

Grants Fund Annual Report 2019/20

For the period of April 1, 2019 to March 31, 2020



wildlife | fish | habitat





TABLE OF CONTENTS

Grants Program 2019/20

Key Program Highlights	1
Executive Summary	1

Annual Report of Activities and Synopsis of Funding Recipient Projects 2 - 10

Introduction	2
The Funding Cycle	3
Funding Eligibility	3
Major Funding Goals and Priorities 2019/20 Grants	4
Proposal Review Process	5
Funding Allocations	5
Synopsis of Approved Projects for 2019/20	7
Grant Projects' Contribution to ACA Funding Priorities	9

ACA Grants Program Project Summaries 11 - 59

ACA Conservation, Community, and Education Grants	11
ACA Research Grants	48

APPENDIX: Projects in Relation to Grants Funding Priorities 2019/20 61 - 66

ACA Conservation, Community, and Education Grants Funding Priorities	61
ACA Research Grants Funding Priorities	65

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.

Alberta Conservation Association

#101 - 9 Chippewa Road
Sherwood Park, AB, T8A 6J7

Amy MacKinven, Grants Program Administrator
Email: amy.mackinven@ab-conservation.com

Visit our website at: www.ab-conservation.com

Front Cover Photo: Kids enjoying the Taber Fish and Game Association Youth Fishing Recruitment Day
Photo provided by: Steph Roberts

From the project: 'Taber Fish and Game and ACA Youth Fishing Recruitment Day' (020-00-90-207)

Grant Program 2019/20

KEY PROGRAM HIGHLIGHTS for the Grants 2019/20:

ACA Conservation, Community, and Education Grants received 115 funding applications requesting a total dollar value of just over \$1.6 million. A total of \$969,635 was allocated to 82 projects.

ACA Research Grants received 38 funding applications requesting almost \$1.2 million. A total of \$329,388 was allocated to 16 projects.

Project budgets ranged from \$1,200 to \$48,000.

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 2019/20 funding round has provided approximately \$19.3 million to 1,276 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 \$110 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 153 applications (115 to ACA Conservation, Community, and Education Grants and 38 to the ACA Research Grants) requesting just over \$2.8 million in 2019/20. A total of \$1.3 million was allocated to 98 projects (82 ACA Conservation, Community, and Education Grants projects and 16 ACA Research Grants projects). The aim of this report is to document the procedures for 2019/20 and to provide an overview of activities and results of projects financially supported through ACA's Grants Program in 2019/20.

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 2019/20 funding round, the Grants program has granted approximately \$19.3 million dollars to 1,276 projects implemented in Alberta. These projects have leveraged an estimated \$110 million in conservation work across the province. After the 2019/20 project selection process, a total of \$969,634 was granted to 82 ACA Conservation, Community, and Education Grants (CCEG) and \$329,388 was granted to 16 ACA Research Grants (RG) projects. This document provides an overview of the activities of the CCEG and the RG for the 2019/20 funding cycle.

We have some impressive results and outreach coming in from ACA Grants-supported projects in 2019/20: more than an estimated 4,000 youth and novices participated in fishing, archery, hunting, and trapping activities across Alberta; and an estimated 65,000+ people were involved in outdoor conservation activities, and outreach activities educating Albertans about conservation-related issues. About 230 teachers were trained to teach archery and other outdoor conservation education programs, such as Hunter Education and/or Fishing Education. At least 450 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, 820 bird or bat boxes were built and installed. Four thousand five hundred 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, bull trout 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 *Ambystoma tigrinum* Virus (ATV) in tiger salamanders. Another couple of long-term wildlife research projects continued with ACA RG funding, for example the University of Montana's project monitors the Ya Ha Tinda elk herd and the University of Sherbrooke's project following the Ram Mountain bighorn sheep population. These are just a few examples—read about all the achievements of each of the projects that received funding in 2019/20 in the Project Summaries section of this report.



Teens examining root systems with the 'Extreme by Nature' program
Photo provided by: Helen Schuler Nature Centre

Relating to the project: "Extreme by Nature" Environmental Education for 11 to 15-year-olds (030-00-90-240)

The Funding Cycle

The funding priorities, guidelines, and application forms were made available to the public on Oct. 29, 2018 via the ACA website, and by email to existing contacts. Details of the 2019/20 funding cycle are in the table below:

2019/20 FUNDING CYCLE DATES

Window to receive completed RG applications	November 1–30, 2018
Window to receive completed CCEG applications	January 1–25, 2019
RG adjudication meeting	February 10, 2019
CCEG adjudication meeting	February 28, 2019
ACA Board approval and notification of applicants as to funding status	End of March 2019
Cooperative Project Agreements signed, initial payments made, and project work begins	From April 1, 2019
Interim reports due and second payments made (if required)	September 1, 2019
Final reports due	March 15, 2020
Projects end and final payments made (if required)	March 31, 2020

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 over-head costs. Since fiscal year 2009/10, funding priorities have been used by the Grants to guide applicants in drafting their applications. There were a few changes to the funding priorities lists for CCEG and RG in 2019/20. See Major Funding Priorities Grants 2019/20 below 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 should 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 2019–2020: ACA Conservation, Community, and Education Grants” and “Project Submission Guidelines for Funding in 2019–2020: 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 amongst the conservation community working in Alberta and 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 2019/20

This text is taken from Section C of the *Project Submission Guidelines for Funding 2019-2020*.

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. 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.
6. Projects related to outdoor conservation education.

Funding Priorities for 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. A few changes have been made to the Funding Priorities this year; these changes have been underlined. Funding Priority #12 is new.

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 detection technologies (e.g. DNA/eDNA, camera traps, drones, etc.).
4. Evaluate the effect of agricultural runoff, pesticides, herbicides or pharmaceuticals on fish or wildlife species' food availability and/ or quality in agricultural landscapes.
5. Evaluate the effect of recreational access (mode, timing, duration) on wildlife & 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 genetics or demography (e.g. fish size limits, three-point or larger elk requirements, etc.).
8. Social Science studies of hunting and angling related to demography, attitudes, norms and practices.
9. Evaluate the effect of biological solutions of carbon sequestration on grasslands and treed lands.
10. Evaluate approaches for improving the abundance of pollinators in agricultural landscapes.
11. Work towards clarifying status of current data deficient species.
12. Efficacy of alternative wetland restoration strategies.

Proposal Review Process

CCEG Adjudication:

The ACA Board of Directors appointed the Adjudication Committee for the CCEG. The CCEG adjudication committee in 2019/20 consisted of seven citizens of Alberta representing the province's conservation community, one public-at-large member from the ACA Board of Directors, and one ACA staff member, 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.

The CCEG ranks 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 for 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 28, 2019 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 2019 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 sometime 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. 10, 2019 at the University of Alberta.

Funding Allocations

For the 2019/20 funding cycle, a total of \$1.3 million was made available for project funding via the Grants: \$970,000 for CCEG and \$330,000 for RG. Of the 115 applications requesting just over \$1.6 million to CCEG, 82 were funded (a 71 percent success rate for applications receiving full or partial funding). Of the 82 CCEG projects funded in 2019/20, 46 (56 percent) had been funded by ACA in previous years and 36 (44 percent) were new projects.

The RG received 38 applications requesting almost \$1.2 million for the 2019/20 competition. Of these 16 were funded (a success rate of 42 percent for applications receiving full or partial funding). Five (31 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 provided two project reports, an interim report due September 1, 2019 and a final report due March 15, 2020. If the project was completed at the time of the interim report (September 1), then applicants could submit a final report.

One RG recipient and one CCEG recipient did not accept the grant money and did not sign the ACA Cooperative Project Agreement. The grant funds were not dispersed for those two grants. Another CCEG grant was accepted, but did not proceed due to a sudden unforeseen circumstance. The unused funds were returned to ACA. Ten projects (five RGs and five CCEGs) 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.



Bull Trout

Photo provided by: Trout Unlimited Canada

Relating to the project: Bringing Back Bull Trout (020-00-90-275)

Synopsis of Approved Projects for 2019/20

A summary description of each of the 98 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); 16th 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; AHEIA's Wildlife Workbook Rewrite for Children; \$3,000

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

Alberta Hunter Education Instructors' Association; Conservation Education for the Army Cadet League of Canada - AB; \$3,000

Alberta Junior Forest Wardens Association; "AC Conference" (Alberta Youth Outdoor Skills Conference); \$2,510

Alberta Mycological Society; Fungal Biodiversity Survey, West Castle - Mushroom Identification; \$3,000

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

Battle River Research Group; A Complex Relationship Between Agricultural Practices and Wildlife Habitat in Central-East Alberta; \$2,950

Calgary Fish & Game Association; Pop Up Archery Range for Youth Education; \$2,500

Camrose Wildlife Stewardship Society; 2019 Camrose Purple Martin Festival; \$1,35

Carbon and District Agricultural Society and Curling Club; Creation of Archery Club and Range; \$3,000

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

Growing Great Kids Coalition/ Family and Community Support Services (FCSS) Town of 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

J.T. Foster School; J.T. Foster School Wildlife Education and Recruitment; \$3,000

Legacy Land Trust Society; Conservation Community; \$3,000

Oneway & District Fish & Game Association; Birdhouses; \$2,500

River of Death and Discovery Dinosaur Museum Society; Summer Day Camps; \$1,763.62

River of Death and Discovery Dinosaur Museum Society; Junior Palaeontologist II Day Camp; \$1,980.76

Southern Alberta Bible Camp; Archery Program; \$2,500

Southern Alberta Bible Camp; Pelletary Program; \$1,500

Spruce Grove Fish & Game Association; Bird/Bat Box Project; \$2,000

Taber Fish & Game Association; Taber Fish and Game Outdoor Day and Antler Measure; \$2,500 – **note: did not proceed*

The Botha School Society; Botha School Wildlife Education Program; \$2,625

Town of Cochrane; Kids Can Catch 2019; \$3,000

Weaselhead/Glenmore Park Preservation Society; Weaselhead Invasive Plant Program 2019; \$2,500

Yellowhead County; Kids Can Catch Event; \$1,700

Yellowhead Junior Forest Wardens Regional Council; JFW Regional Camp 2019; \$1,200 – **note: grant not accepted*

Yellowhead Junior Forest Wardens Regional Council; Trailblazer Advanced Camp; \$2,000

Large Grants (over \$3,000)

Alberta Fish & Game Association (AFGA); Increasing Habitat for Species At Risk in Alberta's Grassland Region through Adaptive Management, Habitat Enhancement, Assessment and Outreach; \$25,100

Alberta Fish & Game Association; Pronghorn Antelope Migration Corridor Enhancement; \$40,698

Alberta Hunter Education Instructors' Association; 26th Annual Outdoor Women's Program; \$15,000

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

Alberta Hunter Education Instructors' Association; AHEIA's National Archery in the School Program; \$40,000

Alberta Hunter Education Instructors' Association; AHEIA's Youth Hunter Education Camps (Week 1,2,3,4); \$48,000

Alberta Hunter Education Instructors' Association; Provincial Hunting Day Initiatives; \$20,000

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; \$15,000

Alberta Riparian Habitat Management Society – Cows and Fish; Implementing Riparian Habitat Management Improvements for Westslope Cutthroat Trout; \$11,150

Alberta Trapper's Association (ATA); Trapper Education in Schools; \$21,100

Alberta Trapper's Association; Helping to education future trappers and ensure long-term sustainable harvest using the best available science; \$20,248

Alberta Trapper's Association; Youth Camp; \$19,480

Alexis Nakota Sioux Nation; Lake Isle Flowering Rush Project; \$30,000

Ann & Sandy Cross Conservation Area; Outdoor Conservation Education for High Needs Schools; \$6,250

AQUALITY Environmental Consulting Ltd.; Alberta Wetlands 101 Online Experience; \$13,000

Aquarium Society of Alberta; Water on Wheels; \$12,075

Beaverhill Bird Observatory; Public Engagement, Wildlife Conservation and Monitoring at Beaverhill Lake; \$23,250

Bow River Trout Foundation; Bow River Policeman's Flats River Access Upgrade 2019; \$6,304 **note: these funds were left over from the 2018/19 project and were used toward the 2019/20 project.*

Calgary Chapter Pheasants Forever Canada Society; Post-Secondary First Pheasant Mentor Hunt Program; \$4,850

Calgary Fish & Game Association (CFGA); CFGA Pheasant Crate Upgrade for Remaining Crates; \$4,095

Camrose County; Enhancing Conservation Areas within Camrose County; \$36,652.56

Canadian Parks and Wilderness Society - Southern Alberta Chapter; Healthy Habitats: Getting Albertans Outside to Enjoy, Value and Use Alberta Wilderness; \$20,000

Chinook Pheasants Forever; Ross Creek Conservation Site Food Plots Planting; \$3,250

Chinook Pheasants Forever; Sauder Reservoir Habitat Project; \$26,970

Ducks Unlimited Canada; Marshkeeper's – Conservation through Volunteer Empowerment; \$5,500

Edmonton and Area Land Trust; Land Stewardship and Monitoring of New Natural Areas in Beaverhills Biosphere Reserve; \$7,650

Glenbow Ranch Park Foundation; 2019 Invasive Species Management at Glenbow Ranch; \$12,400

H.A. Kostash School; H A Kostash School Youth Mentorship Program; \$8,000

Lesser Slave Lake Bird Observatory Society; Avian Monitoring and Outreach Education Programs at Lesser Slave Lake; \$24,500

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

Nature Alberta; Nature Kids Family Nature Nights and Field Trips Across Alberta; \$10,400

Nature Conservancy of Canada; An Integrated Pest Management Strategy for Tackling Non-Native, Noxious Weeds Across Alberta; \$35,000

North East AFGA; Fish Habitat Restoration in NE and Central Alberta Lakes; \$15,000

Northern Lights Fly Fishers/ TUC Edmonton Chapter; Conserving and Restoring Arctic Grayling in the Upper Pembina River Watershed – Habitat Restoration Planning; \$8,997

Northern Lights Fly Fishers/ TUC Edmonton Chapter; Fishery Enhancement - Beaumont; \$9,250

Red Deer County; Wildlife and Native Habitat Enhancement in Red Deer County via ALUS (2019); \$40,000

Red Deer Fish & Game Association; Pheasant Pen Replacement Program; \$14,412

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; \$3,825

St. Paul Fish & Game Association; Lac Delorme (George's Lake) Access Improvement; \$5,000

Sturgeon School District; Environmental Opportunities Enhancement; \$15,000

Taber Fish & Game Association (Taber FGA); Taber Fish & Game and ACA Youth Fishing Recruitment Day; \$18,900

Taber FGA; Winter Family Fun Fishing Day; \$9,528.13

Trout Unlimited Canada (TUC); Stream Rehabilitation Training (SRT) Program; \$11,900

Trout Unlimited Canada; Bringing Back Bull Trout; \$30,000

Trout Unlimited Canada; Yellow Fish Road (YFR) and Water Edu-Kit (WEK); \$22,310

Waterton Biosphere Reserve Association; Promoting Wetland Stewardship and Improving Wetland Habitat in Waterton Biosphere Reserve; \$10,856

West County Watershed Society; 10 Years Later – A Closer Look at Riparian Enhancement Projects in the Beaverlodge River Watershed; \$22,926.69

Wetaskiwin County; Wetaskiwin/ Leduc Alternative Land Use Services (ALUS); \$4,500

Wildlife Conservation Society Canada; Going to Bat for Bats: Citizen Science in Alberta; \$29,500

Wildlife Preservation Canada; Conserving Species-At-Risk Bumble Bees, Associated Bee Communities, and their Habitats in Glenbow Ranch Provincial Park; \$20,032

ACA Research Grants

Athabasca University (Dr. Glover); Characterizing Arctic Grayling Distribution and Habitat Preferences Using Environmental DNA; \$15,000

Ducks Unlimited Canada (Dr. Devries); Understanding the Importance of Migratory and Breeding Habitat Selection for Northern Pintails; \$14,600

Fiera Biological Consulting Ltd. (Dr. Clare); Quantifying Yield Impacts and the Profitability of Wetlands in Agricultural Cropland; \$16,800

Goldstream Publishing Inc. (Mr. Simmons); Using Citizen Science to Enhance Fisheries Data Collection and Monitoring; \$15,000

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

University of Calgary (Dr. Post); Assessing the Effectiveness of Alberta's Walleye Regulations to Sustain High-Quality Fishing Opportunities; \$14,100

University of Calgary (Dr. Smits); Assessing the Capacity of Urban Wetlands to Support Biodiversity Using Amphibian Sentinels; \$14,500

University of Lethbridge (Dr. Goater); Ecological Epidemiology of Emerging *Ambystoma tigrinum* Virus (ATV) in a Population of Tiger Salamanders in Southwestern Alberta; \$6,338

University of Lethbridge (Dr. Pyle); Contribution of Pesticides and Climate Change to the Decline of Freshwater Mussel Populations in Alberta; \$27,000

University of Lethbridge (Dr. Laird); Biodiversity and Distribution of Cryptic Duckweed in Species in Alberta; \$25,000

University of Lethbridge (Dr. Burg); Assessing Translocation Success and Implications of Greater Sage Grouse in Alberta using Genetic Assignment Methods; \$35,000

University of Manitoba (Dr. Koper); Effects of Oil Infrastructure and Noise on Nest Predators in Alberta's Grasslands; \$25,000

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 Saskatchewan (Dr. Lane); Sex-Specific Responses to Climate Change in a Wild Hibernator; \$22,700

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

Wildlife Conservation Society Canada (Dr. Lausen); Evaluating the Efficacy of Bat Boxes for the Conservation and Recovery of Bats; \$26,000 – **note: grant not accepted*

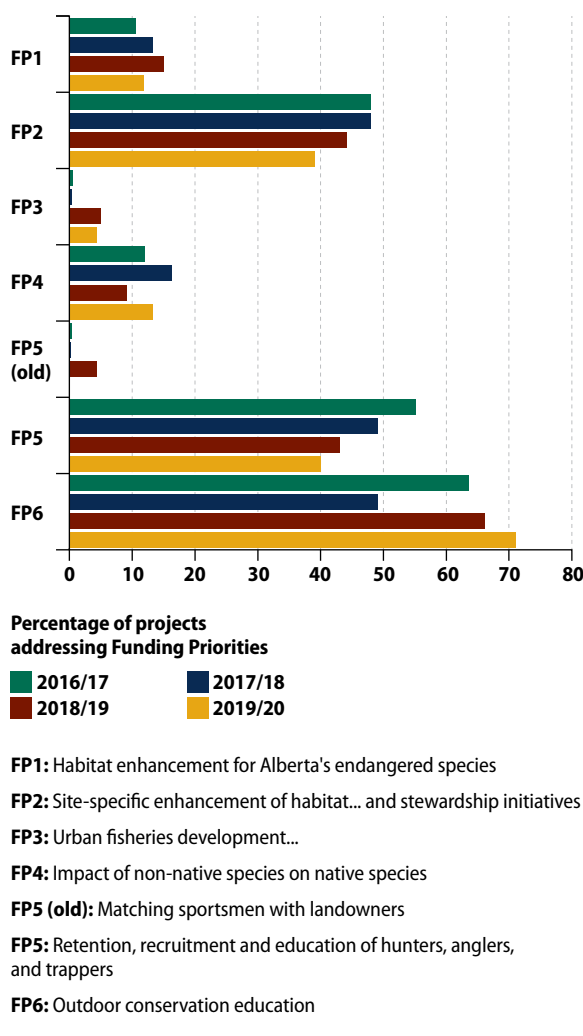
Grant Projects' Contribution to ACA Funding Priorities

In total, 98 projects were approved for funding in 2019/20: 82 CCEG projects and 16 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; and 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 was reduced from seven funding priorities to six funding priorities in 2019/20. Funding priority #5 from previous years, *"Improvement and innovation in matching sportsmen with landowners (e.g., facilitating hunter access to depredating waterfowl, elk, and deer)"* was removed from the 2019/20 funding priority list. A few changes were made to the 2019/20 RG funding priority list: funding priority #8 was reworded again to *"Social Science studies of hunting and angling related to demography, attitudes, norms and practices."* Funding priority #10 *"Evaluate the effects of agricultural run-off on fisheries"* was removed and incorporated into funding priority #4, making it *"Evaluate the effect of agricultural runoff, pesticides, herbicides or pharmaceuticals on fish or wildlife species' food availability and/or quality in agricultural landscapes."* Funding Priority #12 is new: *"Efficacy of alternative wetland restoration strategies."* A few other wording changes were made, and those changes have been underlined in the funding priorities section of this report, see page 4.

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 2019/20 contributed to ACA's Funding Priorities. One of the CCEG funded projects did not mention a link to a Funding Priority. Two funded research projects did not mention a link with any of the Funding Priorities; however one of the two specified links with the document *"Research Needs for Fisheries and Wildlife in Alberta"* by Dr. Boyce and Dr. Poesch; a document made available to RG applicants. For a complete overview of which funded projects link to the various ACA Funding Priorities in 2019/20, see the Appendix, page 61.

This year the three most cited CCEG Funding Priorities were (in order): #6 *Projects related to outdoor conservation education* (with 71 percent of projects citing this funding priority), #5 *Projects related to retention, recruitment and education of hunters, anglers or trappers...* (40 percent), followed by #2 *Site specific enhancement of habitat... & stewardship initiatives...* (39 percent). For an overview of how CCEG projects relate to the Funding Priorities, see Figure 1.

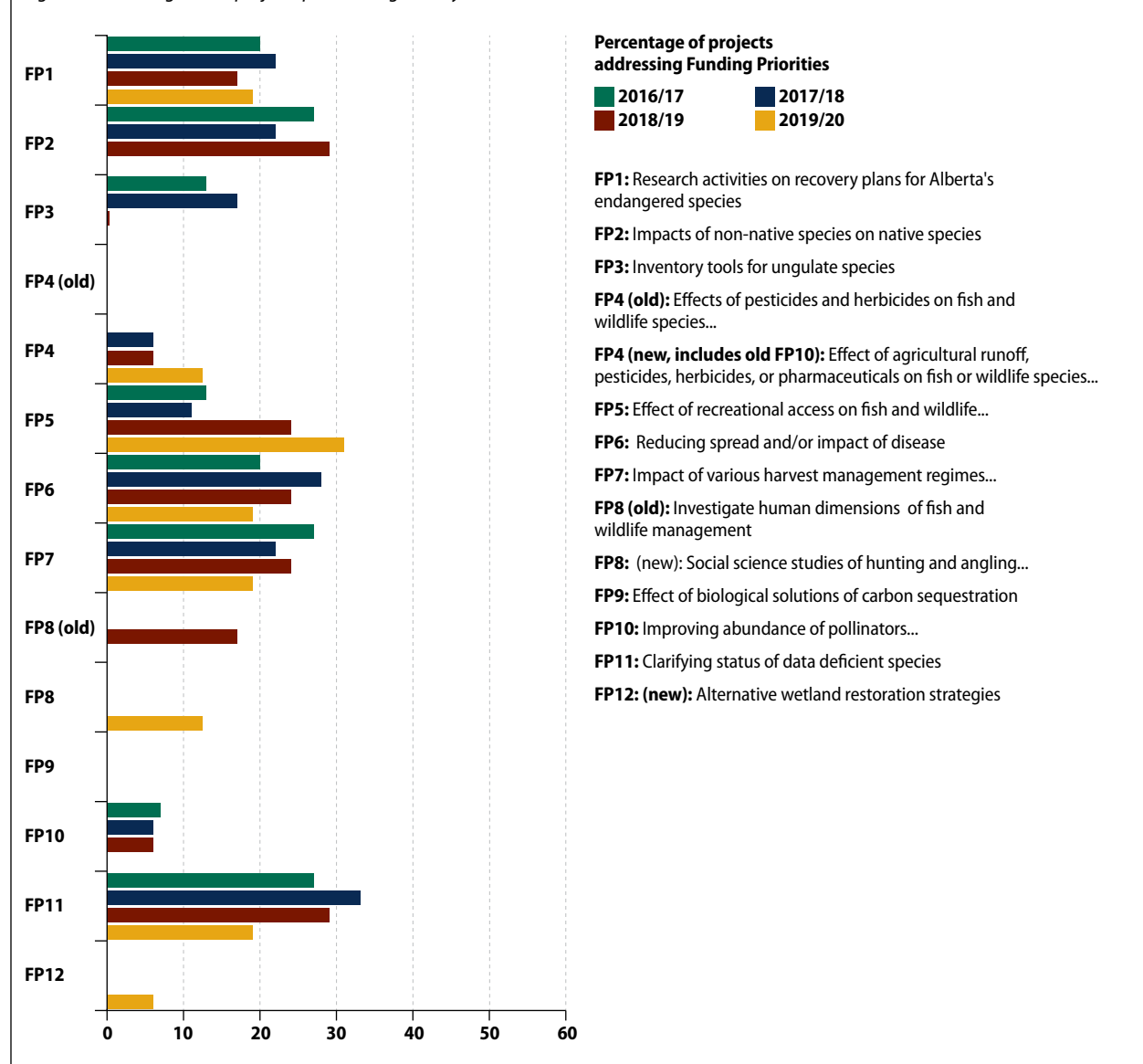
Figure 1: Percentage of CCEG projects per Funding Priority since 2016/17



The most cited RG Funding Priorities in 2019/20 was #5 *Evaluate the effect of recreational access...* (31 percent of projects mentioning a link with these funding priorities). Funding Priorities #1 *Research activities specifically list on provincial recovery plans for Alberta's endangered species...*, #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 genetics or demography*, and #11 *Work towards clarifying status of current data deficient species* were mentioned by three of the 16 funded projects (19 percent). Four funding priorities were not mentioned by any of the funded projects which went ahead this year: #2 *Impact of non-native species on persistence of native species*; #3 *Develop and validate inventory tools to determine the relative density and range of ungulate species...*, #9 *Evaluate the effects of biological solutions on carbon*

sequestration... and #10 Evaluate approaches for improving the abundance of pollinators in agricultural landscapes. Funding Priority #8 was reworded again this year: in 2018/19 this priority was "Investigate the human dimensions of fish and wildlife management" and was changed to "Social Science studies of hunting and angling related to demography, attitudes, norms and practices." This year two RG projects cited a link with FP #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 since 2016/17



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, Assessment, and Outreach

Alberta Fish & Game Association

Grant: \$25,100

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 main OGC objective is to enhance wildlife habitat through sustainable practices by addressing the proximate causes of habitat loss and degradation; this was done by implementing two new ranch-wide monitoring and adaptive grazing management projects and assessing the 16 existing members who implemented monitoring projects in 2013 through 2019. 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.

Results/Deliverables:

- Two new ranch-wide monitoring and adaptive grazing management projects have been implemented and installation was completed in October 2019.

- All 16 ranches have been assisted on-site in this year's monitoring and data entry procedures. Due to OGC's continued support through one-on-one assistance, ranching members have expressed that they feel more confident in the application of these techniques.
- Ferruginous hawk habitat enhancements this year included:
 - Completed refurbishments of one new artificial nesting structure with assistance from Fortis Electric Alberta.
 - Inspection of ten artificial nesting structures at Bullpound Pasture.
- Two stock water (one spring improvement and one small water pipeline project) were completed in spring 2020. SAR suitability, particularly for Sprague's pipit breeding and foraging habitats, was the main goal.
- 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 2019. The habitat indicators assessment was completed by March 31, 2020.
- Wildlife observations were completed at all monitoring sites.
- Protect wildlife habitats through five-year voluntary stewardship agreements and renew expiring agreements: eight new members and 18 renewals have been made this year. 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 and loggerhead shrikes by involving OGC members in annual census (Note: The next loggerhead shrike census is scheduled for 2020): The 30th burrowing owl census showed numbers were down slightly over the 2018 census year, indicating this population is somewhat stable, albeit at very low numbers. A fair response rate was recorded, and phone follow up was conducted to augment mail response.
- OGC website communications have been updated in an ongoing manner by including information on projects and updating social media links.
- Meetings/Conferences: OGC staff attended two Prairie Conservation Forum meetings, Chinook Applied Research Association workshop, the Oldman Watershed Council AGM, and the Milk River Watershed Council Canada meeting. The Calgary Stampede Cattle Trail exhibit (90-95,000 attendees) and the Medicine Hat Stampede were attended by OGC volunteers. Educational materials were shared with many rural and urban attendees.

Pronghorn Antelope Migration Corridor Enhancement

Alberta Fish & Game Association

Grant: \$40,698

Project Code: 030-00-90-160

Project Status: Funded since 2009/10; Completed

Project Website: www.afga.org/pronghorn-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 bottom strand of wire in select locations along fence line and add fourth smooth wire to bottom of barbed wire fence in prime pronghorn migration corridor as identified by Alberta Conservation Association. Bottom wire will be 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 are onsite.

Results/Deliverables:

- This year's wildlife friendly fencing work was carried out at the following locations: MacRae, Balog, and Snow Ranches (July 24 to 28, 2019), Deer Creek Ranches (Aug. 21 to 15, 2019), and Barnes Ranching (Sept. 12 to 15, 2019).
- Smooth wire installed: 44 km
- Barbed wire manipulated to wildlife friendly standards: 103 km
- Total amount of re-configured to enhance antelope migration: 174 km

16th 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 the ACA Recruitment and Retention of Hunters, Anglers and Trappers Fund (R&R fund); Completed

Project Website: www.aheia.com/outdoor-youth-program

The 16th Annual Outdoor Wildlife Learning (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 held April 13, 2019. It was a success with 113 participants attending. Eighteen mentors/instructors 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, 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 April 13, 2019 at the Calgary Firearms Centre with 113 youth participants, 12 volunteers, and six staff.

26th Annual Outdoor Women's Program

Alberta Hunter Education Instructors' Association

Grant: \$15,000

Project Code: 002-00-90-219

Project Status: Funded since 2013/14, except 2018/19; Completed

Project Website: www.aheia.com/outdoor-womens-program

The goal of the 26th Annual Outdoor Women's Program (OWP) was to host 150 women at the Alford Lake Conservation Education Centre for Excellence for five days of learning, camaraderie, fun and an opportunity to begin to master the outdoors. This year's OWP took place from Aug. 7 to 11, 2019 with 150 women in attendance and 33 instructors/volunteers. The objective was to have women of all ages be encouraged to experience, explore, and develop an understanding of the natural world through over 30 different hands-on programs.

Results/Deliverables:

- A total of 150 women graduated from this year's OWP with expanded knowledge, skills, and confidence in Alberta's wilderness environment. Many of these women are now becoming hunters and anglers as have their predecessors of the OWP program.
- Fifty-seven percent of women were first-time attendees, 37 percent had attended one to four years before, and six percent had attended five years or longer.

AHEIA Teachers' Workshop

Alberta Hunter Education Instructors' Association (AHEIA)

Grant: \$6,000

Project Code: 002-00-90-248

Project Status: Funded since 2016/17; 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 18 to 20, 2019 with 18 participants and the International Bowhunter Education Program on July 21, 2019 with 16 participants.

AHEIA's National Archery in the School Program

Alberta Hunter Education Instructors' Association (AHEIA)

Grant: \$40,000

Project Code: 002-00-90-239

Project Status: Funded since 2015/16 (except 2017/18) and previously by the R&R fund; Completed

Project Website: www.aheia.com/nasp

AHEIA's National Archery in the Schools Program (NASP) promotes instruction in international style target archery as part of the in-school curriculum. It provides opportunity to improve educational performance and participation in the archery shooting sports for Grades 4 to 12. AHEIA's NASP instructor training is being offered to teachers who are certified Conservation Education instructors so that they may include archery into their teaching format for the Career and Technology Studies (CTS) Wildlife Strand, introducing students to archery at an early age in both the public and separate school systems. In addition, all physical education department heads and teachers from those schools are invited to the training sessions, thus opening 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.

Deliverables/Results:

- In 2019, 49 new schools were added to the roster of Alberta schools delivering the NASP program, bringing the total up to 450 Alberta schools delivering the NASP program at the end of 2019. 49 schools received either equipment or grants to purchase NASP archery equipment.
- 158 new teachers were trained in delivering the NASP program, bringing the total up to 1,780 Alberta teachers trained in NASP delivery.
- The NASP Provincial Tournament in Edmonton had 2,000 youth participants, representing 80 teams from 50 schools.

AHEIA's Outdoor Bound Mentorship Program

Alberta Hunter Education Instructors' Association

Grant: \$3,000

Project Code: 002-00-90-222

Project Status: Funded since 2014/15 and previously by the R&R 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 "magic of mentoring" has proven results in conservation education and again has continued to show great success in the development and progression of future hunters/anglers and respectful outdoor users. The Outdoor Bound Mentorship Program provided mentorship for 535 youth and novice participants; 197 mentors provided this great learning opportunity over 1,282 hunting days as well as fishing days. Mentors spent time mentoring these youth, novice hunters, and anglers in the field, giving them a great start in their future hunting and/or angling pursuits.

