six and 11 song perches (an important habitat characteristic for Canada warblers). Three sites had gentle slopes and one had a medium slope.
- Four ARUs were set up in May 2018 and collected in July. Canada warblers were detected on all ARUs. One unit was damaged by wildlife and stopped recording on 26 July. The three fully functioning recorders detected Canada warblers until the 4th, 17th and 12th of July. Canada warblers sang sporadically through the season, peaking at the beginning, shortly after the birds' arrival, from May 30th, before gradually declining in calling rate until early July.
- The researchers expected to find denser populations of Canada warblers, and breeding evidence. Even with more time than the budget allowed allocated, the researchers were not able to find or capture the number of Canada warblers the rapid assessment suggests. This result suggests the Canada warblers in the Grande Prairie region may not be breeding successfully or are breeding in very low numbers (being at the edge of the species range). Another year of surveys will be conducted to determine if banded birds return to the same areas.
- Three final reports on results—Rapid Assessment, ARUs, and Model—have been completed. Canada warbler habitat association guide is complete. Canada warbler model is complete, and it will be tested with data collected in 2019. The model is being incorporated into forest management planning.
- Journal article: one more year of data is required as recommended by ECCC, particularly with the low numbers of birds banded. The range map will be published separately within the next few months (and information is being contributed to the status reporting [AEP]). ACA will be acknowledged in all publications and a copy will be provided to ACA.
- Presentation of results: the Wildlife Society conference is full this year, but STRIX Ecological have a sponsor's booth and will have information available on the project. The final results will be presented (including data from 2019) at the conference in March 2020.

Discovering Didymo Distribution (D3)

Trout Unlimited Canada (Mr. Lindsay)

Grant: $8,460

Project code: 020-00-90-229

Project status: Funded in 2016/17 & 2017/18; Completed

Project website: www.tucanada.org/discovering-didymo-distribution

The objective of the 2018/19 Discovering Didymo Distribution Project (D3) was to build on the successes of the 2016 and 2017 D3 sampling seasons and engage with volunteer anglers and post-secondary students in a citizen science initiative to continue expanding the knowledge base on *Didymosphenia geminata* (Didymo) in Alberta. Throughout the 2018/19 season of the D3 project, Trout Unlimited Canada (TUC) again worked closely with Dr. Leland Jackson's lab at the University of Calgary (U of C). During the 2018 field season, 71 samples were collected by 67 volunteers from 52 waterbodies throughout the province, with remote data entry made possible using the EpiCollect5 project app. Collected samples were returned by mail to the U of C for microscopy to determine if Didymo was present in each sample. The results obtained from the 2018 sampling season effort were compiled by U of C research analysts and visualized in a web map format hosted on the TUC website for anyone to access. Using the web map, users can see Didymo observations from 2016, 2017, 2018, and from previous sampling events conducted by others in the mountain parks from 2004, 2009, 2010, 2011, and 2013. Of the 71 samples collected in 2018, 24 tested positive for Didymo.

Deliverables/Results:

- 232 kits were distributed to to at least 74 volunteer anglers in Alberta. This is above the anticipated 150 sample kits.
- Of the kits distributed 31 percent were successfully completed, returned, and analyzed. Unused kits from the D3 project will be stored at the U of C for any interested samplers to continue in 2020 and beyond. There has been some interest from participants to sample again in 2020 and the U of C will be able to analyze these samples on an as-needed basis. Thanks to the instructional video, project app, and easy to use kits, TUC expect that a small number of interested samplers can be accommodated without further funding for a couple of years.
- Of the 71 complete observations, Didymo was detected in 24 samples (suspected to be blooming at nine of these sites). Didymo was absent in 47 sites.
- A web map featuring results of the 2018 sampling season was created and hosted on the TUC website.
- A summary report of the 2018 D3 Project was produced and provided to ACA and shared on the TUC website.
- A News Stream article was posted to the TUC website regarding the 2018 D3 project on Aug. 8, 2019. The project webpage was updated with the results of the 2018 sampling season in March 2019.
- A presentation was given to Olds College Land and Water Club about TUC and the D3 Project on Nov. 23, 2018.

Is Cougar *(Puma concolor)* Habitat Selection on a Reclaimed Mine Based on Prey Availability?

University of Alberta (Dr. Boyce)

Grant: $20,000

Project code: 030-00-90-286

Project status: New; Completed

Project website: http://grad.biology.ualberta.ca/boyce/meghan-beale-msc/

Reclaimed mines can support a variety of plant and animal species. Two reclaimed coal mines in west-central Alberta mines host a complex assembly of large-bodied predator and prey populations, including cougars (*Puma concolor*), bighorn sheep (*Ovis canadensis*), elk (*Cervus elaphus*), and mule deer (*Odocoileus hemionus*). Mammal populations can be linked to mine reclamation, which has provided a mosaic of valuable habitat features for ungulates and their predators. Although reclamation has been successful at attracting a diverse set of large mammals, reclamation also might be facilitating increased predation on bighorn sheep. Thus, the main objectives were to model habitat selection for bighorn sheep, elk, mule deer, and cougars on reclaimed mines to determine how ungulates responded to reclamation features, and to determine whether cougars exploited residual landscape configuration while hunting. To evaluate ungulate habitat selection, the researchers used direct ground counts on a fixed survey route between 2004 and 2017. The researchers created a grid of 200 by 200 m non-overlapping sampling units for their study area and assigned each ungulate group to a sampling unit. The researchers also assigned landscape features to each sampling unit to represent changes due to mining and reclamation. The researchers modelled habitat selection pooled over four seasons by fitting exponential resource selection functions (RSFs) in a used versus available design. The project results demonstrate that bighorn sheep, elk, and mule deer selected landscape features to increase access to quality forage and decrease predation risk. Results from habitat selection models support their predictions; namely, bighorn sheep strongly selected high walls whereas elk and mule deer selected reclaimed grasslands. To model cougar habitat selection, the researchers outfitted seven cougars with GPS collars between March 2017 and January 2018 and collected a GPS location every 1.5 hours. The researchers visited clusters of GPS points to determine successful cougar predation events, and collected species, age, and sex of prey. The researchers created RSFs and step selection functions (SSFs), using landscape features as covariates. At a fine scale, cougars selected rocky outcrops, forests, forest edges, and high relative availability of bighorn sheep when on the reclaimed mines. Further, cougar predation events on bighorn sheep were closer to forest edges than randomly expected, which supported that cougars exploited residual landscape when hunting. Cougars also specialized in and selected bighorn sheep on reclaimed mines. Ultimately, this research supports that the reclaimed mines have successfully provided habitat for wildlife. The researchers recommend that ecologists consider wildlife a target for evaluating the success of ecological reclamation.

Deliverables/Results:

- The researchers found that bighorn sheep, elk, and mule deer selected landscape features to increase access to quality forage and decrease predation risk. Results from habitat selection models supported predictions; namely, bighorn sheep strongly selected high walls whereas elk and mule deer selected reclaimed grasslands. Ungulates also responded to mining and reclamation features in ways that the researchers did not anticipate. Bighorn sheep and elk selected for haul roads, which was attributed to seeking human refuge from predators. Bighorn sheep also selected main roads, which the researchers propose was due to mineral salts available on roadways. Further, mule deer avoided haul roads and selected disturbed areas, which was exactly opposite to elk.
- In terms of cougar habitat selection, they found that two individual cougars selected reclaimed mines when establishing home ranges. Of these two individuals, one selected and the other did not select reclaimed mines at the third order. At a fine scale, both individuals selected for rocky outcrops, forest edges, forest, and high relative availability of bighorn sheep availability when on the reclaimed mines. Further, cougar predation events on bighorn sheep were closer to forest edges than randomly expected. These findings support predictions that forest edges influenced cougar movements, as well as predation on bighorn sheep. However, it was expected that cougars would use forest patches for refuge while moving through open landscapes, and they did not find evidence of this. Lastly, both individual cougars specialized on bighorn sheep and bighorn sheep were selected disproportionately to their availability (by biomass). The researchers did not find evidence that cougars selected particular age-sex classes of bighorn sheep but submit that samples sizes may have been too small to test this hypothesis.
- The researchers have a multitude of deliverables from this project including lab meeting presentations, committee meeting presentations, presentations to high schools, and two videos made for other funding partners.
- Meghan Beale will be presenting findings from her ungulates analysis as a poster at the Alberta Chapter of the Wildlife Society (ACTWC) Conference in March 2019.
- Meghan Beale's M.Sc. thesis was completed and is available May 2019 at the University of Alberta. Cougar data from this project has been made available to Bighorn Wildlife Technologies Ltd. and will be made available to Teck Resources and AEP in the future.
- Two manuscripts were submitted for publication in peer-reviewed scientific journals in April 2019.

Chronic Wasting Disease in Deer: Modelling transmission from contact rates

University of Alberta (Dr. Merrill)

Grant: $32,400

Project code: 030-00-90-228

Project status: Funded in 2014/15 and 2017/18; Completed

Project website: www.abchronicwasting.biology.ualberta.ca

Chronic wasting disease (CWD) is the most significant issue in wild cervid management in North America. Recent studies from Wyoming and Colorado now demonstrate population-level declines in deer related to CWD. Alberta is one of two provinces in Canada with CWD in wild cervids, with over 1,000 detected cases (~85 percent in mule deer) in eastern Alberta since its detection in 2005. At present, major routes or factors influencing animal-to-animal or environment-to-animal transmission are not known, necessitating small-scale behavioural studies for justifying cost-effective control. The researchers began

the third year of the four-year field study (one of the four years being the pilot study) with a fifth year of data analysis and modelling. Field studies were initiated at Canadian Forces Base Wainwright (CFBW) in winter 2016/17 as a pilot study and the study expanded to a replicate site, Cresthill Grazing Reserve (CHGR), nearby CFBW. On CFBW, the research team captured and collared 35 deer in 2017, with additional deer captured on CHGR the proceeding two years (25 deer in 2018, and 32 deer in 2019). Supplementing the GPS locations from collars, monthly density surveys were performed, and 24 game cameras deployed. To complement the proximity data from the collars, daily behavioural surveys were carried out on collared individuals. The researchers are currently in the preliminary stages of analyzing the contact data from the GPS-proximity collars. Overall, however, the researchers have found that contact rate between deer vary slightly between seasons but averaged one to two contacts per day, with more contacts occurring in winter compared with summer. The researchers chose CFBW and the CHGR as study sites because CWD has been detected and they are single land-owner/organization with the potential for doing manipulative experiments to address how different harvest strategies may influence group composition, movement among groups, and disruption of social bonds that can alter disease transmission. Results from this field study will provide inputs into models for predicting changes in CWD prevalence rates to improve targeted surveillance and control.

