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# REPORT

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## Williston Area Schools Ecology Program

### Project No. PF17-W1422 – Annual report 2017

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## EXECUTIVE SUMMARY

The Williston School Ecology Program has completed its third year of programming, and has delivered all of the school ecology modules outlined in the project proposal. The modules, and the revisions made to them, were very well received by the school community, and interest in continuing this program remains consistently high. The high school module pilots were implemented for the first time this year, with overall good outcomes and valuable lessons learned. Volunteer engagement continues to be a cornerstone of this project, and provides expert knowledge, in-kind support, and exposure to career fields that are very valuable. The partnership with McLeod Lake Indian Band remains strong and active. An exciting avenue for program extension in Moberly Elementary school (serving Saulteau and West Moberly First Nations) has opened up, and potential new sources of funding to diversify the support portfolio for this program are outlined.

The Williston School Ecology Project aligns with the Fish and Wildlife Compensation Program's Peace Basin Plan (Section 4.3) in that it addresses the outlined 'Stewardship and Education' priorities. This project meets the criteria of having a "high educational, volunteer and/or community engagement component", given that the recipients of the projects are K-12 students at the local schools and diverse volunteers from the community provide half of the time spent on this project. The activities undertaken as part of this project address habitat-based actions, whose goal is "improving general habitat conditions or ecosystem function", in a long-term way by cultivating environmental stewardship, ecological knowledge and nature appreciation among the next generation of northern BC residents.

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## ACKNOWLEDGMENTS

This project is truly a community-wide collaboration and would not be possible without the generous support of many individuals and organizations. Christy Wright did an excellent job establishing this program and stepping up to meet a need that many in the community had recognized. Christy's thorough written content and mentorship allowed a smooth program transition with no interruption to the module implementation schedule – the first four modules of this year's programming were implemented by her, and the module-specific reports for those modules are also provided by her.

Many thanks, again, go out to our returning and new volunteers. Tremendous accolades go to Jim Tuck, who is a reliable and committed program volunteer and a deeply knowledgeable source of local information. Thanks to all the local organizations and industries that provide expert in-kind support through the volunteerism of their staff, and materials (they are individually listed in this report). Thanks to Jeff Ransamaag for lending us skulls for the mustelid module, and to Jim Tuck for sourcing some additional furs.

McLeod Lake Indian Band continues to be a positive and enriching program partner. From the elders who have shared their stories of traditional livelihoods and values with the students, to Anita Vallee's famous bannock, moose stew and humor, to the logistical help with setting up field sites and providing firewood, this program would not have been the same without them. Special thanks to Jenine Solonas for her roles as a mentor to ensure program continuity within the school, as an Aboriginal Liaison, and a helper on many field trips. Special thanks also to Cherri Carlson, the Ab-Ed coordinator at Mackenzie Secondary and her students, who were incredibly helpful during some cold winter field trips with keeping the firepit and hot food stations running smoothly for the younger students.

This Project is funded by the Fish and Wildlife Compensation Program (FWCP). The FWCP is a partnership between BC Hydro, the Province of B.C., Fisheries and Oceans Canada, First Nations and public stakeholders to conserve and enhance fish and wildlife impacted by the construction of BC Hydro dams. The HCTF Go! Program has also been an important source of support for the program's operations. Wildlife Infometrics continues to provide invaluable ideas, administrative program support, and a hub for program operations and networking. Morfee Elementary and Mackenzie Secondary have been tremendously encouraging of the program, and must be commended for being flexible around the inevitable changes associated with field excursions, weather days, and the timing of the natural phenomena we work around.

# INTRODUCTION

## History of the program

The Mackenzie School Ecology Program (now the Williston School Ecology Program) originated as a volunteer venture by a Wildlife Infometrics staff and other community members. The first few modules that were offered at Morfee Elementary were based on previous outdoor education programs at the school, which had all been discontinued for various reasons. These one-off modules were very well received by students, and teachers from all grades requested to have something similar in their classroom. The 2014-2015 fiscal year was the first funded year of program implementation, with 4 modules developed and delivered. In 2015-2016 the rest of the elementary modules were developed and delivered, with the program gaining broad support in the school and growing recognition within the community. In 2016-17, the focus was on continuing to implement and improve the existing elementary modules in Mackenzie, as well as implement pilot modules at the high school and explore extension possibilities.

## Goals and Objectives

1. To extend ecological and cultural education by providing hands-on and outdoor-based learning experiences to students
2. To foster a greater appreciation for local flora and fauna, and place-based learning
3. To expose students to a variety of career possibilities in the environmental and natural resource fields
4. To address the FWCP Peace Region's strategic objective of community engagement in alignment with the Peace Basin Plan (Section 4.3) to support 'Stewardship and Education' projects.

# RESULTS

## General Summary

In the 2016/2017 activity year, we delivered 10 ecology learning modules to 18 classes ranging from kindergarten to grade 10. These modules reached ~ 320 students, as well as the 18 teachers, 5 teaching assistance staff, and over 30 parents who chaperoned these activities.

A major new step for the program this year was implementing pilot modules in the Mackenzie Secondary School. Developing and implementing the high school modules posed unique challenges and opportunities. Notably, high school students rotate through four, 90-minute class blocks a day. This factor limits the 'search radius' for suitable field trip sites to locations accessible within ~10 minutes i.e. walking distance (as described in the 'Spruce Seed' module below). Alternately, arrangements can be made for students to miss one class block so that the Science block can be paired with the other morning/afternoon class, thus allowing for a 2.5 hour block (see 'flicker' module below). This widens the 'search radius' to sites accessible within 20-25 minutes, which provides

more interesting location options, but also raises the possibility that some students may not be allowed (by the teacher granting the leave permission) or willing to attend.

These challenges notwithstanding, we have tested what we feel to be a useful and workable model. Specific details are described in the 'Module-specific accounts' below, while we describe the general model here. For both modules, we used three full class blocks. In the first class we provided an introduction to the central topics as they related to the class curricula, shared information on the focal ecology topics and local details, did a few interactive exercises with the students, and prepared students for the field trip and the data they will be collecting. The second class was the field trip, where students collected some specific data to be used in the 3<sup>rd</sup> class for analysis, and also learned about the natural history of the field site. The third class was focused on analyzing and interpreting the data collected during the field trip, and also on a general discussion of the ecology of the site we visited. Student attendance and interest in the modules was high, which was not unexpected, given that this program provided one of very few outdoor learning opportunities for these students in their school year.

As part of an expanding connection with the high school, we have engaged the aboriginal education program at Mackenzie Secondary. The coordinator (Cherri Carlson) and several of the students in the program have joined a couple field trips with the elementary classes, and have played a valuable role by assisting with chaperoning students between stations, helping with set up and take down, and running the fire-pit and warm-up stations. Besides helping run a smoother field trip, we see these as excellent opportunities for the students to assume a leadership role in a low-stress setting, and also learn some ecology and aboriginal knowledge while on site at the field trip.

Throughout the year, we revised and updated the elementary module content to reduce redundancy for split-grade classrooms and re-align with the new provincial curriculum learning outcomes. Many of the changes were 'tweaks' focused on the delivery of the classroom modules and ways of talking about the content that ties in with classroom curricula. Some examples are: updating the classroom forestry (gr 5) session to be based on a discussion of renewable and non-renewable resources, and developing an activity where students have to identify and discuss the 'renewability' of various resources. Also, we added a new component to the 'wildlife values' station on the forestry field trip – students got to identify and classify wildlife trees based on material taken directly from forestry manuals. For the grade 7 caribou field trip, we significantly revised the focus of both the classroom and the field trip component, taking a more evolution-focused angle, compared to the 'predator-prey dynamics' focus of previous years. For all modules, we incorporated wildlife documentary video clips into the classroom session – a new step which really helped illustrate concepts such as the leaping gait of the mustelids, or the UV vision of caribou.

The Williston School Ecology Project aligns with the Fish and Wildlife Compensation Program's Peace Basin Plan in that it addresses the outlined 'Stewardship and Education' priorities. This project meets the criteria of having a "high educational, volunteer and/or community engagement component", given that the recipients of the projects are K-12 students at the local schools and diverse volunteers from the community provide half of the time spent on this project. The activities undertaken as part of this project address habitat-based actions, whose goal is "improving general habitat conditions or ecosystem function", in a long-term way by cultivating

environmental stewardship, ecological knowledge and nature appreciation among the next generation of northern BC residents.