Deliverables/Results:

- This year the program had 535 participants with 197 mentors taking part in 1,282 hunting/fishing days in the field during Alberta's hunting season.

AHEIA's Wildlife Workbook Rewrite for Children

Alberta Hunter Education Instructors' Association (AHEIA)

Grant: \$3,000

Project Code: 002-00-90-301

Project Status: New; Completed

Project Website: www.aheia.com/free-workbooks#section_7901

The Wildlife Workbook is an outdoor education introduction aimed at pre-school and grade school children. It was originally produced in the 1980s and remains a very popular publication for children. Many thousands of copies have been printed and distributed free of charge. AHEIA is updating a few of the activity pages and will reprint the updated version for continued distribution of this well-received resource. The Wildlife Workbook is designed to interest young children in Alberta's wildlife by introducing them to wildlife and the outdoors in a colouring-style workbook with many different activities. They are encouraged to talk about what they are learning with their teachers, classmates and family.

Results/Deliverables:

- Twenty-five thousand copies of the updated eight-page supplement to the Wildlife Workbook have been printed. These updates targeted the younger grades and pre-school age children. The copies are being distributed to schools, the Conservation Education Wildlife Museum, sportsperson shows, and at AHEIA's various Conservation Education Centres.

AHEIA's Youth Hunter Education Camps (Week 1,2,3,4)

Alberta Hunter Education Instructors' Association (AHEIA)

Grant: \$48,000

Project Code: 002-00-90-224

Project Status: Funded since 2014/15 and by R&R Fund; Completed

Project Website: www.aheia.com/outdoor-youth-program

The Youth Hunter Education Camps are designed to target and attract youth to hunting and angling related activities, which in turn provide introductory opportunities to become hunters, anglers and responsible outdoors people. A full week of training was provided at each camp with meals, accommodations and all necessary course equipment provided. The week immersion into the outdoor training provided the perfect opportunity to entice youth to choose outdoor recreation, especially the pursuit of hunting and angling with their time and energy. Evenings were filled with mentor time at the stocked trout lake and numerous practical experiences that were also available; these included rifle, shotgun, compass, GPS, archery, field techniques, wilderness first aid, spin casting, fly fishing, and more.

Deliverables/Results:

- Four Youth Hunter Education Camps had 196 campers, 88 volunteers, and 21 staff were held during the month of July 2019 at AHEIA's Alford Lake Conservation Education Centre for Excellence near Caroline, Alberta. Each camp was filled to capacity with a waiting list for all camps.
- There was a 100 percent conversion rate from attendees to graduates. All graduates have purchased a WIN card and have been recruited to the fold of hunters and anglers.

Conservation Education for the Army Cadet League of Canada - Alberta

Alberta Hunter Education Instructors' Association (AHEIA)

Grant: \$3,000

Project Code: 002-00-90-213

Project Status: Funded in 2016/17, 2018/19, and 2019/20; Completed

A 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 is coordinated through the Governor of the Army Cadet League of Canada and the Brigadier General responsible for Army Cadets. Inroad gained through the Army Cadet League has expanded the reach of Conservation Education and has enabled further recruitment into hunting and outdoor resource conservation. Students in the Army Cadet League are outside of AHEIA's traditional audience and this expansion has been successful. 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:

- Twenty-seven cadets were trained in all aspects of the Hunter Education Course, the Fishing Education Course, and the Firearms Safety Course.

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 R&R fund; Completed

Project Website: www.aheia.com/outdoor-youth-program

The 17th annual Outdoor Youth Seminar (OYS) took place from Aug. 16 to 18, 2019 at the Alford Lake Conservation Education Centre for Excellence. The OYS provided 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 pig-roast and a celebration around the two days of learning that took place.

Deliverables/Results:

- The OYS was well attended with 110 youth participants in the program, 36 volunteer instructors, and four AHEIA staff at the two-day seminar (Aug. 16 to 18, 2019). 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. They 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: \$20,000

Project Code: 030-00-90-245

Project Status: Funded since 2014/15 and by R&R fund; Completed

The fourth Saturday of September has been designated as Provincial Hunting Day by the Alberta Government. This year marked the 13th 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 of all ages are invited to try their hand at outdoor sports such as hunting, fishing, trapping, shooting, and/or archery. Provincial Hunting Day was Sept. 28, 2019. AHEIA hosted events at the Alford Lake Conservation Education Centre for Excellence near Caroline, Alberta and the Calgary Firearms Centre in Dewinton. These facilities are large and allow for a great training atmosphere with plenty of opportunities for practical hands on experiences. These AHEIA events were free of charge and were open to Albertans of all ages.

Deliverables/Results:

- The Provincial Hunting Day events were attended by 150 participants despite the unseasonably cold and snowy day. The educational activities were led by 33 volunteers and three staff members.

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 to 2019/20; Completed

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

The Wild Game for the Food Bank Program'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 Alberta Environment and Parks (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 23rd year of this successful program that has provided the protein portion for over a half million meals to those in need. This season more than 4,500 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 Alberta Conservation Association, generously participated in supporting this project with another successful season providing a very valuable food source to help the food banks feed Albertans. An estimated 4,500 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

Grant: \$15,000

Project Code: 015-00-90-266

Project Status: Funded in 2018/19 and 2019/20; Extended until Nov. 30, 2020

Project Website: www.abinvasives.ca/invasive-species/eddmeps-alberta and www.eddmeps.org/alberta

Early detection followed by a rapid response is one of the most cost-effective ways to reduce impacts and prevent spread of invasive species. The EDDMapS Alberta platform is a free smartphone app that allows citizen scientists to report invasive species occurrences. Once those reports are received, they are sent to an expert to ensure proper identification and the report is sent to the local weed inspector for follow-up. EDDMapS Alberta can also be used for distribution mapping as invasive species reports are compiled into an interactive map that can be viewed online or downloaded. This is beneficial for invasive species managers to inform invasive species management efforts and

prioritization. With the support of this grant, the Alberta Invasive Species Council was able to update the app and promote EDDMapS throughout 2019 and 2020 at conferences and outreach events, via social media, and printed materials.

Deliverables/Results:

- The EDDMapS Alberta app was downloaded by 329 iPhone users, 96 Android cell phone users and updated on 2,803 devices since April 1, 2019. There were 530 reports submitted to the system since April 1, 2019 and there are currently 5,890 reports in the system.
- EDDMapS Alberta was promoted at the following meetings and events: Alberta Recreation and Parks Association's Parks School, Wainwright Garden Day, Medicine Hat's invasive species event, Big Lakes and Lesser Slave Lake Watershed Alliance event, Living in the Natural Environment event (MD of Bighorn), Nature Conservancy of Canada Eat and Greet event (Twin Butte), and The Canadian Land Reclamation Association conference (Red Deer).
- An EDDMapS training component was incorporated at all events attended.
- EDDMapS Alberta promotional materials (a pull-up banner and two rack cards) have been developed and ordered/received and will be distributed to promote the app.
- EDDMapS Alberta social media posts are being delivered on a frequent and ongoing basis. In the last year, ten EDDMapS Alberta posts to Facebook, nine to Instagram, and 20 to Twitter. Many of these have been shared by other organizations. Also, individuals were encouraged to report invasive species using EDDMapS Alberta in news articles from CTV News and High River Online.

"AC Conference" (Alberta Youth Outdoor Skills Conference)

Alberta Junior Forest Wardens Association (JFW)

Grant: \$2,510

Project Code: 002-00-90-307

Project Status: New; Completed

Project Website: www.ajfwa.ca

The goal of the JFW's annual AC Conference is to bring together the older Wardens (Adventurers aged 12 to 15 and Challengers aged 16 to 18) from across the province to learn and share outdoor skills and leadership from experienced wilderness instructors and mentors. The objective is for the wardens to raise their skills and personal development through the responsible use of our natural heritage, explore the relationship between conservation and outdoor pursuits, build community-minded teens, and foster skilled youth mentors for young people and families interested in living, playing and working in the outdoors. The AC Conference achieved the goals set out with 73.5 instructional hours of programming in 18 different sessions, including sessions on wilderness skills and conservation. Of note were the five instructors who are very recent graduates of the JFW program. They taught fly tying, paracord/survival bracelets and leadership trials. The Rocky Mountain Trapper Association set up a display and held sessions for the wardens to introduce them to the world of trapping. Other sessions included group cooking, dreamcatchers and Cree storytelling, painting with wool, carving boomerangs, leadership trials, creating copper wire bracelets, pouches/wallets from bicycle inner tubes, the art of camouflage. It also included an introduction to trapping, forging,

Hoo-ha: feminine needs in the outdoors, bodacious balms, outdoor cooking, botanical printing, wall tent set up, and the Adventure Race.

Results/Deliverables:

- The AC Conference was successfully held the weekend of April 5 to 7, 2019 at Camp Alexo. 115 people attended including 68 wardens as well as 47 adults, including Committee Chairs, camp cook, instructors, and parent drivers (chaperones).

Fungal Biodiversity Survey, West Castle - Mushroom Identification

Alberta Mycological Society (AMS)

Grant: \$3,000

Project Code: 015-00-90-277

Project Status: New; Completed

Project Website: www.albertamushrooms.ca

In September 2019, 68 collectors (aka citizen scientists and volunteers) from the AMS chose nine sites with various tree species and locations in or about Weald-Robb, Alberta and gathered fungal specimens. This is known as the Great Alberta Mushroom Foray (GAMF). The main purpose of this GAMF was to determine what species of fungi are found at various sites in the Weald-Robb area of Alberta. GAMF in Weald-Robb is one of a series of great forays across Alberta. The survey of the biodiversity of fungi in Alberta started in 2005 and has been held annually (except in 2017 when it was cancelled due to a wildfire in Waterton). The nine sites in the Weald-Robb area were surveyed and fungi were gathered with some in situ photographs and all with collection notes. The gathered fungi were taken to a temporary lab set up at Robb Community Hall/Robb Multiplex where they were sorted, identified, catalogued, and photographed. Mycologists and experts identified more than half of those collected. As well, some specimens were sampled for DNA and some were dehydrated and mailed to the Mycological Herbarium in Ottawa. Typically, one specimen from each species was accessioned. Duplicate species were used to create an educational display for AMS members and the neighbouring general public. Edible duplicates were prepared for consumption at the Saturday evening potluck. Expert mycologists verified the identity of exactly 300 specimens. Then the identified specimens were added to the AMS database. A most complex yet organized database that notes who collected, where it was collected, the mycologist's identification, and many other pieces of necessary information.

Results/Deliverables:

- The GAMF was held Sept. 13 to 15, 2019 in and around Weald-Robb, Alberta. There were 68 participants; three of whom were mycologists or expert identifiers, and one participant was a PhD lichenologist who shared her expertise as it related to fungi.
- Expert mycologists verified the identity of exactly 300 specimens and 153 DNA smears were prepared and sent to the Mycological Herbarium in Ottawa.
- The knowledge gained by the difficulties experienced when the DNA smears were analyzed will be used to revise the DNA protocol used by AMS at future GAMFs.
- The fungal database for Weald-Robb was created and added to the ever-growing fungal database for the province of Alberta held by the AMS.

- A report was published in the Fall 2019 Spore Print www.albertamushrooms.ca/wp-content/uploads/2019/10/Mushroom-Newsletter-Fall-2019-w-attachment.pdf.

Grazing Schools for Women: Promoting habitat and improved livestock grazing stewardship 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 to 2015/16, 2017/18 to 2019/20; Completed

Project Website: www.cowsandfish.org

The initial success of the Original Grazing School for Women (GSW), now in its 17th year, spawned the Southern Alberta Grazing School for Women (SAGSW), now in its 16th year. The two school committees are comprised of many partner organizations, from rural municipalities, conservation and stewardship organizations, forage or other research groups, and provincial government. Each of the committees developed agendas that resulted in a positive learning experience for the women who attended. The GSW was held mid-June in the Lamont area, while the SAGSW was held in late July in the Milk River area. Using a well-tested and proven approach, Cows and Fish delivered the school to 66 registrants, primarily livestock managers and landowners, to build core skills and knowledge to support these women's ability to effectively manage lands and livestock. 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 83 percent of respondents from the two schools indicating that the school will influence their grazing management, and 98 percent of participants from both schools 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. 91 percent of respondents listed at least one new thing they had learned.

Deliverables/Results:

- Both schools, each held over two days, had good attendance (66 registrants) plus 31 committee members and 18 speakers, and high impact with 83 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 26 who had attended previously, 96 percent had implemented changes! This means that individuals are going home and applying what they learn to change management.
- Various blogs and articles were written.

Implementing Riparian Habitat Management Improvements for Westslope Cutthroat Trout

Alberta Riparian Habitat Management Society - Cows and Fish

Grant: \$11,150

Project Code: 020-00-90-167

Project Status: Funded 2011/12, 2015/16, 2017/18 to 2019/20; Completed

Project Website: www.cowsandfish.org

This project promoted stewardship and lead to site-specific enhancements to improve overall riparian habitat and sport-fishery habitat, focused on areas with westslope cutthroat trout (WSCT) populations. 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. Specifically, the WSCT threats that this work will reduce are sedimentation, habitat loss and degradation resulting from off-highway vehicles, linear disturbance and poorly managed riparian grazing. 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. Much of the historic range of WSCT is heavily modified and impacted, and population loss is influenced by management and land use. It is urgent habitats are maintained and improved, because so few healthy areas and populations remain. Cows and Fish expertise lies in working effectively with a diversity of stakeholders and land users, helping them to understand riparian function and address riparian issues; this expertise is needed to improve habitat and help prevent further loss and habitat degradation, while working to improve existing issues. Cows and Fish work with partners to help prioritize and select sites, participate in workshops and meetings, and work collaboratively to improve riparian habitat. Priority areas for WSCT habitat improvement were identified and selected in collaboration with expert and stakeholder input, focusing on Silvester, Beaver, O'Hagen creeks and an unnamed tributary to Vicary Creek. Detailed plans were developed for Beaver Creek (seven sites) and O'Hagen Creek (one site), and Silvester Creek (one site). Cows and Fish also supported plans lead by partners at an unnamed stream.

Deliverables/Results:

- Riparian site recommended enhancement and improvement plans: Completed planning for seven adjacent sites at Beaver Creek, contributed to planning led by partners at Silvester Creek and supported plans made by partners at the unnamed tributary to Vicary Creek. Time was also spent planning planting and harvesting local seed for the O'Hagen Creek site. This planning thus includes at least nine sites, in addition to the somewhat hopeful longer-term planning for improvements at Dutch Creek, which is currently on hold.
- Riparian management changes and habitat improvements: This project has completed riparian management changes and habitat improvements two locations (Silvester Creek and a tributary to Vicary Creek), in addition to having plans/approvals for work at up to eight more sites (Beaver and O'Hagen creeks).
- Riparian site enhancement and improvement summaries: Field work and data entry are done. A brief summary presentation was developed for the March 12, 2020 Stakeholder Workshop, covering Silvester and Beaver Creek projects, which will form the basis of those site summaries.

- Stakeholder workshop: On March 12, 2020, Cows and Fish hosted the Native Trout Stakeholder Workshop at the M.D. of Ranchlands with 51 people attending, working with the Native Trout Collaborative to determine priority topics of interest. The afternoon workshop session was used to have communication consultants gather input on key messages, knowledge and attitudes to native trout and related topics. This afternoon workshop session enabled participants to directly have input on communication planning that will help Cows and Fish, Alberta Conservation Association, Alberta Environment and Parks, Canadian Parks and Wilderness Society, Foothills Research Institute and others more effectively reach audiences with the aim of benefiting landscape use and fish populations.

Helping to Educate Future Trappers and Ensure Long-Term Sustainable Harvest Using the Best Available Science

Alberta Trapper's Association

Grant: \$20,248

Project Code: 002-00-90-304

Project Status: New; Extended until March 1, 2021

Project Website: www.wildlifeecology.org/fur_book.html

Decisions related to furbearer management encompass a complex array of management objectives across a range of species. These complex decisions face increased scrutiny and opposition from non-government as well as within government sources, causing threats to the future of furbearer management. Science-based management is critical for making informed and defensible decisions, both from the perspective of the trapper and the wildlife manager, but there currently is no comprehensive and contemporary science-based product available to guide and improve furbearer management. The 1987 book, *Wild Furbearer Management and Conservation in North America*, was a critical resource that filled that role for many years. Unfortunately, this resource has become dated. Critical accomplishments and advancements during the past three decades are lacking, and include the Agreement on International Humane Trapping Standards (AIHTS), trap and fur product certification efforts, updates to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), genetics, population monitoring using harvest data, and the role of trappers as citizen-scientists. The overarching goal is to work with partners across Canada, Mexico, and the U.S. to update this resource and make it available for the education of Alberta's future trappers and resource managers. The project objectives include: 1) contributing to and supporting a network of collaborating furbearer specialists across North America to ensure appropriate topics are sufficiently covered in the book, including ensuring that an Alberta and Canadian perspective is included; 2) highlighting the advancements and accomplishments in furbearer management during the past 30 years, including the contributions that trappers have made to research and ongoing improvement; and 3) disseminating this information across a wide audience of wildlife professionals, trappers, hunters, and others to coordinate support for informed and defensible management decisions and policies in an increasingly complex and controversial environment. The main activities have included recruitment of a core group of project advisers (including from Canada) to help guide the project; formalizing book content; recruitment of about 140 wildlife professionals from across North America to serve as chapter authors; and initiate and

continue the peer-review, editing, and layout components for the book. Currently, several chapters are in the layout process, and about 20 chapters are in various stages of peer review and editing. Work continues with authors of other chapters to ensure high-quality products. Finally, the large volume of work has resulted in some delays, including reassignment of authors for several chapters.

Results/Deliverables:

- The publication of the book is scheduled to occur during late 2020 or early 2021.

Trapper Education in Schools

Alberta Trapper's Association (ATA)

Grant: \$21,100

Project Code: 002-00-90-288

Project Status: Funded since 2018/19; 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. 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 staff or instructors spoke to students, teachers, and other members of the public who were interested in attending about the important role trapping plays 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:

- Fur kits continue to be updated as needed and were used in 21 locations throughout Alberta. ATA staff and/or instructors provided presentations in 20 locations with an average of 267 people per presentation.

Youth Camp

Alberta Trapper's Association (ATA)

Grant: \$19,480

Project Code: 002-00-90-252

Project Status: Funded since 2018/19; Completed

Project Website: www.albertatrappers.com/youth-camps

The 2019 ATA youth camp was attended by 60 very enthusiastic youth between the ages of 12 and 17. Some have never attended such a camp and were able to develop skills, engage in survival building activities, and learn about the benefits of the trapping industry. Level One, with 23 participants, covered safety, modern trapping, lures, fire and tinder, reading signs in the bush, survival tips, and trap line stories. The attendees left this introductory level program feeling confident in their new skills and excited about all that they had experienced. Level Two,

with 23 participants, 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. Level Three, with 13 participants, reviewed levels one and two, and covered understanding kill traps, fur handling, safe use of a knife, axe and saw, and how to build a bush camp. ATA's first offering of the *Introduction to Trapping Youth Day Camp* had 16 children participate; they learned about bush safely, ground zero, and had the opportunity to touch and explore many different tanned furs and dress up like a trapper. ATA looks forward to having many of these youth attend the 2020 youth camp, where they will move up to the next level and welcome a new group of children into Level One.

Deliverables/Results:

- The youth camps had 60 children, ages 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. Also, the 13 children who completed Level 3 are anxiously waiting to attend the ATA mentoring program in 2020, as well as participate in the Standard Trappers Course.
- The Day Camp exceeded expectations with 16 children ages six to 11 attending. These children were introduced to the trapping industry and survival in the bush. They also had the opportunity to dress up like a trapper and do a trapping-style craft.
- ATA youth camps were offered at two locations, Alford Lake and Marten Lake, both of which were well attended. The *Introduction to Trapping Youth Day Camp* was held in Westlock.

Lake Isle Flowering Rush Project

Alexis Nakota Sioux Nation

Grant: \$30,000

Project Code: 015-00-90-276

Project Status: New; Completed

Project Website: www.ansn.ca

Flowering rush is a prohibited noxious weed in Alberta. Flowering rush is present in Lake Isle and is moving toward Lac Ste. Anne via the Sturgeon River. If left unchecked, the flowering rush will crowd out native vegetation, form mats on the water, disturb fish and wildlife habitats, and accelerate eutrophication in the lake. In order to avoid detrimental impacts of the rush, AEP and other communities want to apply herbicide to large patches around Lake Isle. Alberta Environment and Parks has consulted Alexis Nakota Sioux Nation (ANSN) and failed to gain community support for herbicide use on the rush. The Lake Isle Flowering Rush project will build community capacity for rush removal, begin restoring native habitat, and reduce the need to apply herbicide by hand-digging flowering rush around Lake Isle. This project will employ community members to remove flowering rush. Stoney Language Specialists will be engaged in this project to ensure these activities are done in a culturally appropriate way. This project is engaging ANSN Members, the Lake Isle and Lake Ste. Anne Water Quality Society, the Government of Alberta, and residents around Lake Isle to remove flowering rush, a prohibited noxious species. The project team conducted outreach by water and surveyed 40 km of shoreline to

identify dig sites in Lake Isle, Lac Ste. Anne, and Birch Lake to determine the extent of the rush infestation while speaking to lake residents. The goal was to host three workshops with AEP and nine workdays with staff and volunteers; remove 150 m² of flowering rush; employ two supervisors and eight project staff; and provide for 90 volunteer-days removing flowering rush around Lake Isle. ANSN were able to host seven Flowering Rush Removal Workshops and conduct 52 days of outreach, monitoring, and/or digging up to Sept. 20, 2019, with an average of four staff per day (approximately 204 staff-days). The project teams removed 294 m² of flowering rush, filling over 400 garbage bags with the prohibited noxious plants. This project was completed as planned with additional funding, which extended the length and impact of the project.

Deliverables/Results:

- ANSN employed 25 staff to host seven public workshops with 137 volunteer engagements and work an additional 52 days surveying and removing flowering rush. The team cleared approximately 294 m² of flowering rush, filling over 438 construction garbage bags between July 1 and Sept. 20, 2019.
- GPS data were provided to the Summer Village of Silver Sands to inform future projects.
- ANSN staffed a considerable number of outreach/monitoring and dig days with additional funding from other sources and were able to offer regular positions until Sept. 20, 2019. The team also dug in less accessible areas without volunteers.

Outdoor Conservation Education for High Needs Schools

Ann & Sandy Cross Conservation Area (ASCCA)

Grant: \$6,250

Project Code: 002-00-90-293

Project Status: Funded since 2018/19; Extended until March 31, 2021

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

ASCCA's educational 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 they 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. Transportation costs were covered for 23 classes from five high-need schools that attended the conservation education programs at ASCCA. In addition, funding from Alberta Conservation Association (ACA) allowed ASCCA to purchase new program supplies that will enhance and expand their programs. This project aligns 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. Several high-needs schools informed ASCCA that they were having difficulties affording other costs associated with school trips, meaning some bussing funds were unused and reallocated to purchase snowshoes for use during the winter programs.

Deliverables/Results:

- The main deliverable for this project was to provide on-site programs for approximately 30 classes from 15 high-needs schools. The closing of schools due to the COVID-19 pandemic impacted ASCCA's ability to fully meet this goal. However, ASCCA were able to cover bussing costs for 23 classes from five high-needs schools. This project has been extended to allow for these site visits to continue, if possible, into 2021.
- With feedback from program participants, ASCCA will be able to further refine and develop their programs. The following quotes were gathered from participants, demonstrating the need for conservation programs for high-needs schools.
 - "I learned about light pollution. It effects how birds see. I was excited to learn about constellations, and we did. We got to look through a telescope and see Orion's Belt. I was excited because I love the night sky." – student from Catherine Nichols Gunn School.
 - "It was AMAZING! So informative, exciting, and so much fun! The students were engaged and interested the whole time. I think you're doing great." – teacher from Keeler School.
 - "Many of our students have physical and or developmental disabilities, which causes them difficulties in many or all aspects of life, especially in language, mobility, ability to learn, understanding and use of information, self-help, independent living and social skills. With the ACA grant, almost every classroom at our school will be given the opportunity to have an outdoor field trip experience and an opportunity for students to do and see things that they might not be able to experience in their family life. Thank you again for supporting our school and students." – quote from Calgary Quest School, which provides individual programming for children with special needs from ages 2.5 to 20 years of age and from all cultural and economic backgrounds.
- Two articles were submitted to a local newspaper, the *High Country News* (Jan. and Mar. 2020 issues), to demonstrate the impact of ACA's support of outdoor conservation learning for high-needs school.

Alberta Wetlands 101 Online Experience

Aquality Environmental Consulting Ltd.

Grant: \$13,000

Project Code: 002-00-90-308

Project Status: New; Completed

Project Website: www.albertawetlands.ca

Water literacy in Alberta needs to be improved and topics surrounding Alberta's wetlands are some of the most challenging to understand. The goal of this project is to increase clarity surrounding wetlands and wetland management in Alberta among a variety of target groups (e.g. industry, consultants, municipalities, government, landowners, and the general public). Aquality's wetland professionals have streamlined the means for this project by creating a barrier-free online wetland education series. Aquality's wetland professionals provided the course content and expertise for a free online learning experience using video media. The course material is derived from Aquality's award winning course *Alberta Wetlands: From Classification to Policy*. The video media enables updated content to be easily passed on to the student, as the Wetland Policy and its directives are continuously evolving. Working

with Intrinsic Design, www.albertawetlands.ca (using WordPress) was launched on Feb. 2, 2020 (World Wetlands Day). As this is a free course, students must have an account and login linked to a valid email address. Students have access to a post-login access page where they can track their progress through each of the wetland modules. The video series features 11 five-minute videos each with a corresponding review quiz (five questions each). The videos are uploaded to a Vimeo account and are paired with the course's website. A passing grade of 80 percent on all course quizzes is needed to receive a certificate of completion. Students can also participate in the course just to gain some information with the option of skipping the quizzes. Since the site's launch, over 150 students have participated in the course. The course has been registered under the Convention of Wetlands (Ramsar), linked to Alberta Society of Professional Biologists website, and shared with municipalities, Watershed Planning and Advisory Councils (WPACs), and other groups. The site will be linked with Ducks Unlimited Canada, The Alberta Water Council, Inside Education, and other water literacy organizations.

Deliverables/Results:

- A video series of 11 five-minute video modules for viewing ease and focused learning objectives. There are also Introduction and Conclusion videos to review what will be covered in the course and to summarize all the content (no quizzes for these videos). The modules are:
 1. Wetlands in Alberta Introduction (mineral and organic distribution in Alberta)
 2. Wetland Loss in Alberta
 3. Wetland Valuation
 4. The Alberta Wetland Classification System – Peatlands
 5. The Alberta Wetland Classification System – Mineral Wetlands
 6. The Alberta Merged Wetland Inventory
 7. Wetland Legislation, Policy, and History of Water Management in Alberta
 8. The Alberta Wetland Policy
 9. The Alberta Wetland Policy – Mitigation Strategies
 10. Wetland Policy Directives and Tools Part I – Permanence, Identification and Delineation
 11. Wetland Policy Directives and Tools Part II – Introduction to Alberta Wetland Rapid Evaluation Tool and Wetland Assessment and Impact Report
- Each video has a corresponding review quiz with five questions each. A minimum passing grade of 80 percent is required on each of the quizzes for the student to receive a program completion certificate. Students can also bypass the quizzes if they are taking the course just to gain some information and are not interested in a completion certificate. A final exam was unable to be developed as it was outside the scope of the budget.
- The www.albertawetlands.ca website has been developed by Intrinsic Design featuring attractive graphics, original artwork, a post-login navigation page, website reporting, access to student records, and account reactivation. There is also a feature to add module "sets", so more courses may be able to be added later. The videos are uploaded to a Vimeo account and the Vimeo video ID is paired with the website for viewing. The website was launched on Feb. 2, 2020 (World Wetlands Day) and over 150 students have participated thus far.

Water on Wheels

Aquarium Society of Alberta

Grant: \$12,075

Project Code: 002-00-90-306

Project Status: New; Extended until Sept. 1, 2020

The Water on Wheels project objective was to build a small mobile trailer to both monitor local water bodies and improve education about our native and invasive species of fish. Opportunities for fishing, conservation, and identification of invasive species will be key objectives of the trailer display. A small single-axle trailer that can be easily towed by a variety of vehicles can be utilized in situ for field studies and sampling, for public education and engagement at events, festivals, markets, tradeshow, and for educational use with outbound exploration and student groups. The project, while not quite yet complete, has all the major component pieces in-hand or waiting on shipping, and construction is underway. The Aquarium Society of Alberta anticipate the vehicle will be on the road in May 2020. Given the current status of the COVID-19 pandemic and its impacts, work will only proceed at the comfort level of the participating volunteers and the state of their health. As such the May 2020 target may be extended, given the progress of situation.

Results/Deliverables:

- The aquarium trailer is almost completely outfitted and ready for events this spring depending on the status of COVID-19 pandemic. The society has received a great deal of interest in having the trailer at select summer events and some summer youth camps for program delivery with the trailer (summer 2020).
- Blog post: www.aquaticbiosphere.ca/new-initiative-water-trails (July 2019)

A Complex Relationship Between Agricultural Practices and Wildlife Habitat in Central-East Alberta

Battle River Research Group (BRRG)

Grant: \$2,950

Project Code: 002-00-90-302

Project Status: New; Completed

Project Website: www.battleriverresearch.com

BRRG is a non-profit organization, based out of Forestburg, Alberta, which has been involved in environmental, agricultural, and demonstration projects for 30 years. BRRG organized a field day this year and one of the sessions addressed the relationship between agricultural practices and wildlife habitat. Dr. Edward Bork a professor from the University of Alberta was the speaker at the session. Information on the economic benefits of wildlife habitats on croplands was clearly communicated by the speaker in his presentation. Current literature about wildlife habitats on croplands was provided to producers and industry representatives. Each participant received a program booklet that included weblinks, contact information, and the latest fact sheets on agriculture and environment. An exclusive agenda of the event was provided through a variety of means to potential participants.

Deliverables/Results:

- The BRRG field day platform was used to provide information to producers and encourage them to protect the wildlife habitats on croplands: and was attended by 45 participants.
- A prairie-wide press release in newspapers, and mail notifications.
- The event was advertised on local radio stations, web pages, and social media.
- A billboard setup at the event.
- Printed literature was distributed.

Public Engagement, Wildlife Conservation, and Monitoring at Beaverhill Lake

Beaverhill Bird Observatory (BBO)

Grant: \$23,250

Project Code: 030-00-90-124

Project Status: Funded since 2006/07; Completed

Project Website: www.beaverhillbirds.com

This project continued the BBO's stewardship of the Beaverhill Natural Area, an internationally recognized wildlife area. Long-term monitoring of wildlife continued, and their wildlife conservation activities were expanded. The BBO engaged the public about the importance of Beaverhill Lake, wildlife and natural areas in Alberta, and the threat of climate change. 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.

Results/Deliverables:

- Spring migration monitoring was conducted from May 1 to June 9, 2019, with standardized banding and census conducted throughout these dates. BBO staff operated 13 mist nets and recorded 647 captures of 44 species, achieving an overall capture rate of 25.8 birds per 100 net-hours.
- Fall migration monitoring was conducted from July 20 to Oct. 20, 2019. BBO staff operated thirteen mist nets and recorded 1,262 captures of 58 species, resulting in an overall capture rate of 27.7 birds per 100 net-hours.
- Monitoring Avian Productivity and Survivorship (MAPS) program was operated from June 10 to Aug. 8, 2019 to monitor breeding birds in the Natural Area. 638 captures were recorded. 15 natural nests were discovered and monitored this summer.
- Owl migration was monitored from Sept. 1 to Nov. 7, 2019. 991.5 playback hours were accumulated and a total of 475 owls were captured (444 northern saw-whet owls, 25 long-eared owls, four boreal owls, and two great-horned owl) which resulted in a capture rate of 47.9 owls/100 net-hours.
- All bird sightings and banding captures were reported to eBird.com, which is publicly accessible.