Deliverables/Results:

- The researchers just ended their first year of collar deployment on CGR and have some preliminary data regarding seasonal movements and habitat use of the deer within the study area. Using minimum convex polygons (MCP) the researchers determined that during winter of 2018 the home ranges were 14.7 ± 8.23 km^2 for females and 13.9 ± 4.88 km^2 for males. Males and females travelled an average of 0.18 ± 0.34 km and 0.18 ± 0.29 km between GPS locations recorded at two-hour intervals. Grassland habitats were used most frequently during winter, followed by perennial croplands and shrublands. Habitat use in winter was very similar between male and female mule deer. During summer, home ranges expanded for both sexes, with an average of 57.8 ± 104 km^2 for females and 50.6 ± 56 km^2 for males. On average, males travelled further (0.27 ± 0.46 km) within a two-hour interval compared with females (0.30 ± 0.49 km). During the summer, both male and female mule deer continued to follow the same patterns of habitat use as in the winter, occupying grassland habitats for the majority of the time.
- Contact data from the 2017 WildScope collars on CFBW showed high variability between seasons. Female deer had contacts ranging from 0.15 to 11.33 contacts/day during March and April, 0 to 0.25 contacts/day during May and September, and 0 to 1.50 contacts per day from October and November. Contact rates were higher in the winter than in the summer (Mann-Whitney U test: -6.54, $P<0.01$, $n=6$). Contacts occurred throughout the day but appeared to be highest during crepuscular periods when deer were most active with ~ 60 percent of contacts occurring within one hour of sunrise or sunset. Furthermore, longer contacts occurred between 11 p.m. and 4 a.m. in the winter.
- Contact data in 2018 from the Lotek Litetrack collars on the CGR showed similar trends to the WildScope collars in 2017. Daily contact rates of females on CGR did, however, vary less between seasons compared with those on CFBW, with 1.21 to 1.56 contacts/day between February 2018 and April 2018, and from 1.11 to 2.10 between May 2018 and September 2018. Similar to the collared deer on CFBW, contacts between mule deer were higher in the winter than in the summer (Mann-Whitney U test: 48, $P<0.01$, $n = 22$). On average, collared deer contacted other collared individuals 1.75 ± 2.27 times per day in the winter and 1.38 ± 0.36 times per day in the summer. In addition, average contacts made by males were more frequent than females (1.93 ± 3.23 contacts/day and 1.44 ± 0.84 contacts/day, respectively). In the winter, most contacts occurred late in the evening between 10 p.m. and 2 a.m. Contacts in the summer varied more widely across the day with the most contacts occurring earlier in the evening, between 6 p.m. and 8 p.m.. These preliminary results will be combined with those of 2019 and 2020 to provide more a rigorous analysis of deer density, distribution, and habitat selection to assess the factors influencing individual contact rates and exposure to potential environmental contamination of CWD.
- Blood (pregnancy), ear tissue (genetic), and tonsil (CWD-test) samples were collected and sent to labs for respective analyses.
- A capture summary report (2019) was produced and was sent to CFBW and government personnel.
- No modelling deliverables are reported at the time because results are too preliminary.
- Dr. Merrill organized a symposium (Aug. 6, 2018) with five other scientists on modelling disease transmission in populations using contact data at the International Deer Biology Congress (www.deerbiologycongress.org).
- Dr. Merrill was keynote speaker at the Ontario Federation of Anglers and Hunters Chronic Wasting Disease Conference, Mississauga, Ont. in March 15, 2019.
- Maria Dobbin, Eleanor Stern, and Peter Smolko presented posters at the Alberta Chapter of The Wildlife Society, March 23 to 24, 2019 on spread and contact modelling approaches for CWD.
- The researchers have updated the project website with information regarding the 2019 mule deer captures: https://grad.biology.ualberta.ca/merrill/spread-of-chronic-wasting-disease/

Cyanobacterial Blooms and Their Toxic Effects on Fish Populations

University of Alberta (Dr. Wang)

Grant: $26,000

Project code: 020-00-90-258

Project status: New; Completed

Cyanobacterial blooms can pose many risks to Alberta's water sheds, agriculture, and recreation. Unfortunately, cyanobacterial blooms are becoming all too common in Alberta lakes, often believed to be a result of climate change and increased human impact. Many factors, including weather, anthropogenic nutrients, and eutrophication affect cyanobacteria dynamics. This project should help researchers to understand and predict how cyanobacterial blooms can be mitigated to reduce their harmful implications. The overall goal of this project is to provide early warning predictions and understanding of harmful cyanobacterial blooms using mathematical and computational tools. The project can be separated into two distinct approaches that share the same overall common goal. One approach is a mathematical modelling technique that will capture how seasonal phosphorus inputs

influence bloom dynamics. This approach involves the formulation of a stoichiometric cyanobacteria model with phosphorus impulse. The researchers wish to shed light on how annual spring run events influence the longevity and severity of cyanobacterial blooms. As a result, the researchers will better understand the driving mechanisms behind the bloom process including onset and senescence. In addition, the researchers can approximate the longevity of cyanobacteria in terms of certain important environmental parameters, such as nutrient run-off concentration and water exchange rates. The other approach involves the use of machine learning to analyse existing data about various Alberta lakes. Bayesian Network (BN) enables the researchers to predict the bloom using data of 75 Alberta lakes and reservoirs collected from 1985 to 2017. The BN algorithm uses available data of the current month, including sample chemical data, watershed information, and weather data in the winter and the current month to provide early warning for the bloom in the next month.

Deliverables/Results:

- A modelling framework was created for impulsive phosphorus inputs, and the researchers were able to understand the driving mechanisms behind cyanobacterial blooms. Furthermore, the researchers can approximate the longevity of a bloom based on environmental parameters, which will aid in creating management strategies. This objective has been completed and submitted for publication. The follow-up work is to model and evaluate the impact of cyanotoxin on fish communities (incomplete).
- In addition to the negative effect of cyanotoxin, the depletion of oxygen in the lake water following the death of cyanobacteria communities can cause fish populations to decline. The researchers use machine learning techniques to predict the onset of blooms and therefore provide early warnings to help mitigate the potential impacts on fish populations and the overall aquatic ecosystem. The preliminary results of predicting blooms have been obtained; however, in order to obtain robust results, other machine learning techniques need to be tested over more data. The researchers expect to complete this next year. The final framework can be applied to predict the cyanotoxin levels and help uncover the effect of blooms on fish populations.
- Several meetings were held:
  - Data requirement of a machine learning technique for predicting cyanobacterial blooms in Alberta lakes. The meeting was held on Jan. 21, 2019, with seven participants from the University of Alberta and AEP.
  - Discussion on the data, covariates, modelling and results for predicting cyanobacterial blooms in Albertan lakes. The meeting was held on Mar 20, 2019 with seven participants from the University of Alberta, AEP, and the University of Toronto.
- Publications:
  - C. M. Heggerud, H. Wang, M. A. Lewis. "Multiple-scale analysis of a stoichiometric cyanobacteria model with phosphorus impulses," submitted for publication in *SIAM Journal on Applied Mathematics*.
  - "Early warnings for cyanobacterial blooms in Alberta using machine learning algorithm," in preparation.

Evaluating Camera Trap Surveys as an Effective Means of Monitoring Remote Ungulate Populations

University of British Columbia (Dr. Burton)

Grant: $39,690

Project code: 030-00-90-278

Project status: New; Completed (Extended until May 31, 2019)

This multi-year project will determine the feasibility of using camera trap surveys and hierarchical Bayesian spatial count models to develop a standardized inventory tool for estimating ungulate densities in remote regions of north-eastern Alberta. This project capitalizes on concurrent AEP aerial ungulate (2018) and caribou DNA capture-recapture (2019) surveys to validate ungulate population estimates obtained through camera trap surveys in the Lower Athabasca Region. In November 2017, field work was initiated for this project, deploying the first 30 cameras within the focal Richardson caribou range. In November 2018, the research team deployed another 28 cameras, and serviced all cameras in April 2019. Cameras are deployed in a two-factorial design (on/off seismic lines and inside/outside of wildfire burns). Preliminary analyses on the first year of camera data (379 day sampling period) summarized detections of 14 mammal species, ranging from 222 snowshoe hare detections to three wolverine detections, and a single detection of a white-tailed deer on the western boundary of the study area (in close proximity to the winter road). Frequently detected species were black bear and caribou (178 and 132 detections, respectively), while intermediately detected species included moose and lynx (70 and 62 detections). The researchers had few wolf (n = 20) and no coyote detections. The project objectives are to use field and simulated data to determine standards for ungulate camera trap surveys, for example effects of camera spacing and placement, sampling site, occasion length, and season on ungulate detectability and model accuracy. This project will also use advanced Bayesian methods (spatial count and mark-resight models) to estimate population densities for moose and caribou, contributing to the broader regional assessment of mammal community responses. An equally important objective is to validate winter density and demographic estimates against concurrent provincial survey methods by comparing estimates obtained from camera trap surveys with moose population estimates from the aerial ungulate distance sampling survey, and with caribou population estimates from the DNA capture-recapture survey. Preliminary estimates from camera data suggest densities of ~three moose/100 km^2 and ~ one caribou/100 km^2 in the survey area. These come from two field trips per year costing ~$46,000 in aircraft costs, compared to ~$88,000 in aircraft costs for an aerial moose survey for the northern portion of WMU 530. Once complete, this project will compare population estimate precision and costs between camera trap methods and the provincial surveys.

Deliverables/Results:

- The researchers found that camera traps can be an effective means of monitoring remote ungulate populations. The provincial surveys have an advantage in terms of spatial coverage, covering a substantially larger area (~7,000–8,000 km^2, depending on the survey) than the camera trap array (463 km^2 for 30 cameras or ~6,700 km^2 for the state-space area of the density model). But provincial methods are temporally limited, surveying for only a few days/weeks once every five to ten years, compared to continuous camera trap monitoring for a two-year period. In addition, the provincial surveys are focused on single species (caribou and moose, respectively), while the camera trap survey detects multiple mammal species, including caribou and moose. The preliminary results suggest that camera trap surveys

might be the perfect complement to provincial ungulate surveys. Species-specific snapshot surveys that cover entire management units for species at risk or of management concern (i.e., caribou within a range and moose within a WMU) are important for providing robust density and demographic estimates to inform management. However, the expense associated with these surveys is high. The researchers recommend implementing multiple camera trap arrays in a region to provide longitudinal multi-species surveys to augment provincial aerial surveys; camera trap surveys can provide an assessment of mammal community responses, including interannual variability. The researchers have only conducted preliminary analyses with the first year of camera trap data. Future work should examine the feasibility of studying behaviour, group dynamics (e.g., group size and structure), recruitment, and survival using camera trap data.