## Module-specific accounts

### *Grade 10 – Flicker Genetics*

This module pilot was implemented in one Grade 10 Science class, on May 23-25<sup>th</sup> (2017), following the class-fieldtrip-class model. In this module, the goal was to use a local organism to illustrate the curriculum goals of understanding ‘genes and chromosomes’ and ‘simple patterns of inheritance’<sup>1</sup>. We chose to focus on Northern Flickers (*Coleaptres auratus*), due to the interesting biogeography in Mackenzie – specifically, the presence of Red-Shafted (western), Yellow-Shafted (eastern) and intergrade individuals in the Mackenzie area. In the first class, we discussed the geology and geography of the northern Rocky Mountains and its effects on species distributions, presented several examples of local plant and animal species that experience an overlap zone, and learned to identify flickers to the subspecies level based on physical traits. We also introduced the Punnett Square in this class. In the second class, we took the students on a field trip to the nearby Mugaha Marsh, near the Mugaha Bird Banding station. Our goal was to observe a pair of nesting flickers at their nest, record their physical characteristics, and identify them to one of the three subspecies possibilities. Unfortunately, due to the late spring in Mackenzie, the flickers were more than two weeks behind their regular schedule and were not yet nesting on May 24<sup>th</sup> (much to the surprise of local bird-watchers), which made observations challenging. Nonetheless, the students got a chance to observe the flickers’ habitat, and spent time doing some other bird-watching at the marsh. For the third class, the students drew colored paper flickers out of a hat, identified their subspecies, and then performed 16x16 Punnett Square to predict the genotype and phenotype of the chicks of their ‘mated pair’. In future years, we would like to implement this module in June to ensure a higher probability of observing nesting flickers in the wild, and continue to coordinate with local birding experts at Mugaha Bird Banding Station.

### *Grade 4 – Mustelids and food chains*

This module was implemented in two grade 4 classes (with some grade 3 students in them), reaching 52 students, 6 homeschooling students, 8 parent volunteers, and 2 homeschooling parent volunteers. The in-class session (for each class) consisted of a 1.25hr activity and presentation focused on local mustelids, their characteristics, habitats, and food chains. Specifically, we discussed differences and similarities across the 6 local mustelid species (body shape, skulls, behavior, furs, musk glands), supplemented by hands-on demonstrations of skulls (lent by a local hunter), cured pelts (lent by a local trapper and from existing program supplies), and vials of musk. We then discussed the role of mustelids in local food chains, and played a ‘food chain links’ game, aided by handmade wooden blocks depicting food chain organisms. In small groups, students were assigned a habitat and a mustelid, and after a short explanation, they had to connect organisms in their habitat in the proper food chain order (e.g. for a river habitat, the students connected links in the following order: ‘aquatic vegetation’-> ‘Mayfly’ -> ‘Dragonfly’ -> ‘Trout’ -> ‘River Otter’). The purpose was to introduce

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<sup>1</sup> [https://curriculum.gov.bc.ca/sites/curriculum.gov.bc.ca/files/pdf/10-12/science/en\\_s\\_10.pdf](https://curriculum.gov.bc.ca/sites/curriculum.gov.bc.ca/files/pdf/10-12/science/en_s_10.pdf)



students to the idea that similar species differentiate ecologically to reduce competition, and to illustrate the diverse but generally meso-predator role that mustelids occupy in food chains.

On March 31<sup>st</sup>, both classes came out to McLeod Lake Historic post for a morning, to participate in 5 stations covering the following topics and activities:

- Hudson's Bay Company Fur Trading Post (by Mackenzie and District Museum), where students bartered with pieces of fur they earned in the classroom for typical trade goods of the old days ('salt' = pretzels, 'potatoes' = chips, 'sugar' = candy, etc)
- Food chains and habitats game (by local volunteer), where students reinforced concepts learned in class by identifying the habitat associated with the food chain they belong to
- Snowshoe and tracking walk (by local volunteer), where students got to learn how to spot and identify tracks in the snow, while practicing their snowshoeing skills (a first for some of the students!)
- Skinning hut (by local volunteer), where students observed a young local trapper demonstrate and explain various trapping techniques, skin a squirrel, and discuss trapping ethics
- Local history around a firepit, where students were treated to stories of McLeod Lake's history and traditional way of life by McLeod Lake Indian Band elder Alec Chingee (Figure 4), and hot dogs and hot chocolate provided by Mackenzie Secondary Ab Ed program students

### *Grade 7 – Caribou adaptations*

On November 7<sup>th</sup>, we visited two grade 7 (with some grade 6) classrooms and delivered an introduction to caribou and their adaptations, reaching 57 students and 2 parent volunteers. We began by discussing caribou habitat and the challenges these animals face in their environment. Then, we presented the students with an 'adaptations challenge': students had to sort a stack of 'adaptation cards', with pictures belonging to different local animals, into 8 categories (e.g. vision, overwintering strategy, hooves). Then, out of each category, they had to use their reasoning to select the adaptation that most matches the caribou's life needs. After the students tried their best to pick out the correct adaptations, we provided the answer, explaining the function and importance of each adaptation, and showed 2 videos: one about the Northern Mountain Caribou's ecology generally, and one discussing the caribou's ability to see in UV.

On November 8<sup>th</sup>, both classes come for a morning to Kennedy siding. We were fortunate that, even with our large group of 60+ people, we spotted caribou in the forest and crossing the road. Provincial caribou biologist Dale Seip joined the field trip and shared his knowledge of caribou ecology and conservation, and described the management measures being undertaken for the Kennedy Siding herd. Students looked at a feeding trough (some even sampled a pellet, and found it not very palatable), and learned about motion-activated cameras on-site. The station circuit included:

- a VHF collar telemetry hunt led by Dale Seip (Figure 7),
- a predator-prey dynamics game led and narrated by ministry biologist Mike Klaczek,

- a warm-up fire pit station where students got to hear about the importance and role of caribou to the local indigenous people,
- a station where students revisited the concepts of morphological adaptations, illustrated by a variety of ungulate antlers, some tracking, fecal pellet hunting, and a caribou hoof demo,
- a lichen scavenger hunt station where students learned to identify the common local lichen species, with a focus on caribou preferred species.

McLeod Lake Indian Band members (Anita Vallee and Jenine Solonas) also provided delicious moose soup and bannock for all students and volunteers to enjoy for lunch, which was much appreciated on that wet and chilly day.

### *Grade 5 – Forestry*

This module was implemented in two grade 5 (with some grade 4) classrooms, reaching 52 students and 6 parent volunteers. On October 27<sup>th</sup>, we conducted an in-class activity focused on renewable and non-renewable resources and their importance to all people, and especially resource-centered communities like Mackenzie. We began with a broad introduction and quickly moved to an activity where students received a stack of cards depicting familiar natural resources (e.g. sunlight, an apple tree, gold, gas, elk) and they had to, going based on the definition and their own reasoning, sort the resources into a 'renewable' and 'non-renewable' pile, which led to a discussion about whether some renewable resources could still run out if used unsustainably. The rest of the presentation touched on the history of logging in BC, and how today we appreciate a whole of range of forest values and manage our forests for renewal.

On October 28<sup>th</sup>, the students came out to a woodlot at Lions Lake near Mackenzie, and each class rotated through 5 stations, which focused on:

- 1 – Mature forest: students learned about the planning that goes in n before logging. Students practiced mensuration by measuring tree DBH and height using DBH tapes, Esilon tapes and clinometers (Figure 5).
- 2 – Planting and regenerating: how do foresters ensure that the trees come back? Students helped plant a pine seedling, and participated in a 1/100<sup>th</sup> ha regen survey (Figure 6).
- 3 – Growing trees: understand competition and variability among saplings. Students learned how to age young trees by looking at whorls, measure trees using a meter-stick, and discuss how trees of the same age could have very different heights.
- 4 – Young forests: students examined tree cookies and learned how to determine tree age by counting tree rings. They also explored the biodiversity of the young forest, which included mosses, lichens, mushrooms and some late-season blueberries!
- 5 – Wildlife trees and stream: learned about maintaining wildlife values throughout a forestry operation. Students used a standard 'Wildlife Tree Value Rating' system to rate wildlife trees at their station, and discuss how they are used by a variety of wildlife species.

We were fortunate to have Anita Vallee, her mother Josie Valee, and Jenine Solonas from MLIB join us to acknowledge the Tse'khene traditional territory, share some stories of trapping at Lions Lake in the 50's and 60's and discuss First Nations forest values and culturally modified trees (CMTs). Cherri Carlson (Mackenzie Secondary Ab-Ed) and several high school students joined the trip, helping chaperone the kids through the stations, make signs, make and keep the firepit going, keep supplies organized, and aid the students in cooking bannock over the fire.