- Two student interns were hired to monitor the bat populations weekly throughout the spring, summer, and fall. Two reports were created outlining the results and published on the BBO website.
- Several major on-site events were hosted: Big Birding Breakfast two days in June 2019 (73 visitors), Steaks and Saw-whets two days in Sept. 2019 (130 visitors), Young Ornithologist Workshop (nine participants), as well as 20 on-site presentations (20 groups hosted), and at least 200 off-site talks or demonstrations (>260 talks to >38,000 people).
- BBO's trail cameras detected: 231 white-tailed deer, 16 snowshoe hares, 13 moose, four mule deer, four coyotes, three striped skunks, two porcupines, a northern flying squirrel and a house wren.
- Maintained, cleaned, and replaced approximately 500 bird boxes as needed. Six student interns monitored nest progress of house wrens and tree swallows. Intern reports were completed and published on the BBO website.
- Compiled the Annual Report (April 2020), three seasonal reports (spring, summer, and fall) and three newsletters (April, September, and December). 2019 Annual Report which summarizes BBO's activities can be found here: www.beaverhillbirds.com/media/1919/2019-annual-report.pdf
- The trails in the natural area were widened in the spring, summer, and fall, and all trails were mowed twice. Weekly checks were conducted to remove any downed trees on the trails due to increased beaver activity. Over 50 new Alberta Parks signs were installed along the trail system this year to improve visitor navigation and experiences.
- Staff walked the perimeter fence in the spring and patched weak areas as needed. No issues were had with cattle in the natural area this year due to fence maintenance carried out over the previous years. The last 100 m of internal barbed wire fence was removed further protecting local wildlife.
- Supervised 12 student interns to complete research and monitoring projects.
- Shared data with collaborators.

Bow River Policeman's Flats River Access Upgrade 2019

Bow River Trout Foundation (BRTF)

Grant: \$6,304 (unspent funds from 2018/19 were used to fund the 2019/20 project)

Project Code: 020-00-90-263

Project Status: Funded since 2018/19; 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 other boulders were moved into the main river channel. In 2018/19 BRTF carried out site improvements with an ACA grant. More deficiencies at the site were identified and more improvements and maintenance work were carried out at Policeman's Flats throughout 2019, such as removal of instream rocks (that could not be removed in 2018) and upgrades

to the culver intake and outflows across the causeway from the county road to the park lot. In conjunction with this work, BRTF volunteers carried out a bank erosion prevention initiative of planting willow saplings. The BRTF committed to maintain the site, and contracted waste disposal and port-a-potty services throughout 2019. The objective to enhance river access for the fishing community was met, and the improvements and ongoing maintenance continue to benefit the public's use and enjoyment of this site.

Deliverables/Results:

- All site work has been completed, including in stream work that could not occur in 2018.
- Willow saplings were planted in spring of 2019 to stabilize the bank.
- Bins and portable toilets are onsite with collection contracts in place.
- A clear and unobstructed access to the Bow River for public use by boat anglers and other recreational river users was accomplished.
- On-site signage is in place.

Post-Secondary First Pheasant Mentor Hunt Program

Calgary Chapter Pheasants Forever Canada Society

Grant: \$4,850

Project Code: 030-00-90-296

Project Status: New; Completed

Project Website: www.pfcalgary.ca

Pheasants Forever Calgary recruited and trained 42 post-secondary students from the Cities of Calgary and Lethbridge on how to hunt upland gamebirds with a focus on pheasants. Participants were students from Lethbridge College, University of Lethbridge, University of Calgary, and Mount Royal University. All students were provided with a full day of professional development. The students enjoyed seminars on upland gamebird biology, hunting upland gamebirds, and cleaning and preparing upland birds. The students were then personally trained to improve their shooting skills by professional instructors followed by a mentored hunt with expert coaches, dogs, and dog handlers. The hunt is as close to being a live hunt as any trip afield could be.

Results/Deliverables:

- A total of 42 students were put through the comprehensive one-day program at two different events. One event was held at Spruce Creek Upland Club on Sept. 14, 2019 with 19 students from University of Calgary Firearms Association and from the student chapter of Backcountry Hunters and Anglers in Calgary. The second event was held on Oct. 26, 2019 at ACA's upland gamebird habitat experimental property, the Enchant Hilton. 15 students from Lethbridge College, Renewable Resource program and eight students from the University of Lethbridge Backcountry Hunters and Anglers Association attended the event.
- The students were provided professional instruction on: life history and conservation of upland gamebirds, strategies and tactics for hunting upland gamebirds, safety instruction and upland gamebird simulated shooting, simulated pheasant hunts with mentors' professional dog handlers and experienced pointing dogs, and cleaning and cooking of upland birds.

CFGA Pheasant Crate Upgrade for Remaining Crates

Calgary Fish & Game Association (CFGA)

Grant: \$2,948.40

Project Code: 030-00-90-291

Project Status: Funded in 2018/19; Completed

Project Website: www.calgaryfishandgame.com/pheasants

The 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 crates' condition decline further. In 2018/19, 50 new aluminum game bird crates were purchased to continue to raise and release pheasants without risking injury to the birds and volunteers. An additional 35 additional crates were purchased in 2019/20 to have enough for their pheasant program.

Results/Deliverables:

- 35 additional new crates were purchased and engraved with ACA's and CFGA's logos.

Pop-Up Archery Range for Youth Education

Calgary Fish and Game Association (CFGA)

Grant: \$2,500

Project Code: 002-00-90-299

Project Status: New; Completed

Project Website: www.calgaryfishandgame.com

The CFGA has a booth at the Boat and Outdoors Show every year, running an interactive fishing pond for children and providing conservation education information to visitors of the show. The CFGA's goal was to introduce kids to the sport of archery in a safe and fun way. This project will reach more children and educate them about archery, as this is a growing aspect of CFGA's involvement within the community. A pop-up archery range will provide children with a safe introduction to archery. The portability of this pop-up archery range will allow CFGA to conveniently set up archery at various events such as their annual fundraising banquet.

Results/Deliverables:

- A blow-up archery booth was purchased. Alberta Conservation Association's and CFGA's logo were added to the archery booth.
- It was used at the Calgary Boat and Outdoors Show in 2019.

Enhancing Conservation Areas within Camrose County

Camrose County

Grant: \$36,652.56

Project Code: 020-00-90-273

Project Status: New; Completed

Project Website: www.county.camrose.ab.ca/content/tillicum-beach-park

Fishing is a favorite outdoor pastime for many Albertans with many frequenting locations within Camrose County throughout the year. This project enhanced the conservation areas within the County's boundaries. Selecting geographic areas spread throughout the County

gives more of Alberta's youth the opportunity to experience and interact with nature. With day use and overnight camping options available at these sites, an increase in tourism can be expected. Tillicum beach adjacent to Dried Meat Lake is the County's most popular site that has received two new adjustable aluminum docks for anglers to fish off. Due to concerns of whirling disease, no fish stocking took place in 2017, depleting inventories and requiring the need to restore populations. Windsor Lake received approximately 1,793 brook and rainbow trout. Camrose County Nature Conservatory (CCNC) will receive approximately 1,692 rainbow trout. Aeration systems were installed into the CCNC to increase over-winter survival rates.

Results/Deliverables:

- Two docks were installed. Camrose County is pleased to report that the docks were installed by the contractor and have been well received. Lots of positive feedback was received from people at the park and on social media (and it has been very busy).
- Fish were stocked at Windsor Lake and the CCNC. This fish stocking has also been well received. Although Camrose County doesn't have statistics on the numbers of fish caught this season, they have had inquiries on the fishing from people who haven't been there before, so that indicates more fishing is occurring.

2019 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, 2017/18–2019/20; Completed

Project Website: www.facebook.com/CamrosePurpleMartinFestival

The Camrose Purple Martin Festival (CPMF) committee held its 10th annual festival on June 15, 2019. The festival was a one-day public celebration of nature, birds, and greenspace with a focus on purple martins. The CPMF involves a collaboration between the 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 CWSS. The CWSS strives to create 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 offered several activities, including demonstrations by purple martin landlords, a keynote address by Dr. Lu Carbyn (scientist emeritus, Canadian Wildlife Service), a keynote address by Dr. Dorothy Hill (biology professor, Mount Royal University), a purple martin research overview by Glen Hvenegaard (sciences professor, University of Alberta Augustana), a bus tour to an active martin colony, children's activities highlighting purple martin and wildlife natural history, and information booths. The festival attracted approximately 80 people who provided very positive feedback. The festival also resulted in recruiting additional landlords and more local publicity (at least two local newspaper articles).

Results/Deliverables:

- The CPMF attracted approximately 80 people to the festival on June 15, 2019 (which was close to the anticipated number of participants). A debrief session was held on June 24, 2019, evaluations were

received from participants, and an evaluation of the event was written up (e.g., likes, dislikes, future interest, and local economic impacts).

- Two articles were published about the CPMF and conservation in the local newspaper (in June and July 2019).
- Participation was increased in the volunteer Purple Martin Landlord Program by two people (August 2019).
- The list of contacts was updated regarding future wildlife stewardship and educational activities (June 30, 2019).
- The planning manual was updated for future Camrose Purple Martin Festivals (August 2019).

Healthy Habitats: Getting Albertans outside to enjoy, value and use Alberta wilderness

Canadian Parks and Wilderness Society - Southern Alberta Chapter (CPAWS SAB)

Grant: \$20,000

Project Code: 002-00-90-253

Project Status: Funded since 2016/17; Completed

Project Website: www.cpaaws-southernalberta.org/campaigns/education

This project was designed by the CPAWS SAB 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 on species at risk, watersheds, forest ecosystems, climate literacy, parks and wilderness ecosystems, grizzly bears, and grasslands ecosystems. This was achieved by hiring highly experienced interpretive guides and training them with the latest science, conservation, and curriculum materials. Programming materials were maintained and replenished, and fun and engaging activities were ensured. CPAWS SAB operated with the highest safety standards following a robust organizational risk management plan. The hikes and the benefits of this project were marketed 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, CPAWS SAB inspired youth and new Albertans to engage in stewardship and conservation in Alberta. At the end of the project, participant feedback was used for project improvement. The project objectives were met and exceeded for the Healthy Habitats project with the delivery of 223 interpretive hikes and snowshoe programs to school groups in Grades 3 to 12 and new immigrants, reaching over 4,800 youth, and nearly 600 new Albertans who experienced conservation education in an outdoor setting in the province. Project evaluations showed that 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, 97 percent of participants indicated that their program was fun and that they enjoyed participating in the activities. During these unique wilderness experiences, CPAWS SAB educated participants on conservation and inspired stewardship: 99 percent of participants indicated that they learned something new about conservation and 98 percent stated that they were inspired to care for the environment. 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.

Results/Deliverables:

- Engaged 4,823 Alberta youth (including new immigrant and Indigenous youth) and 598 adult new immigrants in conservation during 223 interpretive hikes and snowshoe treks (191 youth hikes, and 30 new immigrant hikes). In addition, 60 teachers participated in two snowshoe treks as part of their professional development.
- 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 that:
 - 97 percent of participants indicated that they have enjoyed the program and would do it again;
 - 99 percent of participants indicated that they have increased their knowledge about conservation in Alberta; and
 - 98 percent of participants indicated that they would engage in some kind of stewardship because of the program.

Creation of Archery Club and Range

Carbon and District Agricultural Society (CDAS) and Curling Club

Grant: \$3,000

Project Code: 002-00-90-309

Project Status: New; Completed

The CDAS set out to create an archery club and range based out of the Carbon Curling Rink. The range was completed as of May 11, 2019 with a full complement of targets, 3-D targets, and rental equipment (bows and arrows) and was open to all residents of Carbon and surrounding community. Range operation was facilitated by 100 percent club volunteer participation. In its inaugural season, 33 seasonal memberships were sold to participants ranging from seven to over 70 years of age. Between May 11 and Oct. 16, the CDAS was open for 63 daily sessions (minimum twice weekly) and hosted 429 sign ins. This level of membership sales fell within the range of the projected membership sales but was short of the target. However, the number of sign-ins exceeded what CDAS had hoped for. Shooter participation was focused primarily on recreational shooting rather than competitions, and several 3-D shooting nights were held successfully. Another accomplishment of the first season was being able to host a nine-week youth instructional program with a certified instructor, which was attended by eight youth members. Overall, the season was a great success and generated a lot of participation and interest.

Results/Deliverables:

- Archery range was fully equipped and operating as of May 11, 2019.
- The archery club had 33 members in 2019.
- Experienced archers operate the range, facilitate visitors, provide basic instruction, as necessary.
- The focus was on new archers both youth and adult and 55 percent of the membership were new to archery. A youth instructional course was successfully hosted (eight participants).

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

Castor Fish and Game Club

Grant: \$3,000

Project Code: 020-00-90-269

Project Status: Funded in 2018/19; Completed

The overall goal of the project is to conduct a multi-year study of the Parr Reservoir (locally known and referred to in this report as the Castor Creek) for fish suitability. The objectives of the project's second year were: to evaluate water quality through water testing including dissolved oxygen, temperature, ice cover, and laboratory testing for water quality, and to conduct additional research into sources and costs of stocking yellow perch. Information obtained during year two testing was summarized in a report submitted to Alberta Conservation Association (ACA) and shared with other interested parties. Laboratory testing of water samples was unfortunately not completed in year two, neither was any spring or summer sampling due to a lack of volunteers. A winter sampling event in March was attempted but was unsuccessful as the dissolved oxygen probe malfunctioned and could not be repaired within time or budget of the project. Two winter sampling events did take place successfully; dissolved oxygen, temperature, and water and ice depth were collected. The values indicate that dissolved oxygen is low, but is within survivable levels for yellow perch. These were similar results to year-one data. Local Alberta fisheries' biologists were contacted to determine additional steps, such as permitting and costs to transfer native species such as yellow perch in the Castor Creek. Other groups, including the Battle River Watershed Alliance, were also contacted and support and additional information was offered. These groups indicated that sharing data as well as continuing with the study would allow them to assist and make plans that may lead to stocking of the Castor Creek. Their suggestions were utilized in planning for year three of study. Information collected in year two of study indicates that further study is still needed to determine the suitability of the Castor Creek for fish survival.

Results/Deliverables:

- The results of this year's study indicated that dissolved oxygen values are low, but still within the potential for yellow perch survival as pockets with higher dissolved oxygen values are present. Ice cover was less this year compared to last year and overall water depths were also decreased compared to previous years.
- While researching the feasibility, cost, and sourcing of yellow perch, a lot of support for the project was found. Alberta fisheries' biologists are looking to conduct fish transfers and stocking in surrounding waterbodies. The additional information that this project is collecting is likely to encourage them to consider the Castor Creek for future stocking and transfers. The biologists suggested further studies could be conducted and sharing information collected in this study on Fisheries and Wildlife Information System (FWMIS). The suggestions given were utilized for planning of data collection and budgeting for the 2020/21 season.
- Winter water testing was carried out, during which dissolved oxygen, ice and water depth, and temperature were recorded (January and February 2020). A third attempt to collect winter data occurred on March 11, 2020, but the dissolved oxygen meter malfunctioned during

sampling so dissolved oxygen data was not collected in March 2020.

- Research on costs and feasible sources of yellow perch occurred this season by collaborating with Alberta fisheries biologists, local partners such as the County of Paintearth and the Battle River Watershed Alliance, and various Environmental Consulting companies working in the province and attempting the same work.
- A summary report with data and information collected during the 2019/20 season was submitted to ACA.

Ross Creek Conservation Site Food Plots Planting

Chinook Pheasants Forever (CPF)

Grant: \$3,250

Project Code: 015-00-90-273

Project Status: New; Completed

Project Website: www.pheasantsforeverchinook.ca/news/2019-winter-wheat-project/

Ross Creek Conservation Site is located 15 km east of Medicine Hat just off the Trans-Canada highway and is 1,097 contiguous acres of mixed habitat ranging from native prairie to riparian vegetation. It is a heavily used conservation site, as it is one of Alberta Conservation Association's (ACA's) designated pheasant release sites with hunters coming from all over Alberta to pursue these birds, plus, many deer hunters utilize it starting in the September bow season. The project objectives are: to provide a readily available fall and winter food source for upland game birds and ungulates, to produce more and healthier wildlife, to provide overhead protection for the upland birds from predators, to reduce stress on the released birds, to produce more wildlife for the hunters that utilize this Conservation Site, and to provide nesting cover for ground nesting birds. CPF, with approval from ACA, has over the last three years put in food plots at the Ross Creek Conservation Site. In 2019, both food plots were replanted to winter wheat which will provide wildlife with a readily available high energy food source plus cover for ground nesting birds. Through the spring and summer, food plots were sprayed several times to control the weeds (especially Canada thistle). In September, seed was purchased, soil was prepped, and seed was planted in both food plots. Timely moisture through the fall ensured germination and robust growth before winter freeze up. The winter wheat is going into the spring growing season in fantastic shape with high moisture content in the soil.

Results/Deliverables:

- Two food plots totaling 11 ac were planted to winter wheat. As the winter wheat grows in the spring of 2020 it will provide cover for ground nesting birds. When it matures by the fall of 2020, it will provide feed for the wildlife at the Ross Creek Conservation Site through the fall and winter. This high energy food source will help the wildlife come through the winter into the critical spring fawning and nesting period, which hopefully will result in more and healthier wildlife.
- Several hundred people were reached through the CPF Facebook page and website (updated October 2019).
- This project was presented to attendees of CPF's March 13, 2020 banquet via PowerPoint and the emcee (approximately 300 attendees).

Sauder Reservoir Habitat Project

Chinook Pheasants Forever (CPF)

Grant: \$26,970

Project Code: 015-00-90-274

Project Status: New; Completed

Project Website: www.pheasantsforeverchinook.ca/projects/sauder-peninsula-project/

This is a collaborative project between St. Mary River Irrigation District (SMRID), Alberta Conservation Association (ACA), CPF, Calgary Pheasants Forever, and South Eastern Alberta Watershed Alliance (SEAWA) to enhance approximately 156 acres of land (which borders Sauder Reservoir) by establishing several multi-row shelterbelts on land owned by SMRID. This is an ecologically significant riparian and upland buffer along Sauder Reservoir which will improve water quality, re-establish riparian buffers, improve fish and wildlife habitat and increase recreational opportunities. This is a multi-year project to improve water quality on southern Alberta reservoirs, which has diminished to the point where boil water advisories have been issued on some of these reservoirs. This also coincides with a reduction in habitat and buffers along the boundaries of these reservoirs due to agricultural encroachment. The loss of these buffer strips has also reduced the numbers and variety of wildlife that formerly used these natural areas to live. The goal is to re-establish these buffer areas to create a healthy ecosystem, which will help clean-up the water in these reservoirs; it will improve fish habitat and increase the numbers and varieties of wildlife that live along these reservoirs. Approximately 8,700 shrubs along with landscape fabric were ordered late 2019 and early 2020. The landscape fabric and shrubs will be installed in the spring of 2020. The site will be monitored to confirm improvements in water quality and in the habitat for wildlife.

Results/Deliverables:

- The project is slightly behind schedule due to an abnormally wet fall, which did not allow ACA to prepare the land because of soft conditions. This will happen in the spring of 2020 along with the installation of the landscape fabric; the planting of the shrubs will follow shortly afterwards as planned. The replacement of the old fencing and installation of the new fencing will be completed this year on schedule.
- 8,700 shrubs to be planted in spring of 2020.
- 275 m of wildlife friendly fencing to be installed by August 2020.
- 156 ac of lakeshore buffer created and managed by June 2020.
- Approximated four km of shoreline and riparian area protected.
- 156 ac of enhanced habitat for wildlife.
- Approximately 17,000 people will view this project on Facebook.
- Video publication to be completed by September 2020.

MarshKeepers - Conservation through Volunteer Empowerment

Ducks Unlimited Canada (DUC)

Grant: \$5,500

Project Code: 015-00-90-275

Project Status: New; Completed

Project Website: www.ducks.ca/initiatives/marshkeepers

The MarshKeeper program started in Alberta four years ago as a pilot program for DUC, as for some time volunteers were asking to do more than just raise funds. After three years, people who signed up to be MarshKeepers saw it as a success and DUC have decided to continue the program for the foreseeable future. Having volunteers check in on projects and do minor maintenance allows DUC's conservation staff to focus efforts on other projects. In 2019, with the help of this Alberta Conservation Association grant, volunteers were brought together from across Alberta on four occasions. It was an opportunity for DUC to teach volunteers the importance of conservation, why volunteers are so important to DUC's mission, and to show them why they value their time and commitment as a volunteer. It also provided an opportunity for DUC to thank them on a personal level for what they do for conservation in this province. Classroom time was spent with DUC's staff from various business lines explaining their roles, and field time where volunteers got to increase their knowledge of wetlands, bird identification, and watershed importance. It was also an opportunity for volunteers to meet and talk to other likeminded conservationists. The feedback was all positive.

Results/Deliverables:

- Two field tours were held: one in the north based out of Edmonton on June 15, 2019 (27 volunteer participants), and a second one in the south based out of Calgary on June 23, 2019 (24 volunteer participants).
- In May 2019, a MarshKeepers boot camp was held in Red Deer which included classroom sessions in the morning and field sessions in the afternoon with 33 volunteers.
- The feedback at each session was that more group events are needed; volunteers commented how much they learned, how much they enjoyed seeing different DUC properties and the comradery with fellow volunteers.
- Throughout the summer, DUC had a rotating group of volunteers who went to Bow Habitat Station on a bi-weekly basis to keep the wetland area cleaned up.
- These events were advertised on social media and in the Alberta Inside newsletter.
- Volunteers under the MarshKeeper program inspected approximately 26,000 ac of land last year.

Land Stewardship and Monitoring of New Natural Areas in Beaverhills Biosphere Reserve

Edmonton and Area Land Trust (EALT)

Grant: \$7,650

Project Code: 015-00-90-271

Project Status: New; Completed

Project Website: www.ealt.ca/smith-blackburn

The primary goal of this project was to enhance wildlife habitat at the Smith-Blackburn Homestead, an EALT Conservation Site. This resulted in three main objectives: removing fencing to make the land more wildlife friendly, reducing the extent of invasive plants on the land, and engaging volunteers in stewardship activities that benefit wildlife and their habitat. The main activities that were engaged in by staff and volunteers included the removal of page wire within the interior of the conservation land and removal of barbed wire from a section of the property boundary fence. Invasive plants were reduced through manual removal, and Canada thistle was specifically targeted through the release of biocontrol insect, the stem gall fly. As a result of these activities, all the main objectives were completed. All of the fencing wire that needed to be removed from the conservation land was successfully removed. Invasive plants, mainly Canada thistle and white cockle, were removed on five different volunteer days, which helped toward the goal of reducing the extent of weeds on the land. Lastly, volunteers were engaged in a variety of stewardship activities that aided in improving wildlife habitat. There were many achievements of this project. One of the most impressive was the number of volunteers engaged with stewardship activities on the land. EALT initially anticipated having about 20 volunteers help at the conservation site, but the final number of volunteers engaged was 82.

Results/Deliverables:

- Removed 400 m of page wire fencing from inside the conservation land. This was done by a group of eight volunteers at a one-event day. An additional 400 m of barbed wire fencing was removed from the south boundary of the conservation land. This was done by a group of seven volunteers in one event day.
- Twenty containers of gall flies were released at six release points, each covering a one-meter radius, to help control Canada thistle. This was done by a staff member and a volunteer.
- Manual removal of Canada thistle and some white cockle was also done over the course of three volunteer days, with a total of 65 volunteers engaged in this stewardship activity.
- A total of 82 local volunteers were engaged (over five volunteer event days) to aid in these and other stewardship activities.
- Due to the many volunteers engaged in this project, all eager to visit one of EALT's newest lands (which are not yet open to the public and slated to open in summer/fall 2020), EALT were able to complete additional stewardship work at the site at the same time as the wire and weed removal, such as cleaning nest boxes and installing an educational sign.

2019 Invasive Species Management at Glenbow Ranch

Glenbow Ranch Park Foundation (GRPF)

Grant: \$12,400

Project Code: 015-00-90-272

Project Status: Funded from 2015/16 to 2017/18 and 2019/20;
Completed

Project Website: www.grpf.ca

The primary objective of this project was to maintain and (where possible) restore the integrity of the natural ecosystems at Glenbow Ranch Provincial Park. The continued efforts in using biocontrol methods to manage hound's tongue (through the release of weevils) was so successful that weevils will not have to be purchased and released in 2020. This success was the result of a continued focus on vegetation management at Glenbow Ranch and an example of the need for year over year management of invasive species. This year the GRPF began using the application ArcGIC Collector to survey invasive species. This application, which is much more efficient than past methods used, allowed for mapping of 100-point features consisting of ten invasive species, 19 lines of four species and 124 polygons of nine species. Using ArcGIC Collector to record the percent canopy cover and distribution of invasive species will also allow GRPF to assess the results of the program and set goals in a more meaningful way. Detailed analysis of this data will occur in the new year by Alberta Parks staff. This analysis will help determine where to focus vegetation management efforts in 2020. Due to time constraints, GRPF were unable to complete the herbicide applications for smooth brome control in 2019. However, the mapping and other preparation work was completed, including the construction of specialized wicking applicators, so that herbicide application can be done in spring 2020. The project also worked to increase public awareness of the importance of controlling invasive species and enhance public understanding of these activities to the integrity of the native grasslands. Volunteers played a key role in weed pulls and weevil release activities. A total of 366 volunteer hours were focused on vegetation management in 2019. These volunteer opportunities were great educational opportunities for all who took part, including not just GRPF volunteers, but corporate teams as well. A news story was aired on Global Calgary about the success of using weevils at the park. Lastly, programming was delivered to over 1,500 area students through the Explore Grasslands programming. Children learned about invasive species, pollinators, ungulates, grassland management, and the need to steward these lands for the future.

Results/Deliverables:

- A decrease in the amount and variety of invasive species at the park: mapping of historical hound's tongue infestations has found that this species does not occupy more than ten percent canopy cover in any polygon. Those polygons generally had 30 to 80 percent canopy cover of hound's tongue in the past. It seems that extensive hand pulling and herbicide application from 2012 to 2014 reduced the infestations in the primary management area significantly. Following that, the presence of the bio control weevils has further reduced the population of hound's tongue throughout the park. It now seems that the weevils have achieved something resembling a "natural" balance with hound's tongue, keeping the population low (less than ten percent canopy cover/hectare) without eliminating it completely. This is the best outcome one could reasonably expect.

- A report outlining exactly what species of invasive plants were controlled, by what means, and when is complete.
- Photo documentation of the progress of the invasive species control at the park: photos were submitted with the final report.
- Increased public awareness of the importance of invasive species control: Volunteer opportunities included wildflower counts, hand pulling buttercup, caragana cut back, helping cover up secondary trails which were negatively impacting erosion and native plant species, and other hand pulling activities. The vegetation management work was featured in the GRPF newsletters, on social media, and the use of weevils for biocontrol of hound's tongue was featured in a news story by Global Calgary.
- Delivery of spring school programming related to grassland and pond habitats: The vegetation management assistant supported the school programming team in the delivery nine Explore Grassland Programs at the park in the spring and two Explore Pond Programs. An additional three schools were provided support for grassland programming in the fall of 2019.

Kids Can Catch with Growing Great Kids

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

Grant: \$3,000

Project Code: 020-00-90-265

Project Status: Funded in 2018/19 & 2019/20; Completed

The GGKC hosted the Kids Can Catch (KCC) fishing event in the Hinton community as an engagement opportunity to promote an appreciation for the environment and to promote sustainable fishing practice in Alberta. As an early childhood development coalition, the goal of the GGKC was to promote family engagement, outdoor activity, young children's gross and fine motor skill coordination, and social competencies. GGKC's goals were satisfactorily met as approximately 215 people attend the event, despite the cool and rainy weather. Participants learned to fish with knowledgeable professionals and volunteers to teach them about sustainable fishing practice in Alberta. The Alberta Parks team was also there to educate families about local wildlife, plants, and critters. They set up stations about boat safety and cleaning, wildlife, fishing, and critter catching, which added a great deal of information and excitement to the event. A local food truck was on site with half-price food, Barrow Safety provided first aid (the only need was a bandage for a small injury resulting from a fishing hook). Team members from Parent Link and the Youth Centre were also there to help run the event and youth volunteers also helped. GGKC were happy to introduce many families to a sustainable fishing culture and to our natural parks and spaces. 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 our hope that the GGKC, in cooperation with other stakeholders, can support the Kids Can Catch event as an annual event for years to come.

Results/Deliverables:

- The KCC event was held July 6, 2019 at Kelly's Bathtub with 215 participants. This was a good turnout considering the dreary, rainy weather experienced the day of the event.
- Positive feedback was received from event participants. Comments from the participant surveys done the day of the event:

- "These interactive activities are one of our favourites! Thank you."
- "Everything was great."
- "So much fun! What a wonderful family experience. Thank you."
- "Love the fishing rod rental."
- "Amazing info and work."
- "Loved the bug catching!!"
- Many community collaborators helped make the event a success, including Alberta Parks, Hinton Family and Community Support Services, Parent Link, the Youth Centre, Alberta Health Services, Resident Care Foundation, Morad Communication, and Barrow.
- Eight community volunteers with knowledge about fishing attended the event to support new anglers.
- Local radio stations provided free on-air promotion.
- The Hinton Voice newspaper provided free pre-event promotional coverage.

H. A. Kostash School Youth Mentorship Program

H. A. Kostash School

Grant: \$8,000

Project Code: 020-00-90-209

Project Status: 2014/15, 2016/17 and 2017/18 and previously by R&R Fund; Completed

H.A. Kostash School's many wildlife programs are extremely popular among the students and have grown over the years. With over a hundred students participating in the Wildlife/Outdoor Education and Archery Program (this is close to half the school's population). The Archery Program continues to be popular with Grade 3 to 12 students. The archery teams participated in two tournaments and were able to compete at the Alberta Hunters Education Instructors' Association's (AHEIA) National Archery in the Schools Program (NASP) Provincials until it was closed due to COVID-19 orders. New to the tournaments has been the introduction of 3D shoots, which has been met with eagerness to compete. Unfortunately, the season couldn't be finished due to pandemic and the closure of schools. The mentorship hunt took place in the fall with many first-time hunters experiencing the thrill of a successful hunt. The wildlife students were in the planning stages for their spring trips, which have been postponed until a later date. However, the students were able to participate in a division-wide ice fishing trip to Skeleton Lake. Students from many schools in the division were brought together to build friendships and for some to catch their first fish. With the COVID-19 pandemic many plans were suddenly halted.

Results/Deliverables:

- 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. H. A. Kostash school has become a model for other schools in the division and Alberta.
- The total number of students participating in the outdoor education programs is 175.
- Thirty-six students participated in the division-wide ice fishing day at Skeleton Lake.

- Mentorship hunt: ten students participated in hunter training, firearm safety, and hunting ethics. The students spent a day at the local range prior to a weekend of hunting. Many students experienced their first successful harvest.
- Eighty-six students participated in the NASP Archery Provincials, until the event was cut short.
- Many of the trips planned for the spring were put on hold.

"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 offered by the 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 conservation. In 2019/20, EBN delivered 13 programs to 150 youth participants and 20 adult mentors/participants. There was a slight decrease in program attendance over last year.

Results/Deliverables:

- EBN programs are designed to provide a positive experience for participants and to connect them with nature. Programs are delivered monthly, allowing youth to connect with their peers as well as mentors such as HSNC staff and volunteers, and volunteers from allied organizations.
- The 13 programs delivered in 2019/20 included:
 - Sculpting (eight) – creation of miniature sculptures inspired by plants.
 - Geocaching (23) – teens found hidden geocaches and created two new ones for others to find.
 - Gel Printing (nine) – ink prints were created using objects found in nature.
 - Natural Inks and Dyes (ten) – natural dyes were created using materials found in nature.
 - Wetlands (five) – explored a local wetland with the watershed authority to understand local aquatic invertebrates.
 - Wind Turbines (12) – Lethbridge College instructors toured participants through the Wind Turbine Technology Training Lab. Participants had the chance to test their own wind turbine designs.
 - Forest Forensics (13) – participants were challenged to utilize several scientific methods to understand tree health.
 - Hoop Dancing (eight) – teens discovered cultural connections to nature with a local hoop dancer.
 - Inspired by Nature (22) – participated in a youth art exhibition on display October and November.