- Data processing/analysis of preliminary data complete.
- Field visit for bi-annual camera data retrieval (November 2018).
- Field visit for bi-annual camera data retrieval (field work delayed; completed April 11, 2019).
- Preliminary report provided to ACA and AEP (field work delayed; completed by May 30, 2019).
- Presented at the B.C. Chapter of the Wildlife Society (Kelowna, March 2019) and at the Alberta Chapter of the Wildlife Society (Canmore, March 2019).

Biogeography of Native Bumble Bee Species in Alberta: The influence of weather

University of Calgary (Dr. Cartar)

Grant: $7,473.34

Project code: 030-00-90-289

Project status: New; Completed

Bees in Alberta are data deficient. To address this, the researchers obtained a broad single-season snapshot of bee populations by sampling simultaneously across a geographic range, piggybacking on a provincial program that disperses observers across a network of well-spaced fire lookout towers from April through September. The researchers have processed and catalogued most of the trapped bumble bees. When the processing of specimens is complete, likely in the summer of 2019, the researchers will fit statistical models that seek to explain abundances of bumble bee species using their functional traits (body size, tongue length, nest site), phylogeny, and, most importantly, past and current weather. The work will be written up for publication. The short-term objectives were: 1) to collect a snapshot of geographic population data for (data-deficient) bumble bee species in Alberta; 2) to relate abundances of bumble bee species to current and past weather, and to species traits (body size, tongue length, nest site, phylogeny), for generation of predictive models; and 3) to raise awareness about wild bee ecology and diversity, while promoting healthy pollinator populations and habitats through the use of citizen science. The short-term goal of Objective 1 has been met, Objective 3 has begun (the non-trivial involvement of 67 volunteers, and counting), and Objective 2 is awaiting the completion of processing and identifying ~9,000 more bumble bee specimens.

Deliverables/Results:

- More than 10,000 curated specimens of bumble bees, sampled across the forests of Alberta, and housed in the collections at the University of Calgary.
- Identified 23 species of forest bumble bees so far. First, two species of bumble bees are of conservation concern: *Bombus occidentalis* (COSEWIC status = *Threatened*), and *B. terricola* (COSEWIC status = *Special Concern*). These species are not uncommon in the samples (1.5 percent and 2.4 percent of the sample, where 4.3 percent is the proportion expected from this community if species abundances were perfectly even). At least in Alberta, all is not lost for these two species. Another surprise is the abundance of *B. sandersoni,* which have not been collected much from Alberta, but the infrequency of collection may reflect relative inattention to sampling bees in the north. Finally, the importance in Alberta's forests of small and drab (i.e., not charismatic) bumble bees (*B. bifarius* and *B. mixtus*), both ground nesters, is surprising. Both bees are small-bodied and short-tongued. Their abundance may reflect Alberta's unsustainable (for biodiversity) levels of logging, which the researchers think is converting the world to one in which short-tongued bees flourish (i.e., clearcuts).
- Although the researchers provided collection materials to all 130 tower sites in Alberta, samples from only 48 were returned. The researchers are not disappointed with the level of buy-in (37 percent) from tower observers, and note that the geographic range is broad, but the project is data deficient in the northeast.
- The work of processing bees continues, limited by the citizen science aspect of the research. The project relies on students and volunteers to process specimens. As expected, the researchers obtained enormous volunteer support primarily from members of the Alberta Native Bee Council, mostly from the Crowsnest Pass, Calgary, Red Deer, and Edmonton. Undergraduate students from the University of Calgary, and a few interested Calgarians, provided the bulk of the pinning and labelling efforts.
- In closing, the summer of 2018 was a much more important "snapshot" of bee diversity in Alberta than the researchers had expected when designing this study.
- Two other studies provided data complementary to those collected in the present research. Both extraneous studies also used blue vein traps, so their data can easily be compared to ours. Dr. Paul Galpern at the University of Calgary (also funded by ACA) sampled the Calgary to Edmonton corridor, obtaining ~ 20,000 bumble bees, most of which have been pinned and identified. Dr. David Prescott, of AEP, obtained ~10,000 bumble bees from most of the Aspen Parkland region of Alberta, all of which have been pinned and identified. The combined samples from these three studies, all housed permanently in the collections at the University of Calgary, provide a depth and breadth of bumble bee sampling, in a single season, that is unparalleled in the world. The researchers expect the research arising from these collective data to be of global significance.
- Two undergraduate research projects at the University of Calgary were both completed in April 2019.
- Public engagement: The researchers have thus far engaged at least 67 citizen science volunteers in this work: 48 carrying out the field sampling at fire towers, and 19 processing specimens.
- CBC published a story about the project (www.cbc.ca/news/canada/calgary/bee-count-alberta-university-calgary-1.4768995) and the St. Albert Gazette also carried a story (May 18, 2018, "Bee study at Bisg Lake").

Wild Pollinator Conservation and Restoration in Southern Alberta Croplands IV: Pollinator community responses to prairie habitat restoration

University of Calgary (Dr. Galpern)

Grant: $22,000

Project code: 015-00-90-225

Project status: Funded 2015/16 -- 2017/18; Completed

Project website: http://ecologics.ucalgary.ca/lab/science/pollinator-conservation/

This study continued the Dr. Galpern lab's investigation into the relationship between landscape and pollination ecosystem services in prairie Alberta by examining habitat restoration and its influence on bee community structure over time. The researchers focused on how native bees return to restored spaces in the parkland region of central Alberta. Understanding how bee recolonization happens not only provides valuable insight into predicted patterns of bee community restoration, but also allows the researchers to provide farmers with a timeline in which they may begin to see the additional pollination services provided by native bees in these restored spaces. The researchers sampled at 28 sites in the parkland region of central Alberta at various stages of restoration from cropland to grassland. These sites ranged from newly restored in 2018 to sites that were restored 25 years ago. The researchers also expanded their broad-scale landscape level sampling by collecting native bees in varying landscapes at 40 additional sites in the parkland region of Alberta and at 17 of the long-term monitoring sites in southern Alberta, making this the fourth year of sampling for these locations. These sampling activities resulted in the collection of approximately 40,000 bees, of which about 22,000 were bumble bees. Bees of most species have now been identified by a taxonomic expert, with a small subsample of rarer species reserved for further verification by experts in those taxa. With this year's support from ACA plus the previous three years of funding from ACA and several other funders, the researchers have made the bee collection at the University of Calgary the third largest in Canada in terms of the total number of bees (> 150,000 curated specimens). It is unparalleled in terms of its geographic coverage and the consistent sampling of prairie landscapes of conservation interest. Due to the higher than expected amount of effort involved in processing this year's specimens (now mostly complete), the researchers will require several more months to perform the statistical analyses to determine the relationship between time since grassland restoration and the abundance and community structure of bees found there. Two postdocs funded by different agencies will join the team this summer to assist in the analysis of these data and those collected in the previous three summers. Through these four person-years of postdoctoral funding recently awarded, they anticipate many additional insights from this ACA co-funded pollinator data. In addition, an M.Sc. student will join in the fall with the explicit task of furthering our understanding of the relationship between wetland restoration and bee communities by leveraging results from this study and using these to frame more targeted research questions intended to support conservation applications.

Deliverables/Results:

- As noted, analyses regarding habitat restoration and bee communities are still ongoing on these data. However, the researchers did make several important and unexpected discoveries:
  - The researchers collected five specimens of the bumble bee species *Bombus bohemicus* (the gypsy cuckoo bumble bee) during 2018. This bee is listed as *Endangered* federally under the Species At Risk Act. These specimens were collected at five locations on restored habitat near Red Deer and Edmonton and the records were contributed to the recovery strategy for this species, which is currently being drafted. They are among only eight recent records of these species from Alberta. The project's intensive and geographically extensive sampling of bumble bees in Alberta has also been used by Environment Canada in their drafting of the recovery strategy in order to demonstrate the low frequency of this and other species.
  - The researchers were able to demonstrate, using this year's and previous year's bumble bee data, that two other species of conservation concern are generally more abundant near wetlands in Alberta. These findings also point to the possibility that the maintenance of wetland features could be used to support their recovery. B. terricola listed federally as Special Concern and B. occidentalis recommended for listing by the advisory body COSEWIC were once abundant in Alberta and throughout the prairies. This data demonstrate that wetlands are aggregating these species either because they are attracted to the floral communities near wetlands, or they are using these habitats for nesting. These results have been communicated to practitioner audiences through webinars and public lectures and will be the subject of a future manuscript.
- During the fourth year of the project (2018/19) the researchers have involved three student research assistants, one international intern, one postdoctoral project manager, and five grower-cooperators on this project.
- Data from the first, second, and third year of the project (funded each year, in part, by ACA) were presented publicly on 13 occasions in 2018/19, reaching conservation practitioners, growers, the general public, and academics. These presentations occurred twice at the Canadian Society for Ecology and Evolution in Guelph; three times at the North American Colloquium for Conservation Biology in Toronto; and at the Canola Discovery Forum in Banff; the Yukon Science Institute in Whitehorse; the Prairie Conservation and Endangered Species conference in Winnipeg; Field Boundary Habitat Workshop hosted by Agriculture and Agri-Food Canada in Indian Head, Sask.; a webinar for Ducks Unlimited Canada; at an in-service talk for Ducks Unlimited Canada employees at Oak Hammock Marsh, Man.; and as two podcasts for Ducks Unlimited and *Canola Digest,* respectively. Results from the project have also featured in several other print or web media this year including *Canola Digest, Top Crop* and *UToday*, the web publication of University of Calgary.
- A paper from the second year of the project has now been published in the international peer-reviewed journal *Biological Conservation* (Impact Factor: 4.66) entitled "Pothole wetlands provide reservoir habitat for native bees in prairie croplands" (Vickruck et al., 2019. *Biol. Cons.* 232:43-50). This adds to a paper from the first year of the project previously reported to ACA on the topic of canola crops and bees (Galpern et al., 2017. *Ecol. Evol.* 7:2414-2422). Analyses from the third year of this project, which examined the influence of pollinators living near wetlands and crop yields, are complete and demonstrate an effect of wetlands on yields mediated by beneficial arthropods. These results will be submitted for publication this spring.