### *Grade 1 – Pond Ecosystem*

This module was implemented in two grade 1 (with some kindergarten) classrooms on September 26<sup>th</sup> and 28<sup>th</sup>, reaching 44 students and 10 parent volunteers. In each class, we spent some time introducing the concept of 'ecological community' (using students' daily life as an analogy), and how every ecosystem is composed of interacting living organisms, and the abiotic factors that meet their habitat needs. Students received cards depicting local pond organisms, whose 'identity' they assumed. We then led students through a hands-on experience, where they had to locate their pond organisms on a large felt pond, in food chain order (i.e. producers first, then herbivores, then carnivores, etc) (Figure 2). After our felt pond was populated, students linked hands (keeping their pond identities) to make several pond food chains.

Our field trip took place at a local pond, where the class and adults walked to the wetland and identified interesting features of their environment. Many of the students (and some parents) did not know that the pond existed and found it very interesting. At the pond, student groups (led by a parent volunteer) had to locate their creature's habitat in the pond ecosystem, and then do a scavenger hunt for things to smell, see, hear and touch in the wetland environment. Also, students 'sampled' pond biota with dip nets and identified some aquatic insects (Figure 3).

### *Grade 10 – Spruce seed energy pyramids*

This module was implemented in one grade 10 Science class, on September 21<sup>st</sup> – 23<sup>rd</sup>, following the class-fieldtrip-class model. During the first class, we introduced the concept of food chains and the associated energy pyramids, discussing the flow of energy through ecosystems, and the conservation of matter. We then focused in on common local ecosystems, zooming in on the mature spruce forest and its inhabitants. During the second class, we walked out into a mature spruce stand at John Dahl Regional Park (adjacent to the school), where students identified and GPS-marked mature spruce trees (and for some students, first learned to differentiate spruce from pine from fir), estimated cone crop abundance, searched for squirrel middens (rich in spruce remains), and also engaged in some casual shrub and forb ID and other natural history observations of this ecosystem type (Figure 8). During the third class, students conducted a lab where they synthesized the cone crop information from the field and dissected a white spruce cone and counted the seeds. We then, as a class, weighed their seed crop and calculated the calories of energy present in their sample, extrapolated that estimate to John Dahl Park and the entirety of the spruce forest present within Mackenzie's district boundaries. We provided materials for the teacher to extend the activity with the students further: using information collected in the field, in their lab activity, and from factsheet of literature information (which we provided), they could calculate the amount of energy available at 3 trophic levels from this year's spruce seeds in Mackenzie, and how many Pine marten (*Martes martes*) this can support through the winter months.

### *Kindergarten – Birds and listening skills – from Christy*

This module was implemented in 3 kindergarten classrooms, reaching 56 students. Wildlife Infometrics organized props and pictures for this module; Mackenzie Secondary School provided several hands-on models (skeletons, invertebrates ...) and the Mackenzie Nature Observatory provided bird mounts and posters. Students were introduced to different classes of vertebrate animals (fish, reptiles, mammals, birds, amphibians) and specifically discussed birds and their attributes. The focus was on 'observation' and 'identification' and the characteristics we can use to help us do that: colors, shape, size, call/song. After the presentation, students were taken outside to play a game where, in pairs, they learned the songs of locally common species. Then, the 'listeners' in the pair found their partner based on the song they were singing, then switched roles.

### *Grade 2 – Fish Life Cycle – from Christy*

This module was implemented in two Grade 2 classes, reaching 43 students and 6 parent volunteers. Christy Wright conducted a school presentation on the life cycle of the Rainbow Trout, and discussed fish habitat and inventory methods. We arranged a field trip to Morfee Creek where the students visited stations to learn about aquatic ecology and wildlife sign. The stations included fish habitat, aquatic insects, fish inventory methods, stream wildlife signs and First Nations traditional fishing methods. Partners for this field trip included Jim Tuck, Stephi Reghi (Mt Milligan), Nik McEwan and Jenine Solonas (SD 57 Aboriginal Education). Students conducted an outdoor activity where they 'caught fish' (different sized paper fish) and conducted a basic analysis of the size distribution within their 'sampled population'.

### *Grade 3 – Plant taxonomy and uses – from Christy*

This module was implemented in 2 classes, reaching 45 students in grade 3. The program consisted of a school session, with local foresters, to learn about different groups of plants. An indoor PowerPoint presentation that introduced some broad plant groups (mosses, ferns, gymnosperms, angiosperms) was followed by an outdoor scavenger hunt. During the scavenger hunt, students used laminated sheets depicting their focal plant group as a guide for finding and collecting example specimens in the field (see Figure 3). The second component, implemented in conjunction with McLeod Lake Indian Band (MLIB) members, focused on traditional plant uses. Originally we planned a large field trip to the McLeod Lake Historic Post, but we were unable to coordinate key elders from the community (they were not available this year). With help from Kandy Klijnsmit (MLIB), Jenine Solonas (SD 57 Ab Ed), Janie Dubman, and Jim Tuck, we were able to organize traditional tea tasting and identification at the school. This session included Devil's Club, rose hip, Labrador and mint teas.

### *Grade 6 – Insects and Adaptations – from Christy*

This module was implemented in two grade 6 classrooms, reaching 57 students. The module started with a field trip to Morfee Creek to identify and collect different aquatic and terrestrial insects. With the assistance of Jim Tuck, students were placed into groups and were provided with sample bottles, labelling materials and nets. Each group was assigned to one of 6 groups of insects (e.g. beetles, or mayfly or Diptera) to search for, identify and provide a specimen of to the class. The afternoon session was conducted in the classroom, where the students identified, drew and described their

insects' unique adaptation. Jessica Card (volunteer) set up microscopes, so the students were also able to search for and examine microscopic fauna in water droplets from the pond where we did the collection.

## Community Support

Table 1. A summary of support sources, presented by module.

| Topic                          | Contribution   |  | Financial Assistance       |
|--------------------------------|--|--|----------------------------|
|                                | Volunteer and In Kind Support  | Materials  |                            |
| <b>Birds</b>                   |  | MNO posters and bird mounts, Mackenzie Secondary, Wildlife Infometrics   | FWCP<br>HCTF               |
| <b>Pond Ecosystems</b>         | Jim Tuck   |  | FWCP                       |
| <b>Fish</b>                    | Mt Milligan (Steph Righi)<br>Jim Tuck<br>Wildlife Infometrics (Nik McEwan)<br>SD 57 (Jenine Solonas)                                     | Wildlife Infometrics<br>District of Mackenzie  | FWCP<br>HCTF<br>Morfee PAC |
| <b>Plants</b>                  | MLIB elders<br>Jim Tuck<br>Janie Dubman  | MLIB<br>Christy Wright   | FWCP<br>HCTF               |
| <b>Mustelids</b>               | MLIB elders<br>Steph Righi<br>Jim Tuck<br>Mackenzie and District Museum  | Jeff Rensamaag (skulls)<br>Jim Tuck (scents, pelts and plaques)<br>Matt Erickson (traps for demo)<br>Fraser McDonald (squirrels) | FWCP<br>Morfee PAC         |
| <b>Forestry</b>                | Canfor (2 foresters)<br>Conifex (2 foresters)<br>MLIB Elders<br>MFLNRO/BCTS (2 foresters)<br>SD57 (Jenine Solonas)<br>CNC (Anita Vallee) | WII (forester equipment)<br>District of Mackenzie (tent)<br>Duz Cho<br>MLIB (firewood and bannock)                               | FWCP<br>Conifex            |
| <b>Insects and Adaptations</b> | Jim Tuck<br>Jessica Card<br>MFLNRO   | SD 57<br>Mackenzie Health Unit<br>District of Mackenzie  | FWCP<br>HCTF               |
| <b>Caribou</b>                 | Dale Scip<br>Mika Klaczek<br>BCTS (Nik McEwan)<br>MLIB<br>Jim Tuck<br>CNC (Anita Vallee)<br>SD57 (Jenine Solonas)                        | MFLRNO – (telemetry equipment)<br>Wildlife Infometrics (demo material)<br>MLIB ( firewood, moose stew and bannock)               | FWCP                       |

Table 2. Summary of in-kind contributions towards the school ecology program, presented by name of community organizations and individuals.