- Owls (ten) – teens had an up-close and personal experience with owls from the Alberta Birds of Prey Centre.
- Climbing (eight) – learned a basic wall climbing technique, including how to tie a safe knot.
- Upcycling (12) – looked at ways to extend the life of everyday products such as shirts/sweaters.
- Solar Power (ten) – participants were challenged to build their own solar lantern and explored different forms of energy used to create electricity.
- Whenever possible HSNC incorporates the assistance of allied organizations in program delivery. In 2019/20, HSNC leveraged mentorship and expert leadership from the following community group partnerships: Alberta Birds of Prey Centre, Elissa Wilms, Lethbridge College, Linda Hajash, Maria Livingstone, Oldman Watershed Council, Rotary Club of Lethbridge East, and Southern Alberta Art Gallery.
- HSNC promoted the EBN program with two telephone call outs, 24 Facebook postings, 11 tweets, and six Instagram posts.
- In total, 150 youth participated in the program (a slight decrease from last year).
- Overall, repeat program participation decreased to an average repeat participation of 1.79 in 2019/20 versus an average 2.02 in 2018/19. 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

Grant: \$3,000

Project Code: 015-00-90-254

Project Status: Funded since 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 also affects the 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. This includes removing garbage from the river valley coulees (Coulee Clean-Up), tracking types of garbage found along shorelines (Shoreline Clean-Up), early detection and rapid response in the removal of invasive species (Weed Pulls), and increasing awareness on the issue of dog feces left behind in natural areas (Doggy Doo Doo Clean-Up). On the 12th anniversary of hosting conservation projects, HSNC was proud to increase community engagement in conservation projects to their highest level to date—with 2,068 volunteers donating over 3,303 hours to take part in conservation projects including Coulee Clean-Up, Shoreline Clean-Up, and Invasive Weed Pulls.

Results/Deliverables:

- Ninety-nine Coulee Clean-Ups (1,706 participants), 16 Shoreline Clean-Ups (342 participants) and several Weed Pulls (20 participants) were completed.
- Removed over 545 bags of garbage (including 32 bags of invasive plants) from natural areas throughout Lethbridge's river valley.
- Catalogued and recoded 8,643 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 small plastic pieces (13 percent) and food wrapper (nine percent).
- Engaged 97 community groups to participate in conservation projects.
- The project had local news coverage by Global TV, CTV, Bridge City News, Lethbridge Herald, Lethbridge News Now, B93.3 FM, Country 95.5 FM, and CJOC 94.1 FM.
- Hosted a barbecue for conservation volunteers with 160 in attendance as a thank you and to build community among local stewards.

J.T. Foster School Wildlife Education and Recruitment

J.T. Foster School

Grant: \$3,000

Project Code: 002-00-90-296

Project Status: New; Completed

This project aims to develop the J.T. Foster school wildlife career and technology studies program. Students developed and demonstrated the attitudes, skills, and knowledge required for responsible participation in a range of outdoor activities by attending camps and field days. The school teaches their students to be ethical and safe hunters. This program builds on practical applications for the outdoors through field days, allowing students the time to practice with the equipment they will encounter during hunting, fishing, and outdoor adventures. Students completed the fisher and hunter education courses, campsite visits, and a range day field trip to Alberta Hunter Education Instructors' Association (AHEIA's) Calgary firearms centre.

Results/Deliverables:

- The program grew from ten students in semester one to 21 students in semester two.
- Three students applied for environmental professions in post-secondary.
- Eighteen students completed the fisher education course.
- Thirty-two students completed the hunter education course.
- Students had two classes a week at a campground (space donated by Nanton Lions Club) to practice outdoor skills.
- Students had fly fishing practice.
- Eighteen students went on an overnight camping trip to Coleman Lake on May 28 and 29, 2019.
- Students went on a range day field trip to AHEIA's Calgary Firearms Centre on Oct. 29, 2019.

Conservation Community

Legacy Land Trust Society (LLTS)

Grant: \$3,000

Project Code: 002-00-90-305

Project Status: New; Completed

Project Website: www.legacylandtrustsociety.ca

The main goal of the Conservation Community project is to engage both rural and urban residents in conservation and stewardship efforts in their own backyard. The program has three objectives: raise the public awareness of conservation work happening in the community; share information on wildlife habitat and related topics; and foster a community where social networks are formed around the stewardship and conservation. This project involved providing a presentation to 92 Grade 7 students at Hugh Sutherland School. The presentation focused on pollinators and the efforts that we can take on large and small scales to conserve their habitat. This presentation emphasized the importance of pollinators to our food system, their habitats, and the threats to their populations. This has been a pilot project for LLTS and they look forward to continuing to deliver more presentations the future. As a result of this program, LLTS has had people interested in getting involved with more programming, such as creating bee hotel and bird house building workshops. Thanks to this program a meaningful dialog has been created regarding conservation efforts in both rural and urban areas. LLTS hopes to keep the momentum of the program up and continue building on what has been created.

Results/Deliverables:

- Over 90 Grade 7 students learned about LLTS conservation programming. The unexpected results of the program were the blooming demand for the program and the interest from the community. For example, LLTS is currently discussing the opportunity to have students build bee hotels. This could include one for students to place in their own backyard and another to be given to the town of Carstairs for a park/public area. This was a pilot to see what an educational conservation program would look like and LLTS is thrilled with the traction it has created amongst the community.
- The programming yielded the following results and showed the following changes in knowledge pre and post presentation: 72 percent of students' knowledge increased regarding protection of pollinator habitat and 71 percent of students' knowledge increased regarding how pollinator habitats are affected by chemicals (e.g., pesticides and herbicides). 95 percent of students agree or strongly agree they enjoyed the presentation. 75 percent agree or strongly agree they will use what they learned at home. LLTS believes these are numbers are meaningful and believes it makes their programming worthwhile.

Avian Monitoring and Outreach Education Programs at Lesser Slave Lake

Lesser Slave Lake Bird Observatory Society (LSLBO)

Grant: \$24,500

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 LSLBO has been operating 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. They used 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 106,000 birds representing over 150 species were visually recorded, with an additional 4,352 birds banded from 67 species. Fall migration during 2019 was the busiest ever for LSLBO with banding records for many new 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 357 birds from 36 species were banded. Of 67 detected species, 29 were confirmed to have bred in at least one site. 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 88 northern saw-whet. The LSLBO continues to support collaborative research projects on boreal bird species with forest industry and academics. Final reports were completed for all projects and provided to stakeholders and funders.

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 400 outdoor education programs and hands-on interactive programs to over 10,500 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, hands-on programs were provided to 3,675 visitors of all ages on the importance of the boreal forest.

Results/Deliverables:

- Three core avian monitoring programs were successfully delivered: Spring/Fall Migration Monitoring, MAPS program, and Northern Saw-whet Owl Monitoring program. Over 106,000 birds were recorded during visual counts, and 4,797 birds were banded during all monitoring programs. The Fall Migration Monitoring was the busiest fall ever at the LSLBO with over double the average capture rate. All data has been submitted for species population trend analysis.
- Year-round outdoor education programs were delivered to over 10,500 students and public across the Lesser Slave Lake Region. All program lesson plans and resources are available to other educators (available on request).
- 2019 LSLBO Annual Report.
- Published article which used capture and observation field data from the LSLBO's Spring Migration Monitoring program from 1994 to 2014:
 - Lehtikoinen, A., Lindén, A., Karlsson, M., Andersson, A., Crewe, T.L., Dunn, E.H., Gregory, G., *et al.* 2019. Phenology of the avian spring migratory passage in Europe and North America: Asymmetric advancement in time and increase in duration. *Ecological Indicators*. 101 (2019): 985–991.
- Two peer-reviewed articles currently under review or accepted for publication with LSLBO contributions:
 - Roberto-Charron, A., *et al.* in review. Population-specific migration routes of a threatened Neotropical songbird, the Canada warbler (*Cardellina canadensis*).
 - Oliver, R., *et al.* 2020. Behavioral responses to spring snow conditions contribute to long-term shift in migration phenology in American robins. *Environ. Res. Lett.*

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-educational-programs

MVC has been in partnership with Alberta Conservation Association (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, encourage biodiversity and maintain fish and wildlife habitat. REEP uses the following means: providing a 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 MVC 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 MVC 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 17 projects funded through REEP. This resulted in 14 more producers who are now aware of the importance of beneficial management practices and sustainable agriculture. Of these projects, five producers have also signed new conservation agreements with Alternative Land Use Services (ALUS) for projects focused on wetland enhancement.

Results/Deliverables:

- In 2019/20, 17 projects were funded through REEP: eight fencing projects, seven off-site watering systems, one creek crossing, and one planting project. The total area surrounding water bodies that has been fenced off this year is 130.4 ha and five km of new riparian fence has been installed. This results in 14 more producers who are now aware of the importance of beneficial management practices and sustainable agriculture. Of these projects, five producers also signed conservation agreements with ALUS for projects focused on wetland enhancement. Not all approved REEP projects were completed due to a wet fall and early winter. Three multi-year ALUS projects were completed. It is becoming more common for projects to take longer to complete, due to the larger scope of ALUS projects.
- Focusing on specific watersheds and partnering with other organizations doing work in the watershed has become an important

aspect of the program. MVC was excited to partner with ACA, in 2019, on the riparian conservation project on Dogpound Creek. Two joint meetings were held with landowners, which resulted in one signed agreement and a second one in progress.

- REEP ads run in the newspaper regularly, pamphlets are handed out at events, and the MVC website promotes the program.
 - Website: www.mountainviewcounty.com/content/applications-sought-reep-alus-projects
 - Newspaper Articles: www.albertafarmexpress.ca/2019/06/27/alberta-producers-practice-land-stewardship-for-the-long-term
www.mainstnorth.ca/farmers-looking-to-do-their-part-to-keep-carbon-in-the-ground
- Multiple events have been hosted with an average of 25 attendees monthly at workshops. REEP information is displayed and examples of completed projects are highlighted at workshops and during presentations to encourage more participation. Highlights include:
 - Presentation to East Olds Dairy Group with Red Deer County and Alberta Agriculture on Environmental Farm Plans (EFP), the Canadian Agricultural Partnership (CAP), and REEP (Jan. 22, 2019).
 - Hosted EFP workshops at the MVC office and provided information on REEP (March 4, 2019 and Nov. 19, 2019).
 - Hosted a Solar Workshop and provided information on REEP (May 15, 2019).
 - Soil Health Field Day with Dr. Jill Clapperton hosted with Foothills Forage and Grazing Association (June 12, 2019).
 - Get the Dirt on Soil Health with Dr. Kris Nichols, hosted with Grey Wooded Forage Association and the Food Water Wellness Foundation (October 24, 2019).
- Project profile sheets are completed for each project that is funded and are available upon request.
- Riparian Health Assessments on 2019/20 projects are complete and available. All multi-year projects were visited to take completion photos. Three ALUS sites were visited with a professional photographer, who also captured some great drone footage of the projects.
- Five-year follow-up riparian health assessments on the 2014 projects were completed; landowners are encouraged by the measured improvements resulting from their projects and this has sparked renewed interest in building on this success and sharing it with others.
- Six ALUS participants had their contracts come up for renewal this year; sites were visited, and a project monitoring report card was completed with the producer at each site and renewal agreements were completed. It was exciting to visit participants who were up for renewal and see their pride in the positive changes on the landscape; of special note was the increased wildlife in the project areas.
- REEP projects are available for tours and road signs may be posted. In 2019/20, MVC again supported Open Farms Days with ten farms participating. MVC hosted a bus tour to three of the participating farms on the Saturday, August 17, 2019. Additionally, the MVC Agriculture Service Board toured an eco-buffer project site in October and it was a great opportunity for the board to see this type of project in its first year to gain an understanding of the labour required in the first years

to have a successful planting. MVC's ALUS program was expanded in 2019 to include funding for eco-buffers based on the biodiversity potential offered, funding was approved for two project sites.

- MVC estimates that one-on-one conversations were held with 75+ landowners around beneficial management practices, an additional 2,595 ac of land are managed with increased sustainability and five km of wildlife-friendly fencing has been installed.

Nature Kids Family Nature Nights and Field Trips Across Alberta

Nature Alberta

Grant: \$10,400

Project Code: 002-00-90-264

Project Status: Nature Kids funded since 2014/15 and previously by the R&R 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 eight years to be a successful and sustainable project in Edmonton. The average attendance has been 80+ people/event/year over the eight years FNNs have run (2012 to 2019). FNNs reached a new level of popularity in the last couple years, averaging 104 people/event in the summer of 2018 and an average of 86 people/event in the summer of 2019 and an average of 49 people/event during the winter FNNs. This year Nature Kids also decided to host three field trip events in three different cities in Alberta, where participants took school buses to various provincial parks and natural areas in Alberta. Unfortunately, the Lethbridge field trip was cancelled. Nature Kids had a total of 605 people attend the summer and winter FNNs and 60 people attend the field trip events. Nature Kids took on the long-standing Snow Goose Chase event this year, where two buses of families were brought out to the Beaver Hills Biosphere to learn all about spring migration and the snow geese that migrate north to Beaver Hills every year, as well as learning about other cool Alberta wildlife. A total of 57 people attended this event, for a grant total of 722 participants this year. All 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 Nature Kids chose to host field trips and the Snow Goose Chase to offer ways for families to get outside to natural areas they may never have been to by providing transportation. All events were free to the public and featured local experts thereby addressing the problem that children today do not have enough access to nature-based activities. Throughout the course of 2019/20, Nature Kids brought themes such as wildlife in the city, wet and wild (all about water), precious pollinators, way of the woods (all about forests and trees), beautiful bugs, indigenous summer, as well as a hibernation event and multiple field trips to Elk Island National Park, Mount Yamnuska, and the Beaver Hills Biosphere. Nature Kids collaborated with several organizations to bring these events to the families of Alberta, with new organizations participating this year such as the Edmonton Urban Coyote Project, Alberta Chapter of the Wildlife Society, Alberta Amphibian and Reptile Conservancy, Alberta Community Bat Program, Work Wild – Alberta Tree Products, and cultural Indigenous instructors. Nature Kids also collaborated with Miquelon Lake Provincial Park, the Edmonton Nature Club, and the Beaver Hills Biosphere Reserve Association to host their Celebrating Wildlife event and Elk Island National Park. Nature Kids also collaborated with the Canadian Parks and

Wilderness Society and the Alberta Institute for Wildlife Conservation to host their field trip events. This project was a huge success and Nature Alberta is happy to continue to offer these types of events to the families of Alberta.

Results/Deliverables:

- The main results of this project were that over 700 people attended the ten various events and 100 volunteers helped with the Nature Kids FNNs and other events through 2019/20 across the province.
- Six summer FNNs were held in Edmonton with a total of 517 participants and 75 volunteers participating throughout the summer. The Winter FNN in Edmonton was successful with 88 people in attendance, and eight volunteers.
- Two field trips were hosted in Calgary and Edmonton with 60 people and six volunteers who attended. The Lethbridge field trip was cancelled due to booking issues.
- Nature Kids took on the organization of the Snow Goose Chase (the name of the event was changed to Celebrating Wildlife) this year. It was scheduled for April 27, 2019, but it was postponed until May 4, 2019 due to poor weather. 57 people participated with 11 volunteers. This date change meant fewer people participated as two buses had to be cancelled at the last minute.

An Integrated Pest Management Strategy for Tackling Non-Native, Noxious Weeds Across Alberta

Nature Conservancy of Canada (NCC), Alberta Region

Grant: \$35,000

Project Code: 015-00-90-279

Project Status: New; Completed

Project Website: www.natureconservancy.ca

With the support from this grant, the NCC Alberta Region was able to run a broad-spectrum and innovative program for weed management across the province. NCC was successful both in their proven methods of weed management such as hand-pulling and spraying as well as more innovative solutions such as targeted browsing and biocontrol agent release. NCC also informed the general public's weed awareness and engaged conservation volunteers to help manage the spread of noxious species on some of the NCC properties. This project was all about using a diverse set of methods to target and hinder the spread of non-native, noxious weeds across Alberta. NCC's strategy for tackling weeds involved a strategic, seven-tiered approach including: weed mapping, targeted spraying, targeted browsing, hand-pulling, biocontrol agents, weed primers, and weed awareness and education. The battle against invasive weeds in Alberta is on-going, and in 2019 NCC amplified their efforts thanks to this grant by greatly increasing weed control and education efforts across the province. Certified weed sprayers were contracted across Alberta and experimented with targeted browsing by goats to tackle larger weed patches (easily the cutest form of weed control in existence!). To help spread the word on weed management in Alberta, ten weed-related stewardship events were held where volunteers learned about the impacts of non-native, noxious species, management options, and identification. NCC also armed the public and conservation volunteers with PlayCleanGo boot brushes to help them prevent the spread of noxious weeds. The goal being that these combined efforts will greatly help slow the spread of noxious weeds across Alberta, keeping habitat healthy for our fish and wildlife and all Albertans to enjoy.

Results/Deliverables:

- Forty NCC properties were mapped for invasive species and chemical control was implemented on more than 30 projects across the province. An estimated 480 ac was targeted with spray and 28 ac managed with hand-pulling.
- Targeted browsing using goats was implemented on two projects in 2019, and the results on one of the projects are very encouraging. Invasive species density on this project has decreased from 2019 and continued success is expected with targeted browsing on this site. The second targeted browsing project has had less successful results, and NCC is exploring other control options for the area.
- Biocontrol agents were released on 14 NCC projects in 2019 and NCC will continue to monitor these sites for successful establishment. An estimated 12,000 biocontrol agents were released.
- NCC is working on creating methods to assess the success of these control methods and hopes to continue implementing these methods in 2020.
- One thousand boot brushes were distributed.
- Eight weed primers were created.
- Twenty-five percent of all conservation volunteer events focused on weed removal or mitigation.

Fish Habitat Restoration in NE and Central Alberta Lakes

North East Alberta Fish & Game Association (AFGA)

Grant: \$15,000

Project Code: 020-00-90-274

Project Status: New; Completed

The project's objective is to develop Fish Habitat Restoration Plans for several lakes in north-east and central Alberta and to implement actions that will lead to improved fish habitat and improved water quality to benefit Albertans. Several lakes in north-east and central Alberta that use to be fish-bearing are being assessed with some funds and volunteers from Alberta Conservation Association (ACA), AFGA, and other organizations. With increased water levels, it is expected that the fish habitat will recover without continual lake aeration. Several lakes provided excellent fish habitat prior to the decline in water levels, which resulted in unsuitable fish habitat. The value of such information may lead to improved fish habitat in several lakes. ACA could adopt this information and incorporate aeration in several other lakes. Alberta lakes that no longer provide fish habitat and fish resources should be assessed and restoration plans established and implemented. Fish habitat and water quality status of several lakes was assessed by conducting winter dissolved oxygen testing by a volunteer workforce. The current status of the fish inhabiting the lakes will be determined by volunteers with support from AFGA. Aeration opportunities and possibilities will also be determined. The lakes assessed included the following lakes that used to be producers of pike, perch, and in some lakes walleye and lake whitefish: Muriel, Upper Mann, Lower Mann, Missawawi, Cache, Bonnie, Jackfish (West of Edmonton), Lac Delorme, and Frenchman. The project also gathered information on three man-made borrow pits adjacent to Highway 63.

Results/Deliverables:

- Project Report: Northeast and Central Alberta Lakes Fish Habitat Restoration Feasibility Winter 2019-20 Monitoring Report. EnviroMak Inc. March 27, 2020.
- An article was written in Lakeland This Week, April 28, 2020.

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

Northern Lights Fly Fishers/TUC Edmonton Chapter (NLFF TUC)

Grant: \$8,997

Project Code: 020-00-90-197

Project Status: Funded since 2012/13; Completed

Project Website: www.nlff.org/grayling

In 2019, NLFF TUC continued to collect data in support of a multi-year initiative (2011 to 2019) 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 2019 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) capture evidence of non-compliance with angling regulations or other land use concerns; and 4) perform water quality analysis to determine if there are any current issues or impediments to future stocking or use of streamside incubators. 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 Arctic grayling populations 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 the Alberta Environment and Parks (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.

Results/Deliverables:

- Over 33,000 images were captured at 15-minute intervals at each wildlife camera site. Six photographs of non-compliance with angling regulations (total closure of Upper Pembina River) were recorded. Two jet boats were observed at one of the sites. The data was shared with AEP.
- Water temperature data was recorded and provided to AEP for input into the provincial database.
- Video data was captured, with particular focus on potential areas for installation of streamside incubators.
- Water quality was analyzed at eight sites. Sixty-five parameters (pH, temperature, minerals, metals, etc.) were measured from each sample, and only one parameter exceeded guidelines. Although the data is preliminary, the inference drawn is that water quality is not an issue nor is it an impediment to future restocking activities.

- Additional video was captured at remote sites near TransCanada Pipeline crossing and on Nelson Creek and other tributaries. The cumulative total number of video files is over 500 minutes of content in 121 files.
- A PowerPoint presentation will be updated and delivered after presentation to the NLFF TUC club in April 2020. Water temperature analysis will be included in the presentation.

Fishery Enhancement - Beaumont

Northern Lights Fly Fishers/ TUC Edmonton Chapter (NLFF TUC)

Grant: \$9,250

Project Code: 020-00-90-276

Project Status: New; Completed

The goals of this project were to: increase awareness of and support for recreational angling in Beaumont, Alberta by its citizens, city administration and elected officials; increase public awareness of Alberta Conservation Association's (ACA's) trout stocking program, trout species stocked by ACA in Beaumont's Don Sparrow Lake (previously known as Beaumont Pond), responsible angling practices, and the dangers of dumping fish and aquarium plants in local waterbodies; encourage and help facilitate a partnership between the City of Beaumont and ACA for maintaining and enhancing the Fish Stocking Program in Beaumont in future years; and free up resources for ACA to expand its Fish Stocking Program to other municipalities. NLFF TUC provided volunteer input to the creation of Beaumont's Recreation Master Plan especially regarding the recreational, social and economic benefits of maintaining and promoting a local recreational fishing opportunity. With the agreement from the City of Beaumont administration, NLFF TUC then purchased and stocked 2,500 (20 cm) rainbow trout in Don Sparrow Lake which was then supplemented by the stocking of 250 brown trout by ACA. NLFF TUC then designed and had manufactured signage for the lake illustrating the differences between the two trout species and providing information on responsible angling practices. In addition, NLFF TUC arranged for Alberta Environment and Parks (AEP) to provide the City of Beaumont with signage for the lake and for all the city's storm water ponds regarding the illegality and dangers of dumping fish and aquarium contents. An article, "Don Sparrow Lake – Bringing Nature to the City" was written by NLFF TUC and published in "Beaumont News" describing the history of the fishery, the stocking program, responsible angling practices, and the dangers of introducing invasive species. In addition, NLFF TUC provided some angling education at the lake including assistance with ACA's Kids Can Catch event, introducing new immigrants to fishing and teaching other individuals how to catch a fish. The City of Beaumont administration drafted a letter of thanks to ACA's CEO for its many years of stocking Don Sparrow Lake. This was signed by the City of Beaumont Mayor who then invited NLFF TUC to make a presentation to City Council at its public meeting on Oct. 22, 2019 in support of NLFF TUC's recommendation to council that the City become a Corporate Partner in Conservation with ACA.

Results/Deliverables:

- A total of 2,500 rainbow trout were purchased by NLFF TUC and stocked by the end of May 2019. Brown trout were provided by AEP and also stocked in May 2019.
- Ongoing discussion with City of Beaumont administration and city council led to increased awareness of ACA's support for the Don

Sparrow fishery. A letter of thanks to ACA from the Mayor to ACA's CEO, and a motion was recommended for the city to become an ACA Corporate Partner in Conservation.

- Signage was installed at the lake to increase public awareness of the trout species stocked.
- Unexpectedly, the city decided to rename the lake from Beaumont Pond to Don Sparrow Lake in memory of a former long-term MLA from the area. ACA replaced its information sign at the lake to reflect this change.
- Signage was obtained from AEP for the lake and all stormwater ponds in the city regarding the illegality and dangers of dumping aquarium fish and plants. Signage was installed by the city.
- An article was written by NLFF TUC and published in "Beaumont News" regarding the stocking program, the benefits of and best practices for recreational angling, and the dangers of invasive species.

Birdhouses

Oneway & District Fish & Game Association (OFGA)

Grant: \$2,500

Project Code: 030-00-90-102

Project Status: Funded 2006/07–2009/10, 2013/14, 2016/17–2010/20; Completed

Project Website: www.ofga.ca

The goal of this project was to build 750 birdhouses for wild birds each year, as well as educate and provide awareness to OFGA members and the public at large about the importance of safe habitat for birds in the wild. As OFGA work with youth to build these houses, the youth also learn some valuable woodworking skills along the way. OFGA successfully built and distributed over 400 houses between April and September 2019. Due to time/volunteer constraints and a restructuring of the OFGA's youth club, OFGA was unable to complete a fall workshop, and fell short of the goal of 750 birdhouses. Although they did not reach their goal this year, it is still one of their most popular events and has been a successful project to date. OFGA plan to continue this project into the future on an annual basis.

Results/Deliverables:

- A "cutting bee" was held in late spring 2019 where volunteers prepared materials for the birdhouses to be assembled.
- The following building workshops were held: two workshops at space generously donated by Cabela's Edmonton South, a community birdhouse build at the Oneway Heritage Days Pancake Breakfast, and a birdhouse build for the public organized by the OFGA Youth Club at the Oneway Heritage Days in June 2019. All these events are supervised/manned by volunteers of the OFGA. Attendees of the workshops took home their own birdhouse to mount in a suitable location.
- Over 400 birdhouses with OFGA members and with families from the public.

Wildlife and Native Habitat Enhancement in Red Deer County via ALUS (2019)

Red Deer County (RDC)

Grant: \$40,000

Project Code: 015-00-90-128

Project Status: Funded similar projects since 2006/07; Completed

Project Website: www.rdcountry.ca/207/conservation

The project goal is to work with landowners who wish to implement actions on their land, to conserve or improve riparian and native range habitat in 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 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 are 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. Alberta Conservation Association 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 342 ALUS projects, initiated by 26 landowners, throughout RDC.

Deliverables/Results:

- Twenty-six RDC landowners have been supported with financial and technical resources for their 342 on-the-ground riparian and/or native range habitat enhancement/stewardship projects on their land. The impacts of these 342 projects: 694 ac of riparian and/or native range habitat, 16 km of river and stream, and 338 ac of waterbody will be conserved and/or enhanced through sustainable management. Approximately 1,420 animal units will be impacted in the new livestock management regimes.
- These projects include: 24 off-site watering systems, 45 riparian or range management fencing projects, one berm, four riparian, 12 tree/shrub plantings, 15 creek crossing, and 241 waterbody, riparian, or upland wildlife habitat improvement-through-management change projects.

- Eleven 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 nine workshops/tours/field days (total attendance about 350).

Pheasant Pen Replacement Program

Red Deer Fish & Game Association (RDFGA)

Grant: \$14,412

Project Code: 030-00-90-292

Project Status: New; Completed

Project Website: www.reddeerfishandgame.com/programs

The goal of this project was to replace and repair a 20-year-old pheasant pen. This would enable the RDFGA to continue with its Alberta Pheasant Program. This program introduces young people to shotgun safety, shot shell diversity, shot shell patterns and clay pigeon shooting. These young hunters also get experience on walking safely with a shotgun, watching the dogs for any indication of a bird, while noting the position of other hunters, and only firing when safe to do so. The students also learn how to clean their birds. Each year the program has around 100 students enrolled. To make the program affordable, RDFGA raise their birds from locally supplied pullets. With an unexpected donation of material, equipment, and better pricing on the net, RDFGA were able to increase the height and size of the pheasant pen. This will result in the ability to increase the program with any increase in demand and allows the birds to forage for food and have more room. The project is now complete with 400 pullets making the pen their new home.

Results/Deliverables:

- The new larger pheasant pen was completed in the summer of 2019 with 210 volunteer hours.

Junior Palaeontologist II Day Camp

River of Death and Discovery Dinosaur Museum Society (operating as Philip J. Currie Dinosaur Museum)

Grant: \$1,980.76

Project Code: 002-00-90-311

Project Status: New; Completed

Project Website: www.dinomuseum.ca/programs/summer-camps

The Philip J. Currie Dinosaur Museum prides itself in offering high-quality programs for affordable pricing to keep the programs available for as many participants as possible. One of the popular summer programs is the Summer Camp programs. There has been a demand to increase program offerings and the Junior Palaeontologist II Day Camp was created to fill this demand. The goal was to create a more scientific and palaeontological knowledge-based camp for children ages nine to 16. The camp ran from Aug. 19 to 23, 2019. While the maximum number of participants was 20, this camp only had 12 participants, the smaller number created a more close-knit environment for engagement and learning. With this funding Philip J. Currie Dinosaur Museum was able to purchase additional microscopes for examination of rocks and fossils,

and hydrochloric acid, which was used in rock sample testing. Many of the participants and even a couple leaders had not before had the chance to see the reaction between different minerals and hydrochloric acid; this type of experience is what the project is aiming to create. The campers had unique scientific experiences both at the museum and on the two field trips to known local fossil localities: Pipestone Creek Park and Klusken Hills Provincial Park. Positive reviews were received from all campers and their parents, which shows the quality of this programming and demand to continue the summer camps.

Results/Deliverables:

- This brand-new day camp 'Junior Palaeontologist II' ran from Aug. 19 to 23, 2019. There were 12 participants in total. One participant came from Japan and another from America, the rest were local. There were two camp leaders, and two camp assistants from the local area as well.
- Through camp activities, participants gained a new understanding of Alberta fossils as well as culture. Since there were participants from outside Alberta, the camp emphasized the importance of our land formation, wildlife, and laws. Also, through camp activities, the sciences were prompted and encouraged. Participants were put into a science environment and were able to do hands on activities and labs, safely and effectively. The participants of the camp gained a deeper appreciation for the sciences, which promotes a new generation of scientists and science-minded citizens. However, this camp had other aspects to it as well. The program promoted things like friendship, cooperation, and problem-solving skills (all skills that will help the children in their upcoming school year).

Summer Day Camps

River of Death and Discovery Dinosaur Museum Society (operating as Philip J. Currie Dinosaur Museum)

Grant: \$1,763.62

Project Code: 002-00-90-312

Project Status: New; Completed

Project Website: www.dinomuseum.ca/programs/summer-camps

The education department of the Philip J. Currie Dinosaur Museum has been delivering high-quality summer programming since 2011. The aim is to keep all program high quality, but at affordable pricing in order to keep these programs available for as many participants as possible. Week-long summer day camps started in 2017 with increased demand for more offerings, dates and age ranges. Due to this demand, the museum ran three weeks of full-day week-long camps in addition to the new Junior Palaeontologist II Camp. The specific goals of these camps were to offer a higher quality and more science focused camps. During the summer, two Jurassic Journey camps ran (July 8 to 12, 2019 and Aug. 6 to 9, 2019). This camp is an introductory full-day camp for ages seven to 11. For many of the campers it is their first time attending a full-day camp and their first experience in a fully immersive paleontological camp. Complete with two field trips to local sites, it provides participants with a small sample of the world of palaeontology. The Junior Palaeontologist Camp is for youth ages eight to 13 and ran from July 22 to 26, 2019. This camp is designed for slightly older children, ideally those who have already attended the Jurassic Journey camp as it builds upon what was learned in Jurassic Journey. The number of participants was lower than initially anticipated, with six participants for the July Jurassic Journey Camp, ten participants in

the July Junior Palaeontologist camp and 11 participants in the August Jurassic Journey camp. The smaller number of campers allowed for a more close-knit camp with high engagement and learning. Overall, the camps were very well received. Extra supplies were purchased, and new activities were added to the camps, such as creating a diorama of the paleo environment. The museum was able to offer a unique camp experience at the museum, Pipestone Creek Park, and Klusken Hills Provincial Park.

Results/Deliverables:

- The Jurassic Journey camp ran twice, July 8 to 12, 2019 with six participants and again Aug. 6 to 9, 2019 with eleven participants. The Junior Palaeontologist Camp ran from July 22 to 26, 2019 with ten participants. There were 27 participants in total from the three camps. There were two camp leaders, and two camp assistants.
- Participants learned the basic concepts of paleontology, as well as other sciences, through hands-on activities and crafts which furthered their paleontology knowledge. With all the materials provided by this grant, participants created their world of paleontology and learned from it.

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: \$3,825

Project Code: 002-00-90-235

Project Status: Funded in 2015/16, 2016/17, 2018/19, 2019/20; Partially Complete

Project Website: www.safewater.org

The project goal was to send hands-on water testing kits to schools in Alberta for students to use on field trips. SDWF sent three High School Operation Water Drop (HS OWD) kits to Katrina Bruin at Mary Butterworth, a junior high school in Edmonton; one Operation Water Pollution (OWP) kit, three Elementary Operation Water Drop (EL OWD) kits, three HS OWD kits, and three Operation Water Biology (OWB) kits to Adam Argento at Oilfields High School in Black Diamond; and one OWP kit, five HS OWD kits and five OWB kits to Deborah Sharhan at St. Joseph High School in Red Deer. Katrina and her 90 students planned to test the water at Beaumaris Lake, Adam and his 90 students planned to test the water in Kananaskis Country at Sheep River and Champion Lakes, and Deborah and her 80 students planned to test the water at Bower Ponds and the Red Deer River. These kits were not used as of March 31, 2020, as the teachers preferred to use the kits later in the spring.