Ecological Epidemiology of Emerging *Ambystoma tigrinum* Virus (ATV) in a Population of Tiger Salamanders in Southwestern Alberta

University of Lethbridge (Dr. Goater)

Grant: $6,096

Project code: 030-00-90-285

Project status: New; Completed

Epidemiologists do not understand the factors that lead to year-to-year variation in outbreak dynamics for emerging wildlife diseases. Thus, high host mortality can be observed in one year, followed by undetectable mortality the following year. This inconsistency can occur even in the face of high rates of transmission in both outbreak and non-outbreak years. One objective of this research is to monitor year-to-year variation in demographic characteristics of threatened western tiger salamanders and variation in transmission rates of a lethal emerging *Ambystoma tigrinum* virus (ATV). A long-term objective of this monitoring work is to test the hypothesis that variation in annual host mortality is associated with variation in host condition. The researchers have been monitoring salamander demography and ATV infection dynamics in Livingstone Lake in southwestern Alberta since 2012. Larval salamanders were collected in live traps during the start (mid-July), middle (end-July) and end (mid-August) of the larval period. During each collection, the researchers assess individual rates of development, evidence for ATV-induced pathology, and then release the larvae. Prior to release, the researchers remove a small section of the tail. This tissue is analyzed back in the lab with standard molecular procedures to diagnose ATV infection status in each individual. Larval densities were relatively low in 2018 compared to other years, whereas larval growth rates were among the highest the researchers have recorded. The estimate of ATV transmission rate (65 percent) was also among the lowest the researchers have recorded. There was no detectable ATV-induced host mortality during the 2018 larval period. Overall, the six-year data set provides the longest-running annual monitoring program involving emerging ATV in any tiger salamander population. This is important because, for the first time, the researchers can match variation in host demographic characteristics (e.g., host density, development rate, condition) with variation in the transmission of a potentially lethal emerging pathogen.

Deliverables/Results:

- There are four important results. First, there is high variation in larval densities between years. Orders of magnitude differences in annual larval densities have been reported for other species of tiger salamander. Such variation is often attributed to variation in adult attendance at breeding sites, variation in the quality of the aquatic habitat (water depth, predator pressure) and variation in the harshness of terrestrial overwintering conditions. Such variation underscores the critical importance of long-term monitoring studies to document annual variation in at-risk species. Second, there is high variation in host quality between years. Low-condition years are those in which host growth rate between the first capture in mid-June and metamorphosis approximately 30 days later is low (2003 and 2017). High-condition years are those in which growth rate over the same interval is significantly higher. The timing of metamorphosis is approximately the same in the two groups of larvae, but larvae in the second group transform at a significantly larger size. The researchers do not understand the factors that underlie this high variation in host quality between years. Third, ATV recolonizes the larval population each year. Larvae are born uninfected and are exposed within their first few weeks (prevalence reaches about 50 percent by end July), The rate of transmission between individuals is high, such that in three of the six years, prevalence reached 100 percent by the end of the larval period. Consistent annual recolonization can be attributed to visitation by infected adults to Livingstone Lake each spring for reproduction.
- Outbreak dynamics are episodic and inconsistent. Preliminary results indicate that outbreaks occurred in the years (2013 and 2017) when larval growth rates were at their lowest. These results are consistent with the hypothesis that whereas almost all salamanders are exposed to ATV in all years, high host mortality is restricted to those years in which host condition is low. The challenge ahead is to determine the underlying factors that determine variation in host condition between years.
- Journal publications:
  - Lung, O., Nebroski M., Gupta S., and C.P. Goater. 2019. "Genome sequences of Ambystoma tigrinum virus from outbreaks in tiger salamanders in Alberta, Canada." Submitted March 1, 2019 to *Genome Announcements*.
  - Lung, O., Reimer S.A. and C.P. Goater. 2017. "User-friendly Taqman probe coupled-insulated isothermal PCR (iiPCR) for rapid detection of emerging Ambystoma tigrinum virus (ATV) in western tiger salamanders (Ambystoma mavortium)." *Journal of Virological Methods* 241: 21-24.
- These two contributions are important because they firmly establish the molecular diagnostic methods that are fundamental to the analyses of the long-term epidemiological patterns of ATV infection in these salamanders. The genomics works in Lung et al 2019 is key to follow-up studies because it will enable us to evaluate the invasion pathway of ATV into southern Alberta from potential sources in sites of ATV emergence in Western Canada versus the Northwestern United States.

Bull Elk Recruitment, Survival, and Harvest in a Partially Migratory Elk Herd in the Ya Ha Tinda

University of Montana (Dr. Hebblewhite)

Grant: $30,000

Project code: 030-00-90-281

Project status: Funded in 2017/18; Completed

Project website: www.umt.edu/yahatinda

The goal of this project is to understand bull elk ecology in a partially migratory population and how predation, hunting, and migration affect the number and size of bull elk in a population. The researchers have four main objectives of this multi-year project: 1) continue the long-term population monitoring of the Ya Ha Tinda elk herd by monitoring pregnancy, mortality, and migratory behaviour of individually marked females; 2) determine migratory movements of

bull elk in the Ya Ha Tinda herd; 3) determine cause-specific mortality, survival, age structure, and trophy potential of bull elk in the Ya Ha Tinda elk herd; 4) develop an integrated population model based on the long-term female data that includes bull elk population dynamics and migration. In March 2018, the researchers deployed collars on 38 female elk to maintain a sample size of ~ 60 collared individuals as part of their 18+ year study on demographics and migration of the Ya Ha Tinda elk population. The researchers monitored 63 radiocollared female elk from March 30, 2018 to March 15, 2019, and a total of ten collared individuals died during this reporting period with eight being killed by predators (two wolf, three grizzly bear, three cougar) and two dying of natural causes, similar to long-term trends. As part of the new research focused on bull elk ecology and migration, the researchers successfully aerially darted and radiocollared 32 bull elk in January 2018, and 29 bull elk in January 2019. In summer (June–August) 2018, the collared bull elk migrated following similar routes as the females. However, the first year of movement data suggest that the proportion of migratory males is different than the proportion of migratory females. In June and August, 19 (63 percent) of the collared bull migrated into Banff National park, six (20 percent) remained as residents on the winter range, and five (16 percent) migrated east into provincial land. Twenty-nine percent (eight) of 28 collared bulls (four bulls lost collars prior to hunting season) were harvested during the 2018 hunting season and one bull died of malnutrition in February 2019. The data from this long-term project was used to produced three new scientific publications as well as two Master's theses, and a PhD thesis. In addition, the bull elk research was presented at three public outreach events and three scientific conferences.

Deliverables/Results:

- The first two years of bull elk collaring were a success as was the continuation of the project's long-term data collection. The project is on target for the continued monitoring of sufficient sample sizes of adult male and female elk in the population. The researchers expect to have one more year of adult male captures in January 2020 after which the researchers will monitor the survival, migration, and habitat selection of collared bulls for an additional year. This should provide us with about 150 bull elk-years of data assuming a 60 percent survival rate.
- So far, this study has provided insight into differences in male and female migration and cause-specific mortality. Females are more vulnerable to wolf, cougar, and bear predation than males and hunter harvest is the leading cause of death for male elk in the population. A higher proportion of males are following western migratory routes than females, potentially gaining access to high forage quality. Despite western migrants spending time within Banff National park, this strategy does not limit bull elk vulnerability because male migration occurs prior to the hunting season. However, the age and size of harvested bulls varies between WMU's within the study area due to differences in the antler point restriction regulations. Despite this population being managed using both a quota system and antler point restriction, the male age-structure is skewed toward younger animals (two to four years of age) with no males reaching mature age classes (seven to eight years of age). Despite studies in both Banff National Park and Yellowstone finding that wolves select for male elk during mid to late winter, the researchers did not observe any wolf caused mortalities in the first year of the study.
- Presentations on the Ya Ha Tinda Study in the reporting period:
  - Alberta Wildlife Society Conference, Canmore, AB, March 21, 2019. Bull Elk Ecology and Vulnerability in a Partially Migratory Population (Poster). Martin, H., Normandeau, J., Hebblewhite, M., Merrill, E.
  - Greater Yellowstone Coordinating Committee Wildlife Migration Symposium, Jackson, WY, June 6, 2018. Long-term Research Reveals Migratory Flexibility in a Partially Migratory Elk Population (Poster). Martin, H., Killeen, J., Hebblewhite, M., Merrill, E., Berg, J., Eggeman, S., Bohm, H.
  - University of Montana Graduate Student Conference, Missoula, MT. April 20, 2018. Do elk change migratory behavior in response to environmental or intrinsic factors to increase fitness? Poster presented by H. Martin.
- Public outreach:
  - Martin, H. 2019. Ya Ha Tinda Elk Research Presentation. Sundre West Country Community Centre, Sundre, AB. 28 February 2019.
  - Martin, H. 2018, Bull Elk Ecology and Migration. University of Montana Back Country Hunters and Anglers Student Chapter. University of Montana, Missoula, MT. September 2018.
  - Martin, H. 2018."Conducting elk research (horsing around) in Canada." Wildlife Biology Program Blog – The official blog of the University of Montana's Wildlife Biology Program. April. www.wildlifebiologymontana.tumblr.com/post/173335654944/conducting-elk-research-horsing-around-in-canada.
- Scientific publications in the last year:
  - Normandeau, J., Macaulay, K., Berg, J., and Merrill, E.H. 2018. "Identifying guard hairs of Rocky Mountain carnivores." *Wildlife Society Bulletin*, Published September 21, 2018.
  - Hebblewhite, M., Eacker, D.R., Eggeman, S., Bohm, H. and Merrill, E.H. (2018). "Density-Independent Predation Affects Migrants and Residents Equally in a Declining Partially Migratory Elk Population." *Oikos*, Early View Articles, DOI: 10.1111/oik.05304
  - Tucker, M., Hebblewhite, M., Merrill, E.H et al. 2018. "Moving in the Anthropocene: Global reductions in terrestrial mammalian movements." *Science* 359: 466-469. (Featured wolf and elk data from Ya Ha Tinda.)
- Completed theses:
  - MacAulay, K.M., 2019. *Spatial predation risk for elk (*Cervus canadensis*) in a multi-predator community on the Rocky Mountain East Slopes, Alberta.* Master's thesis, Department of Biological Sciences, University of Alberta, Edmonton, Canada. 95 pages.
  - Berg, J.E., 2019. *Shifts in strategy: Calving and calf survival in a partially migratory elk population*. Dissertation, Department of Biological Sciences, University of Alberta, Edmonton, Canada. 288 pages.
  - Spilker, E., 2018. *Spatial predation risk and interactions within a predator community on the Rocky Mountains East Slopes, Alberta*. Master's thesis. Department of Biological Sciences, University of Alberta, Edmonton, Canada. 116 pages.