|   | Total Hours | Bird     | Pond      | Fish      | Plant     | Forestry  | Insects   | Caribou   | Spruce Cones | Flickers  | Mustelids |
|---|-------------|----------|-----------|-----------|-----------|-----------|-----------|-----------|--------------|-----------|-----------|
| Jim Tuck (personal)                               | 87          |          | 15        | 10        | 8         |           | 10        | 15        | 9            | 8         | 12        |
| Mt Milligan (Steph Righi)                         | 12          |          |           | 4         | 8         |           |           |           |              |           |           |
| Janie Dubman (personal)                           | 26          |          | 1         |           | 8         | 2         |           | 2         | 1            | 4         | 8         |
| MLIB (Jenine Solonas, Alec Chingee, Anita Vallee) | 34          |          |           | 4         | 4         | 12        |           | 10        |              |           | 4         |
| Canfor (Sarah Curtis, Laura Young)                | 16          |          |           |           |           | 16        |           |           |              |           |           |
| Conifex (Amanda Mjolsness)                        | 8           |          |           |           |           | 8         |           |           |              |           |           |
| Dale Seip (FLNRO)                                 | 8           |          |           |           |           |           |           | 8         |              |           |           |
| Mike Klaczek (FLNRO)                              | 8           |          |           |           |           |           |           | 8         |              |           |           |
| Christy Wright (personal)                         | 4           |          |           |           |           |           | 4         |           |              |           |           |
| Teachers (SD57)                                   | 22          | 2        | 2         | 2         | 2         | 2         | 2         | 2         | 4            | 2         | 2         |
| Jessica Card (personal)                           | 4           |          |           |           |           |           | 4         |           |              |           |           |
| FLNRO (Ryan Bichon)                               | 11          |          |           |           |           | 8         | 3         |           |              |           |           |
| BCTS (Matthew Parker)                             | 8           |          |           |           |           | 8         |           |           |              |           |           |
| Wildlife Infometrics (Nik McEwan)                 | 4           |          |           | 4         |           |           |           |           |              |           |           |
| Nik McEwan (personal)                             | 6           |          |           |           |           |           |           | 6         |              |           |           |
| Mackenzie Museum (Courtney Deley)                 | 6           |          |           |           |           |           |           |           |              |           | 6         |
| Mackenzie Museum (Jim Wiens)                      | 6           |          |           |           |           |           |           |           |              |           | 6         |
| Matt Erickson (personal)                          | 2           |          |           |           |           |           |           |           |              |           | 2         |
| Stephanie Righi (personal)                        | 6           |          |           |           |           |           |           |           |              |           | 6         |
| Matthew Parker (personal)                         | 5           |          |           |           |           | 3         |           |           |              |           | 2         |
| Parent volunteers                                 | 68          |          | 12        | 10        |           | 16        |           | 6         |              |           | 24        |
| <b>Total hours</b>                                | <b>351</b>  | <b>2</b> | <b>30</b> | <b>34</b> | <b>34</b> | <b>75</b> | <b>23</b> | <b>57</b> | <b>14</b>    | <b>14</b> | <b>72</b> |

## EXTENSION AND FURTHER DEVELOPMENT

Extension for the school ecology project happens both formally and informally. Informal outreach is extensive because the program is well known within the community since it has been continuously implemented for the past 3 years, and has involved so many people from the community.

Formal program extension has included the following channels:

- The FWCP banner (Figure 1) is posted at almost every field trip site
- The FWCP logo is added to all material presented and given out during modules, such as PowerPoint presentations and work sheets (

- Facebook update on Wildlife Infometrics page – Posted on May 29<sup>th</sup> and summarizing all modules implemented during the 2016-17 school year under 2016-17 funding.
- An article in the Macktown Buzzette community flyer – In the May 17, 2017 issue (APPENDIX C. Article in Macktown Buzzette).
- Wildlife Infometrics website update – the new version of the website will go live in September and will include a program summary (see Appendix D. Project description for WII new website (to be launched September 2017)).
- Program update in Morfee Elementary school newsletter – draft is written (see Appendix E. SEP summary for Morfee Elementary June 2017 newsletter) and includes all modules implemented during the 16-17 school year i.e. 4 16/17 modules, and 4 17/18 modules. Newsletter is issued in mid-June, so this content will be submitted once the final two modules of the school year (grade 3 on June 2<sup>nd</sup>, and Grade 6 on June 16<sup>th</sup>) are implemented.

Extension and trips up to TKD and Kwadacha were not requested by the communities and so, were not carried out (for more detail, see change request created on 09/22/2016). Multiple attempts (over 15 emails and phone calls) to contact and extend the program to Hudson Hope School were made, and the module manual was sent for review (after a phone call where I offered to do that). However, at this point the response from the school administration has been very limited, and the offer for an in-person meeting to discuss ways to implement this program at Hudson Hope has not been reciprocated. The project coordinator will contact Hudson Hope School again in late August. During the 2017/2018 year, the program coordinator will contact all three schools (TKD, Kwadacha, Hudson Hope) in August to see if approaching at the beginning of a school year might make it easier to integrate a pilot into the school year, and also to offer support in applying for independent program funding (from FWCP and other funding sources).

In March 2017, a community volunteer and science educator from Moberly Lake (Marcie Fofonoff) contacted Wildlife Infometrics with interest in partnering with/learning from the Williston School Ecology Program. Sauteau First Nations are very supportive and interested in using the experience and materials from our program to expand ecological and traditional land-based learning in Moberly Lake Elementary. An initial meeting was conducted at the Sauteau Lands office on March 31<sup>st</sup>, 2017. As of the date of submission of this report, a collaboration has been formed and three WSEP modules have been implemented at Moberly Lake Elementary (under the 2017-18 contract), with discussion for future collaboration ongoing.

In order to leverage additional sources of funding and increase the program's financial resilience, we will investigate and apply to the following funding sources in the 2017-18 program year:

- McLeod Lake and Mackenzie Community Forest<sup>2</sup>
- Mt Milligan Mine Legacy program<sup>3</sup>
- BC Hydro GO (Growth Opportunities) Community Fund<sup>4</sup>

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<sup>2</sup> <http://mlmcf.ca/project-funding/>

<sup>3</sup> <http://centerragold.com/operations/mount-milligan/community-engagement>

<sup>4</sup> <http://www.northerndevelopment.bc.ca/funding-programs/capacity-building/bc-hydro-go-fund/>

As an extension document, I will update and streamline the current module manual to become an easily-shareable and easy-to-use resource for other communities (already shared with Hudson Hope, Tsay Keh, Kwadacha, and Moberly Lake Elementary).

## **Evaluating program success**

By all measures, this project has met and, in some cases, exceeded the expectations set out at its inception. The program's reach has expanded rapidly and now includes the entire elementary school population, as well as the high school grades (the 2016/17 pilots were implemented in grade 10, but the modules could be easily modified to suit both older and younger high school grades). The module topics are tailored to meet provincial curriculum learning outcomes, but through deeper and more place-based activities than general classroom instruction. The school teachers and administration really appreciate this program and the enrichment it brings to their classes. Community support for the program is high and continues to grow, as evidenced by the high numbers of both returning, committed volunteers, and new individuals who contribute in-kind support to the program. The high level of engagement by the school and broader community was evident when the previous program coordinator (Christy Wright) was outgoing, and the current coordinator (Janie Dubman) was not confirmed yet. Several teachers and volunteers actively inquired about the program, expressing their hope that it would continue to be delivered, and would not be terminated due to staffing changes. The project has and continues to benefit from several key partnerships, particularly with the McLeod lake Indian Band. Band members and representatives participate in almost every module, sharing their valuable perspectives and traditional knowledge, and thus strengthening the connections between the communities of McLeod Lake and Mackenzie. Exposure to a diversity of professional options, a secondary goal of the project, has been achieved through the students' direct interactions with the professional volunteers who lead stations on the field trips.

### *Future metrics of success*

While some of the objectives of this project are qualitative in nature and difficult to measure directly, we like the idea of more formally evaluating success. Some of the information that we currently record that could be used in structured evaluation is: number of students reached, number of instructional hours, topics of modules delivered, number of professional volunteers, their affiliations, and number of hours donated, number of non-professional volunteers and their hours (e.g. parent chaperones, high school students), and amount of material support received from other project sponsors (i.e. not FWCP). Some new metrics we could develop and incorporate into program evaluation could be teacher feedback forms (with a numerical ranking of various module metrics, as well as a feedback section), as well as student field trip reflection sheets where they could describe their experience and what they learned.