Results/Deliverables:

- A total of 24 water testing kits were sent out to three teachers by May 30, 2019. These kits were to be used by during field trips by 260 students. The teachers were planning on using these kits spring 2020, but given that schools closed in March 2020 due to COVID-19, the kits have not been used. Teachers will send reports to SDWF when the kits are eventually used.

Archery Program

Southern Alberta Bible Camp (SABC)

Grant: \$2,500

Project Code: 002-00-90-216

Project Status: Funded in 2014/15, 2015/16, and 2016/17; Completed

Project Website: www.sabc.ca

The main goal of this archery program was to provide an engaging and challenging experience in a safe and fun context with the result of a general appreciation of the outdoors and outdoor activities. SABC accomplished this goal by using the funds provided by Alberta Conservation Association (ACA) to better equip their range with bows and arrows, so that campers were able to have the best experience they could. Every camper, who was in the archery program, experienced four days of lessons that included a wildlife conservation/education lesson that focused on different species of deer, archery safety, proper use of bow and arrow, and practice shooting. From these lessons, campers were able to learn how to use bows safely and correctly, intentionally connect archery with hunting through wildlife conservation, and help campers understand their role and responsibility in environmental stewardship. With many SABC campers coming from an urban context, having them go through the archery program allowed them to experience and enjoy an outdoor activity all while learning and developing skills to prepare them for other outdoor activities they may participate in. Throughout the ten weeks of summer camp, 407 campers participate in this program and every camper was sent home with a report card showing their progress through the week and a mention of SABC's partnership with ACA. Alongside summer camp, SABC offers one-hour introductory archery sessions for rental groups who come to the camp and offer archery as an activity for other day camps and winter retreats that they are involved in.

Results/Deliverables:

- Over the ten weeks of summer camp SABC had 407 campers participate in the archery program.
- Every participant was sent home with report card that showed what they accomplished that day and their progression over the week.
- A fully operational archery range and equipment thanks to the grant received.
- Trained archery instructors provided by SABC.
- With rental groups, day camps and winter retreats, SABC have the great opportunity of running archery at an introductory level for many kids who may never get the chance to try archery anywhere else.

Pelletry Program

Southern Alberta Bible Camp (SABC)

Grant: \$1,500

Project Code: 002-00-90-236

Project Status: Funded in 2015/16, 2016/17 and 2019/20; Completed

Project Website: www.sabc.ca

The main goal of SABC pelletry program was to provide an engaging and challenging experience in a safe and fun context resulting in a general appreciation of the outdoors and outdoor activities. SABC believe that this was accomplished by using the funds provided by Alberta Conservation Association (ACA) to better equip their range with

new pellet guns and targets, so that campers were able to have the best experience they could. Every camper who was in the pelletry program had four days of lessons that included a wildlife conservation/education lesson that focused on different species of bears, firearm safety, proper use of firearms, and practice shooting. From these lessons, campers were able to learn how to use firearms safely and correctly, intentionally connect firearms with hunting through wildlife conservation, and understand their role and responsibility in environmental stewardship. With many campers coming from an urban context, having them go through this pelletry program allowed them to experience and enjoy an outdoor activity all while learning and developing skills to prepare them for other outdoor activities they may participate in. Throughout the ten weeks of summer camp, 234 campers participated in the program and every camper was sent home with a report card showing their progress through the week and mentioned the SABC partnership with ACA.

Results/Deliverables:

- Over the ten weeks of summer camp SABC had 234 campers participate in the pelletry program.
- Every participant was sent home with a report card that showed what they accomplished that day and progression over the week.
- A fully operational pellet gun range and equipment thanks to the grant received.
- Trained pelletry instructors provided by SABC.

Bird/Bat Box Project

Spruce Grove Fish & Game Association (SGFGA)

Grant: \$2,000

Project Code: 030-00-90-293

Project Status: New; Completed

Project Website: www.sprucegrovefishandgame.org

The objectives of this project were to educate youth about local wildlife and increase membership and expand participation and awareness of the SGFGA among local youth and their families. The plan was to distribute nesting boxes at various functions in the Spruce Grove vicinity. SGFGA cut out and assembled 400 plus songbird nesting boxes and 20 bat roosting boxes. The songbird boxes were distributed to youth participants at the SGFGA's picnic in the park event, the family fishing day, the Kids Can Catch event and at monthly meetings. New members and families have been attracted to the club with this effort. The children were shown how to assemble the bird boxes and instructed on how to care for them well into the future. The bat boxes will be installed at some conservation sites in the spring to improve roosting areas and survival of bats in the Spruce Grove area.

Results/Deliverables:

- Nest boxes: 400+ songbird nesting boxes and 20 bat roosting boxes were cut and assembled.
- It is estimated this project has increase awareness in over 4,000 people in the Spruce Grove area when taking into account the relatives and friends of the children who received a bird box kit.
- The bat boxes will be installed at some conservation sites in the spring to improve roosting areas and survival of bats in the Spruce Grove area. The only delay to this project was deciding to wait until the spring thaw to install the bat roosting boxes. This would help ensure they can be secured in areas that will not restrict the bats ability to make the best use of them.

Lac Delorme (George's Lake) Access Improvement

St. Paul Fish & Game Association (St. Paul FGA)

Grant: \$5,000

Project Code: 020-00-90-277

Project Status: New; Extended until December 2020

Fish stocking has been stopped at Lac Delorme (George's Lake) due to poor access to the lake shore. Furthermore, with increased water levels the perimeter access, shore angling or boat access has been restricted. By improving the road (a distance of 300 m), access for fish stocking and for anglers, and small boats would result in increased angling opportunities in Alberta. The project objectives are to: improve road access for fish stocking; improve access for anglers to reach lake shore; increase angling opportunities; and maintain the integrity of the landscape for fish and wildlife. This project is still moving forward; the St. Paul FGA is now finalizing a public land disposition application. Currently St. Paul FGA volunteers have spent a total of approximately five days in field trips to the site and another 40 hours of time on this project.

Results/Deliverables:

- The application for a recreation lease to be named after Mr. Mike Grekul (the person who donated the land) is now being reviewed by Alberta Environment and Parks and the Public Lands Division. Alberta Conservation Association has been assisting with the application.
- Volunteers have provided site-specific information towards the completion of the application. The County of St. Paul has already supported the project and the construction is awaiting the issuance of the recreation lease.
- The application process has been verified and the current process requires review by Indigenous peoples.
- Construction will occur later in 2020.

Environmental Opportunities Enhancement

Sturgeon School District

Grant: \$15,000

Project Code: 002-00-90-297

Project Status: New; Completed

This project allowed students within the Sturgeon Public School Division to have increased opportunities to connect with nature, learn about ecosystems, sustainability, and conservation. It afforded students the chance to experience outdoor activities such as archery, canoeing, animal identification and tracking, orienteering, hiking, snowshoeing, and other outdoor pursuits. The exposure to these outdoor experiences promoted conservation awareness and activities. The students who benefitted from the outdoor activities gained increased respect for the natural world, increased knowledge of ecosystems and wellness. This project provided additional opportunities to encourage students to spend more time outside, pursue outdoor activities they had not previously been exposed to, and to help increase students understanding and responsibility for their natural world.

Results/Deliverables:

- Over 1,000 students from Grade 1 through 12 participated in nature-based learning, estimated at more than the 880 students.
- Groups participated in various activities such as: learning angling regulations and angling opportunities, canoe instruction and paddling opportunities, stewardship learning, conservation learning

(including a presentation from the Nature Conservancy Canada), trapping presentations, wildlife identification from skulls, scat, antlers, furs, feathers, tracks, homes, survival skills including shelters and fires, ecosystem analysis, soil analysis, tree identification, forestry practices, weather tracking, orienteering, snowshoeing, backcountry skiing, nature journaling, bird watching and identification, archery, hiking, fish and wildlife presentation, outdoor games, trip planning, connecting with nature using their senses and Indigenous learnings.

- Eighty percent of the schools in Sturgeon Public School Division brought at least one group to the Outdoor Classroom and two thirds of the schools brought three or more groups.
- An unintended outcome was that more students have registered and participated in high-school based Physical Education Outdoor Leadership courses.

Taber Fish & Game and ACA Youth Fishing Recruitment Day

Taber Fish & Game Association (TFGA)

Grant: \$18,900

Project Code: 020-00-90-207

Project Status: Funded 2018/19 & previously funded via Lethbridge Fish & Game Association; Completed

On June 1, 2019, the 9th annual youth fishing day was held. This year the event had amazing weather, and an incredible turn out of youth and volunteers, with 520 youth in attendance aged one to 17. All youth were supplied with the fishing gear they needed to fish the day of the event and maintain their fishing careers in the future. It was incredible to see the shores lined with youth catching trout, learning about proper fish handling and catch and release procedures. Several volunteers were on site, assisting with the release of fish and showing youth and adults the benefits of going barbless. TFGA worked with the kids to show them the unique markings and colors of rainbow trout and showed them what other markings trout can have that make them unique. The kids were encouraging each other and teaching each other. TFGA taught several youths how to start a new reel with line, as well as tying on hooks and pickerel rigs. Youth were in the water assisting volunteers on releasing fish, and right in there getting their hands dirty. Overall, this year was an incredible success! TFGA were also able to develop a great report for the fisheries biologists with detailed listings of the fish caught including species and overall length. A total of 32 fish were entered, measured, and released. Fish smaller than 15" were not entered to keep the overall casualties low. Not one casualty was recorded this year.

Deliverables/Results:

- Five hundred and twenty youth attended the event. All youth were given fishing equipment and take-home packages.
- The event will be featured in a 2019 fall episode of Fishing the Wild West with Wes David.
- The main organizer was nominated by many of the youth and adults in attendance to win a fishing trip to promote youth in the outdoors.
- The event was featured in the Taber Times.
- Social media presence has expanded by 30 percent since promoting the 2019 event.
- Posters were distributed by volunteers throughout southern Alberta.
- Post cards were mailed to all previous participants.

Taber Fish & Game Outdoor Day and Antler Measure

Taber Fish & Game Association (TFGA)

Grant: \$2,500

Project Code: 002-00-90-298

Project Status: New; Did not proceed

Every year the TFGA holds an outdoor day and antler measuring day. There are product vendors, antler/horn displays, activities for youth, food and drink vendors and promotion of all upcoming events throughout the year. With this grant, TFGA were looking to further engage the children under 17 at this event. Unfortunately, due to unforeseen circumstances this event did not take place this year.

Results/Deliverables:

- This grant was not used due to the organizer being unable to take on the project for unforeseen personal reasons.

Winter Family Fun Fishing Day

Taber Fish & Game Association (TFGA)

Grant: \$9,528.13

Project Code: 020-00-90-272

Project Status: New; Completed

On Feb. 8, 2020, TFGA embraced their 9th annual Family Fun Fishing Day at Sherburne Lake. The morning started with a little bit of snow, and then the sun started to shine. Fifty kids accompanied by parents, guardians and grandparents attended throughout the day. All youth in attendance each received a take-home bag filled with a toque, barbless hook, tape measure, ice safety printout and sunglasses. A few pike and perch were caught and released back into the lake. Everyone in attendance had a great day enjoying the outdoors on the lake with family and friends.

Results/Deliverables:

- In total 100 people attended the fishing day at Sherburne Lake (kids, parents, guardians, grandparents, and volunteers). All youth in attendance (50) were given fishing equipment and take-home packages.
- All fish caught this day were released back into the lake safely.
- The Facebook page now is at 493 after this event, many have shown interest in attending in the years to come.
- Bass Pro Shop kindly donated 10 percent off all equipment purchased and 25 percent off ice augers and ice huts.

Botha School Wildlife Education Program

The Botha School Society

Grant: \$2,625

Project Code: 002-00-90-310

Project Status: New; Completed

The goal of the project was to increase students' knowledge, awareness, and appreciation for local wildlife. The kindergarten students had the most time to explore outdoors, observing the kestrel nesting box and studying local pond life. The students were always happy to be outside and had lots of questions about the pond creatures. The entire school

enjoyed participating in the games and activities with the Buffalo Lake Nature Club. The field trip to the Royal Alberta Museum was a highlight of the school year. Parents and staff members were responsible for small multi-age groups of students during the facility tour. Students particularly enjoyed the fully preserved buffalo, appreciating the surprising height and the dense coat of hair. Other areas they related to was the pond life exhibit and the native wasps. The trip to the museum could only have been undertaken with the use of the charter buses. Traveling this distance with young children requires washroom facilities and a safe vehicle.

Results/Deliverables:

- Participation: 62 students worked with two Buffalo Lake Nature Club members; 13 students participated in the kestrel nesting box activities; 13 students were involved in the wetland studies; 64 students participated in the trip to the Royal Alberta Museum.
- Nine parents and six school staff members acted as supervisors.

Kids Can Catch 2019

Town of Cochrane

Grant: \$3,000

Project Code: 020-00-90-278

Project Status: New; Completed

The Kids Can Catch event in June 2019 was a huge success. The project's goal was to have families connect to each other while exploring the outdoors. The project's objectives were to enhance understanding of what is required to care for fish, parks, and natural environments, to have people feel more connected, and to have increased confidence trying new activities. Fishing rods were purchased to give to participants. Fishing experts and volunteers were on hand to support learning of children and their families (newcomers, new to fishing, those impacted by poverty where the purchase of the fishing rod was impossible due to financial constraints). The event encouraged and promoted lifelong interest in connecting with nature through angling, utilizing parks, within the community and the province.

Results/Deliverables:

- Registration for this event was full immediately after it was published in the community guide.
- The project was successfully completed on June 15, 2019 with 200 children attending. The total attendance was 500 (including parents and relatives).
- The pond was stocked by Canadian Tire, Town of Cochrane, and Alberta Conservation Association.

Bringing Back Bull Trout

Trout Unlimited Canada (TUC)

Grant: \$30,000

Project Code: 020-00-90-275

Project Status: New; Completed

Project Website: www.tucanada.org/looking-for-clues-the-case-of-the-missing-bull-trout

TUC's Bringing Back Bull Trout – Tay River project involved assessment of the threats facing bull trout in the Tay River watershed, incorporation

of this information in a remediation plan to address problem areas, and dissemination of this information through public engagement via on-the-ground rehabilitation and assessment activities in the watershed, social media, open house, and project signage which will be installed at key access points in the region. Alberta Conservation Association (ACA) funding of the project was critical in supporting three primary components: 1) Riparian Health Inventories (RHI), which were completed by Cows and Fish in August 2019; 2) assessment of off-highway vehicle (OHV) trails in portions of the Tay River watershed, and 3) preparation of an OHV remediation plan. The main results of the project were the completion of monitoring and assessment efforts throughout the watershed to better understand the issues impacting aquatic habitat in the Tay River watershed in the context of bull trout recovery. An OHV trail inventory was completed and assessment in select portions of the watershed and compilation of a report detailing the findings of this work. RHIs were completed at nine sites, and a summary report with recommendations for future efforts to maintain riparian health in the watershed. Overall, the watershed is rated as healthy with a score of 88 percent. Data was assessed from water temperature data loggers that were deployed and retrieved from ten sites throughout the watershed on the mainstem of the Tay River and tributary sites. Overall findings indicate that water temperatures during the 2019 season were generally suitable for bull trout with a few periods of higher than optimal temperatures occurring at sites on the lower mainstem of the Tay in August. Electrofishing inventories were conducted at 30 sites (three TUC, 27 Alberta Environment and Parks) in partnership with AEP fisheries management including one site hosting a volunteer workday to engage the public. Results of the electrofishing inventories were somewhat disappointing as no bull trout were captured at any of the sampling sites. A partnership with Alberta Agriculture and Forestry and the Foothills Research Institute collected field data for validation of the Road Erosion and Delivery Index (READI) model to help calibrate the model and allow for prioritization of potential point sources of sediment pollution in the watershed for remediation in subsequent project years. A summary report/remediation plan was completed for the project synthesizing information from all of the above information sources for the Tay watershed in 2019. This document will help guide additional rehabilitation efforts by TUC and partner organizations in the 2020 and 2021 field seasons to support bull trout recovery in the watershed.

Results/Deliverables:

- To date, 83 volunteers have been engaged during three volunteer workdays, an open house event in Red Deer, and a TUC Central Alberta Chapter meeting.
- Riparian habitat has been improved and protected at one large site as opposed to two smaller sites. The large riparian rehabilitation site included the entire right downstream bank of the Tay River (~300 m) at the Tay River Campground where live willow staking and wattle fencing was installed during two volunteer workdays in June 2019.
- Digital copies of completed 2019 RHIs (Summary document submitted with final ACA report).
- Digital copy of OHV trail/stream crossing assessment and remediation plan report (Summary document submitted with final ACA report).
- Summary of temperature assessment, sedimentation model results/activities, fisheries assessments (electrofishing assessments and spawning surveys).
- Education of public and TUC/project partner audiences through social media and "News Stream" posts relating to the project reached 8,067.

Stream Rehabilitation Training (SRT) Program

Trout Unlimited Canada (TUC)

Grant: \$11,900

Project Code: 020-00-90-271

Project Status: New; Completed

Project Website: www.tucanada.org/stream-rehabilitation-training-program

The Stream Rehabilitation Training (SRT) project achieved its goals of training over 50 professionals, and volunteers in the science and application of watershed and stream rehabilitation. By teaching others how to improve our natural infrastructure (e.g. floodplains, stream valleys, wetlands), Alberta's freshwater resources can be more resilient and sustainable. In preparation for the workshops, TUC updated the workshop manuals one to three and the presentation slides with new content and images. A comprehensive marketing plan was developed, which enabled TUC to promote the program in an organized and thoughtful manner. A comprehensive list of potential program participants was generated throughout the province and personal invitation letters were sent out to target audiences. As a result, TUC saw participant enrollment in the workshops from a variety of backgrounds including all levels of government, environmental organizations, watershed alliances, universities and colleges, Indigenous peoples, TUC members and volunteers as well as industry partners and consulting agencies. From November 18 to 21, 2019, 52 participants from a variety of backgrounds took part in the first set of this workshop series. Success was measured in the high registration numbers, positive comments, and high interest in the upcoming second set of workshops four to six. The workshops provided time to mentor through answering questions and promoting discussion on the topics presented. According to post workshop surveys, over 75 percent of the participants felt it was useful to extremely useful in improving their knowledge and skills to undertake successful stream rehabilitation work planning. Participants also indicated the course resulted in improving their knowledge in the following: understanding river systems, developing a plan, knowing the key elements of a rehabilitation plan, and knowing the human elements and legislation related to stream rehabilitation. With the Alberta Conservation Association support, TUC was able to offer a sliding scale of discounts to university and college students, Indigenous people and TUC members and volunteers interested in this valuable learning opportunity. This first series of workshops provided registrants the knowledge and tools needed to understand and access watershed and stream systems, recognize and diagnose problems and develop rehabilitation plans. TUC looks forward to these registrants moving forward with the knowledge, training, and mentorship they have received to improve water quality, habitat, biodiversity, and overall stream health for the environment and people.

Deliverables/Results:

- Designed, revised, and produced an Alberta-focused program manual.
- Prepared appropriate field site tours and field work sites for program participants
- Trained 52 people in stream rehabilitation techniques through one session: SRT provided 52 people with the knowledge and awareness of environmental issues, so they can engage in problem solving and take action. By investing in this education of people who can restore and protect our water resources they ensure the resources will be available for these user groups and they can, in turn, teach others to make informed and responsible decisions.

- The main results of the project included the following:
 - High registration numbers – 86 percent of target registered.
 - Diversity of participant backgrounds, interest and communities.
 - Very complimentary feedback and testimonials for the workshops.
 - Positive email responses from organizations plus cooperation to promote.
 - Increase in social media presence through likes and shares on SRT posts.
 - There is plenty of interest in the second set of workshops.
 - Continuing interest to become a TUC rehabilitation volunteer for projects.
- Prepared and summarized participant pre- and post-surveys for the workshop series.

Yellow Fish Road (YFR) and Water Edu-Kit (WEK)

Trout Unlimited Canada (TUC)

Grant: \$22,310

Project Code: 020-00-90-211

Project Status: YFR funded since 2014/15 and WEK funded in 2017/18 and 2018/19; Completed

Project Website: www.tucanada.org/yellow-fish-road and www.tucanada.org/water-edu-kits

Yellow Fish Road (YFR) and Water Edu-Kit (WEK) are TUC's premiere environmental education programs which teach youth about storm water pollution prevention, the exploration of the chemistry and science of water, and the importance of water conservation. The need for these programs has never been stronger as water pollution, increased urbanization, overuse, and poor water management are leading to increased nutrient load, contamination, and erosion. Due to overwhelming demands, these programs were no longer sustainable in their present formats. In 2018, TUC launched a self-directed and delivered program model for both programs to accommodate this growing need while advancing the programs with the newest technological standards. As YFR and WEK evolved, some of the key feedback received from participants and partners is the need for concise and straightforward lesson plans for teachers and group leaders. The objectives and deliverables of this grant was to improve and grow these existing programs by making them simpler and more effective to deliver. To accomplish this, TUC contracted professional curriculum developers to research and develop lesson plans for both programs. The planned activities will now ensure that both programs can continue to be key resources for youth to learn about the importance of storm water pollution prevention and the impact of human activities on our water resources. TUC will also focus on specifically targeting their programming to ensure that it reaches more remote communities and underserved groups throughout the province.

Results/Deliverables:

- Through interviews, an environmental scan and design sprint, curriculum developers created two comprehensive lesson plans for the YFR and WEK programs (for the grade levels that the YFR and WEK programs target). The lesson plans were researched and curated so that they can be easily integrated into the lesson plans of interested educators or group leaders.

- TUC staff tested the developed lesson plans during a strategic planning session. Feedback and comments were implemented into the new lesson plans.
- Launch of the new lesson plans will be delayed until all the presentation resources and supplies are in place and re-tested to ensure their effectiveness in the classroom.
- Continued promotion of the new program model through traditional media and newer methodology will occur as the lesson plans are developed with the goal to maintain 2018 participation levels as the programs are improved.
- Participant numbers from 2019/20 of the YFR/WEK programs:
 - YFR had 65 kits ordered with 230 presentations and 6,800 participants.
 - WEK had 50 kits ordered with 120 presentations and 5,000 participants.
- Programs took place in 18 cities including: Airdrie, Brooks, Calgary, Camrose, Coaldale, Devon, Drayton Valley, Edmonton, Fort McMurray, Lethbridge, Medicine Hat, Okotoks, Red Deer, Sherwood Park, and Slave Lake, St. Albert, Wainwright, and Warman.
- Ten events with 14,000 participants at events in six cities: Calgary, Edmonton, Lethbridge, Red Deer, Sherwood Park, and St. Albert.

Promoting Wetland Stewardship and Improving Wetland Habitat in Waterton Biosphere Reserve

Waterton Biosphere Reserve Association (WBRA)

Grant: \$10,856

Project Code: 015-00-90-250

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

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

The overall goal of this project was to build capacity for wetland stewardship and improve wetland habitat within Waterton Biosphere Reserve (WBR). Specifically, the project objectives were to: 1) Identify locations with northern leopard frogs (NLF) and/or locations that have suitable NLF habitat on private lands that would improve regional population connectivity with newly established NLF populations in Waterton Lakes National Park, Magrath and Beauvais Lake areas, and discuss wetland stewardship with these targeted landowners; and 2) 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. WBRA expanded their survey efforts this year to include wetlands in the Magrath region of Alberta. Through field efforts, WBRA connected with six different landowners and completed visual surveys at 25 different wetlands. Further, 38 eDNA samples were collected from 19 of these wetlands. In collaboration with biologists from the Calgary Zoo, who were also working with NLF in the area, eDNA samples were collected from three wetlands within the Town of Magrath. These eDNA samples were analyzed by a Washington State University lab specializing in eDNA analysis. Through the eDNA sampling, one newly known location with NLF present was identified. This location is downstream from the re-established Beauvais Lake Provincial Park (BLPP) population and it is possible that the frogs have expanded their distribution from that area. Also, eDNA was used to detect the presence

or null detection of tiger salamander, striped chorus frog, western toad, long-toed salamander, and Columbia spotted frog, as well as to identify the presence of the chytrid fungus, which is known to impact the health of amphibian populations worldwide. These results have been shared with the participating landowners and submitted all data to the Alberta Government through FWMIS. Further, WBRA have reached a broader audience through their NLF outreach campaign by promoting the project via their e-mail list server, social media, and website. WBR residents were encouraged to submit their NLF sightings. Through these activities, WBRA have advanced their overall goal of building capacity for wetland stewardship in WBR.

Results/Deliverables:

- Visual surveys were conducted at 25 field sites and eDNA samples collected from 19 wetlands (38 samples) were sent to a lab for analysis. The lab detected eDNA in the samples for showing the presence or lack of presence of six native amphibian species including: striped chorus frog (five sites), Columbia spotted frog (one site), northern leopard frog (three sites), western toad (no sites), long-toed salamander (two sites), and tiger salamander (two sites). The lab also tested each sample for the presence of chytrid fungus, a widespread amphibian disease. This was detected at two sites.
- WBRA are pleased to report that the 2019 work identified one previously undocumented NLF population located on private land approximately seven km downstream of BLPP. This is in addition to the five NLF sites identified in the same area through the 2018 surveys. It is possible that the NLF that were re-established in BLPP approximately ten years ago have since self-colonized additional sites on these adjacent private lands. If this is the case, it indicates that the NLF reintroduction effort was fully successful. The eDNA sampling allowed for the detection of several more species than the visual surveys. Notably, the eDNA sampling detected amphibians at several sites where they were not detected visually.
- Field site data sheets finalized.
- Letters to the six landowners connected with during the field efforts were completed. Conversations with the landowners provided an opportunity to discuss amphibians and wetland stewardship, raising their awareness of the value of habitats they manage to wetland species and of the importance of wetland stewardship. The letters to each participating landowner detailed the findings with a map of sites surveyed, results specific to their property, and an information sheet containing descriptions and photos of local native amphibians as well as chytrid fungus.
- In a mailout, a copy of Alberta Conservation Association's "Amphibians on my Land" booklet was included.
- Sightings submitted to FWMIS: all data (amphibian sightings, eDNA results, and other wildlife sightings) were entered into the *FWMIS Random Observation Loadform* and submitted to the regional Alberta Environment and Parks office.
- Continued to promote the NLF outreach campaign, originally launched in 2017, by e-mail to their list server (600+ people) and have shared the information on the WBRA Facebook page and website.
- WBR residents have been encouraged to submit their NLF sightings and stories directly via an e-mail address (northernleopardfrog@watertonbiosphere.com) that was established explicitly for this purpose.

Weaselhead Invasive Plant Program 2019

Weaselhead/Glenmore Park Preservation Society (WGPPS)

Grant: \$2,500

Project Code: 015-00-90-127

Project Status: Funded 2009-10 to 2017/18; Completed

Project Website: www.theweaselhead.com/invasive-plant-program

Spotted knapweed (*Centaurea stoebe*) was first reported in the Weaselhead in 2015 growing along the banks of the Elbow River and manual removal by WGPPS volunteers started in 2016. The goal of the 2019 project was to continue efforts to prevent this species becoming permanently established in the Weaselhead and adjacent Glenmore Parks. In 2019, the project's objectives were to make a comprehensive search for spotted knapweed on all river banks/gravel bars in the Weaselhead and along the edge of the Glenmore Reservoir in Glenmore Park (the only areas to date spotted knapweed has been found), record the location and density of plants, remove all plants found, and add the data to a GIS. These objectives were achieved: a thorough search of target areas was made; heavily infested areas were visited multiple times and much effort invested in identifying and remove first-year rosettes as well as flowering plants; plant material was bagged, weighed and removed for disposal in city weed bins; distribution and location of plants were recorded and data added to a GIS. In total, 136 kg of plant material was removed. The GIS data will provide a baseline against which to measure the success or otherwise of efforts to control the spread of this species in future years. Of special interest will be to see the effect of removing the spotted knapweed first-year rosettes on abundance in 2020.

Results/Deliverables:

- The project was successfully completed as described although unfortunately many more first-year rosettes were found than expected (possibly due to the wet spring) and weeding was more difficult than anticipated. Removal of rosettes almost always required the use of spades to dig out roots rather than hand-pulling as often successful with mature plants.
- First-year rosettes as well as flowering plants were removed. Removing rosettes required better identification skills than when removing only flowering plants. As a result, more work had to be carried out by paid staff as opposed to volunteers, and when volunteers were involved, the staff/participant ratio had to be higher than originally planned.
- A thorough search was made with heavily infested areas visited multiple times.
- A total of 136 kg of plant material was removed.
- Data on location and density distribution of areas infested with spotted knapweed along the edge of the Elbow River and Glenmore Reservoir (with details of amount removed from each area) were mapped on a GIS.
- Four weeding workshops took place with a total of 39 volunteers (very wet weather reduced number of workshops as some areas were difficult to access in wet conditions). Three individual volunteers also helped. Making a total of 42 volunteers that were directly involved in the project.

- Information about the project and promotion of involvement in the project was provided through social media, during ongoing educational programs, and at events, such as the annual Bioblitz, annual picnic and the Annual General Meeting.
- People using the boot-brush station (installed in the park in 2017 by the WGPPS) read information about spotted knapweed on an adjacent sign.

10 Years Later - A Closer Look at Riparian Enhancement Projects in the Beaverlodge River Watershed

West County Watershed Society (WCWS)

Grant: \$22,926.69

Project Code: 015-00-90-278

Project Status: New; Completed

The WCWS supports education and awareness events in the local community as well as Riparian Health Inventories and Assessments. The education and outreach events, in 2019, reached 70 people with community members coming together to learn and talk about the watershed. The Riparian Health Inventory revisit involved reconnecting with nine of the original project landowners, meeting one new one, and reassessing the nine sites that had trees planted, and/or fencing, and/or off-stream watering systems installed by the landowners and partners, and riparian health data collected by Cows and Fish. The landowner conversations gathered their perspectives on what's been happening over the past ten years and the new riparian health data now gives two snap-shots in time of how well those riparian areas are functioning and offered insight into the success of the projects so far. In 2019, three of the sites increased in score enough to move to a higher health category; two more sites had a lower score, but did not change their health category; and four sites did not change overall. The details of each site are unique and variable, but on average, physical alterations were less and the scores for those indicators improved or stayed the same. The average score of the vegetation indicators did not change overall, but individual sites responded differently with some scores increasing, some decreasing, others staying the same. At least 175 unique plant species were found within these riparian areas and 75 percent of them are native, the same proportion as in 2009. Overall, there continues to be a good naturally occurring riparian forest cover, but the success of the plantings from 2009 appears limited within the active floodplain with a bit more success for those planted on higher ground. One goal of the tree plantings in 2009 was to add a bit of diversity to the riparian landscape and that has been achieved though perhaps less than the WCWS would have liked. The other management changes made in 2009 were done primarily to keep livestock away from the water and to let the riparian area rest with the goal of increasing riparian health for sites starting out in lower condition and maintaining health for those that were already healthy and functioning. This seems to have worked as no sites declined from their original overall health category. The WCWS look forward to sharing the results with community at their 2020 AGM.