Density-Dependent Habitat Selection of Feral Horses and Competition with Other Ungulates in a Changing Landscape

University of Saskatchewan (Dr. McLoughlin)

Grant: $30,000

Project code: 030-00-90-288

Project status: New; Completed

In 2018 the researchers proposed to launch, in collaboration with a network of colleagues in university, government, and an NGO, the largest GPS-tracking study of feral horses in Canadian history. Over a three-year period, the researchers are hoping to track up to 30 adult females across an equal number of social groups (bands), in three management zones along the Alberta foothills (with varying horse density). The initial project had three primary objectives: 1) document resource selection of horses with respect to the establishment of bands, within band seasonal ranges, and horse population size; 2) forecast occupancy of habitat by horses with changes in landscape features (due to forestry, climate change) and population density; and 3) model niche overlap between horses, elk, and other wildlife and cattle. The researchers have now added additional objectives regarding 4) determining the size and trend of the horse population, independently using a 130-camera trap network and in comparison to current methods of enumeration as carried out by the province; and 5) evaluating the efficacy of immunocontraceptive darting of a subsample of females. Deployment of collars has proven to be the greatest challenge: in the first year of the project the researchers had to completely redesign the approach to horse captures to deploy GPS-tracking collars, given the logistics and expense of moving corrals around to where they are needed, and preventing public interference in their operation. A large, on-the-ground darting program like this has not been conducted anywhere in Canada before, or even in the United States where helicopter wrangling and industrial processing of feral horses to manage reproduction at permanent facilities is the norm. However, the research team is making progress. The program has been expanded to include University of Calgary's (U of C's) Faculty of Veterinary Science (Dr. Nigel Caulkett) to develop the best and safest drug combinations to fully immobilize horses; this is very new, compared to how feral horses are usually handled (e.g., in chutes). The researchers are tracking now up to 100 horses by GPS given the band structure. Some earlier collars from November have dropped/slipped (horse grooming of leather break-away) and the researchers have had to redesign fit (the new ACA collars are protected by their "tear-drop" design). The researchers hope to complete their initial round of deployments to have between ten and 15 active collars on mares before April 15, 2019 (which means most of the collars will not likely be deployed now until next fall/winter).

Deliverables/Results:

- At present, the main results of the project relate to what the researchers are learning about how to safely dart feral horses from the ground, which is ground-breaking research in North America as handling horses in this way is very rare. Building on this, results from this project so far have already proven to have practical application to the development of a framework for non-lethal control of the Alberta horse population, based on what the researchers are learning now about how to best handle, capture, and track the horses, but also the body condition and productivity of the population using data at capture and through surveillance. In the long run, what the researchers are learning and investing in now has real potential to save the Alberta government money later on in terms of managing horses.
- The researchers have learned that they can dart a female from the ground at 30 m with relative ease. The researchers have also learned that helicopters are not necessary to capture feral horses, and in fact capture by helicopter presents an inferior option (irrespective of cost considerations) compared to on-the-ground darting for most bands (the latter being much more controlled and less disturbing to the herd). Once the researchers have one collar on a band, tracking is easy in real time GPS and by VHF signal, a logistical advantage that is critical if immunocontraceptive darting of most females with follow-up booster shots is a goal. The researchers are still working on the best and safest drug combinations to immobilize horses through their partnership with the U of C's Faculty of Veterinary Science. The researchers are also working on the best design and model of GPS collar-type to maintain contact with horses (which is somewhat by trial and error, but also building on past experiences in the United States). The main finding is that a female can be darted and collared to keep track of a band without a helicopter, and that researchers can likely maintain contact with a band over very long periods, using the models of collars available (for as long as five years).
- What this all means is that, if AEP is looking at enacting an immunocontraception program, the researchers have already learned quite a bit about the logistics of maintaining contact with bands necessary for this approach. The researchers have other questions they can and will ask with the data, but in terms of the first-year results of the study with application to managing horse numbers, this work is establishing the foundations for AEP to develop an immunocontraception program if it so chooses. The researchers know how much they are currently spending to track a band, and what it would cost to maintain that tracking over time. Then, factoring in on-the-ground costs of darting, personnel hours involved in applying immunocontraception, etc., going forward the researchers hope to identify the actual costs of a large-scale population reduction program through immunocontraception (to compare with other options).
- Publication:
  - Boyce, P., and McLoughlin, P.D. 2018. "Ecology and management of feral horses in the Alberta foothills." 110th Canadian Institute of Forestry Annual General Meeting and Conference, September 18-20, Grande Prairie, AB.

Evolutionarily Sustainable Management of Bighorn Sheep

University of Sherbrooke (Dr. Festa-Bianchet)

Grant: $9,950

Project code: 030-00-90-174

Project status: Funded from 2011/12–2016/17; Completed

The 46th year of research at Ram Mountain was very successful. The research team continued to monitor the effects of an attempted genetic and demographic rescue of the population, which had declined to low numbers and lost genetic variability. Of the nine sheep translocated from Cadomin in 2015, six remained on Ram Mountain and three ewes reproduced. At least 52 percent of the 92 sheep alive in 2018 carry some Cadomin genes. The researchers continued to monitor survival, growth, and reproduction of the entire population. Except for one adult ram and one lamb, all sheep were captured and measured. With 20 yearlings and 22 lambs alive in September, the population is recovering, having increased by 42 percent since 2015. Of 34 adult ewes, 23 (68 percent) are aged two to seven years. The researchers published 12 papers in refereed literature; another two have been submitted. The researchers continued to interact with wildlife managers and stakeholders in Alberta, by offering to meet with the Alberta Chapter of the Wild Sheep Society and contributing to the ongoing discussion about bighorn sheep management through media interviews and presentations at scientific meetings.

Deliverables/Results:

- This is a long-term program, so there are few "main" results in any particular year. The 2015 transplant appears to have contributed to population recovery, although two of the five transplanted ewes (now aged four and five years) did not produce lambs this year, and only two of the six lambs they produced in 2017 survived to one year of age. Survival over the last winter was high, with 20 of 24 lambs surviving.
- In addition to the scientific publications listed below, the researchers have continued to engage in the ongoing discussions about sheep management in Alberta. Although suggestions for changes in regulations were widely supported by provincial biologists responsible for bighorn sheep, no changes have been made to bighorn sheep hunting regulations. This research clearly indicates that the current hunting regulations select for small-horned rams. The researchers will continue to present the scientific case for evolutionarily sustainable bighorn sheep management in Alberta.
- Dr. Festa-Bianchet offered to make a presentation to the Alberta Chapter of the Wild Sheep Society in March 2019, but his offer was refused; he is tentatively scheduled for a presentation at the 2020 meeting.
- In May 2019, Dr. Festa-Bianchet made two presentations at the meeting of the BC Wildlife Federation. This research is a major contributor of scientific data for the interim Management Plan for bighorn sheep in Alberta, which cites 37 publications from the Ram Mountain study and another 15 from their other research programs in Alberta, at Sheep River and Caw Ridge.
- Refereed publications using data from the Ram Mountain study since 2018 (names underlined are graduate students and postdocs):
  - Festa-Bianchet, M., S.D. Côté, S. Hamel, and F. Pelletier. "Long-term studies of bighorn sheep and mountain goats reveal fitness costs of reproduction." *Journal of Animal Ecology*, in press.
  - Renaud, L.-A., G. Pigeon, M. Festa-Bianchet, and F. Pelletier. "Phenotypic plasticity in bighorn sheep reproductive phenology: from individual to population." *Behavioral Ecology and Sociobiology*, in press.
  - Renaud, L.-A., F. G. Blanchet, A. Cohen, and F. Pelletier. "Causes and short-term consequences of variation in milk composition in wild sheep." *Journal of Animal Ecology*, in press.
  - Douhard, M., M. Festa-Bianchet, J. Landes, and F. Pelletier. "Trophy hunting mediates sex-specific associations between early-life environmental conditions and adult mortality in bighorn sheep." *Journal of Animal Ecology*, in press.
  - Douhard, M., M. Festa-Bianchet, S. Hamel, D. Nussey, S.D. Côté, J. Pemberton, and F. Pelletier. "Maternal longevity and offspring sex in wild ungulates." *Proceedings of the Royal Society*, 286: 20181968.
  - Festa-Bianchet, M. 2019. "Mountain sheep management using data versus opinions: a comment on Boyce and Krausman." *Journal of Wildlife Management*, 83: 6-8.
  - Festa-Bianchet, M. and A. Mysterud. 2018. "Hunting and evolution: theory, evidence, and unknowns." *Journal of Mammalogy*, 99: 1281-1292.
  - Poirier, M.-A., D.W. Coltman, F. Pelletier, J.T. Jorgenson, and M. Festa-Bianchet. 2019. "Genetic decline, restoration and rescue of an isolated ungulate population." *Evolutionary Applications*, in press.
  - Miller, J.M., M. Festa-Bianchet ,and D.W. Coltman. 2018. "Genomic analysis of morphometric traits in bighorn sheep using the Ovine Infinium HD SNP BeadChip." *PeerJ*, 6: e4364.
  - Douhard, M., S. Guillemette, M. Festa-Bianchet, and F. Pelletier. 2018. "Drivers and demographic consequences of seasonal mass changes in an alpine ungulate." *Ecology*, 99: 724-734.
  - Poirier, M.-A. and M. Festa-Bianchet. 2018. "Social integration and acclimation of translocated bighorn sheep (*Ovis canadensis*)." *Biological Conservation*, 218:1-9.
  - Hamel, S., J.-M. Gaillard, M. Douhard, M. Festa-Bianchet, F. Pelletier, and N. G. Yoccoz. 2018. "Quantifying individual heterogeneity and its influence on life-history trajectories: different methods for different questions and contexts." *Oikos*, 127: 687-704.

Optimizing Mitigation Strategies for Reducing Grizzly Bear Agriculture Conflicts

Waterton Biosphere Reserve (WBR) Association (Dr. Morehouse)

Grant: $18,000

Project code: 030-00-90-287

Project status: New; Extended until March 15, 2020

Project website: www.watertonbiosphere.com/projects/carnivores-communities

Facilitating coexistence between humans and large carnivores is a pressing challenge to those tasked with managing human-wildlife conflicts globally. Although problems and solutions tend to be place-specific, the general premise of human-wildlife conflict is consistent: where people and wildlife share the landscape, challenges arise. Using a case study approach, the researchers evaluated the effectiveness of conflict mitigation efforts of a community-based program in southwestern Alberta. The Waterton Biosphere Reserve's (WBR) Carnivores and Communities Program (CACP), specifically reduces livestock loss and damage to stored grain/crops and addresses safety risks from carnivores (particularly grizzly bears) by engaging residents in hands-on programming. The researchers used a web-based survey primarily distributed via email to local residents using Survey Monkey as a cost-effective and efficient data collection technique. The researchers organized the survey into five sections with questions on demographics followed by perspectives on the efficacy of, or programming needs for, attractant management, deadstock removal, bear safety workshops, motivations or barriers to participation, and future direction. Survey results indicated that participants felt the CACP effectively reduced conflicts with large carnivores, as well as increased their sense of security living with large carnivores and enabled them to learn skills and gain confidence in using mitigation tools (i.e., bear spray). The researchers also evaluated temporal trends in large carnivore conflicts using occurrence records (i.e., provincial complaint data) from 1999 through 2016, to identify trends in incidents (e.g., property damage, obtained anthropogenic food, killed or attempted to kill livestock or pets). The researchers focused on incidents related to the CACP's deadstock removal and attractant management programs and used a Chow test to evaluate if the 2009 commencement of the CACP represented a break point or structural change in the data. The researchers show both attractant and deadstock-based incidents decreased after the CACP implementation, and that prior to 2009 incidents were increasing. Taken together, the results demonstrate the effectiveness of a contextually specific, community-based approach to addressing human-carnivore conflicts, indicating that success depends on both reducing conflicts themselves as well as engaging multiple stakeholders in learning opportunities and crafting solutions. More broadly, project evaluation and CACP lessons learned provides a useful framework for addressing human-carnivore or other wildlife conflicts for other conservation organizations globally. The project made substantial progress towards completing the project objectives, but the principal investigator (Andrea Morehouse) was on maternity leave beginning in July and has only recently returned to work part-time, so the project was extended.