## **Long-term plan for this project**

By the nature of the rotating school student population, this project requires continuous implementation to deliver benefits. We believe, and this sentiment is echoed by many teachers and community members, that providing engaging and enjoyable outdoor learning opportunities for today's youth is more important than ever – both because of the local and global environmental challenges they will need to address in their future, and the growing disconnect between youth and nature. We see this as a project that will



be ongoing as long as interest from the school and community is present, and a coordinator is able to perform the role. Similarly to the Mugaha Bird Banding Station, our vision is to see this program become a reliable and integrated part of environmental outreach in Mackenzie. More specifically, we expect this program to shift into the 'small grants' (<\$20,000) FWCP funding category, since all the modules have now been developed, and will require only minor annual revisions and updates, and the actual implementation. In addition to the FWCP base funding, we have started exploring the possibility of partnering with the McLeod Lake and Mackenzie Community Forest, and applying for funding from the Mt Milligan Mine (part of the Centerra Gold group), both local industries whom we hope may become long-term project supporters. In addition, we continue to leverage the FWCP funding to garner material support from HCTF GO grants, the Parent Advisory Councils of the elementary and high schools, and small-scale funding from local forest companies.

Due to the very community-based and network-driven model of this project, expanding the program (in full-scale) to other communities is not feasible. We will also approach the new BC Hydro Community Growth Opportunities Fund (<http://www.northerndevelopment.bc.ca/funding-programs/capacity-building/bc-hydro-go-fund/>) this funding year to explore the possibility of implementing a similar program, but scaled down and adapted locally for implementation at Moberly Lake Elementary. While directly 'transplanting' the program to other communities, such as Moberly Lake, would be prohibitively expensive because of the travel costs the coordinator would incur while traveling between far-flung towns, the program can be extended by 1) providing module implementation info (the 'manual'), 2) remote support for planning, and 3) assisting (in-person) with implementing the modules for the first time.

## PHOTOS FROM MODULE IMPLEMENTATION



Figure 1. FWCP banner posted during a field trip

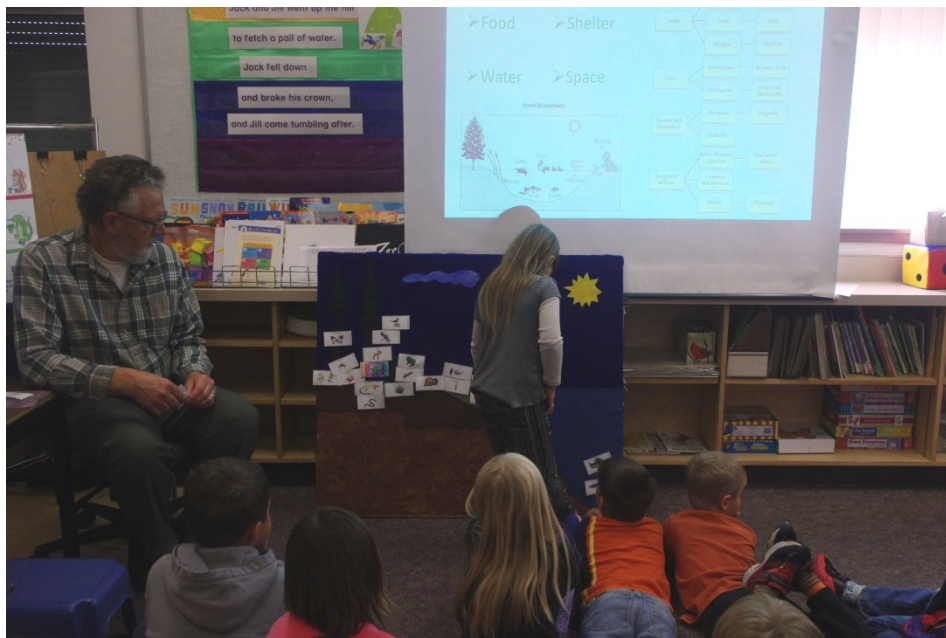


Figure 2. Students during the Grade 1 Pond Communities module, finding their 'habitat' in the pond.





Figure 3. Students in the Pond Communities field trip, dip-netting for aquatic insects. Blurred to protect students' privacy.



Figure 4. Students at Grade 4 Mustelids field trip at McLeod Lake Historic Post, learning about history from community member.





Figure 5. Students on Grade 5 Forestry field trip practicing tree mensuration.



Figure 6. Student planting a seedling at the 'regenerating forest' station on the grade 5 field trip





Figure 7. Students on Grade 7 Caribou Evolution field trip learning about radio telemetry as a survey technique from provincial caribou biologist.

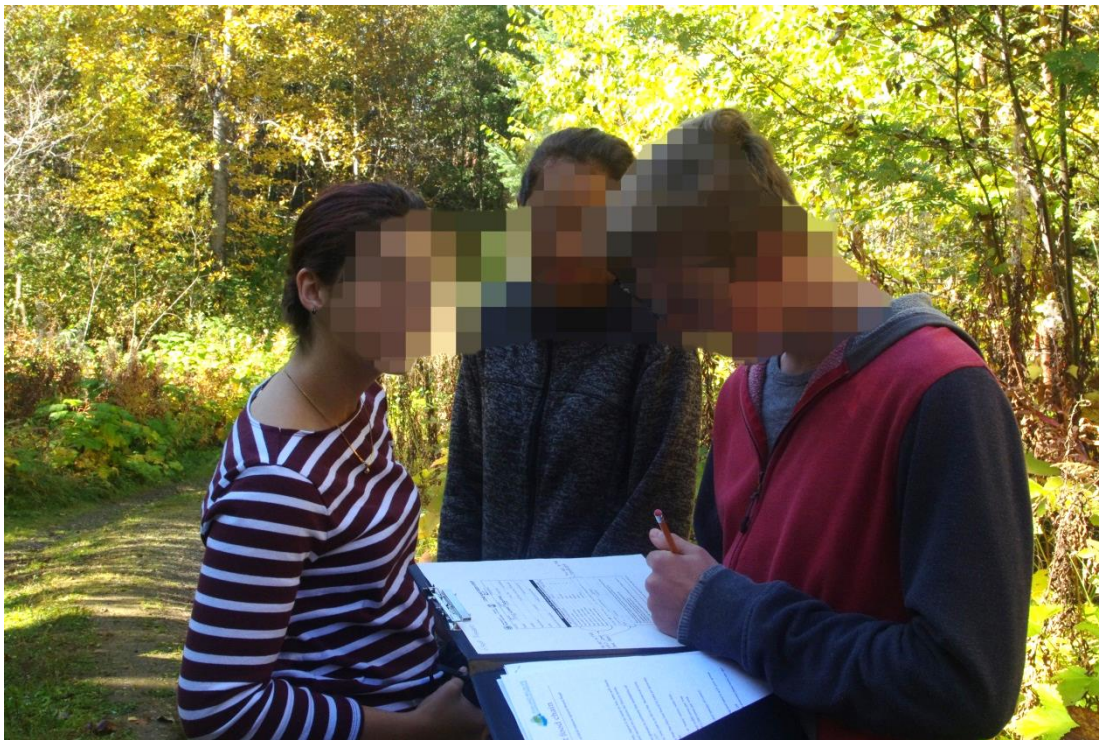


Figure 8. Students filling out a spruce cone crop survey form on the Grade 10 field trip.

## APPEDIX A. TEACHER FEEDBACK

### Morfee Elementary

*Evan Wilson, Gr 4/5, Oct 31/2016 (Forestry)*

*"Thanks Janie,*

*It really was a great field trip. Very organized, lots of adults and very thought-through which is super nice for a change. The presentation the day before was great too. The kids all loved it!"*

*Sarah Schroeder, Gr 5/6, Oct 31/2016 (Forestry)*

*"Thanks Janie! I really appreciated all the effort you put in and the pre-activity was awesome. My kids really enjoyed it, even the ones who were repeaters from last year:)"*

*Carly Russo, Gr 7, Nov 16/2016 (Caribou)*

*"Thank you so much! The kids had a great time and I really liked the changes you made to the stations."*

*Evan Miller, Gr 3/4, March 31/2017 (Mustelids and trapping)*

*"Hi Janie,*

*I just wanted to say thank you so much for allowing my class (along with Mrs. Roper's) to go to McLeod Lake to learn all about the animals and history of the area. My class could not stop buzzing about everything they saw and did as it all made a lasting positive impression on them. Much appreciated!"*

### Mackenzie Secondary

*Michael Russo, Grade 10 Science, May 29/2017 (Flicker hybrids)*

*"Lessons went well. The 3 days were clear and well prepared. You also did a great job adapting and thinking about what happens if there are no birds. Improvement, if you know that you will be switching to general birding, have field books on hand for students and give specific birds that they will need to find/id or a worksheet to fill in with the birds that they did see. This will keep them on task and have something formal to hand in at the end. Accountability. Great job."*

## APPENDIX B. FWCP LOGO ON CLASS WORKSHEET



### Body systems of Insects

Recorder (name):

Date:

1. Identify your insect specimen (species and life stage):
2. Draw the organism;

3. Label the organism with the following body parts:

|                    |            |         |       |       |          |
|--------------------|------------|---------|-------|-------|----------|
| Head               | Thorax     | Abdomen | Femur | Tibia | Antennae |
| Wings (if present) | Mouthparts | Gills   | Eyes  |       |          |

4. Identify at least one structure that is part of the following body systems:

|                   |           |         |
|-------------------|-----------|---------|
| <u>Locomotory</u> | Digestive | Sensory |
|-------------------|-----------|---------|

5. BONUS: If your insect is not an adult, is it going to have a complete or an incomplete metamorphosis? (circle your answer).