Results/Deliverables:

- The kick-off community meeting for this project was held on May 14, 2019 in conjunction with the WCWS AGM with approximately 30 people in attendance.
- The spring tour was also held on May 14, 2019 with 51 students plus their teachers from three schools. These two education and outreach events allowed opportunities for community members to come together to learn and talk about the watershed.
- The Riparian Health Inventory revisit had Cows and Fish visiting nine sites that had trees planted, and/or fencing and/or off-stream watering systems installed by the landowners, and riparian health data collected in 2009. This work involved ten landowners at the time and since then only one property has changed ownership. Cows and Fish reconnected with the owners of all of the properties, had one-on-one conversations with them to see what's been happening over the past ten years and then collected riparian health data again in an attempt to gather two snap-shots in time of how well those riparian areas are functioning to offer insight into the success of the projects so far. At the time of this report, in 2019, it appears that three of the sites had scores increasing enough to move up a health category (one *unhealthy to healthy but with problems*, one *healthy but with problems to healthy*, one *unhealthy to healthy*). Two more sites had a lower score but did not change health category. Four sites had less than a five percent variation in score and thus did not change health categories. The details of each site are unique and variable, but on average physical alterations (e.g. soil compaction from livestock trails or hoof shear) were less and the scores improved or stayed the same. The vegetation indicators average score did not change overall, but individual sites responded differently with some scores increasing, some decreasing, others staying the same. Cows and Fish identified 175 unique plant species, a few more than in 2009, of which 75 percent of are native, the same proportion as in 2009. Overall, there continues to be a good-to-excellent naturally occurring tree and shrub cover. A specific survivability study of the plantings done in 2009 was outside of the scope of this project, but as a general observation, Cows and Fish staff did not see many previous plantings that survived the past ten years. However, those that did survive, mostly outside of the active floodplain, are growing well and adding some biodiversity to the riparian landscape within these sites. This is both disappointing and encouraging, but perhaps not unexpected as over the past decade there has been a few years with flooding and many of the seedlings may not have been able to take root in time. In addition to tree planting, any other management changes made by the landowners in 2009 in partnership with Alberta Conservation Association (Beaverlodge Riparian Conservation project) and the County of Grande Prairie's Rural Extension program, were done to keep livestock away from the water and to let the riparian area rest. This seems to have worked as no sites declined from their original overall health category.
- Riparian Health Inventories for ten sites originally inventoried in 2009, includes ten individual landowner meetings, ten individual landowner reports, and a summary report of all sites.
- A follow-up community meeting was planned for May 6, 2020.

Wetaskiwin/Leduc Alternative Land Use Services (ALUS)

Wetaskiwin County

Grant: \$4,500

Project Code: 015-00-90-261

Project Status: Funded in 2018/19; 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. Alberta Conservation Association (ACA) funding supported 69 ha of enhanced wetland and creek riparian and upland areas associated with six new 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. One participant is a hunter/trapper and huge wildlife enthusiast, making him uniquely positioned to appreciate ACA's support of the local ALUS program. Gate signs were provided to participants upon project completion.

Results/Deliverables:

- Completed projects enhancing 69 ha of wetland and creek riparian and upland areas, one nesting structure, and 1.91 km of riparian fencing.
- Six new ALUS participant projects were supported with the material costs of the following:
 - Pipestone Creek Watershed (two km east of Pigeon Lake Watershed): Indirect watering system and wetland electric fence was completed.
 - Pipestone Creek Watershed – “Eyot Creek,” a tributary of Pipestone Creek: Goose tower was completed.
 - Bigstone Creek Watershed: Wetland exclusion fencing was completed.
 - Adjacent to Leduc County Environmentally Significant Area – #54 Weed Creek, (North Pigeon Lake): Exclusion fence for woodlot and ephemeral tributary of Weed Creek was completed.
 - Leduc County Environmentally Significant Area #52 – Weed Creek: Exclusion fence, Weed Creek was completed.
 - Leduc County Environmentally Significant Area #70 – Whitemud Creek: Exclusion fence, Whitemud Creek. Tree planting and single row shelterbelt. Part of a larger livestock facility relocation project supported by the Canadian Agricultural Partnership was completed.

Going to Bat for Bats: Citizen science in Alberta

Wildlife Conservation Society Canada (WCS Canada)

Grant: \$29,500

Project Code: 030-00-90-284

Project Status: Funded since 2017/18; Completed

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

WCS Canada has been leading efforts to prepare for the arrival of the white-nose syndrome (WNS) disease in western Canada. This is being accomplished by improving public perceptions of bats, increasing awareness of conservation challenges, improving management of bat populations, and collecting data needed to address key knowledge gaps in the management of bats. These activities are high priority action items listed in the federal recovery strategy for the endangered little brown myotis and northern myotis. In Alberta, WCS Canada administers two projects designed to meet these goals: the Alberta Community Bat Program (ACBP) and BatCaver. Many bats in Alberta live in close association with human communities and rely on public stewardship for their survival and reproductive success. ACBP engages the public using several outreach and education approaches to build support and partnerships for bat conservation in the province. During the 2019/2020 grant period, the project saw major growth in the number of events being delivered across the province, with involvement in over 73 events, including bat walks, school talks, public presentations, information booths, workshops, and conferences. Educational resources have been developed to improve bat management, with the goal of promoting high survival and reproductive success, which is needed to ensure resilience of our bats to white-nose syndrome and other threats. Resources include several popular guides and information resources, as well as a social media campaign that has reached well over one hundred thousand unique users during the year. The ACBP also responds to hundreds of public questions through its toll-free number, email, and social media messaging. A citizen science program is managed with the goal of identifying roosts and collecting monitoring data needed to evaluate habitat use and population changes in the province. In 2019, over 60 roosts were reported to the program, and DNA barcoding is being used to identify what species are using these features. Many of these sites are being monitored using specialized equipment to collect data on occupancy and microclimatic properties, which is needed to better understand the use of human habitat in the province.

BatCaver has been instrumental in the discovery of new hibernacula in western Canada. During the 2019/20 season, program participants conducted inventories and deployed monitoring equipment at a new hibernaculum recently discovered along the eastern extent of the Rocky Mountains. BatCaver also raises awareness of the importance of WNS decontamination, which is needed to help slow the progression of this disease.

Deliverables/Results:

- ACBP events: From April 1, 2019 to March 31, 2020, over 73 successful ACBP events were held, which is more than double the target deliverables. These included 18 booths/information tables, 21 talks/public presentations, 15 bat walks (including two that also allowed kids to participate in mist-netting as part of a separate research project), 16 school visits (to 28 classes), and three bat house building workshops (one scheduled for late March). In addition to regular bat events, WCS Canada's Cori Lausen gave a webinar on bat houses that is available to help guide professional decision making regarding

these potential mitigation tools (the webinar can be found at: www.youtube.com/watch?v=jqcr0h56P5A&feature=youtu.be). A poster summarizing citizen science/ roost monitoring results is also scheduled to be presented at the Alberta Chapter of the Wildlife Society.

- ACBP social media activity was more than double the 2019/20 stated deliverable. From March 1, 2019 to Feb. 29, 2020, the ACBP posted 592 Facebook posts with an average reach of 965 users (average impressions: 1,205/post); total impressions were 713,336. During the same period there were 709 Twitter posts with an average of 819 impressions each (581,794 impressions total). Cumulative impressions were 1,295,130 (i.e., content of the ACBP appeared on people's screens about 1.3 million times). During the most active month, the program reached 108,322 unique users on Facebook alone, of which 9,244 engaged with program content at least once. Program followers increased by 45 percent on Facebook and 13 percent on Twitter during the 12-month period ending Feb. 29, 2020. Total impressions for Facebook and Twitter were nearly identical to the same period one year earlier, which fell short of targets for growth, but this may be a strong outcome in light of changes to Facebook's handling of organic reach and increasing competition for user's attention.
- ACBP website update: The ACBP website (www.albertabats.ca) was maintained and updated, and traffic grew during the grant period, thereby meeting the stated deliverable and targets. Based on Google Analytics, from March 1, 2019 to Feb. 29, 2020 the number of users accessing the website increased 13.1 percent and page views increased 17.5 percent compared to the same period one year earlier (this excludes file downloads and untrackable users).
- ACBP written guides and brochures: The three comprehensive guides continue to be available for download by the public. The "Managing Bats in Buildings" guide had a major revision, which was released in June 2019. The "Bat House Guidelines" guide was also updated in June 2019 to reflect changes in understanding of best practices related to bat houses. In addition, a "Bat Ambassadors" guide was completed in 2019, which provides comprehensive information for those interested in delivering bat outreach programs (The guide is not yet publicly accessible). The three guides have been accessed many thousands of times over the last year. In addition, several 'infographics' were prepared to highlight bat-management recommendations on social media; these infographics were prepared instead of a brochure because they were likely to have higher user uptake. The pest-control brochure is scheduled for completion during Spring 2020.
- Bat-houses and bat condos: WCS Canada is currently leading development of a continent-wide best management practice document for bat houses. The ACBP also provides information in its bat house guidebook. Several bat houses were monitored by WCS Canada in 2019 through the ACBP; several of these had temperature/humidity sensors to help determine the frequency of overheating. Because of cold wet temperatures in 2019, not many overheating events are expected. The results are currently being analyzed. Of note, three bat condos were installed in Alberta during the spring of 2019 by private landowners. The ACBP has been working with these landowners and have facilitated the installation of temperature and humidity sensors to collect much-needed information on the microclimatic conditions and use of these features. All three of these condos have had some degree of use. Additional sites are planned for 2020.
- Citizen Science: 61 guano samples at summer bat roosts were submitted or collected by the program in 2019, representing approximately 50 new roosts (additional sites were reported to BatWatch, but not yet analyzed). Citizen science data is currently being analyzed (including using DNA barcoding), with results tentatively planned to be presented at the 2020 Alberta Chapter of the Wildlife Society Conference (the prior year's results poster www.albertabats.ca/wp-content/uploads/2018ACTWSPoster.pdf). In addition to the roost reporting component of the citizen science project, WCS Canada collaborated with the Edmonton Area Land Trust and Nature Conservancy Canada to complete two North American Bat Monitoring grid cells during the summer of 2020 in the Beaver Hills area southeast of Edmonton. Data for these grid cells has been analyzed and a report prepared.
- The Bat Ambassador Program was launched by WCS Canada in 2019 as part of the ACBP. A comprehensive guide and various digital resources were prepared as part of this program (they can be viewed at www.albertabats.ca/bap password: myotis!). The project was piloted in south-eastern Alberta over the summer of 2019, which included a presentation to interpreters in Cypress Hills Provincial Park. Resources were also provided to support an event in Sylvan Lake. The program will be updated and expanded in 2020.
- BatCaver management tool: The habitat model continues to be developed and refined as new caves are explored and information is compiled. In February 2020, a recently discovered cave along the eastern slopes of the Rocky Mountains was explored as part of the BatCaver program—approximately 150 bats were located. Roost loggers and temperature sensors will provide much-needed information on hibernation conditions used by bats in western Canada. Additional caves were also explored, which contained no bats, and will be used to inform the management tool.
- BatCaver website updates: The BatCaver webpage has been maintained and updated as needed.
- BatCaver informational signage and brochures. It has not been necessary to install signs at cave sites – the locations of these sites will remain confidential to reduce the risk of unauthorized access. Brochures have been printed and distributed opportunistically at program events.

Conserving Species-At-Risk Bumble Bees, Associated Bee Communities, and their Habitats in Glenbow Ranch Provincial Park

Wildlife Preservation Canada (WPC)

Grant: \$13,932

Project Code: 030-00-90-295

Project Status: New; Completed

Project Website: www.wildlifepreservation.ca/bumble-bee-recovery

This WPC project was an ecosystem-based approach to understanding the micro- and macro-level habitat variables that most limit/support bees, especially bumble bee species at risk (SAR), at Glenbow Ranch Provincial Park (GRPP). Through targeted field-based initiatives including expert bumble bee surveys, passive sampling (using vane traps), and habitat assessments in different habitats and different seasons, a critical baseline database of bee diversity and distribution was quantified and potential driving forces behind that distribution were inferred. A total of 2,127 individual bumble bees were recorded from 48 surveys (eight

morning and eight afternoon surveys per site, at three sites, for a total of 139 expert survey hours), which included 20 species, five of which are considered rare or at risk. Site-level habitat assessments (conducted in these same three sites) investigated habitat characteristics related to floral composition and bumble bee nesting/overwintering resources and determined that there are detectable differences between the biophysical attributes of the three habitats and that these differences can potentially predict the distribution of bumble bees, especially for rare and declining species. Passive sampling using blue and yellow vane traps set out in one-week intervals for a total of eight weeks collected 2,425 bees, representing 75 species in 21 genera, all of which have been pinned and preserved. The blue vane traps collected a much larger and more diverse sample of bees compared to the yellow traps: the blue traps collected a total of 2,201 bee specimens, representing 20 of the 21 total genera identified during sampling, and 74 of the 75 total species identified; the yellow traps collected a total of 214 specimens, including 15 of the 21 genera, 36 of the 75 species, but was the only colour of trap to collect *Panurginus* sp. This project activity marks the first formal effort to document bee diversity in GRPP and provides a useful tool for quantifying changes in this composition in the future. Focused community outreach engaged hundreds of Albertans in pollinator education, conservation, and habitat stewardship activities designed to support connectedness to nature among participants and expand community capacity for conservation. Forty-five participants volunteered 133 hours in WPC's Bumble Bee Watch Community Science Program who together submitted 150 bumble bee records to BumbleBeeWatch.org under the GRPP project, which have all been verified by regional experts. This data contributes to a valuable repository that supports bumble bee research and conservation initiatives across North America, especially as they pertain to SAR.

Results/Deliverables:

- Surveys, monitoring, and habitat assessments:
 - A total of 2,127 individual bumble bees were recorded from 48 surveys (eight morning and eight afternoon surveys per site, at three sites, for a total of 139 expert survey hours), which included 20 species, five of which are considered rare or at risk.
 - Record numbers of rare and at-risk bumble bee species were recorded, including records for two critically endangered species—gypsy cuckoo and Suckley cuckoo bumble bees—which have never been recorded by WPC. Other rare and at-risk species were recorded, including the yellow-banded bumble (n=eight), the western bumble bee (n=91), and the yellow bumble bee (n=two).
 - Habitat assessments demonstrated that there are detectable differences between the biophysical attributes of the three habitats and that these differences can potentially predict the distribution of bumble bees, especially for rare and declining species. While these patterns are not supported by a robust long-term dataset, they do suggest that the maintenance and protection of dynamic landscapes will be required to maintain bumble bee diversity.
 - Higher percent floral cover was positively correlated with bumble bee abundance even if floral species richness (a measure of total diversity) was low.
 - Total bumble bee species diversity was consistent across the sites, but the composition of that diversity varied.
 - Bumble bee distribution appears to be most directed by the availability of nesting/ overwintering resources in a site, especially for SAR and species with a unique biology and/or life history.
- The yellow bumble bee was recorded only in the west site where nesting and overwintering variables appear limited, but floral species richness was highest.
- Suckley cuckoo bumble bee was recorded only in the east site which had three times as many grass tussocks (a natural structure used for nesting by many bumble bee species) compared to the other two sites. This species is an obligate parasite whose survival depends on successfully parasitizing the nests of its host bumble bee species.
- Similarly, the gypsy cuckoo bumble bee, another obligate parasite, was recorded in only two of the three sites, both of which were characterized as having lots of nesting/overwintering resources (the central site had that highest number of rodent burrows and the east site had the highest number of grass tussocks).
- Passive sampling using blue and yellow vane traps set out in one-week intervals for a total of eight weeks collected 2,425 bees, representing 75 species in 21 genera, all of which have been pinned and preserved.
- The blue traps collected a total of 2,201 bee specimens, representing 20 of the 21 total genera identified during sampling, and 74 of the 75 total species identified.
- The yellow traps collected a total of 214 specimens, including 15 of the 21 genera, 36 of the 75 species, but was the only colour of trap to collect *Panurginus* sp.
- WPC produced and distributed an updated version of the Alberta bumble bee Identification card. The card was distributed to all volunteers and is available at the Park Visitor Centre. WPC continue to discuss additional resource needs with the park and other Alberta partners.
- All data for habitat assessments, surveys and monitoring, and community science initiatives have been summarized and included in reports that have been developed and distributed to community scientists, landowners and permit issuers, and funders.
- Habitat Assessments: Site-level habitat assessments (coupled with survey data) have informed species-specific patterns in habitat suitability for bumble bees in three survey sites in GRPP and continue to inform best practices for land management and land use as it pertains to bees (e.g., managing invasive plants).
- Surveys and Monitoring:
 - Through expert survey efforts, species-specific information on bumble bee distribution and general ecological information (e.g., phenology, floral associations, relative abundance) was collected regularly in three survey sites in GRPP from July 15 to Sept. 20, 2019. These data records have been databased and analyzed resulting in species-specific information on bumble bee distribution within and across GRPP's habitats, including information about what factors are most likely contributing to these distribution patterns.
 - Through passive sampling techniques (eight blue and eight yellow vane traps deployed in one-week sampling intervals between July 13 and Sept. 15, 2019) at eight sampling sites in GRPP, the composition and distribution of the bee community (beyond bumble bees) in GRPP has been formally evaluated for the first time, resulting in a species-level database (including a physical database as pinned, preserved specimens) of 2,415 bee (Hymenoptera: Apoidea) specimens, which includes 75 species identified in 21 genera.

- Community science and outreach:
 - Forty-five volunteers participated in the Bumble Bee Watch Community Science Program at GRPP resulting in a total of 133 program-specific volunteer hours.
 - 150 bumble bee observations were submitted to BumbleBeeWatch.org under the GRPP project code, all of which have been verified by regional experts.
 - Volunteers recorded 18 observations for two bumble bee SAR, the yellow-banded and the western bumble bees.
 - WPC delivered three in-class presentations to over 25 attendees (July 11, 13, and 23, 2019), and three hands-on, outdoor survey workshops to 20 adults, along with several children (July 13, 14, and 27, 2019).
 - Three group survey events were developed and delivered by WPC's Alberta program coordinator, with more than 15 participants being introduced to the program for the first time, and two existing volunteers being successfully re-engaged in the program (Aug. 26, 30, and 31, 2019).
 - WPC tabled at three community events engaging over 150 attendees from communities adjacent to GRPP in pollinator conservation initiatives and providing general pollinator education.

Kids Can Catch Event

Yellowhead County

Grant: \$1,700

Project Code: 020-00-90-260

Project Status: Funded in 2018/19; Completed

This was Yellowhead County's second year hosting a Kids Can Catch event at Millers Lake. The goal was to introduce new anglers to the sport as well as bring experienced fishers back to our lakes. With over 50 youth in participation of all ages and experience levels, the event was considered a great success. Activities included catch-and-release fishing, education provided by local fish and wildlife officers (safe handling, regulations and licenses, fish species etc.), fishing rod raffles, and a free BBQ. 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 positive feedback from participants, parents and volunteers, Yellowhead County would love to continue with this program in the future!

Deliverables/Results:

- The Kids Can Catch event was held on July 4, 2019 at Millers Lake with over 50 youth participants throughout the evening. The weather was not quite what was hoped for as it did rain for nearly the first hour of the event, however participants braved the rain and made the event a success!
- The main result was to get as many youths out to the event as possible and introduce them to the sport of fishing. If the weather had been nicer, likely more people would have turned up for this great event. Out of the 50 youth that were in attendance, close to half were new to fishing. It was great to have rods on site for participants to use so that everyone had a chance to fish. The amount of positive feedback from participants, parents, volunteers received leads the event organizers to believe they will have some new anglers in the area.

JFW Regional Camp 2019

Yellowhead Junior Forest Wardens Regional Council (JFW YRC)

Grant: \$1,200

Project Code: 002-00-90-262

Project Status: Funded in 2017/18; Grant funds not utilized

The objective of the 2019 JFW Regional Camp was to provide outdoor education opportunities and experiences to Junior Forest Wardens that they may not have had the opportunity to do within their individual clubs in the Yellowhead Region. The regional camp brings in a variety of instructors and educators to provide sessions for youth between ages six and 18, as well as their parents and club leaders. Activities for this camp included: archery, atlatl building, blacksmithing, outdoor cooking, bush craft, canoeing, entomology, trail plants and plant identification, axe throwing, first aid, outdoor survival, leave no trace, fire safety, knife safety, etc. Attendees had the opportunity to experience and learn about areas new to them. This will allow the youth to continue to develop a love and respect for our outdoor environment, as well as the wildlife that lives there.

Results/Deliverables:

- The JFW Regional Camp went ahead, but the club had enough funds with corporate sponsors, so they did not require the grant.

Trailblazer Advanced Camp

Yellowhead Junior Forest Wardens Regional Council (JFW YRC)

Grant: \$2,000

Project Code: 002-00-90-303

Project Status: New; Completed

The Trailblazer Advanced Camp went ahead as scheduled. The weekend had 43 attendees, including youth and their participating parents, with 14 attending the optional extra day for Paddle Canada certification. Activities for the weekend included: Paddle Canada canoe skills introduction tandem, survival kit and fire starter construction, archery, sharps course (knife, axe, saw), dressing and cooking of a goose, snaring skills, bush crafts and wilderness survival training, outdoor cooking, and shelter set up. All activities were taught with a focus on respectful use of our natural areas and wildlife. All attendees built and slept in their shelters on Saturday night. Attendees left with a strong foundation for outdoor survival and understanding of our environment.

Results/Deliverables:

- Camp was held successfully Oct. 3 to 6, 2019 at Narrow Lake Conservation Centre, with 14 attendees for the canoe certification and 43 attendees for the main camp. While this camp was not at capacity, there were several competing events happening that weekend that prevented many families from participating. The dates for next year have been adjusted to accommodate this.

ACA Research Grants

Characterising Arctic Grayling Distribution and Habitat Preferences Using Environmental DNA

Athabasca University (Dr. Glover)

Grant: \$15,000

Project Code: 020-00-90-279

Project Status: New; Completed

Project Website: news.athabascau.ca/faculty/faculty-of-science-and-technology/au-researchers-domoreforwildlife

Arctic grayling (*Thymallus arcticus*) is considered a species of special concern under Alberta's Wildlife Act. This cold-water fish, native to northern Alberta waters, is highly sensitive to environmental stressors (e.g. temperature, salinity and contaminants) and habitat fragmentation, both of which are issues of increasing prevalence in their natural settings. However, monitoring populations of Arctic grayling has been problematic due to their migratory nature, low densities, and limited capacity for capture with standard fishing methods. The objective of this study was to establish a sensitive and specific environmental DNA (eDNA) method for detecting Arctic grayling in Alberta waters. The first and most critical step for creating successful eDNA assays is to design primers and a probe to amplify species-specific DNA sequences. To begin, DNA was extracted, amplified, and sequenced cytochrome oxidase 1 (CO1) regions from five species of fish sourced from Alberta waters: brown trout, brook trout, mountain whitefish, rainbow trout, and Arctic grayling. These Alberta-specific sequences were combined with those publicly available for species typically found in Alberta and they were aligned, trimmed, and used to generate Arctic grayling specific primers and probe using ssPRIMER. In addition, an artificial Arctic grayling CO1 gene fragment was designed to use during the testing phase to calculate specificity of the assay. Due to major complications with the availability of Arctic grayling in facilities across Alberta and unsuccessful attempts at collecting from the wild, the researchers were unable to test the assay detection limits from live fish. However, through a newly established collaboration, the researchers now have access to fifty eDNA samples (collected in 2015) from seven sites in Alberta that are associated with 25 habitat metrics. Thus, their new Arctic grayling eDNA assay will be used on Arctic grayling eDNA samples to determine the specificity of their assay and optimal Arctic grayling habitat characteristics based on those results. This research is an important advancement in the monitoring and management of Arctic grayling populations, with the ability to elucidate novel aspects of their life history and their sensitivity to environmental disturbances (e.g. pollution and climate change).

Results/Deliverables:

- Sequenced Alberta-specific partial CO1 genes from five major fish species: brook trout, brown trout, mountain whitefish, rainbow trout, and Arctic grayling. To the researcher's knowledge, there were no Alberta CO1 fish sequences available on the public database.
- Designed and lab validated an Arctic grayling eDNA assay specific to Alberta populations.
- Laboratory and field detection limits assessed, and sampling protocol established: This deliverable is still awaiting completion owing to

unforeseen issues with Arctic grayling supply. The completion of this variable was anticipated for June 2020.

- Water samples collected and filtered from Alberta waterways at various time points and locations as identified by collaborators from Alberta Fish and Wildlife. Presence/absence of Arctic grayling detected by qPCR in the field or laboratory and optimal habitat assigned based on meta-analysis with habitat metrics: The researchers now have access to eDNA samples and habitat metric data, and this analysis is underway. Completion of this deliverable is anticipated for Aug. 2020.
- Final report to Alberta Conservation Association (ACA) and stakeholders completed.
- Press release of key findings: This deliverable will be delayed until the completion of the above delayed research outcomes. Anticipated Aug. 2020.
- Publication of results in *Canadian Journal of Fisheries and Aquatic Sciences* or comparable journal: This deliverable will be delayed until the completion of the above delayed research outcomes. Anticipated Aug. 2020.
- The project and funding provided by the ACA were mentioned in three talks by Dr. Heather Veilleux:
 - Canadian Society of Zoologists meeting (May 2019, Windsor, Ontario)
 - eDNA workshop, James Cook University (September 2019, Townsville, Australia)
 - Invited seminar, University of Guelph (December 2019, Guelph, Ontario)
- Data derived from this project was scheduled to be presented at the Canadian Society of Zoologists meeting in Saskatchewan in May, 2020, the International Congress of Fish Biology meeting in Montpellier, France in June 2020, and at the Canadian Society for Ecology and Evolution meeting in Edmonton, May 2020. All three of these opportunities have been cancelled due to the COVID-19 pandemic. The research team is hopeful that 2021 will provide additional opportunities to present the research conducted as part of this project.

Understanding the Importance of Migratory and Breeding Habitat Selection for Northern Pintails

Ducks Unlimited Canada (Dr. Devries)

Grant: \$14,600

Project Code: 030-00-90-300

Project Status: New; Completed

Cooperating with an ongoing study that was marking wintering pintail females with Global Positioning System, Global System for Mobile Communication (GPS-GSM) tags, the researchers anticipated the ability to gain a greater understanding of female pintail (*Anas acuta*) habitat use and breeding effort/success. Specifically, the project goals were to: 1) determine the characteristics of landscapes selected for breeding, 2) locate nest sites to determine nest habitat selection, and 3) investigate breeding effort and success as a function of landscape/nest habitat/site characteristics, antecedent body condition, and migratory habitat use. Given logistical uncertainties involved in this study, 2019 was planned

as a pilot year. Specific study uncertainties included: 1) the proportion of winter-marked pintails that would settle in prairie Canada to breed, 2) the logistics of manpower needs and travel, time spent contacting landowners for access to potential nest sites, and locating nest sites, 3) the positional accuracy of transmitters along with data handling and analysis to identify nest sites, and 4) whether dorsally mounted GPS-GSM provide unbiased data relative to habitat selection, reproductive timing, effort, and success. Of 32 female pintails marked with GPS-GSM tags on wintering areas in California, ten birds settled in the Prairie Pothole Region (PPR) of Canada. Of these ten birds, the researchers searched approximately 75 potential nest sites, but found only one nest. They also found and recovered the transmitters from two female pintail that were presumed killed by avian predators. It is thought the positional accuracy of the transmitters did not limit the researchers ability to find nests, rather presumptive nest sites were feeding or loafing sites based on visual evidence (e.g., group feeding in fields and flooded patches within fields). Due to the low breeding effort observed, the researchers suspect that the dorsally mounted transmitters (harness) may have impacted breeding behavior and effort as has been reported in other waterfowl species. However, landscape level habitat selection, demonstrated by females, may be relatively unbiased and informative. Given that about 30 percent of the marked individuals settled in the Canadian PPR, if 160 birds been marked as originally planned, then more than 50 birds may have settled in this area. Unfortunately, delays in GPS-GSM marker delivery from the supplier to the project's United States collaborators limited the sample deployed. Given the time spent tracking pintail, contacting landowners, and investigating potential nest sites, the research team is better positioned to undertake future work using this type of technology. However, they believe alternative attachment methods need evaluation given potential impacts on breeding effort. Regardless, information on landscape selection will be useful in PPR conservation planning.

Results/Deliverables:

- As a pilot study, this project was successful in providing information about the utility of using GPS-GSM winter-tagged pintails in answering the questions of interest. While only a fraction of the anticipated 160 female pintails were tagged on wintering areas (problem with tag supplier), the researchers were able to determine that this technology and research approach may be useful for informing breeding landscape selection, but is currently questionable for informing nest site selection, breeding effort, and success. Concerns regarding breeding effort and success stem from apparently low nesting effort and frequent movement (failure to 'settle') which is uncharacteristic of normal breeding behavior. The researchers attribute this behavior to the transmitter attachment method (harness style). That said, if attachment methods change, this conclusion will need to be reassessed.
- Regarding logistical constraints, the researchers believe the quality of GPS-GSM data in terms of location accuracy and frequency is very suitable for aiding in nest site location if an adequate workforce is available to cover the range over which female pintails may settle to breed. While real-time access to location data is likely not feasible, changes in tag programming could bring it below 24 hours which is generally what was experienced.
- Winter tagging of pintails with GPS-GSM transmitters is continuing by the project's United States colleagues with plans to deploy the full 160 transmitters in the winter of 2019-2020. Testing of alternative

attachment styles is also occurring. For those female pintails that migrate to, and settle in, the PPR of prairie Canada, it is thought these birds will provide information on landscape-level habitat selection, which the researchers believe will be useful. Thus, this research has the potential to provide a valuable test of current conservation planning models being used by the Prairie Habitat Joint Venture partnership.

- These efforts suggest only one female pintail nested (the one nest was found in southwestern Saskatchewan), so this resulted in limited ability to understand pintail nest habitat/site selection. This is believed to be related to GPS-GSM marker attachment effect. However, pintail landscape selection during the breeding season may be relatively unbiased using this method.
- Given the much-reduced sample size experienced in 2019, the final report submitted to Alberta Conservation Association serves as the project deliverable.

Quantifying Yield Impacts and the Profitability of Wetlands in Agricultural Cropland

Fiera Biological Consulting Ltd. (Dr. Clare)

Grant: \$16,800

Project Code: 015-00-90-280

Project Status: New; Completed

Project Website: www.fieraconsulting.ca/feature-projects/the-value-of-wetlands

Wetlands are one of the most biologically diverse ecosystems on the planet, but are also one of the most threatened due to human land use and development. In the settled areas of Alberta, wetlands are often drained to increase the area available for cultivation, with the prevailing assumption being that draining wetlands increases crop production and profit. Working collaboratively with agricultural producers in central Alberta, this project quantified input and output costs related to cultivating within drained and retained wetland basins to determine the total economic benefit associated with different wetland management practices. Specifically, canola production for three operations was assessed during the 2019 growing season to produce spatially explicit profit and loss maps across four quarter sections. The economic data was then combined with information regarding wetland location and management status (drained, appeared intact, consolidated), allowing for the calculation of profit or loss for each individual wetland basin, as well as for all wetland basins combined for each operation. Preliminary results suggest that the revenue generated from cultivating within a drained wetland basin is highly variable, ranging from a loss of \$288/acre to a profit of \$442/acre across the drained basins examined. When average profits for drained basins were calculated for each producer, values ranged from a loss of \$146/acre to profits of \$40 and \$80/acre. These results indicate that despite prevailing beliefs, draining and cultivating a wetland basin does not produce an economic benefit in all cases, and that average profits associated with wetland drainage are modest. While this study only includes data from a single year of production, it does provide evidence that draining and cultivating wetlands is not always economically beneficial, and there may be opportunities through policy action to create stronger economic incentives to conserve wetlands, rather than draining them for crop production.

Results/Deliverables:

- **Profitability Modelling:** For all drained wetlands on each of the four quarter sections (n=59), revenues ranged from a loss of \$288/acre to a profit of \$442/acre, with an average profit of \$16/acre. When average profits for drained basins were calculated for each producer, profits were either negative or were less than \$100/acre, which is generally considered to be a reasonable return for canola. These results indicate that despite prevailing beliefs, draining and cultivating a wetland basin does not produce an economic benefit in all cases, and that average profits associated with wetland drainage are modest. While this study only includes data from a single year of production, it does provide evidence that draining and cultivating wetlands is not always economically beneficial, and there may be opportunities through policy action to create stronger economic incentives to conserve wetlands, rather than draining them for crop production.
- **Producer Interviews:** Results from the producer interviews were grouped into four categories: historical perspectives on cropping conditions, perspectives on technology, perspectives on environmental conditions, and awareness of government approaches to wetland conservation. All three producers indicated that the spring of 2019 was one of the driest they could recall, while the summer and fall were the wettest on record. There was a general feeling that weather patterns are becoming more extreme, yet reticence to label it as climate change. Second, in terms of technology in general and the use of precision agriculture more specifically, these producers were early adopters, but are uncertain as to whether the technology provides an economic advantage to their farming operation. Additionally, Producer 1 was concerned about “big data” and privacy issues. In terms of wetland managements, most producers indicated that they farm these areas in dry years, but that this was a financially risky due to the unpredictability of weather, and they felt that wetland areas typically provide lower yields. Consolidation as a management practice was favored by one producer, who considered this to be positive in terms of environmental impact. Finally, most producers had limited to no awareness of the Alberta Wetland Policy or regulatory requirements in Alberta.
- This project has been featured on the Fiera Consulting website (www.fieraconsulting.ca/feature-projects/the-value-of-wetlands) and other social media accounts (Twitter, Instagram, LinkedIn, ResearchGate).
- Final Technical Report, completion date of April 15, 2020.
- Journal publications in a natural science journal and an economics journal are anticipated for fall 2020.
- Conference and public presentations (2020-2021): while Fiera Consulting intended to profile this work at conferences and workshops, the current situation related to the global spread of the novel coronavirus has limited the opportunities to share the results of this work in these forums. These opportunities will be pursued (as appropriate) for the remainder of 2020.