Deliverables/Results:

- The main results are confirmation of the positive impact of the CACP. The researchers have demonstrated through both the occurrence records and social survey that the efforts on attractant management have been effective. There has been a decrease in attractant incidents for grizzly bears since the CACP began. The CACP has also effectively engaged the community, and most survey respondents have indicated they are satisfied with CACP programming. The researchers have also identified an area that needs further work; grizzly bear livestock incidents have continued to increase even with the CACP implemented. The survey results also support this statement. Further work is required to reduce livestock depredation in southwestern Alberta.
- Report detailing the evaluation of the deadstock removal program: The researchers are currently working on a peer reviewed publication that includes the social survey results that relate to the deadstock program evaluation.
- Maps describing conflict risk for different types of incidents before and after the implementation of the Carnivores and Communities Program: The researchers have cleaned the data required to make these maps. All incidents have been mapped and the modelling work for pre-CACP data completed. The researchers are currently working on the modelling for post-CACP data.
- Report detailing the temporal trends in incident type before and after the implementation of the Carnivores and Communities Program: The researchers have completed the evaluation of temporal trends and have final graphs (available in final report) and are currently working on a peer-reviewed publication of these data. The researchers were invited to submit an abstract to the journal *Frontiers in Ecology and Evolution* as part of a special section on the research topic, "Conservation and management of large carnivores – Local insights for global challenges." This abstract has been accepted and the final manuscript will be submitted in August 2019.
- Presentations at community and stakeholder meetings: The researchers have presented information about this project at the Provincial BearSmart Workshop (Sundre, AB) as well as at National Geographic's Living with Wildlife Conference (Lewiston, MT). The researchers have also provided updates to the Carnivore Working Group. The researchers hosted community meetings in Claresholm and Mountain View in February 2019 and provided an update on project progress. The researchers will host a community meeting to share their final results once complete, likely in September 2019.
- Management recommendations for reducing grizzly bear agricultural conflicts: As noted above, the researchers have had an abstract accepted to the journal *Frontiers in Ecology and Evolution*. This manuscript will include some management recommendations.
- Publication in a local magazine or newspaper: This deliverable is not complete, but the researchers are making progress towards the project objectives and the information will be shared once it is finalized.

Baseline Population Monitoring and Bioenergetics of Alberta Bat Populations: Predicting risk of White-Nose Syndrome to guide conservation actions

Wildlife Conservation Society (WCS) Canada (Dr. Lausen)

Grant: $25,165

Project code: 030-00-90-272

Project status: New; Completed

Project website: www.science4bats.org/research

White-nose syndrome (WNS)—caused by the fungus *Pseudogymnoascus destructans* (Pd)—is an invasive disease that spread rapidly across eastern North America and killed millions of hibernating bats. Opportunities remain in western North America for proactive interventions to mitigate impacts, and their efficacy requires understanding of the vulnerability of bat populations. Bioenergetic models that predict WNS survival based on energy consumption, hibernacula conditions, and Pd growth rates have been used to forecast disease impacts. However, these models currently rely on parameters from eastern bat populations. Bats living elsewhere are likely adapted to different conditions. Little is known about the ecology and physiology of bats hibernating in western North America, particularly those in the North (ca. 50° and above). This project focuses on filling some of these knowledge gaps. In 2018 and 2019, WCS Canada collected bioenergetic data at bat hibernacula in Alberta to create WNS survivorship models specific to the federally endangered little brown myotis. Study sites include Walk-In Cave (in Wood Buffalo National Park) and Cadomin Cave, known hibernacula for little brown myotis in Alberta. These sites were compared to little brown hibernacula in Montana to examine latitudinal differences among populations of this species, including physiology and hibernation conditions. The researcher team hypothesized that bats hibernating in northern latitudes would experience a lower risk of WNS mortality than those in more southern latitudes due to higher fat stores and cave temperatures below optimal for growth of Pd. Field data filled critical model parameters: metabolic and hibernal arousal rates, pre-hibernation mass (stored body fat), roosting microclimate, and winter length. Final arousal rate data will not be available until May 2019 when equipment is retrieved from the field. Data to date, together with known growth rates of *Pd* in specific temperature and humidity ranges, enabled the generation of preliminary 'heat maps' predicting mortality from WNS. Although preliminary, the model suggests little brown myotis may experience lower mortality rates than was observed in their eastern North American range. Again, preliminary and thus should be interpreted cautiously, the current model suggests colder cave microclimates and larger fat stores at northern latitudes could result in higher survival of bats compared to southern conspecifics even when infected with Pd. The results of these survivorship models are important for guiding management and conservation decisions related to the continued spread of WNS across North America and could inform resource allocation decisions in Alberta.

Deliverables/Results:

- Working with key collaborators (Dr. David Hayman and Reed Hranac, Massey University in New Zealand, Katie Haase, Montana State University and Yvonne Dzal, University of Winnipeg), the researcher team developed preliminary survivorship models that predict the impact of WNS on populations of federally endangered little brown myotis in north-western North America. The researchers collected metabolic and hibernal arousal rates, pre-hibernation mass (stored body fat), roosting microclimate, and winter length data to develop these models, with special emphasis on predicting the effect of latitude on survival.
- The results of the survivorship models suggest that conservation efforts in Alberta may be differentially directed towards northern and southern little brown myotis populations. If WNS causes mortality of little brown myotis in southern Alberta where fat stores are predicted to be lower and hibernacula warmer, focus here should be on potential mitigation of the disease, such as prophylactic strategies. In northern reaches where little brown myotis may be less vulnerable to mortality from WNS, focus could be on maintaining optimal habitat to ensure a robust population density. The Alberta Government and Parks Canada will be able to use these predictive models for prioritization of conservation resources. For example, resources may shift to understanding the risk that WNS poses to the other four myotis species of overwintering bats in Alberta, three of which are western-specific, and all of which are currently hypothesized to be susceptible to WNS-causes mortality.
- Conclusions based on these models are preliminary and should be interpreted with caution. Important caveats accompany these conclusions. All models assume a static climate, and therefore it predicted that hibernacula conditions will warm as climate changes, and Pd, which remains viable in soils, could have higher growth rates in northern locations in future years. Additionally, all models assume the growth rate of Pd to be that described in Verant et al. (2012); however, recent evidence suggests that the fungus may have higher growth rates at colder temperatures than previously known (Bandouchova et al. 2018), and the fungus may be adapting to cooler growing conditions in Canada's northern latitudes (J.P. Xu, McMaster University, pers. comm.).
- The main deliverables from this project are a compilation of information, driven from this scientifically rigorous project, that is contributing to the collective understanding of potential impacts of WNS in western North America. The project's findings will inform the effective management of bats in Alberta in the face of the threat of WNS. The researchers are currently working on a manuscript that will be published in a peer-reviewed journal (anticipated submission date Aug. 30, 2019).
- The results of the Alberta work are a vital contribution to the broader western North American research initiative led by Wildlife Conservation Society's Dr. Sarah Olson, with a team of disease modellers and physiologists. This larger project will produce several scientific publications, which will include Alberta data.
- The researchers are now poised to present final models at relevant scientific conferences in 2019/20, such as the North American Society for Bat Research and The Wildlife Society, and well as working-group meetings, including as those of the US Fish and Wildlife White Nose Syndrome Committee, and Western Bat Working Group. These products will be essential to the larger efforts to predict species- and population-specific patterns in WNS susceptibility and proactively inform conservation efforts across western North America.
- This project was made possible by the efforts of collaborators, including 22 volunteers in Alberta.
- Presentations:
  - Lausen, C.L., J. Rae, C. Olson, and J. Ray. 2019. "Bat Conservation: Preparing British Columbia for the arrival of white-nose syndrome." Kelowna, B.C., 1–3 March 2019. British Columbia Chapter of The Wildlife Society.
  - Lausen, C.L. 2019. "WCS Canada's Bat Conservation Program. Preparing for the arrival of white nose syndrome—a comprehensive conservation approach." Kaslo, B.C., 10 March 2019. The Langham – Café Langham Inspired Ideas Speaker Series.
  - Lausen, C.L. 2018. "WCS Canada's Bat Conservation Program. Preparing for the arrival of white nose syndrome—a comprehensive conservation approach." Argenta, B.C., 12 Dec. 2018. Friends of the Lardeau River Speaker Series.

APPENDIX:

Projects in Relation to Grants Funding Priorities 2018/19

ACA Conservation, Community, and Education Funding Priorities

FUNDING PRIORITY #1: 12 CCEG PROJECTS

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

Alberta Fish & Game Association; Increasing Habitat for Species At Risk in Alberta's Grassland Region through Adaptive Management, Habitat Enhancement, and Outreach; $40,050

Alberta Riparian Habitat Management Society (Cows and Fish); Implementing Riparian Habitat Management Improvements for Westslope Cutthroat Trout; $8,500

Camrose Wildlife Stewardship Society; 2018 Camrose Purple Martin Festival; $1,350

Elbow River Watershed Partnership; Streambank Restoration Project on Silvester Creek; $19,385

Ghost Watershed Alliance Society; Bioengineering Workshop in the Ghost Watershed; $10,000

Highway 2 Conservation County of Barrhead; Alberta Bat Education and Habitat Enhancement; $3,000

Lesser Slave Lake Bird Observatory Society; Avian Monitoring and Outreach Education Programs at Lesser Slave Lake; $22,750

Northern Lights Fly Fishers TUC Edmonton Chapter; Conserving and Restoring Arctic Grayling in the Upper Pembina River Watershed – Habitat Restoration Planning; $16,965

The King's University; Faith-Based Organizations and Conservation: Engaging volunteers in recovery plans of endangered pines; $4,933

Trout Unlimited Canada; East Slopes Strategic Watershed Action Team; $30,000

Waterton Biosphere Reserve; Promoting Wetland Stewardship and Improving Wetland Habitat in Waterton Biosphere Reserve; $14,350

Wildlife Conservation Society Canada; Going to Bat for Bats: Citizen science in Alberta; $29,994

FUNDING PRIORITY #2: 35 CCEG 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 (e.g., planting/seeding vegetation, development of new fisheries access sites, nest box initiatives, food plot trials and cover plot trials, spawning bed enhancement).

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).