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# APPENDIX C. ARTICLE IN MACKTOWN BUZZETTE

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# The Macktown Buzzette

Biweekly for Mackenzie & area E-mail: thebuzzette@gmail.com Phone: (250) 997-5038 www.facebook.com/macktownbuzzette

May 17 - May 31 2017

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## Mackenzie Trails initiative lacking user input?

**SDL Electrical Services**

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sdlectricalservices@gmail.com Shane Ponce  
www.sdlelectrical.com (250) 997-1525

Shovels are hitting the ground this spring on the first phases of the Mackenzie Trails network but it is not an army of locals holding the spades.

provincial government. According to Hobbs, McElhansey will provide some consulting on the Morfee Mountain MTB trail project as well.

**Elizabeth Joseph CPA, CGA**

Ph: (250) 997-4680 Cell: (250) 997-1693

- Bookkeeping and Accounting
- Personal and Corporate Tax Returns
- Tax Planning

According to Director of Recreation Services Kevin Clarkson, the Morfee Lake Trails project was put out to bid in late February and contracted in March to Cabin Forestry of Vernon.

How many user groups have contacted MORATA so far? "Not many," concedes Hobbs.

But if MORATA does not represent trail user groups, how are these projects being decided at a community level?

"There will be plenty of opportunity for people to contribute their ideas and get involved. Patience."

**Near Heaven Llama Treks Kayak & Paddleboard Rental**

1 Day (24 hours) \$10 single, \$20 double  
Weekend or any 3 days \$25 single, \$50 double  
Long Weekend or any 4 days \$30 single, \$60 double  
Life jackets included.

Text or call to reserve: 250-997-1981. 7 km south of town.  
All taxes included, cash only - book fast stay in your pocket.

Company rep Steve Milne said their crew was working here in early May brushing sections of the trail and marking locations for re-routes and upgrades. They will return in June.

While the initial trails planning model called for stakeholder input on a number of trail systems, Hobbs has stated that MORATA's sole focus at the moment is on a Morfee Mountain bike trail system. The upgraded trail at Morfee Lake will also accommodate mountain bikes.

Clarkson stated that a steering committee has met a few times with reps from some of the user groups but not all. But he emphasized that input from the

Unclear at this point is the extent of the proposed trails network, whether trails for other users are being planned and, without buy-in from local user groups, how long-term trail maintenance will be managed.

**Mr. Munchy's is CLOSED for Staff Holidays May 7 - June 6 See you in June!**

Milne added that locals will be hired for the project, which is expected to run to at least the end of July. There will also be opportunities for volunteer trail building.

In the meantime, two other companies have been hired for trail building and consulting. Northern Trails Solutions out of Vanderhoof was awarded the contract this month for the Little Mac Multi-Purpose Trails project.

**WE'RE BRANDING!**

Over the past year, we have been working towards building our brand and identity from the ground up. As we wrap up the first phase of our branding initiative, we invite you to join us in celebrating the unveiling of our community brand.

**Professional Counselling Services**

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The Mackenzie Trails initiative is a local and regional recreational trails strategy which was proposed to user groups in Mackenzie most recently in 2015 by Mike Leclerc of Recreation Sites and Trails BC. At that time it was proposed as a largely local effort which would require long term commitment and coordination from user groups and volunteers.

According to Clarkson, the Little Mac project is 100% funded through grants from the Northern Development Initiative Trust as well as the Rural Dividend Initiatives Trust. It will improve and connect existing mountain biking trails on Little Mac to the Morfee Lake trail.

**Event Details:**

Date: Wednesday, May 31, 2017  
Time: 6:30 - 8:30 pm (Presentation at 7:00 pm)  
Location: Club 18, 290 Oshtinka Road

\* Appetizers and refreshments will be served, along with cash bar.

**MACKENZIE**

**NOTICE TO RESIDENTS OF MACKENZIE**

The District of Mackenzie Public Works Department wishes to notify residents of Mackenzie that the semi-annual **FIRE HYDRANT FLUSHING AND INSPECTIONS** will be carried out during the week of May 30-June 2, 2017. Please use extra caution when crews are on the streets.

Residents may notice a TEMPORARY discoloration of their water, and a pressure drop. Running your tap for a few minutes should clear up this problem.

Public Works Department  
District of Mackenzie

In 2016, a group was formed under the name Mackenzie Outdoor Route and Trail Association (MORATA). This was ostensibly an umbrella group of all interested user groups and trail stakeholders.

The District has also contracted with McElhansey Consulting Services to provide master planning for the trails network both within and beyond District boundaries.

We hope you are able to attend and help us celebrate as we move forward with our new community brand initiative!

**The Macktown Buzzette**

D.I.V. Community News...

Have a pic or story? Share it with your community  
Ph. (250) 997-5038

President Ross Hobbs describes MORATA instead as "a

Recreation Officer Mike Leclerc told *The Buzzette* that McElhansey was on a list of contractors supplied by the

For more information or if you have any questions, please contact Diane Smith at 250-997-3221 | Diane@district.mackenzie.bc.ca

## Ecology program offers fresh air learning



The School Ecology program has completed a third full year of activities and is proud to report a very successful year.

This year we offered approximately 250 Kindergarten through Grade 10 students field trips and classroom sessions to develop listening skills for native birds (K); learn about pond ecological communities (Gr. 1); mammals and other fur-bearing animals (Gr. 4); forestry life cycles and renewable resources (Gr. 5); and adaptations of caribou at Kennedy Siding (Gr. 7).

The caribou field trip in November showered students and volunteers in a cold rain but their feedback was resounding.

with several sightings of the majestic mammal, followed by a delicious, hot moon stew and bannock provided by McLeod Lake band members.

The School Ecology program is funded through the Fire and Wildlife Compensation Program (Peace Region). It is coordinated by biologist Jen Dubman from Wildlife Infometrics, and in partnership with the McLeod Lake Indian Band.

Our greatest thanks go to the individuals and groups who volunteered their time and years of expertise. The M.I.B. has been a fantastic partner, providing invaluable indigenous perspectives to the field trips.

Many thanks also for the enthusiasm of teachers and administrators at Morfee Elementary and Mackenzie Secondary, the parent chapters, and to Mackenzie as a whole, for supporting the program. We look forward to next year!

Jenise Dubman  
Wildlife Infometrics Inc.

**MACKENZIE**

**Public Works Department**

To the Residents of the District of Mackenzie

**GARBAGE PICK UP** scheduled for

**Monday, May 22, 2017**  
Will be picked up on

**Tuesday, May 23, 2017**

Public Works will endeavor to maintain a normal time schedule on this date, but residents are requested to assist us by placing their garbage curbside by 8:00am.

Thank you in advance for your co-operation.

**NEXT ISSUE: May 31**  
**AD DEADLINE: May 26**

**THE MACKTOWN BUZZETTE**

The Macktown Buzzette is a biweekly publication for Mackenzie BC and surrounding communities. We invite letters, photos and news items from readers. See the Macktown Calendar for local events. Try our free Classified Ads!



## **APPENDIX D. PROJECT DESCRIPTION FOR WII NEW WEBSITE (TO BE LAUNCHED SEPTEMBER 2017)**

Driven by the commitment of Wildlife Infometrics staff to wildlife, environmental stewardship, and community, we are conducting the Williston Schools Ecology Program, which is a grassroots project aiming to support and extend rural K-12 education in the areas of science and outdoor learning. In a collaborative process with local teachers, we have developed and integrated age-appropriate modules which build on regular curriculum at every grade level. The content of these modules covers a variety of ecological topics, from food webs to forestry to fish life cycles, but all focus on highlighting local flora, fauna, and ecosystems.