Using Citizen Science to Enhance Fisheries Data Collection and Monitoring

Goldstream Publishing Inc. (Mr. Simmons)

Grant: \$15,000

Project Code: 020-00-90-259

Project Status: Funded in 2018/19; Partially Completed

Project Website: www.anglersatlas.com/research

This project builds on the success of Goldstream Publishing’s “proof-of-concept” study that tested if self-reported catch data by anglers is useful for monitoring fish populations and if the amount and spatial/temporal extent of data available to fisheries biologists can be substantially enhanced by the app. The goal of this project is to continue collecting catch rate and species composition data to evaluate its usefulness as an alternative to traditional creel surveys. A second goal is to analyse year-over-year catch rate and species composition data for waterbodies across Alberta. This will help determine if this approach could be useful in developing a province-wide monitoring tool for fisheries biologists and managers. The first part of the project—comparing the catch rate and species composition data with results from traditional creel surveys—could not be completed as no on-the-ground creel surveys were conducted in 2019. Only aerial surveys were conducted, which lacks catch-per-unit (CPU) effort and species composition data to conduct the analysis. The second part of the project—analyzing year-over-year data for waterbodies across Alberta—was completed. Overall, Goldstream Publishing saw a similar number of fishing trips reported each year, with 1,687 trips reported in 2018 and 1,784 trips reported in 2019. This represents a small increase of six percent year-over-year and covers 484 waterbodies in the province. Overall, the catch rate in 2018 was 1.63 fish per hour (FPH), dropping slightly in 2019 to 1.47 FPH. Year-over-year comparisons were limited to waterbodies where a minimum of three trips were reported in both 2018 and 2019. This represents 115 waterbodies, of which 87 are lakes, 20 are rivers, five are reservoirs and three are creeks. For each of these waterbodies, a unique report was generated and includes: 1) place name, 2) ID/Latitude/Longitude, 3) table of stats, 4) violin plots showing catch rate distributions and changes in the mean between 2018 and 2019, and 5) species richness plots comparing changes between 2018 and 2019. Overall, the results from the year-over-year comparison are quite promising as a landscape level monitoring system for fisheries managers. This can also serve as an early warning system to alert managers where significant changes are occurring.

Results/Deliverables:

- An unexpected result was that no on-the-ground creel surveys were conducted in 2019 by Alberta Environment and Parks, nor Alberta Conservation Association. The creel surveys that were done were aerial creel surveys. However, this does not produce a CPU effort or provide species composition, so the researchers were unable to run a comparison.
- 1,784 trip reports were submitted by anglers in Alberta in 2019. This represents a six percent increase in reports compared to 2018.
- Analysis was conducted on waterbodies that received at least three reports in both 2018 and 2019. This was considered the minimum sample size to run the analyses. A total of 115 waterbodies met that criteria (87 lakes, 20 rivers, five reservoirs, and three creeks).

- In 2018, the average catch rate was 1.67 FPH, dropping slightly in 2019 to 1.47 FPH.
- Most of the declines in catch rates were seen in lakes and reservoirs. Lakes dropped from 1.82 FPH to 1.54 FPH for reservoirs dropped from 1.91 FPH to 1.51 FPH.
- Catch rates on rivers remained similar year over year, moving from 1.09 FPH in 2018 to 1.07 FPH in 2019. Creek data wasn't included due to the small sample size.
- Individual waterbody catch rates and species compositions were also analyzed to evaluate relative change over one year, and details for all 115 waterbodies were provided in a report.

Chronic Wasting Disease in Deer: Modeling transmission from contact rates

University of Alberta (Dr. Merrill)

Grant: \$32,400

Project Code: 030-00-90-228

Project Status: Funded in 2014/15, 2017/18, 2018/19; Completed

Project Website: 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 2,000 cases (~85 percent in mule deer) in 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. January 2020 marks the beginning of the fourth year of the four-year field study (one of the four years being the pilot study). A fifth year will be devoted to 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 was expanded to a replicate site, Cresthill Grazing Lease (CGL), near the CFBW. On CFBW, the research team captured and collared 35 deer in 2017, with additional deer captured on CGL from 2018 to 2020 (25 deer in 2018, 32 deer in 2019, and 39 deer in 2020). Supplementing the data from GPS locations of collared mule deer, monthly density surveys were conducted and 35 game cameras deployed throughout the CGL. Data analysis will be completed in 2021, but present preliminary analyses were made available in the final report submitted to Alberta Conservation Association (ACA) of deer density estimates, dyad (individual-individual) contact rates, and distribution of deer pellet groups representing environmental input of CWD. Contact data from the GPS-proximity collars is currently being analyzed. Overall, the researchers have found that contact rates vary between season, dyad type, and whether a dyad is within or between the same group. Results from this field study will provide inputs into models for predicting changes in CWD prevalence rates to improve targeted surveillance and control.

Results/Deliverables:

- Capture and radio-collaring: To date, 35 deer have been collared on the CFBW and 96 on the CGL near Edgerton, Alberta. For the final year of the field studies (2020), 39 (26 females and 13 males) mule deer were captured and collared on CGL. Three of those deer were

recaptures from previous years. Body measurements were obtained to assess body condition, blood for pregnancy testing, and ear tissue samples for genetic analyses. An Alberta Fish and Wildlife ear tag and GPS-proximity collar was also attached. For 23 of the deer, rectal biopsies were performed to test for the presence of CWD. CWD was detected in 42 percent of the tested deer (five of 12 viable samples). For 11 (48 percent) samples, there were not enough follicles (< six) to definitively declare that the animal was CWD negative, which is consistent with the reliability of this technique. Blood tests of the 26 females indicated a 100 percent pregnant rate.

- Contact rates: The Lotek Litetrack GPS-proximity collars that were deployed in January 2020 record GPS locations at two-hour intervals and transmit the data remotely to an online webserver. A proximity event is triggered when two collared deer are within three meters of each other. During these "contacts" a GPS point is taken at the start as well as on the 15-minute-interval. In addition, the length of time for the whole event is recorded. This data is transmitted daily to the webserver where they can be accessed by the observer.
- In February 2019, the research team also began performing behavioural observations to supplement the contact data from the GPS collars. Technicians located and tracked collared deer several times weekly to record group size and composition so that data on sex-specific contact rates can be adjusted to account for variation between seasons. Despite their best efforts (>200 hours), sampling of direct observations of contacts of collared deer within groups was found to be constrained due both to very limited visibility in these habitats and that deer were able to detect the observer. Only a limited number of viable observations (~ eight) were obtained in winter 2019 and 2020 and in summer (2019), therefore these efforts were discontinued. The limited data collected may help interpret the accuracy of contact rate collected by the proximity collars.
- More preliminary results were provided in the ACA final report.
- The project website with information regarding 2020 mule deer captures has been updated: abchronicwasting.biology.ualberta.ca
- 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 sent to CFBW and government personnel.
- A completed Project Annual Report was sent to five funding agencies.
- Presentations:
 - Video presentation – Johanna Thalmann, Liam Horne – CWD Fieldwork, SCI Banquet, Edmonton, Alberta (March 30, 2019)
 - Oral presentation – Maria Dobbin - Relating spatial contact metrics to possible transmission routes of CWD, Landscape Ecology course, University of Alberta, Edmonton, Alberta (April 8, 2019)
 - Oral presentation – Johanna Thalmann, Liam Horne - Data Management, CWD Group Meeting, University of Alberta, Edmonton, Alberta (May 21, 2019)
 - Poster Presentation – Peter Smolko, Dana Seidel, Evelyn Merrill, Margo Pybus, Anne Hubbs, Mark Ball – Risk of the Chronic Wasting Disease for Deer in Alberta, PRION Conference, Edmonton Convention Centre, Edmonton, Alberta (May 21-24, 2019)
 - Oral presentation – Jingjing Xu - Modelling Chronic Wasting Disease in Mule Deer, CAIMS annual meeting 2019, Whistler, British Columbia (June 9 to 13, 2019)

- Oral presentation – Jingjing Xu - Modelling Chronic Wasting Disease in Mule Deer, Levin Fest 2019, University of Victoria, British Columbia (June 15, 2019)
- Oral presentation – Johanna Thalmann and Liam Horne - Data Management, CWD Group Meeting, University of Alberta, Edmonton, Alberta (Aug. 12, 2019)
- Oral presentation - Peter Smolko, Dana Seidel, Evelyn Merrill, Margo Pybus, Anne Hubbs, Mark Ball - Risk of the Chronic Wasting Disease for Deer in Alberta CWD Group Meeting, University of Alberta, Edmonton, Alberta (Sept. 23, 2019)
- Oral presentation - Peter Smolko, Evelyn Merrill - CWD risk & spread models for Alberta, Genome Canada ROC meeting, Edmonton, AB (Sept. 30, 2019)
- Oral Presentation - Peter Smolko, Dana Seidel, Margo Pybus, Anne Hubbs, Mark Ball, Evelyn Merrill - Risk of the Chronic Wasting Disease for Deer in Alberta, Merrill/Boyce lab meeting, University of Alberta, Edmonton, Alberta (Oct. 9, 2019)
- Oral presentation – Maria Dobbin - Analysis of mule deer contacts in a CWD endemic area, CWD Group Meeting, University of Alberta, Edmonton, Alberta (Nov. 21, 2019)

Assessing the Effectiveness of Alberta's Walleye Regulations to Sustain High-Quality Fishing Opportunities

University of Calgary (Dr. Post)

Grant: \$14,100

Project Code: 020-00-90-280

Project Status: New; Completed

This project featured three overarching goals related to assessing the consequences of walleye harvest in Alberta; they were to assess the compensatory reserve or productivity of walleye populations in Alberta using state-of-the-art spatial-temporal statistics, to assess the slow-growing walleye hypothesis (SGWH), and to use this information to evaluate the efficacy of the regulations currently being used by the Alberta government to sustain high-quality angling opportunities. The study results indicated that the SGWH, while popular with anglers, is not supported by the best available data when using these spatial-temporal approaches. This research is currently *in review* in the *Canadian Journal of Fisheries and Aquatic Sciences*, and the researchers have shared these findings with both biologists and stakeholders around Alberta. The second objective has not yet been completed, but substantial progress has been made towards this point and work on this will continue to move forward post-ACA funding. Thus far, the researchers have developed the first database of fishing regulations in Alberta, which was an unexpected and time-consuming hurdle. This database has now been shared with government collaborators and it has been used to answer several additional fisheries management questions surrounding walleye management in Alberta. Preliminary findings suggest that slot limits and minimum length limits result in severely truncated length-frequency distributions for walleye in Alberta, which may suggest that tools such as the Special Harvest License (SHL) are necessary for maintaining quality fisheries. At the time of this report, one manuscript is in peer-review related to walleye science and management, two popular press articles have been published on these topics in the

Alberta Outdoorsmen (March and April 2020 issues), and the researcher team has engaged with hundreds of anglers throughout the province during the fisheries open house consultation meetings hosted by Alberta Environment and Parks (AEP). Additionally, a manuscript will be submitted for the unfinished portion of this project in the coming months as the researchers have now assembled a team of additional researchers and biologists, amalgamated all regulations into a central and useable database, and developed the spatial-temporal statistical methods necessary to answer this question.

Results/Deliverables:

- The main finding from this project to date indicates that the slow-growing walleye hypothesis often mentioned by anglers is not supported by the best available data. This means that fisheries managers on the ground should not increase harvest rates in the hopes of improving walleye growth rates as this research indicates that there is a low likelihood of this succeeding.
- This research has also provided new statistical tools for examining growth rates in inland recreational fisheries more generally, which may improve fisheries conservation efforts in many systems beyond Alberta. These methodologies, which are currently in review, will be incredibly useful for assessing life history traits in relation to environmental characteristics for many species and locations, and thus this work is broadly applicable.
- The researchers have also achieved considerable progress toward our understanding of how regulations structure Alberta walleye populations. By creating and sharing the first database on walleye regulations in Alberta, evidence is emerging that slot limits and minimum length limits may often result in severely truncated length distributions for walleye (C. Cahill, personal observation). This phenomenon is unique and lends support to the idea that special tools such as the SHL may be necessary to conserve and maintain walleye populations in Alberta. The researchers continue to analyze data to determine whether the SHL system that is currently in place provides Albertans with sustainable and high-quality fishing opportunities.
- A major outcome of this research has been engaging with Albertans on walleye management and science. This component of the research ended up being more substantial than originally proposed because of timely announcements by the new Alberta government leadership. The researchers took this opportunity to engage Albertans at fisheries management open house events throughout the province alongside AEP biologists, and thus were able to efficiently communicate their key findings and the science behind walleye management to many stakeholders.
- Two publications in peer-review: Currently objective one and two are in review. The second paper is still in progress and will be submitted in the coming year.
- Finished and published two articles in the Alberta Outdoorsmen on "Common Walleye Management Misconceptions."
- Informal presentations at The Fishin' Hole in both Edmonton and Calgary: This did not ultimately happen; instead the researchers volunteered their time to directly engage anglers at AEP open house meetings on fisheries management practices. Chris Cahill used this unexpected opportunity to engage hundreds of anglers around the province on both their research findings and walleye science and management more generally. Chris Cahill drove to and

attended meetings in Calgary, Red Deer, Rocky Mountain House, Edmonton, St. Paul, Lac La Biche, Medicine Hat, and Slave Lake. His role as an external expert at these meetings proved useful during the contentious debates that sometimes arise with walleye management issues in Alberta.

Assessing the Capacity of Urban Wetlands to Support Biodiversity Using Amphibian Sentinels

University of Calgary (Dr. Smits)

Grant: \$14,500

Project Code: 030-00-90-298

Project Status: New; Completed

Approximately 90 percent of Calgary's natural wetlands have been lost or altered due to the city's development. With most of Calgary's remaining wetlands primarily functioning to avoid flooding, little attention has been paid to their ecological functions and capacity to support biodiversity. Amphibians that rely on healthy wetlands for their survival are in global decline, mainly due to habitat loss or fragmentation, and pollution. This project aims to assess the capacity of urban wetlands to sustain healthy boreal chorus frog (*Pseudacris maculata*) (BCF) populations, one of the most common frog species in Alberta. In this study, a metamorphosis assay with BCF tadpoles is conducted directly in urban wetlands to assess key characteristics that influence tadpole development to adult frog form. Objectives of the field study include: using a native frog species, conduct a metamorphosis assay in wetlands with different biological and water characteristics in and around Calgary; to identify factors that determine wetland suitability to support sustained amphibian populations; to establish BCFs as native sentinels with the potential to reflect the sustainability of Alberta's wetlands.

Results/Deliverables:

- As part of the third objective, another laboratory experiment was added to the proposed study: A subset of BCF tadpoles was raised in the laboratory and computer tomographic (CT) scans were taken from different developmental stages up to the metamorphosed adult frog form. The analysis of the scans – recording of organ/skeletal development and rearrangements – are close to being completed. The results from these CT scans will assist researchers (e.g. ecotoxicologists) using BCF as sentinel species in identifying developmental effects of the environmental pollutants. Moreover, these observations are useful to evolutionary biologists and herpetologists.
- Egg collection: completed on May 17, 2019.
- Caging of BCF tadpoles: Tadpoles were transferred into cages in the four urban wetlands on June 5 and 7, 2019. The metamorphosis assay concluded on July 15, 2019. Water chemistry (temperature, pH, dissolved oxygen, conductivity, total dissolved solids and salinity) was measured in the wetlands once per week using a multiprobe.
- Behaviour assay: performed on six tadpoles per wetland between June 26 and 28, 2019.
- Morphometrics/biochemical analyses: Thyroid hormone, triglyceride and metal levels in tadpoles, and water metal analyses have been completed. Analyses of CT scans of BDF development are nearing completion.

• Pitfalls during the field season:

- One experimental set-up was lost (Edgemont stormwater pond) due to the heavy rains, that led to rapid flooding followed by almost complete drainage of the pond during June 21-23, 2019. This can be avoided in the future by having cages free-floating with buoys rather than directly attached to the anchoring post.
- High mortality caused by disease, and predation by leeches that managed to enter the cages was observed at another experimental site. Remaining tadpoles were collected for behaviour assay and metal analyses, but there remained insufficient numbers for thyroid hormone and triglyceride analyses. Leeches were inhabiting only this one experimental wetland in very high numbers.

• Reports and publications in process:

- A comprehensive report on Calgary's stormwater wetlands' amphibian status, riparian characteristics and water chemistry, including the data of this pilot study will be written by all collaborators (Mount Royal University professors: F. Nwaishi and M. Rathburn, City of Calgary Parks Department, Miistakis Institute, Calgary Zoo, and R. Krohn from University of Calgary), under the umbrella of the "Call of the Wetland" project headed by Miistakis Institute. The partners met on March 12, 2020 to discuss the timeline for the report and future collaborations.
- A peer-reviewed publication on "Boreal chorus frog (*Pseudacris maculata*) larval development" is in preparation.

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

University of Lethbridge (Dr. Goater)

Grant: \$6,338

Project Code: 030-00-90-285

Project Status: Funded in 2018/19; Completed

Epidemiologists do not understand the factors that lead to year-to-year variation in outbreak dynamics for emerging wildlife diseases. In extreme cases, high host mortality can be observed in one year, followed by undetectable mortality the very next 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 both 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 hypotheses that variation in annual host mortality is associated with variation in host condition or in variation in ATV virulence. 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 assessed individual rates of larval growth and development, ATV-induced pathology, and then release the larvae. Prior to release, a small section of the tail was removed. This tissue is analyzed in the lab with standard molecular procedures to diagnose ATV infection in each individual. The current proposal provided funding support to complete salamander population monitoring and ATV diagnostics work during the 2019 field season. Total larval abundances in 2019 were the highest

recorded since 2012. Average larval growth rate was consistent with growth rates from previous years. Larvae were exposed to ATV within their first few days following hatching, leading to the highest rates of infection within the first collection period (78 percent) observed since 2012. There was a crash in the larvae population between the second and third sampling period and there was high mortality in the traps and along the shoreline coinciding with the approximate time of metamorphosis. This seven-year data set is 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.

Results/Deliverables:

- 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.
- 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 (e.g. 2013 and 2017). High-condition years are those in which growth rates over the same interval are 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.
- ATV recolonizes the larval population each year. Larvae are born uninfected and are exposed within their first few weeks. The rate of transmission between individual is high, such that in four of the seven 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. Six adults have been collected over the course of seven years. All of these, regardless of year of collection, have tested positive for ATV. These sample sizes are small, but these data support the idea that annual adult visitation to the lake during each breeding season leads to persistence of ATV from year to year.
- The researchers speculate that the seven-year data set demonstrates a temporal pattern of transmission and host mortality that is consistent with predictions from classical epidemiological models. Thus, peak ATV prevalence tends to occur when larval density is highest, coinciding with high mortality events in high-density years (2013/14, 2017, and 2019). Following host population crashes, ATV prevalence declines (almost to zero in 2015 and 2018), which is then followed by a one- to two-year period of host population and ATV recovery. If this interpretation of host density-dependent transmission and outbreaks is correct, a host population crash is anticipated in 2020 and low ATV prevalence, followed by recovery over the subsequent one to two years.
- Publication: Lung, O, M Nebroski, S Gupta, and CP Goater. 2019. "Genome sequences of *Ambystoma Tigrinum* Virus recovered during a mass die-off of western tiger salamanders in Alberta, Canada." *Microbiology Resource Announcements* 8: 29 e00265-19.

Contribution of Pesticides and Climate Change to the Decline of Freshwater Mussel Populations in Alberta

University of Lethbridge (Dr. Pyle)

Grant: \$27,000

Project Code: 020-00-90-281

Project Status: New; Extended until May 31, 2020

The goal of this project is to develop biomarkers to monitor the health of populations of fatmucklets (*Lampsilis siliquoides*) impacted by pesticides and climate change in Alberta. The three objectives to meet the project goal are to: 1) determine whether Roundup, a contaminant associated with agricultural practices in southern Alberta, affects the survival of mussels; 2) determine whether the toxicity of Roundup is altered by different levels of salinity representing climate changes; and 3) develop a suite of biomarkers of effect and exposure to Roundup alone and with salinity. Ten mussel beds (20–119 mussels each) were identified in the Old Man River and 92 fatmucklets were collected for this project. At the University of Lethbridge, a 96-hour range-finding assay was performed to determine the appropriate Roundup concentration to use for co-exposure studies with salinity. Fatmucklets were then exposed to Roundup alone and at two different salinity levels (low and high) to test various endpoints (survival, and molecular and biochemical markers). At the beginning and end of exposure, water samples were collected and sent to the Agriculture and Agri-Food Canada to be tested for Roundup. At the end of exposure, hemolymph and dissected out physiologically sensitive tissues (gill and digestive gland) were collected to test for molecular and biochemical markers of exposure and stress. The researchers are currently testing tissues for biomarkers that indicate oxidative stress from exposure and isolating RNA for molecular analysis using RNAseq.

Results/Deliverables:

- This project was not completed as planned due to delays in: finding enough large mussel beds to collect individuals from; measuring Roundup in exposure water because of a broken liquid chromatography mass spectrometer at Agriculture and Agri-Food Canada. Tissue samples have been processed and analysis of molecular and biochemical endpoints are in progress. The University of Lethbridge has suspended research activity, thus halting progress of the study.

Biodiversity and Distribution of Cryptic Duckweed Species in Alberta

University of Lethbridge (Dr. Laird)

Grant: \$25,000

Project Code: 015-00-90-281

Project Status: New; Extended until December 31, 2020

Duckweeds in the genus *Lemna* are tiny aquatic plants that float on the surface of still waters in Alberta and around the world. Their ubiquity and fast growth make them important food sources for many species, including those of interest to hunters, anglers, and trappers. To understand the importance of duckweeds in Alberta's ecosystems—and on the species of economic and recreational interest they contain—it is necessary to know what species are present, but

even this basic question is in doubt. Specifically, while the Alberta Biodiversity Monitoring Institute (ABMI) and other agencies indicate the presence of two *Lemna* species in Alberta, *L. trisulca* and *L. turionifera*, the project's preliminary DNA barcoding data indicated a third species, *L. minor*, is also present. *L. minor* and *L. turionifera* are cryptic species, so it was unknown whether *L. minor* is truly provincially rare, or merely 'hiding in plain sight'. To this end, this research had two main objectives: 1) to develop molecular tools for the rapid identification of *Lemna*; and 2) to determine the presence and biogeographical distribution and levels of genetic diversity of *Lemna* in Alberta. In collaboration with research partners at the Royal Alberta Museum, the researchers collected samples from 130 wetland locations across Alberta. Many of these samples were cultured in the lab. Using the samples, DNA markers were developed and tested that considerably expedite the molecular identification of *Lemna* species. This research also showed conclusively that there are indeed three species of *Lemna* in the province; moreover, preliminary data appear to show that *Lemna minor* is concentrated in the southern part of the province, while its cryptic congeneric species, *L. turionifera*, is more widespread. Twelve different genes have been sequenced and very little within-species genetic variation was found in both *L. turionifera* and *L. minor*.

Results/Deliverables:

- Preliminary results show that both species, *L. minor* and *L. turionifera* are present in the province even though the ABMI presently only lists *L. turionifera*. *L. minor* appears to be concentrated in the southern part of the province while *L. turionifera* is more widespread and some lakes that tested (N = 7) contain both species. The presence of *L. minor* was not unexpected, based on the researchers' prior data. However, the researchers had no *a priori* knowledge of *L. minor*'s geographic distribution in the province; therefore, its specific distribution was (in a sense) unexpected.
- Molecular tools associated with *Lemna* species identification were developed. However, the researchers have not been able to develop tools to identify lower levels of biological organizations (e.g., strains or ecotypes). This was unexpected but does not substantially detract from the success of this project (and will hopefully be obviated by the upcoming genome sequencing).
- MSc thesis of Kanishka Senevirathna. Kanishka was offered admission to the MSc program by the School of Graduate Studies at the University of Lethbridge and started in January 2019. Completion date: December 2020.
- Two publications in peer-reviewed journals (titles tentative): (a) 'Biodiversity and distribution of cryptic duckweed species in Alberta' (tentative target journal: *Botany*); (b) 'Molecular tools for distinguishing among strains and species of duckweeds' (tentative target journal: *Molecular Ecology*). Completion Date (for both): December 2020.
- Two professional conference presentations related to the publications discussed above (tentative target conference: annual meetings of the Canadian Society for Ecology and Evolution). Completion date: May 2021. Kanishka already presented his research at a local conference and was given second prize for his talk.
- Report to ABMI regarding the biodiversity and distribution of cryptic duckweed species in Alberta. Completion date: December 2020. ABMI has been updated throughout the project on the results.

Assessing Translocation Success and Implications of Greater Sage-Grouse in Alberta Using Genetic Assignment Methods

University of Lethbridge (Dr. Burg)

Grant: \$35,000

Project Code: 030-00-90-301

Project Status: New; Extended until December 31, 2020

Since 2011, the greater sage-grouse (*Centrocercus urophasianus*) recovery project has translocated 82 individuals (three males and 79 females) from Montana to southern Alberta to augment declining local populations. The main goal of this project is to determine the genetic contributions of translocated birds to local Alberta populations to determine the success of current recovery plans. To examine this question, microsatellite and mitochondrial DNA (mtDNA) markers were used to measure relatedness and create pedigrees, thereby quantifying the reproductive output and genetic contribution to wild populations by translocated individuals. This work shows that genetic diversity is lower than values reported in Alberta from previous studies. However, it is likely that genetic contributions from the translocated birds have helped increase genetic diversity levels following population declines in Alberta. These results suggest that translocations are having a positive impact on the native sage-grouse population, although further analyses are necessary to evaluate the effects of these translocations. This project has been extended to use the remainder of the existing funds to analyze additional samples from 2020. Including samples from an extra year will allow the researchers to better assess inter-annual variation in breeding success of greater sage-grouse populations and genetic changes within Alberta populations across a seven-year period, as well as post-translocation monitoring for multiple translocation events. This is particularly important as a translocation was done in 2019, and the 2019 translocation was the first time males were translocated allowing the researchers to get a second year of data from these birds. Results will show how the genetic diversity has changed in this population and which birds are more successful. The research has found that although some measures of genetic diversity (allelic richness) have decreased in the Alberta populations, others (both observed and expected heterozygosity) are comparable to historic levels published in peer-reviewed journals. Preliminary population genetic analyses indicate that contemporary populations form a distinct genetic cluster. Analyses based on mtDNA markers indicate that mtDNA haplotype frequencies have changed from pre-2005 levels, and several new haplotypes were detected in Alberta that were previously found in Montana showing the translocated birds successfully reproduced. It will also assist with recovery across their former range and the province in meeting the goals set forward in the Alberta Greater Sage-Grouse Recovery Plan 2013-2018.

Results/Deliverables:

- Analysis of mtDNA sequence data shows that several haplotypes previously undetected in Alberta are now in the Alberta population. These haplotypes were previously detected in Montana, indicating that translocation may alter mtDNA haplotypes frequencies. As stated above, all mtDNA analyses are preliminary and more sequences were expected back in April 2020 that will allow the researchers to further assess genetic diversity of greater sage-grouse in Alberta based on mtDNA markers. As these markers are matrilineally inherited, it will

allow the researchers to examine more closely the reproductive success of female birds that have been translocated.

- Two journal articles in peer-reviewed publications anticipated for late 2020.
- These results will be presented at upcoming conferences.
- The resulting data will be incorporated into the upcoming update to the Alberta Greater Sage-Grouse Recovery Plan 2019-2024 and the results will be shared with Montana, Fish, Wildlife, and Parks, and the Montana state game commission.

Effects of Oil Infrastructure and Noise on Nest Predators in Alberta's Grasslands

University of Manitoba (Dr. Koper)

Grant: \$25,000

Project Code: 030-00-90-297

Project Status: New; Completed

Grassland birds have faced steep declines across Canada, but the extent to which oil wells have contributed to these declines is not well understood. This is particularly relevant to conservation in Alberta, the province with the highest intensity of oil development. Wells can introduce habitat loss, edge effects, fragmentation, traffic, and industrial noise. It is important to determine whether ecological impacts of wells are due to noise or other factors, because mitigation strategies for reducing impacts of noise (e.g., mufflers) differ from mitigation strategies for reducing above-ground infrastructure (e.g., clustering well heads on centralized well pads). Previously, this research team has demonstrated that oil wells and drilling noise reduces productivity of several species of grassland birds. As the primary cause of nest failure of grassland birds is predation, this suggests that nest predator communities may be affected by industrial activity and noise. The researchers used both real oil wells and a replicated, landscape-scale noise playback experiment to determine effects of well and drilling noise, and oil wells, on a wide range of species that depredate bird nests, including raptors, corvids, rodents, and medium-sized mammals (e.g. coyotes, American badgers). Numerous species were recorded in surveys, including rare species-at-risk such as swift foxes and the western harvest mouse. While no significant differences were found among treatments, this may result from relatively low power to detect effects; further data will be collected in 2020 and 2021 to increase power. A trend was noted for relatively low abundances of rodents in sites that included oil wells, which was surprising, as research elsewhere has concluded that high rodent abundances in sites with wells explain negative impacts of wells on avian productivity. The researchers will explore this further in future surveys. Raptor abundances were relatively independent of presence of wells. No evidence was found that noise attracted or repelled nest predators. This suggests that reducing noise from wells would not decrease their impacts on nest predators, and thus that limited conservation dollars could be spent on more effective mitigation methods. These results also suggest that negative impacts of wells on nesting success may be caused by decreased parental care near wells and roads, while it is less likely that altered predator communities near wells explain these patterns.

Results/Deliverables:

- Small mammal (mice, voles, and ground squirrels), mesopredator (foxes, badgers, etc.), snake, raptor, and corvid abundance were assessed in fifteen 64-ha sites within 50 km of Brooks, Alberta. Treatments included three sites with real wells, three sites with playbacks of well operating noise, three sites with playbacks of well drilling noise, three sites with playback infrastructure turned off, and three control sites.
- Two rodent survey rounds were completed in each site, and an additional survey round in four of the five treatments, between May and July 2019. 320 rodents were captured (181 captures and 139 recaptures) from six different species, which were collected using Sherman folding traps. This included 11 captures of the endangered western harvest mouse, which next season will be targeted for further analysis to confirm the findings.
- A total of 39,000 pictures were obtained by the use of 15 trail cameras. Only five of these showed mesopredators (coyote). 60 afternoon-night surveys were conducted to assess mesopredator abundance; 87 jackrabbits, 98 antelopes, 47 coyotes, 43 deer, 13 American badgers, five red fox and two swift fox were recorded during these observations.

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 and 2018/19; Completed

Project Website: www.umt.edu/yahatinda

The Ya Ha Tinda (YHT) elk herd has declined over the past 20 years from a count of ~2,200 individuals in the early 1990s. This long-term research suggests that predation by large carnivores, wolves and grizzly bears was the leading cause of these declines. As the population declined, the number of elk remaining on the winter-areas year-round increased and the number of elk migrating westward to Banff National Park decreased. However, since about 2012, the population has shown signs of stabilizing near 400 to 500 individuals. Additionally, a new migration pattern developed in the late 2000s where increasing numbers of elk migrate eastward to take advantage of high forage quality caused by timber harvest and the Dogrib fire that burned 10,200 ha in 2001. From 2011 to 2018, 30 percent of marked elk have followed this eastern migration route. Despite the contributions of this long-term research to understanding elk ecology and management, before 2017/18 bull elk ecology and management had not been directly studied. This multi-year project has four main objectives: 1) to continue the long-term population monitoring of the YHT elk herd by monitoring pregnancy, mortality, and migratory behaviour of individually marked females; 2) to determine migratory movements of bull elk in the YHT herd; 3) to determine cause-specific mortality, survival, age structure, and trophy potential of bull elk in the YHT elk herd; and 4) to develop an integrated population model based on the long-term female data that includes bull elk population dynamics and migration. This year, 59 radio-collared female elk were monitored. A total of 11 collared adult cow elk died with eight being killed by predators (seven wolves and one grizzly bear)

and three dying from unknown causes. As part of the new research focused on bull elk ecology and migration, 45 radio-collared bull were monitored during the reporting period. Between September 17, 2019 and November 24, 2019, 12 collared bulls (27 percent) were harvested during the hunting season. During this period two more bulls died, one from unknown causes and another was a suspected wolf mortality. In summer (June to August) 2018 and 2019, the collared bull elk migrated following similar routes as the females. However, the proportion of migratory males is different than the proportion of migratory females. In June and August 2019, 25 (62 percent) of the collared bull migrated into Banff National Park, eight (20 percent) remained as residents on the winter range, and seven (18 percent) migrated east into provincial land.