Alberta Fish & Game Association; Increasing Habitat for Species At Risk in Alberta's Grassland Region through Adaptive Management, Habitat Enhancement, and Outreach; $40,050

Alberta Fish & Game Association; Pronghorn Antelope Migration Corridor Enhancement; $36,728

Alberta Riparian Habitat Management Society (Cows and Fish); Grazing Schools for Women: Promoting habitat and improved grazing stewardship to livestock producers in south and central Alberta; $3,000

Alberta Riparian Habitat Management Society (Cows and Fish); Implementing Riparian Habitat Management Improvements for Westslope Cutthroat Trout; $8,500

Ann and Sandy Cross Conservation Area; ASCCA Wildlife-Friendly Fencing East (and North) Boundary Fencing Project; $34,478

Beaverhill Bird Observatory; Public Engagement, Wildlife Conservation and Monitoring at Beaverhill Lake; $23,750

Bow River Trout Foundation; Bow River Policeman's Flats River Access Upgrade; $27,525

Brazeau County; Sardine Lake Dock; $7,500

Camrose & District Fish & Game Association; Making Pleasure Island Accessible: Angler recruitment and retention, and conservation education; $23,585

Central Alberta Fish & Game Association (Zone 3); Bennett Pond Aeration Electrical Access Fees; $4,300

Elbow River Watershed Partnership; Streambank Restoration Project on Silvester Creek; $19,385

Ghost Watershed Alliance Society; Bioengineering Workshop in the Ghost Watershed; $10,000

Helen Schuler Nature Centre; Community Engagement in River Valley Conservation; $3,000

High River Fish & Game Association; Sheep River Fencing; $2,749

Highway 2 Conservation County of Barrhead; Alberta Bat Education and Habitat Enhancement; $3,000

Lacombe County; Alternative Land Use Services (ALUS); $15,000

Lamont Fish & Game Association; Trout Pond Dock System; $8,000

Lesser Slave Lake Bird Observatory Society; Avian Monitoring and Outreach Education Programs at Lesser Slave Lake; $22,750

Mountain View County; Riparian and Ecological Enhancement Program; $25,000

Nature Alberta; Important Bird and Biodiversity Areas – Enhanced Awareness and Caretaker Support; $18,500

Nature Alberta; Living by Water; $53,500

Northern Lights Fly Fishers Trout Unlimited Canada (TUC) Edmonton Chapter; Riparian Protection on the Raven River (2018); $31,500

Northern Lights Fly Fishers TUC Edmonton Chapter; Conserving and Restoring Arctic Grayling in the Upper Pembina River Watershed – Habitat Restoration Planning; $16,965

Onoway & District Fish & Game Association; Bird/Bat House Project; $800

Onoway & District Fish & Game Association; Salter's Lake Improvements; $2,500

Partners in Habitat Development; Partners in Habitat Development; $15,000

Red Deer County; Wildlife and Native Habitat Enhancement in Red Deer County via ALUS (2018); $40,000

Trout Unlimited Canada; East Slopes Strategic Watershed Action Team; $30,000

Trout Unlimited Canada; Water Edu-kit; $11,000

Trout Unlimited Canada; Yellow Fish Road; $30,000

Trout Unlimited Canada Bow River Chapter; Legacy Island – Habitat Rehabilitation; $3,500

Warne in the Wild; American Kestrel Nest Box Program in Alberta; $3,000

Waterton Biosphere Reserve; Promoting Wetland Stewardship and Improving Wetland Habitat in Waterton Biosphere Reserve; $14,350

Wetaskiwin County; Wetaskiwin/Leduc Alternative Land Use Services (ALUS); $8,750

Wildlife Conservation Society Canada; Going to Bat for Bats: Citizen science in Alberta; $29,994

FUNDING PRIORITY #3: 4 CCEG PROJECTS

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 waterbodies).

Brazeau County; Sardine Lake Dock; $7,500

Castor Fish & Game Club; Evaluation of the Parr Reservoir (Castor Creek) for Fish Stocking Suitability; $3,000

Central Alberta Fish & Game Association (Zone 3); Bennett Pond Aeration Electrical Access Fees; $4,300

Onoway & District Fish & Game Association; Salter's Lake Improvements; $2,500

FUNDING PRIORITY #4: 7 CCEG PROJECTS

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

Alberta Invasive Species Council; Expansion and Promotion of the Early Detection and Distribution Mapping System (EDDMapS) Alberta; $13,175

Helen Schuler Nature Centre; Community Engagement in River Valley Conservation; $3,000

The King's University; Faith-Based Organizations and Conservation: Engaging volunteers in recovery plans of endangered pines; $4,933

Lacombe County; Alternative Land Use Services (ALUS); $15,000

Nature Alberta; Living by Water; $53,500

Southern Alberta Sustainable Community Initiative (SASCI); Foothills Restoration Forum Outreach and Extension: Range Health Assessment training and Fall Information session; $8,181

Wildlife Conservation Society Canada; Going to Bat for Bats: Citizen science in Alberta; $29,994

FUNDING PRIORITY #5: 3 CCEG PROJECTS

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

Big Country Rod and Gun Club; 2018 Annual Big Country Rod and Gun Club First Time Bird Hunt; $1,500

Lacombe County; Alternative Land Use Services (ALUS); $15,000

Wetaskiwin County; Wetaskiwin/Leduc Alternative Land Use Services (ALUS); $8,750

FUNDING PRIORITY #6: 34 CCEG PROJECTS

Projects related to the retention, recruitment and education of hunters, anglers or trappers (including attracting new mentors, training mentors, and providing mentors for new hunters/anglers/trappers; sharing information in schools and with the general public about the link between conservation and hunters/anglers/trappers; this category also includes educating new hunters/anglers/trappers). Generate awareness of the hunting/angling/trapping opportunities available to the public.

Alberta Hunter Education Instructors' Association (AHEIA); 15th Annual O.W.L. Day – "Outdoor Wildlife Learning"; $3,000

Alberta Hunter Education Instructors' Association; AHEIA's Outdoor Bound Mentorship Program; $3,000

Alberta Hunter Education Instructors' Association; Bighorn Sheep Hunting Essentials Course; $2,500

Alberta Hunter Education Instructors' Association; Conservation Education for the Army Cadet League of Canada – AB; $2,500

Alberta Hunter Education Instructors' Association; Mandarin Language Safety Video for AHEIA's Firearms Centres; $2,500

Alberta Hunter Education Instructors' Association; Outdoor Youth Seminar; $3,000

Alberta Hunter Education Instructors' Association; Safety Video for AHEIA's Firearms Centres; $3,000

Alberta Hunter Education Instructors' Association; AHEIA Teachers' Workshop; $6,000

Alberta Hunter Education Instructors' Association; AHEIA's National Archery in the Schools Program (NASP); $40,000

Alberta Hunter Education Instructors' Association; Provincial Hunting Day Initiatives; $16,500

Alberta Hunter Education Instructors' Association; Youth Hunter Education Camp (Weeks 1, 2, 3, and 4); $48,000

Alberta Hunters Sharing the Harvest; Wild Game for the Food Bank Program; $8,000

Alberta Junior Forest Warden Association; AJFWA Pathfinder and Trailblazer North Camp 2019 – "Come to the Real North"; $4,850

Big Country Rod and Gun Club; 2018 Annual Big Country Rod and Gun Club First Time Bird Hunt; $1,500

Calgary Fish & Game Association; CFGA Pheasant Crate Update; $2,948.40

Calgary Fish & Game Association; Upgrade & Expansion of Pheasant Facility; $5,000

Edmonton Mallards – Junior Forest Wardens; Fall Wilderness Family Camp; $2,125

Edmonton Water Striders – Junior Forest Wardens; Fall Wilderness Family Camp; $2,125

Growing Great Kids Coalition; Family and Community Support Services (FCSS) Hinton; Kids Can Catch with Growing Great Kids; $3,000

H.A. Kostash School; H A Kostash Youth Mentorship Program; $7,700

Kneehill 4-H Multi Club; 4-H Club Archery Supplies; $2,500

Lesser Slave Lake Bird Observatory Society; Avian Monitoring and Outreach Education Programs at Lesser Slave Lake; $22,750

Lesser Slave Watershed Council; Kids Can Catch Lesser Slave Lake Winter; $1,090

Lethbridge Fish & Game Association; Fly Tying Programs; $2,000

Lethbridge Fish & Game Association; LFGA – Conservation Community and Education Project; $14,500

Nature Alberta; Nature Kids Family Nature Nights and BioBlitzes across Alberta; $16,180

Onoway & District Fish & Game Association; Salter's Lake Improvements; $2,500

Safari Club International Red Deer Chapter; Red Deer, Kids Can Fish Event; $2,100

Taber Fish & Game Association; 8th Annual AFGA/ACA Youth Fishing Recruitment Day; $14,800

Trout Unlimited Canada; East Slopes Strategic Watershed Action Team; $30,000

Trout Unlimited Canada; Water Edu-kit; $11,000

Trout Unlimited Canada; Yellow Fish Road; $30,000

Trout Unlimited Oldman River Chapter; Fly Fishing and Conservation Program; $3,000

Yellowhead County; Kids Can Catch Event; $2,500

FUNDING PRIORITY #7: 52 CCEG PROJECTS

Projects related to outdoor conservation education.