The strength of this program is rooted in the support of our community. Volunteer experts and helpers aid us in preparing and delivering the in-class exercises and lessons, as well as the outdoor activities where students experience British Columbia's great outdoors and apply their in-class learning to the physical environment. By connecting with local professionals from diverse fields such as forestry, biology, conservation and environmental monitoring, students are exposed to a broader range of career possibilities, and get a glimpse of the work that such professions entail. Our community partners from McLeod Lake Indian Band illustrate the First Nations dimension of ecological knowledge and stewardship through speakers, demonstrations of plant and animal uses, and traditional recipes.

As this program grows, we are working to extend to other rural communities in our region by supporting and mentoring education champions who want to use our program as a model for their own schools. This project is principally funded by the Peace Region Fish and Wildlife Compensation Program; on behalf of its program partners BC Hydro, the Province of BC, Fisheries and Oceans Canada, First Nations and Public Stakeholders who work together to conserve and enhance fish and wildlife impacted by existing BC Hydro dams, with supplemental funding from the Habitat Conservation Trust Foundation and local industries (Canfor, Conifex, Duz Cho).

## APPENDIX E. SEP SUMMARY FOR MORFEE ELEMENTARY JUNE 2017 NEWSLETTER



It is hard to believe that our 2016-17 school year is coming to a close. The end of the school year is always busy. Our students have had, and are looking forward to many exciting learning opportunities as we finish off the year.

Science Alive presenters from SFU visited all of our classrooms in May. Our K-2 classrooms made crystals and bottle rockets, while our 3-7 classrooms did computer science activities. Our Mackenzie Ecology program ran a number of different local field trips (see attached description) and it was great to see all of the parent volunteers heading out with our students and staff to learn more about our local environment. Janie Dubman from Wildlife Infometrics does a great job of organizing this program and finding grants to fund it.

Our Grade 1's and 2's had the opportunity to visit Theatre Northwest in Prince George to watch *Munsch Upon A Time*, a national level theatre production.

Our Kindergarten classes have been busy visiting various locations around the community; their return on the fire truck is always a highlight.

Ms. Gordon's Lil' Mudders are training hard to compete in the Lil' Mudder competition in Prince George on June 23rd and our Airband/Talent Show practices are in full swing thanks to Mrs. Barlow and Ms. Scrase. Students will perform in our last week (27th and 28th) and it is always great to see students share their talents.

Through the month of May we had our gymnastics equipment set up in the gym and students enjoyed the opportunity to try some beginner level gymnastics during PE. At recess and lunch a road hockey game on our back cement pad was student initiated. Students of all grades have been dropping in to play and they are showing great leadership in taking care of the equipment and playing by the supervisor's rules. Similar games of basketball and soccer are taking place at recess and lunch.

Our annual Bike to School Week was a success. Thank you to Ms. Gordon, RCMP, Ms. Hopkins, Ms. Patterson and our crossing guards for all that went into the week. Despite the rain, many of our K-2 students practiced safe riding at our Bike Rodeo. Thank you to Nukko Logging for donating 2 bikes and to the RCMP for donating a 3rd. All of our students were entered in the draw and Amelia Jackson, Caleb Sharp and Cameron Letnes have some nice new wheels just in time for summer.

On June 5th, (N.I. day) Ms. Hyde and Mrs. Barlow took a group of young entrepreneurs to the YES57 event in Prince George to compete against other schools. Grades 5,6,7 student teams developed an idea for a business, product or service. They presented to judges at Duchess Park Secondary and Morfee had the most teams participating. Skye Barlow and Ella Favron came in 3rd place overall!!!

Our 6/7's have visited the high school for orientation and PE blocks; they are looking forward to an assembly at MSS on the 16th, a full day at MSS on the 22nd and their celebrations on the 23rd.

20 Grade 7 students had the opportunity to compete in the Indigenous Games, hosted by Glenview Elementary in Prince George. Ms. Jackson and Ms. Wilson went down with this enthusiastic group.

Sports Day plans are well underway, thank you to Mrs. Dowler, Mrs. Weissenmayer, Ms. Kosakowski and Mrs. Pride for putting things together and to our PAC for running a station. We encourage parents to come out for the morning (9-12) to watch students enjoy the activities they have planned.

We thank our families for all of your support throughout this school year and hope to see you at one of our upcoming events. We also hope you have an amazing summer!



## Morfee School Ecology Program 2016/2017

Another great year of ecology learning and outdoor fun!

The School Ecology Project is a community-based program aimed at providing enriching outdoor, ecology-centered activities for school students. This program is funded mainly by the Fish and Wildlife Compensation Program (Peace Region), coordinated by Janie Dubman, a biologist from local consulting firm Wildlife Infometrics, in partnership with McLeod Lake Indian Band. The program has completed its third full year of activities and is proud to report on a successful year.

Our greatest thanks go out to the local individuals and organizations who have contributed many hours of volunteer time and their years of expertise to the program – these opportunities for the students would never have been possible without their generosity. Canfor, Conifex, the FLNRO/BCTS office (here and in Prince George), and the Mackenzie and District Museum are just some of the partners we want to acknowledge. The MLIB has been a fantastic program partner, with members providing an invaluable indigenous perspective to the field trips. Many thanks also to the enthusiastic and accommodating teachers and administrators at Morfee Elementary and Mackenzie Secondary. Of course, thanks to the parent chaperones who came on the field trips and kept a watchful eye on the young ecology scholars!

This year, we implemented a total of 8 modules in 15 classrooms, reaching ~230 students from grades K – 7. Below is a glance inside the learning and fun behind the modules. Enjoy, thanks for supporting the program, and looking forward to next year!

**Kindergarten** – Birds and listening skills: a presentation about observing birds and their traits, aided by several bird mounts borrowed from the Mackenzie Nature Observatory, were followed by an outdoor game where ‘nesting pairs’ of local birds (who were taught their unique songs) had to find each other blindfolded. Excellent listening skills practice!

**Grade 1** – pond communities: after learning about ecological communities in the classroom, complete with a ‘find your habitat’ game with Velcro creatures on a felt pond, students, parents and teachers walked out to the Bell Subdivision pond where they located the real-life habitat of their creature and dip-netted for aquatic insects

**Grade 2** – Fish life cycles: we started by learning about the life cycles of fish, using the beloved Rainbow Trout as our guiding example. The next day, to glorious sunshine, we visited Morfee creek and rotated through six stations led by knowledgeable local experts on fish sampling, indigenous fishing methods, spawning habitat, casting and tying lures, aquatic insects and forestry practices.

**Grade 3** – Plant taxonomy and uses: We started our exploration of plants by learning the major groupings within the plant kingdom and doing a scavenger hunt for representative specimens in the ‘Big Forest’ behind the school. The next day, we headed out to McLeod Lake Historic Post to explore traditional uses of local plants as food, tea, and medicine, as well as continue learning about plant biology, invasive plant species and forestry.

**Grade 4** – Mustelids and the fur trade: In these classes we took a close look at the six local species in the weasel family, and their important role in both local ecology and history. In the classroom, we experienced some furs and skulls lent by local trappers, and learned about local food chains and the mustelids’ place in it. For our field trip, we spent a morning at McLeod lake learning about the history of the post from MLIB elder Alec Chingee, trading at a Hudson’s Hope post, watching a skinning demo and snowshoeing, as well as reinforcing food chain concepts.

**Grade 5** – Forestry and renewable resources: to set the stage for forestry, we began by learning about renewable and non-renewable resources, the importance of these resources to all people, especially resource-centered towns like Mackenzie, and how we can manage them sustainably. On our field trip to Lions Lake, we were hosted by a group of local foresters who took the students through all the stages of a block’s life cycle, from initial survey to replanting, and we also learned about wildlife values in forestry, as well as First Nations forest values and traditions.