Results/Deliverables:

- 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 low survival rates of bulls that meet the minimum antler point restriction, many large individuals are harvested from the Ya Ha Tinda population through the protection of 2.5-3.5-year-old bulls. Despite studies in both Banff National Park and Yellowstone finding that wolves select for male elk during mid to late winter, this project has only observed one probable wolf caused mortalities in the first two years of the study and it was during the rut when intraspecific fighting and human hunting could have been the proximate cause of death.
- Conference Presentations on the Ya Ha Tinda Study:
 - Martin, H., Hebblewhite, M., Merrill, E. H. (2019) Ideal Free Migration??? Testing for Density-Dependent Migration in a partially migratory elk population. Invited Speaker. *Symposia: Partial Migration*. The Wildlife Society Conference, Reno, NV.
 - Hebblewhite, M. (2019) Plenary: Twenty Years of the GPS-Infused Movement Revolution: Linking Movement Responses to Humans to Animal Fitness. In Gordon Research Conference: Animal Movement as a Link Between Ecology, Evolution and Behavior, Lucca, Italy.
- Stakeholder Presentation:
 - Hebblewhite, M. Ecology and Management of the Ya Ha Tinda Partially Migratory Elk Herd. Parks Canada Bison Science Planning Meeting. 25 February, 2020.
- Completed Theses:
 - Flowers, M. (2019). Winter Behavior of Resident and Migrant Elk at Ya Ha Tinda Ranch. M.S. Thesis. University of Alberta.
 - Normandeau, J.L. (2019). Linking partial migration to endo- and ectoparasite infection of collared and uncollared elk (*Cervus canadensis*). M.S. Thesis. University of Alberta.

- Completed Undergraduate Theses:
 - Hessami, M. (2019). Estimating Migratory-Resident Elk Populations and Juvenile Recruitment Using Remote Cameras in the Canadian Rockies. Senior thesis. University of Montana.
- Scientific Publications in 2019/20:
 - Berg, J.E., Hebblewhite, M., Cassady St. Clair, C., and Merrill, E.H. (2019) Prevalence and mechanisms of partial migration in ungulates. *Frontiers in Ecology and Evolution*.
- Scientific Publications submitted for review in 2019/20:
 - Merrill, E., J. Killeen, J. Pettit, M. Trottier, H. Martin, J. Berg, H. Bohm, S. Eggeman, and M. Hebblewhite. Density-dependent foraging behaviors on sympatric winter ranges in a partially migratory elk (*Cervus canadensis*) population. Submitted to *Frontiers Ecology and Evolution*.
 - Hessami, M., H. Martin, J. Whittington, M. Hebblewhite, R. Steenweg, M. Flowers, E. Merrill. Estimating Elk Calf Survival with Remote Cameras in an Occupancy Framework. Submitted to *Wildlife Society Bulletin*.
 - Normandeau, J. H. Martin, E. Merrill, M. Hebblewhite. Potential Case of Hermaphroditism in Elk (*Cervus canadensis*) in Alberta, Canada. Submitted to *Canadian Field-Naturalist*.
 - Sabal, M., E. Palkovacs, T. Luhring, N. Furey, C. M. Wagner, M. Boyce, M. Melnychuk, H. Martin. Ecological and Evolutionary Consequences of Predators on Migratory Prey. Presubmission to *Trends in Ecology and Evolution*.

Sex-Specific Responses to Climate Change in a Wild Hibernator

University of Saskatchewan (Dr. Lane)

Grant: \$22,700

Project Code: 030-00-90-302

Project Status: New; Extended until Sept. 30, 2020

The effects of climate change on wildlife can be direct (e.g., hyperthermia) and/or indirect (i.e., trophic-level mismatches). A comprehensive understanding of these effects is thus required for accurate predictions regarding climate change. This, in turn, requires highly tractable model systems. A wild population of Columbian ground squirrels (*Urocitellus columbianus*) has been established in southwest Alberta as such a model system. Until recently, these studies (similar to most investigations) have focused primarily on females. With support from ACA, the researchers have expanded their field of investigations to include males, and potential disruptions to the mating system. Ground squirrels exhibit protandrous hibernation phenology, with males typically emerging before females (presumably due to sexual selection favouring relatively earlier male emergence). In other species, climate change has relaxed the natural selection costs of early male arrival, leading to increased degrees of protandry. The fitness consequences for either sex of this shift are, however, mostly unknown. The researchers are coupling observations of hibernation phenologies with genetic paternity analysis of offspring born across seven years (including samples collected in 2019, as well as six years of archived tissue samples) to test two primary hypotheses. First, male ground squirrels, unlike females, are not phenotypically plastic to weather variation. Second,

selection on male reproductive success is conditional on both prevailing weather and female emergence dates. The field data are showing that males emerge significantly earlier than females and, in contrast to the first hypothesis, emergences of both sexes are becoming delayed due to delayed snowmelt in recent years. In fact, males are more plastic than females, meaning that emergence dates of both sexes are most similar during years of late snowmelt (as male emergences are delayed to an extent approximating those of females). Genetic analyses to test the second hypothesis are in progress. DNA tissue samples were collected from all offspring born and adults recruited into the population in 2019 (resident adults had been sampled in previous years). These samples have been sent to the University of Calgary and are awaiting paternity analysis. Recent technological developments have created the opportunity to improve the efficiency of this analysis, however, they do require unanticipated up-front costs and time. This project has been extended to capitalize on these tools. Indirect consequences of climate change are well recognized with respect to asynchronous phenological shifts between trophic levels. The principal investigator believes that asynchronous shifts between the sexes (though understudied) could be equally consequential.

Results/Deliverables:

- The researchers have learned that, although male ground squirrels behaviourally emerge from hibernation approximately one week earlier than females, both are plastically delayed in response to delayed snowmelt. There is between-sex variation in levels of plasticity, however, with the male response being stronger than that of females (in other words, the slope of the relationship between emergence date and date of snowmelt is steeper in males than in females). The researchers previously reported that dates of snowmelt had been progressively delayed, due to an increasing prevalence of late season snowstorms between 1992-2011. This effect continued into recent years. A consequence of progressively delayed snowmelts and a steeper response to this effect in males, the difference between male and female emergence dates has lessened (the sexes have become more similar in their emergence dates in recent years). This result was opposite of what was expected, and the researchers are currently evaluating the physiological emergence data (i.e., when individuals warm their body temperatures to euthermic values) to understand the underlying mechanism. If males' physiological emergences are static (expected due to a need to physiologically emerge seven to ten days before behavioural emergence to undergo spermatogenesis), but behavioural emergences are becoming delayed, it would suggest they are spending a longer period of time at euthermic body temperatures, while sequestered in the hibernaculum. This could suppress male fitness in two ways: they may suffer increased overwinter mortality if they are unable to meet the energetic demands of an extended period of time before emerging above ground. Males that emerge particularly late could also suffer from reduced reproductive success if they miss reproductive opportunities with early emerging females. Fitness data from males will be calculated from the male paternity data.
- High-impact journal publications: an in-progress manuscript is currently being prepared that summarizes the results on hibernation phenology/male plasticity. The male reproductive success data will be added when it is available. Due to the novelty of this research and the broad general interest in climate change influences on wildlife, it is expected this research will be published in a high-impact venue.

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 and 2018/19; Extended until Aug. 30, 2020

Project Website: mouflons.pvp.ca/Ram%20Mountain.htm

The 47th year of research at Ram Mountain was successful, but recruitment to the population was very poor. 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 bighorn sheep translocated from Cadomin in 2015, five remained on Ram Mountain but only three ewes produced viable lambs. At least 60 percent of the 66 sheep alive in 2019 carry some 'Cadomin' genes. The researchers continued to monitor survival, growth, and reproduction of the entire population. Except for one adult ram, all sheep were captured and measured. With only six yearlings and five lambs alive in September, the population has declined by 28 percent from last year, mostly because of poor recruitment. Only 27 percent of lambs survived the 2018/19 winter, one of the lowest lamb survivals recorded since the study began. Of 27 ewes aged three years and older, only seven were seen with lambs and two of those lambs died during the summer. Low recruitment was likely due to a very harsh winter, as weights of most animals in late May were lower than usual. With a young age structure, the population has the potential to recover quickly from this setback. There were eight 2-year-old ewes in 2019, and 27 ewes (75 percent of total) aged two to seven years. Eight papers were published in the refereed literature, and another one is 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.

Results/Deliverables:

- At least 53 percent of bighorn sheep in the study population, aged zero to ten years, now carry some introgressed genes. Although initially these admixed sheep had higher juvenile survival rates than resident sheep and contributed to population recovery, recruitment in the last two years was very low despite the presence of admixture. Admixed lambs are heavier than 'full-resident' lambs in September, but it appears that benefits of admixture may not extend beyond the F2 generation. An undergraduate student is currently analyzing the Ram Mountain pedigree to determine how the frequency of inbreeding may have changed over the last few years after the translocation. Differences in horn growth has not yet been analyzed.
- Monitoring of horn growth of all rams continued, and horn shape has been measured (horn spread and curl arcs) for about eight years now. Because of the small number of adult rams (14 in 2018 and 17 in 2019) these data findings are accumulating more slowly than expected. With six rams aged two years and six aged three years in September 2019, the researchers expect the number of adult rams to increase over the next few years, even though only three yearling males were recruited in 2019.

- The database has been updated to 2018 and a new PhD student, Roxane Lassis is analyzing differences in temporal horn trends across the province and comparing those results with harvest data from BC where rams are hunted under a full-curl regulation.
- A recent paper by Yoanna Poisson in *Journal Applied Ecology* (listed below) suggests that many rams shot in late October in Alberta are likely coming from populations inside National Parks.
- In addition to the scientific publications listed below, the researchers have continued to engage in the ongoing discussions about sheep management in Alberta. Although the researchers' 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 research team will continue to present their scientific case for an evolutionarily sustainable bighorn sheep management in Alberta. Dr. Festa-Bianchet asked to make a presentation to the Alberta Chapter of the Wild Sheep Society in March 2019 and again in 2020, but his offer was not taken up so far, despite assurances to the contrary. In May 2019, Dr. Festa-Bianchet made two presentations at the meeting of the BC Wildlife Federation. Their research was the object of several presentations at scientific meetings, including the 2019 Mountain Ungulate Congress in Bozeman, Montana, where Dr. Festa-Bianchet was an invited speaker, and the upcoming meeting of the Northern Wild Sheep and Goat Council in Canmore. This research is a major contributor of scientific data for the 2015 interim Management Plan for bighorn sheep in Alberta, which cites 37 publications from the Ram Mountain study and another 15 from the other research programs in Alberta, at Sheep River and Caw Ridge. That management plan is due to be revisited this year and it is expected this research will again make a substantial contribution to it.
- Refereed publications using data from the Ram Mountain study since 2019. Names underlined are graduate students and postdocs:
 - Douhard, M., M. Festa-Bianchet, and F. Pelletier. 2020. "Sons accelerate maternal aging in a wild mammal." *Proceedings of the National Academy of Sciences of the US*, in press.
 - Poisson, Y, M. Festa-Bianchet, and F. Pelletier. 2020. "Testing the importance of harvest refuges for phenotypic rescue of trophy-harvested populations." *Journal of Applied Ecology*, in press.
 - Festa-Bianchet, M., S. Côté, S. Hamel, and F. Pelletier. 2019. Long-term studies of bighorn sheep and mountain goats reveal fitness costs of reproduction. *Journal of Animal Ecology*, 88: 1118-1133.
 - Renaud, L.-A., G. Pigeon, M. Festa-Bianchet, and F. Pelletier. 2019. Phenotypic plasticity in bighorn sheep reproductive phenology: from individual to population. *Behavioral Ecology and Sociobiology*, 79:4.
 - Douhard, M., M. Festa-Bianchet, J. Landes, and F. Pelletier. 2019. Trophy hunting mediates sex-specific associations between early-life environmental conditions and adult mortality in bighorn sheep. *Journal of Animal Ecology*, 88: 734-745.
 - Douhard, M., M. Festa-Bianchet, S. Hamel, D. Nussey, S.D. Côté, J. Pemberton, and F. Pelletier. 2019. Maternal longevity and offspring sex in wild ungulates. *Proceedings of the Royal Society B*, 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*, 12: 1318-1328.

Evaluating the Efficacy of Bat Boxes for the Conservation and Recovery of Bats

Wildlife Conservation Society Canada

Grant: \$26,000

Project Code: 030-00-90-299

Project Status: New; Did not proceed

The escalating public interest in constructing bat boxes is based on the premise that these mitigate lost habitat for bats in summer when they are raising young; an assumption that has not been properly tested. There is recent and growing concern, however, that despite their growing popularity, bat boxes might in fact be detrimental to bat populations in situations where microclimates are sub-optimal for reproduction, and/or where over-heating causes mortality, which may worsen with climate change. The project goal was to critically evaluate these and other factors to maximize the conservation value of bat boxes. The plan was to do this by investigating roosting ecology of reproductive female little brown myotis using anthropogenic roosts (bat boxes and buildings), measuring multiple characteristics of these structures as a function of roost switching/occupancy and reproductive success. This grant was not accepted, due to difficulty in finding qualified staff with the availability to carry out the project.

Results/Deliverables:

This grant was turned down, as WCS Canada couldn't secure qualified staff to carry out the project.



Southern Alberta Grazing School for Women participants learning plant identification

Photo provided by: Cows and Fish

Relating to the project: Southern Alberta Grazing School for Women (020-00-90-165)

APPENDIX:

Projects in Relation to Grants Funding Priorities 2019/20

ACA Conservation, Community, and Education Funding Priorities

FUNDING PRIORITY #1: 10 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; \$25,100

Alberta Mycological Society; Fungal Biodiversity Survey, West Castle – Mushroom Identification; \$3,000

Alberta Riparian Habitat Management Society (Cows and Fish); Implementing Riparian Habitat Management Improvements for Westslope Cutthroat Trout; \$11,500

Chinook Pheasants Forever; Sauder Reservoir Habitat Project; \$26,970

Lesser Slave Lake Bird Observatory Society; Avian Monitoring and Outreach Education Programs at Lesser Slave Lake; \$24,500

Northern Lights Fly Fishers TUC Edmonton Chapter; Conserving and Restoring Arctic Grayling in the Upper Pembina River Watershed - Habitat Restoration Planning; \$8,997

Trout Unlimited Canada; Bringing Back Bull Trout; \$30,000

Trout Unlimited Canada; Stream Rehabilitation Training (SRT) Program; \$11,900

Waterton Biosphere Reserve; Promoting Wetland Stewardship and Improving Wetland Habitat in Waterton Biosphere Reserve; \$10,856

Wildlife Conservation Society Canada; Going to Bat for Bats: Citizen science in Alberta; \$29,500

FUNDING PRIORITY #2: 32 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 (i.e. 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; \$25,100

Alberta Fish & Game Association; Pronghorn Antelope Migration Corridor Enhancement; \$40,698

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

Alberta Riparian Habitat Management Society (Cows and Fish); Implementing Riparian Habitat Management Improvements for Westslope Cutthroat Trout; \$11,500

Beaverhill Bird Observatory; Public Engagement, Wildlife Conservation and Monitoring at Beaverhill Lake; \$23,250

Bow River Trout Foundation; Bow River Policeman's Flats River Access Upgrade 2019; \$6,304

Camrose County; Enhancing Conservation Areas within Camrose County; \$36,652.56

Chinook Pheasants Forever; Ross Creek Conservation Site Food Plots Planting; \$3,250

Chinook Pheasants Forever; Sauder Reservoir Habitat Project; \$26,970

Ducks Unlimited Canada; Marshkeeper's - Conservation through Volunteer Empowerment; \$5,500

Edmonton and Area Land Trust; Land Stewardship and Monitoring of New Natural Areas in Beaverhills Biosphere Reserve; \$7,650

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

Lesser Slave Lake Bird Observatory Society; Avian Monitoring and Outreach Education Programs at Lesser Slave Lake; \$24,500

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

Nature Conservancy of Canada; An Integrated Pest Management Strategy for Tackling Non-Native, Noxious Weeds Across Alberta; \$35,000

North East Alberta Fish & Game Association; Fish Habitat Restoration in NE and Central Alberta Lakes; \$15,000

Northern Lights Fly Fishers TUC Edmonton Chapter; Conserving and Restoring Arctic Grayling in the Upper Pembina River Watershed - Habitat Restoration Planning; \$8,997

Northern Lights Fly Fishers/ TUC Edmonton Chapter; Fishery Enhancement - Beaumont; \$9,250

Onoway & District Fish & Game Association; Birdhouses; \$2,500

Red Deer County; Wildlife and Native Habitat Enhancement in Red Deer County via ALUS (2019); \$40,000

Spruce Grove Fish & Game Association; Bird/Bat Box Project; \$2,000

St. Paul Fish & Game Association; Lac Delorme (George's Lake) Access Improvement; \$5,000

Sturgeon School District; Environmental Opportunities Enhancement; \$15,000

Trout Unlimited Canada; Bringing Back Bull Trout; \$30,000

Trout Unlimited Canada; Stream Rehabilitation Training (SRT) Program; \$11,900

Trout Unlimited Canada; Yellow Fish Road (YFR) and Water Edu-kit (WEK); \$22,310

Waterton Biosphere Reserve; Promoting Wetland Stewardship and Improving Wetland Habitat in Waterton Biosphere Reserve; \$10,856

Weaselhead/Glenmore Park Preservation Society; Weaselhead Invasive Plant Program 2019; \$2,500

West County Watershed Society; 10 Years Later - A Closer Look at Riparian Enhancement Projects in the Beaverlodge River Watershed; \$22,926.69

Wetaskiwin County; Wetaskiwin/Leduc Alternative Land Use Services (ALUS); \$4,500

Wildlife Conservation Society Canada; Going to Bat for Bats: Citizen science in Alberta; \$29,500

Wildlife Preservation Canada; Conserving Species-At-Risk Bumble Bees, Associated Bee Communities, and their Habitats in Glenbow Ranch Provincial Park; \$20,032

FUNDING PRIORITY #3:

3 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 water bodies).

Camrose County; Enhancing Conservation Areas within Camrose County; \$36,652.56

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

Northern Lights Fly Fishers/ TUC Edmonton Chapter; Fishery Enhancement - Beaumont; \$9,250

FUNDING PRIORITY #4:

11 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; \$15,000

Alberta Mycological Society; Fungal Biodiversity Survey, West Castle - Mushroom Identification; \$3,000

Alexis Nakota Sioux Nation; Lake Isle Flowering Rush Project; \$30,000

Glenbow Ranch Park Foundation; 2019 Invasive Species Management at Glenbow Ranch; \$12,400

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

Northern Lights Fly Fishers/ TUC Edmonton Chapter; Fishery Enhancement - Beaumont; \$9,250

Sturgeon School District; Environmental Opportunities Enhancement; \$15,000

Trout Unlimited Canada; Bringing Back Bull Trout; \$30,000

Weaselhead/Glenmore Park Preservation Society; Weaselhead Invasive Plant Program 2019; \$2,500

Wildlife Conservation Society Canada; Going to Bat for Bats: Citizen science in Alberta; \$29,500

Wildlife Preservation Canada; Conserving Species-At-Risk Bumble Bees, Associated Bee Communities, and their Habitats in Glenbow Ranch Provincial Park; \$20,032

FUNDING PRIORITY #5: 33 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; “Kids Can Catch” and archery events for kids). Generate awareness of the hunting/angling/trapping opportunities available to the public.

Alberta Hunter Education Instructors’ Association; 16th Annual O.W.L. Day – “Outdoor Wildlife Learning”; \$3,000

Alberta Hunter Education Instructors’ Association; 26th Annual Outdoor Women’s Program; \$15,000

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

Alberta Hunter Education Instructors’ Association; Conservation Education for the Army Cadet League of Canada – AB; \$3,000

Alberta Hunter Education Instructors’ Association; Outdoor Youth Seminar; \$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; \$20,000

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; “AC Conference” (Alberta Youth Outdoor Skills Conference); \$2,510

Alberta Trappers’ Association; Helping to education future trappers and ensure long-term sustainable harvest using the best available science; \$20,248

Alberta Trappers’ Association; Trapper Education in the Schools; \$21,100

Alberta Trappers’ Association; Youth Camp; \$19,480

Calgary Chapter Pheasants Forever Canada Society; Post-Secondary First Pheasant Mentor Hunt Program; \$4,850

Carbon and District Agricultural Society and Curling Club; Creation of Archery Club and Range; \$3,000

Ducks Unlimited Canada; Marshkeeper’s – Conservation through Volunteer Empowerment; \$5,500

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; \$8,000

J.T. Foster School; J.T. Foster School Wildlife Education and Recruitment; \$3,000

Lesser Slave Lake Bird Observatory Society; Avian Monitoring and Outreach Education Programs at Lesser Slave Lake; \$24,500

Northern Lights Fly Fishers/ TUC Edmonton Chapter; Fishery Enhancement – Beaumont; \$9,250

Red Deer Fish & Game Association; Pheasant Pen Replacement Program; \$14,412

Southern Alberta Bible Camp; Archery Program; \$2,500

Southern Alberta Bible Camp; Pelletry Program; \$1,500

Spruce Grove Fish & Game Association; Bird/Bat Box Project; \$2,000

Sturgeon School District; Environmental Opportunities Enhancement; \$15,000

Taber Fish & Game Association; Taber Fish & Game and ACA Youth Fishing Recruitment Day; \$18,900

Taber Fish & Game Association; Taber Fish & Game Outdoor Day and Antler Measure; \$2,500 *did not proceed

Taber Fish & Game Association; Winter Family Fun Fishing Day; \$9,528.13

Town of Cochrane; Kids Can Catch 2019; \$3,000

Trout Unlimited Canada; Yellow Fish Road (YFR) and Water Edu-kit (WEK); \$22,310

Yellowhead County; Kids Can Catch Event; \$1,700

FUNDING PRIORITY #6: 58 CCEG PROJECTS

Projects related to outdoor conservation education.

Alberta Fish & Game Association; Increasing Habitat for Species At Risk in Alberta’s Grassland Region through Adaptive Management, Habitat Enhancement, and Outreach; \$25,100

Alberta Hunter Education Instructors’ Association; 16th Annual O.W.L. Day – “Outdoor Wildlife Learning”; \$3,000

Alberta Hunter Education Instructors’ Association; 26th Annual Outdoor Women’s Program; \$15,000

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

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

Alberta Hunter Education Instructors’ Association; AHEIA’s Wildlife Workbook Rewrite for Children; \$3,000

Alberta Hunter Education Instructors’ Association; Conservation Education for the Army Cadet League of Canada – AB; \$3,000

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

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

Alberta Hunter Education Instructors’ Association; Provincial Hunting Day Initiatives; \$20,000

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; “AC Conference” (Alberta Youth Outdoor Skills Conference); \$2,510

Alberta Mycological Society; Fungal Biodiversity Survey, West Castle – Mushroom Identification; \$3,000

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

Alberta Trappers’ Association; Trapper Education in the Schools; \$21,100

Alberta Trappers’ Association; Youth Camp; \$19,480

Alexis Nakota Sioux Nation; Lake Isle Flowering Rush Project; \$30,000

Ann and Sandy Cross Conservation Area; Outdoor Conservation Education for High Needs Schools; \$6,250

AQUALITY Environmental Consulting Ltd.; Alberta Wetlands 101 Online Experience; \$13,000

Aquarium Society of Alberta; Water on Wheels; \$12,075

Battle River Research Group; A Complex Relationship Between Agricultural Practices and Wildlife Habitat in Central-East Alberta; \$2,950

Beaverhill Bird Observatory; Public Engagement, Wildlife Conservation and Monitoring at Beaverhill Lake; \$23,250

Camrose Wildlife Stewardship Society; 2019 Camrose Purple Martin Festival; \$1,350

Canadian Parks and Wilderness Society (CPAWS) Southern Alberta Chapter; Healthy Habitats: Getting Albertans outside to enjoy, value, and use Alberta wilderness; \$20,000

Chinook Pheasants Forever; Sauder Reservoir Habitat Project; \$26,970

Ducks Unlimited Canada; Marshkeeper’s - Conservation through Volunteer Empowerment; \$5,500

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

J.T. Foster School; J.T. Foster School Wildlife Education and Recruitment; \$3,000

Legacy Land Trust Society; Conservation Community; \$3,000

Lesser Slave Lake Bird Observatory Society; Avian Monitoring and Outreach Education Programs at Lesser Slave Lake; \$24,500

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

Nature Alberta; Nature Kids Family Nature Nights and Field Trips 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; \$8,997

Onoway & District Fish & Game Association; Birdhouses; \$2,500

River of Death and Discovery Dinosaur Museum Society; Summer Day Camps; \$1,763.62

River of Death and Discovery Dinosaur Museum Society; Junior Palaeontologist II Day Camp; \$1,980.76

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; \$3,825

Southern Alberta Bible Camp; Archery Program; \$2,500

Southern Alberta Bible Camp; Pelletary Program; \$1,500

Spruce Grove Fish & Game Association; Bird/Bat Box Project; \$2,000

Sturgeon School District; Environmental Opportunities Enhancement; \$15,000

Taber Fish & Game Association; Taber Fish & Game Outdoor Day and Antler Measure; \$2,500 *did not proceed

Taber Fish & Game Association; Taber Fish & Game and ACA Youth Fishing Recruitment Day; \$18,900

The Botha School Society; Botha School Wildlife Education Program; \$2,625

Trout Unlimited Canada; Bringing Back Bull Trout; \$30,000

Trout Unlimited Canada; Stream Rehabilitation Training (SRT) Program; \$11,900

Trout Unlimited Canada; Yellow Fish Road (YFR) and Water Edu-kit (WEK); \$22,310

Waterton Biosphere Reserve; Promoting Wetland Stewardship and Improving Wetland Habitat in Waterton Biosphere Reserve; \$10,856

Weaselhead/Glenmore Park Preservation Society; Weaselhead Invasive Plant Program 2019; \$2,500

West County Watershed Society; 10 Years Later – A Closer Look at Riparian Enhancement Projects in the Beaverlodge River Watershed; \$22,926.69

Wetaskiwin County; Wetaskiwin/Leduc Alternative Land Use Services (ALUS); \$4,500

Wildlife Conservation Society Canada; Going to Bat for Bats: Citizen science in Alberta; \$29,500

Wildlife Preservation Canada; Conserving Species-At-Risk Bumble Bees, Associated Bee Communities, and their Habitats in Glenbow Ranch Provincial Park; \$20,032

Yellowhead Junior Forest Wardens Regional Council; JFW Regional Camp 2019; \$1,200 *note, grant not accepted so amount not added to total

Yellowhead Junior Forest Wardens Regional Council; Trailblazer Advanced Camp; \$2,000

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).

University of Calgary (Dr. Smits); Assessing the Capacity of Urban Wetlands to Support Biodiversity Using Amphibian Sentinels; \$14,500

University of Lethbridge (Dr. Burg); Assessing Translocation Success and Implications of Greater Sage Grouse in Alberta Using Genetic Assignment Methods; \$35,000

University of Manitoba (Dr. Koper); Effects of Oil Infrastructure and Noise on Nest Predators in Alberta's Grasslands; \$25,000

Wildlife Conservation Society Canada (Dr. Lausen); Evaluating the Efficacy of Bat Boxes for the Conservation and Recovery of Bats; \$26,000 – *note, grant not accepted so amount not added to total

FUNDING PRIORITY #2: 0 RESEARCH PROJECTS

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

Wildlife Conservation Society Canada (Dr. Lausen); Evaluating the Efficacy of Bat Boxes for the Conservation and Recovery of Bats; \$26,000 – *note, grant not accepted so amount not added to total

FUNDING PRIORITY #3: 0 RESEARCH PROJECTS

Develop and validate inventory tools to determine the relative density and range of ungulate species using innovative detection technologies (e.g. DNA/eDNA, camera traps, drones).

FUNDING PRIORITY #4: 2 RESEARCH PROJECTS

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

University of Calgary (Dr. Smits); Assessing the Capacity of Urban Wetlands to Support Biodiversity Using Amphibian Sentinels; \$14,500

University of Lethbridge (Dr. Pyle); Contribution of Pesticides and Climate Change to the Decline of Freshwater Mussel Populations in Alberta; \$27,000

FUNDING PRIORITY #5: 5 RESEARCH PROJECTS

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

Goldstream Publishing Inc. (Mr. Simmons); Using Citizen Science to Enhance Fisheries Data Collection and Monitoring; \$15,000

University of Calgary (Dr. Post); Assessing the Effectiveness of Alberta's Walleye Regulations to Sustain High-Quality Fishing Opportunities; \$14,100

University of Calgary (Dr. Smits); Assessing the Capacity of Urban Wetlands to Support Biodiversity Using Amphibian Sentinels; \$14,500

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 #6: 3 RESEARCH PROJECTS

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

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

University of Calgary (Dr. Post); Assessing the Effectiveness of Alberta's Walleye Regulations to Sustain High-Quality Fishing Opportunities; \$14,100

University of Lethbridge (Dr. Goater); Ecological Epidemiology of Emerging *Ambystoma tigrinum* Virus (ATV) in a Population of Tiger Salamanders in Southwestern Alberta; \$6,338

Wildlife Conservation Society Canada (Dr. Lausen); Evaluating the Efficacy of Bat Boxes for the Conservation and Recovery of Bats; \$26,000 – *note, grant not accepted so amount not added to total

FUNDING PRIORITY #7: 3 RESEARCH PROJECTS

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

University of Alberta (Dr. Merrill); Chronic Wasting Disease in Deer: Modeling 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: 2 RESEARCH PROJECTS

Social Science studies of hunting and angling related to demography, attitudes, norms and practices.

Goldstream Publishing Inc. (Mr. Simmons); Using Citizen Science to Enhance Fisheries Data Collection and Monitoring; \$15,000

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

FUNDING PRIORITY #9: 0 RESEARCH PROJECTS

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

FUNDING PRIORITY #10: 0 RESEARCH PROJECTS

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

FUNDING PRIORITY #11: 3 RESEARCH PROJECTS

Work towards clarifying status of current data deficient species.

Athabasca University (Dr. Glover); Characterizing Arctic Grayling Distribution and Habitat Preferences Using Environmental DNA; \$15,000

University of Lethbridge (Dr. Pyle); Contribution of Pesticides and Climate Change to the Decline of Freshwater Mussel Populations in Alberta; \$27,000

University of Lethbridge (Dr. Laird); Biodiversity and Distribution of Cryptic Duckweed in Species in Alberta; \$25,000

FUNDING PRIORITY #12: 1 RESEARCH PROJECT

Efficacy of alternative wetland restoration strategies.

Fiera Biological Consulting Ltd. (Dr. Clare); Quantifying Yield Impacts and the Profitability of Wetlands in Agricultural Cropland; \$16,800

**NONE OF THE FUNDING PRIORITIES: 3 PROJECTS
(1 CCEG; 2 RESEARCH)**

Calgary Fish & Game Association; CFGA Pheasant Crate Update; \$4,095

Ducks Unlimited Canada (Dr. Devries); Understanding the Importance of Migratory and Breeding Habitat Selection for Northern Pintails; \$14,600

University of Saskatchewan (Dr. Lane); Sex-Specific Responses to Climate Change in a Wild Hibernator; \$22,700

**BACKGROUND DOCUMENT
BY DRS. BOYCE AND POESCH: 4 RESEARCH PROJECTS**

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

Athabasca University (Dr. Glover); Characterizing Arctic Grayling Distribution and Habitat Preferences Using Environmental DNA; \$15,000

Fiera Biological Consulting Ltd. (Dr. Clare); Quantifying Yield Impacts and the Profitability of Wetlands in Agricultural Cropland; \$16,800

University of Manitoba (Dr. Koper); Effects of Oil Infrastructure and Noise on Nest Predators in Alberta's Grasslands; \$25,000

University of Saskatchewan (Dr. Lane); Sex-Specific Responses to Climate Change in a Wild Hibernator; \$22,700

Note: Projects can relate to multiple funding priorities.



wildlife | fish | habitat



101 – 9 Chippewa Road, Sherwood Park, Alberta T8A 6J7
Tel: 780-410-1999 | Fax: 780-464-0990 | Toll Free: 1-877-969-9091

ab-conservation.com