Alberta Hunter Education Instructors' Association; 15th Annual O.W.L. Day – "Outdoor Wildlife Learning"; $3,000

Alberta Hunter Education Instructors' Association; AHEIA's Outdoor Bound Mentorship Program; $3,000

Alberta Hunter Education Instructors' Association; Bighorn Sheep Hunting Essentials Course; $2,500

Alberta Hunter Education Instructors' Association; Conservation Education for the Army Cadet League of Canada – AB; $2,500

Alberta Hunter Education Instructors' Association; Mandarin Language Safety Video for AHEIA's Firearms Centres; $2,500

Alberta Hunter Education Instructors' Association; Outdoor Youth Seminar; $3,000

Alberta Hunter Education Instructors' Association; Safety Video for AHEIA's Firearms Centres; $3,000

Alberta Hunter Education Instructors' Association; AHEIA Teachers' Workshop; $6,000

Alberta Hunter Education Instructors' Association; Provincial Hunting Day Initiatives; $16,500

Alberta Hunter Education Instructors' Association; Youth Hunter Education Camp (Weeks 1, 2, 3, and 4); $48,000

Alberta Fish & Game Association; Increasing Habitat for Species At Risk in Alberta's Grassland Region through Adaptive Management, Habitat Enhancement, and Outreach; $40,050

Alberta Junior Forest Warden Association; AJFWA Pathfinder and Trailblazer North Camp 2019 – "Come to the Real North"; $4,850

Alberta Riparian Habitat Management Society (Cows and Fish); Grazing Schools for Women: Promoting habitat and improved grazing stewardship to livestock producers in south and central Alberta; $3,000

Alberta Trappers' Association; Trapper Education in the Schools; $15,600

Alberta Trappers' Association; Youth Camp; $10,000

Ann and Sandy Cross Conservation Area; Outdoor Education for High Needs Schools at the ASCCA; $7,250

Beaverhill Bird Observatory; Public Engagement, Wildlife Conservation and Monitoring at Beaverhill Lake; $23,750

Big Country Rod and Gun Club; 2018 Annual Big Country Rod and Gun Club First Time Bird Hunt; $1,500

Calgary Fish & Game Association; CFGA Pheasant Crate Update; $2,948.40

Camrose & District Fish & Game Association; Making Pleasure Island Accessible: Angler recruitment and retention, and conservation education; $23,585

Camrose Wildlife Stewardship Society; 2018 Camrose Purple Martin Festival; $1,350

Canadian Parks and Wilderness Society (CPAWS) Southern Alberta Chapter; Connecting with Conservation: Getting kids and new Albertans outside to experience and value Alberta's wilderness; $20,000

Edmonton Mallards – Junior Forest Wardens; Fall Wilderness Family Camp; $2,125

Edmonton Nature Club; 2018 Snow Goose Chase; $3,000

Edmonton Water Striders – Junior Forest Wardens; Fall Wilderness Family Camp; $2,125

Elbow River Watershed Partnership; Streambank Restoration Project on Silvester Creek; $19,385

Ghost Watershed Alliance Society; Bioengineering Workshop in the Ghost Watershed; $10,000

Growing Great Kids Coalition; Family and Community Support Services (FCSS) Hinton; Kids Can Catch with Growing Great Kids; $3,000

H.A. Kostash School; H A Kostash Youth Mentorship Program; $7,700

Helen Schuler Nature Centre; Community Engagement in River Valley Conservation; $3,000

Helen Schuler Nature Centre; "Extreme by Nature" Environmental Education for 11 to 15-year-olds; $3,000

Highway 2 Conservation County of Barrhead; Alberta Bat Education and Habitat Enhancement; $3,000

Lacombe County; Alternative Land Use Services (ALUS); $15,000

Lesser Slave Lake Bird Observatory Society; Avian Monitoring and Outreach Education Programs at Lesser Slave Lake; $22,750

Lesser Slave Watershed Council; Kids Can Catch Lesser Slave Lake Winter; $1,090

Mountain View County; Riparian and Ecological Enhancement Program; $25,000

Nature Alberta; Important Bird and Biodiversity Areas – Enhanced Awareness and Caretaker Support; $18,500

Nature Alberta; Living by Water; $53,500

Nature Alberta; Nature Kids Family Nature Nights and BioBlitzes across Alberta; $16,180

Northern Lights Fly Fishers TUC Edmonton Chapter; Conserving and Restoring Arctic Grayling in the Upper Pembina River Watershed – Habitat Restoration Planning; $16,965

Onoway & District Fish & Game Association; Salter's Lake Improvements; $2,500

Rocky View School District; PISCES' Aquatic Project; $1,772

Safe Drinking Water Foundation; Operation Water Drop, Operation Water Pollution and Operation Water Biology Kits to be Used by Students in Alberta as Part of Field Trips/Outdoor Education; $3,145

Southern Alberta Sustainable Community Initiative (SASCI); Foothills Restoration Forum Outreach and Extension: Range Health Assessment training and Fall Information session; $8,181

Sustainability Resources; Restoration Program; $22,000

Trout Unlimited Canada; East Slopes Strategic Watershed Action Team; $30,000

Trout Unlimited Canada; Water Edu-kit; $11,000

Trout Unlimited Canada; Yellow Fish Road; $30,000

Trout Unlimited Oldman River Chapter; Fly Fishing and Conservation Program; $3,000

Waterton Biosphere Reserve; Promoting Wetland Stewardship and Improving Wetland Habitat in Waterton Biosphere Reserve; $14,350

Wetaskiwin County; Wetaskiwin/Leduc Alternative Land Use Services (ALUS); $8,750

Wildlife Conservation Society Canada; Going to Bat for Bats: Citizen science in Alberta; $29,994

Research Grants Funding Priorities

FUNDING PRIORITY #1: 3 RESEARCH PROJECTS

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

STRIX Ecological Consulting (Ms. Priestley); Canada Warbler Rapid Assessment Protocol – Phase 2; $8,005

Waterton Biosphere Reserve Association (Dr. Morehouse); Optimizing Mitigation Strategies for Reducing Grizzly Bear Agriculture Conflicts; $18,000

Wildlife Conservation Society Canada (Dr. Lausen); Baseline Population Monitoring and Bioenergetics of Alberta Bat Populations: Predicting risk of White-Nose Syndrome to guide conservation actions; $25,165

FUNDING PRIORITY #2: 5 RESEARCH PROJECTS

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

St. Mary's University (Dr. McLean); Evaluating Possible Vectors for the Spread of Invasive Plant Thesium ramosum; $9,985

Trout Unlimited Canada (Mr. Lindsay); Discovering Didymo Distribution (D3); $8,460

University of Alberta (Dr. Boyce); Is Cougar (Puma concolor) Habitat Selection on a Reclaimed Mine Based on Prey Availability?; $20,000

University of Saskatchewan (Dr. McLoughlin); Density-Dependent Habitat Selection of Feral Horses and Competition with Other Ungulates in a Changing Landscape; $30,000

Wildlife Conservation Society Canada (Dr. Lausen); Baseline Population Monitoring and Bioenergetics of Alberta Bat Populations: Predicting risk of White-Nose Syndrome to guide conservation actions; $25,165

FUNDING PRIORITY #3: 1 RESEARCH 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/eDNA samples.

University of British Columbia (Dr. Burton); Evaluating Camera Trap Surveys as an Effective Means of Monitoring Remote Ungulate Populations; $39,690

FUNDING PRIORITY #4: 0 RESEARCH PROJECTS

Evaluate the effect of pesticides or herbicides on wildlife species' food availability and/or quality in agricultural landscapes.

FUNDING PRIORITY #5: 4 RESEARCH PROJECTS

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

Goldstream Publishing Inc. (Dr. Simmons); Using Citizen Science to Enhance Fisheries Data Collection and Monitoring; $23,000

University of Montana (Dr. Hebblewhite); Bull Elk Recruitment, Survival, and Harvest in a Partially Migratory Elk Herd in the Ya Ha Tinda; $30,000

University of Sherbrooke (Dr. Festa Bianchet); Evolutionarily Sustainable Management of Bighorn Sheep; $9,950

Wildlife Conservation Society Canada (Dr. Lausen); Baseline Population Monitoring and Bioenergetics of Alberta Bat Populations: Predicting risk of White-Nose Syndrome to guide conservation actions; $25,165

FUNDING PRIORITY #6: 4 RESEARCH PROJECTS

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

Trout Unlimited Canada (Mr. Lindsay); Discovering Didymo Distribution (D3); $8,460

University of Alberta (Dr. Merrill); Chronic Wasting Disease in Deer: Modelling transmission from contact rates; $32,400

University of Lethbridge (Dr. Goater); Ecological Epidemiology of Emerging Ambystoma tigrinum Virus (ATV) in a Population of Tiger Salamanders in Southwestern Alberta; $6,096

Wildlife Conservation Society Canada (Dr. Lausen); Baseline Population Monitoring and Bioenergetics of Alberta Bat Populations: Predicting risk of White-Nose Syndrome to guide conservation actions; $25,165

FUNDING PRIORITY #7: 4 RESEARCH 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).

University of Alberta (Dr. Boyce); Is Cougar (Puma concolor) Habitat Selection on a Reclaimed Mine Based on Prey Availability?; $20,000

University of Alberta (Dr. Merrill); Chronic Wasting Disease in Deer: Modelling transmission from contact rates; $32,400

University of Montana (Dr. Hebblewhite); Bull Elk Recruitment, Survival, and Harvest in a Partially Migratory Elk Herd in the Ya Ha Tinda; $30,000

University of Sherbrooke (Dr. Festa Bianchet); Evolutionarily Sustainable Management of Bighorn Sheep; $9,950

FUNDING PRIORITY #8: 3 RESEARCH PROJECTS

Investigate the human dimensions of fish and wildlife management.

Goldstream Publishing Inc. (Dr. Simmons); Using Citizen Science to Enhance Fisheries Data Collection and Monitoring; $23,000

University of Sherbrooke (Dr. Festa Bianchet); Evolutionarily Sustainable Management of Bighorn Sheep; $9,950

Waterton Biosphere Reserve Association (Dr. Morehouse); Optimizing Mitigation Strategies for Reducing Grizzly Bear Agriculture Conflicts; $18,000

FUNDING PRIORITY #9: 0 RESEARCH PROJECTS

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

FUNDING PRIORITY #10: 1 RESEARCH PROJECT

Effects of agricultural run-off on fisheries.

University of Alberta (Dr. Wang); Cyanobacterial Blooms and Their Toxic Effects on Fish Populations; $26,000

FUNDING PRIORITY # 11: 1 RESEARCH PROJECT

Evaluate approaches for improving the abundance of pollinators in agricultural landscapes.

University of Calgary (Dr. Galpern); Wild Pollinator Conservation and Restoration in Southern Alberta Croplands IV: Pollinator community responses to prairie habitat restoration; $22,000

FUNDING PRIORITY #12: 5 RESEARCH PROJECTS

Work towards clarifying status of current data deficient species.

Goldstream Publishing Inc. (Dr. Simmons); Using Citizen Science to Enhance Fisheries Data Collection and Monitoring; $23,000

STRIX Ecological Consulting (Ms. Priestley); Canada Warbler Rapid Assessment Protocol – Phase 2; $8,005

Trout Unlimited Canada (Mr. Lindsay); Discovering Didymo Distribution (D3); $8,460

University of Calgary (Dr. Cartar); Biogeography of Native Bumble Bee Species in Alberta: The influence of weather; $7,473.34

University of Lethbridge (Dr. Goater); Ecological Epidemiology of Emerging Ambystoma tigrinum Virus (ATV) in a Population of Tiger Salamanders in Southwestern Alberta; $6,096

NONE OF THE FUNDING PRIORITIES: 1 PROJECT (0 CCEG; 1 RESEARCH)

Avocet Environmental Inc. (Mr. Scobie); Efficacy of Detecting Sharp-tailed Grouse Leks in Fall Surveys; $13,500

BACKGROUND DOCUMENT BY DRS. BOYCE AND POESCH: 1 RESEARCH PROJECT

Boyce, M and M. Poesch, Research needs for fisheries and wildlife in Alberta. University of Alberta. 35pp.

University of Calgary (Dr. Cartar); Biogeography of Native Bumble Bee Species in Alberta: The influence of weather; $7,473.34

Note: Projects can relate to multiple funding priorities.

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