**Grade 6** – TBA. This field trip, which will focus on the body systems of insects, will take place on June 16th.

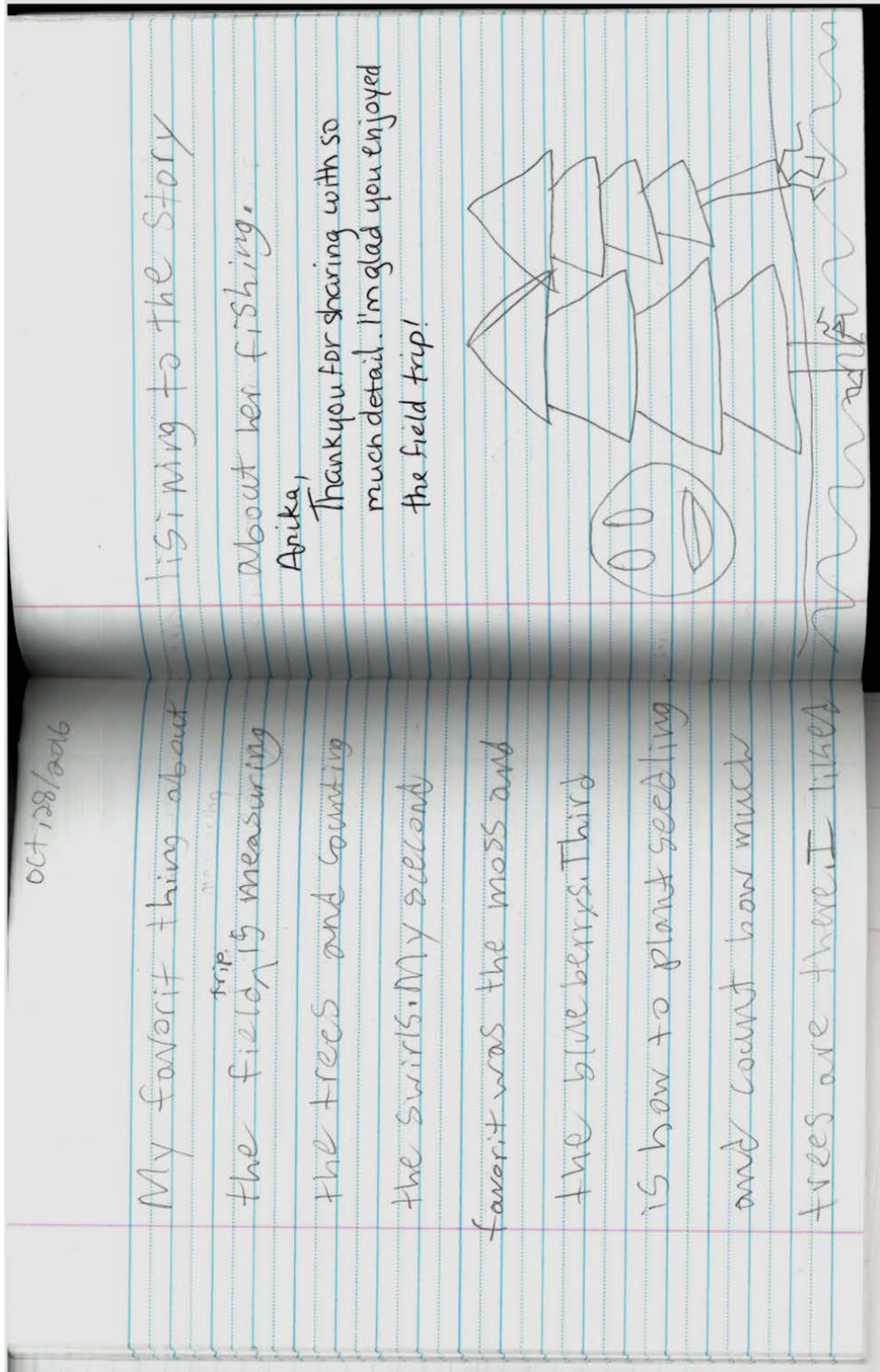
**Grade 7** – With these classes, we looked to the caribou to help us learn about evolution and adaptation. In the classroom, the students rose to the challenge of identifying the adaptations that caribou would need based on their harsh and challenging habitat, and learned some cool facts about the local herds. On our field trip, we seized the amazing local opportunity to observe caribou at Kennedy Siding, and engaged in some hands-on learning about lichen (caribou food), tracks, predator-prey dynamics, and a common technique for studying wildlife – radio telemetry.

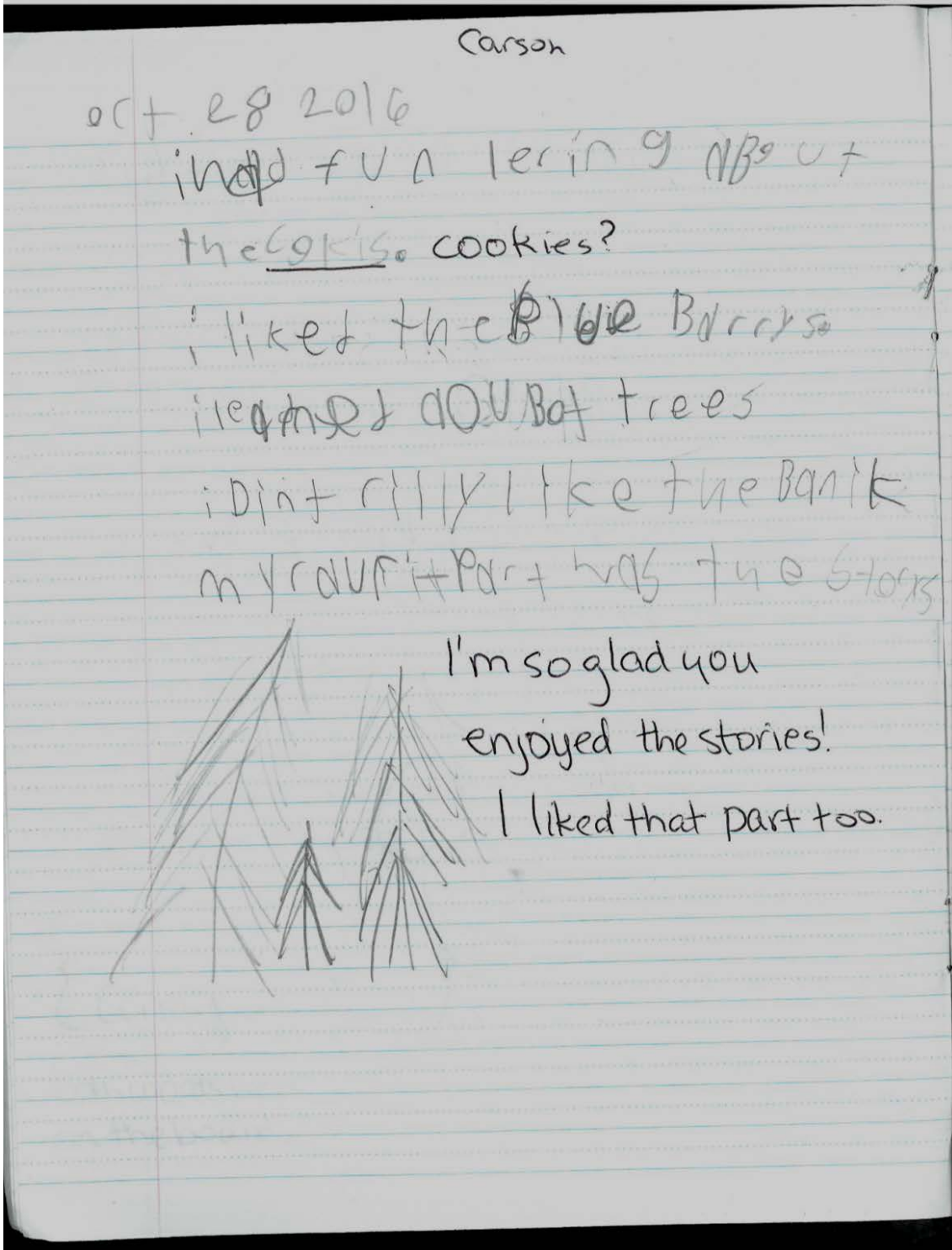
Big thanks again to the awesome community, who supports this project in so many ways, and have a great summer! ~ Ms. Dubman





### APPENDIX F. STUDENT REFLECTIONS ON FORESTRY FIELD TRIP (GRADE 5)





Carson

Oct 28 2016

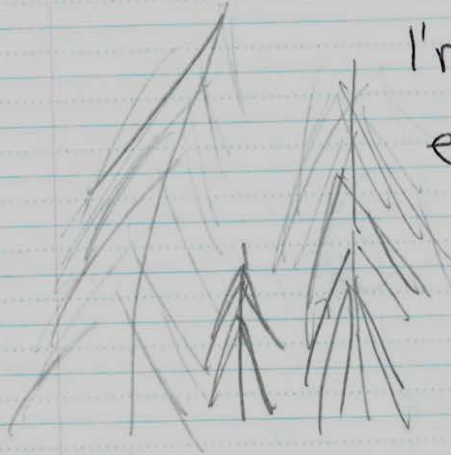
in the forest learning about  
the coyotes cookies?

I liked the ~~the~~ ~~the~~ Bears

and the ~~the~~ ~~the~~ trees

I don't really like the bank

in your part was the story



I'm so glad you  
enjoyed the stories!

I liked that part too.

