Friends of Kootenay Lake Harrop Wetlands Restoration Project - Reference No. W-F15-21

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Prepared For:
Fish and Wildlife Compensation Program

Prepared By:

Friends of Kootenay Lake

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Prepared with financial support from the Fish and Wildlife Compensation Program on behalf of its program partners BC Hydro, the Province of BC, and Fisheries and Oceans Canada, First Nations, and the public.

Acknowledgement

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Friends of Kootenay Lake would like to take this opportunity to acknowledge and thank all the community members of Harrop and Proctor and volunteers who helped immensely to make this project a success. Friends of Kootenay Lake would also like to thank the following organizations, businesses and individuals who gave their assistance, expertise, and in-kind support to the project:

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- Martin Carver
- Neil Fletcher, BC Wildlife Federation
- Nicole Kapell, Ktunaxa Nation Council
- Rob Fox
- Robin Annschild
- Sunshine Bay Park Commission
- Sunshine Bay Riding Club
- Terry Anderson, Ministry of Forests Lands and Natural Resource Operations
- Thomas Hill
- Thor Smestad, Tree Bear Native Plants and Ecological Services
- Tom Biebighauser, Center for Wetlands and Stream Restoration
- Victoria Silk, Environment Canada

Executive Summary

In 2014-2015 the Friends of Kootenay Lake received funding from the Fish and Wildlife Compensation Program and Environment Canada to complete the Harrop Wetlands Restoration project. The project restored two degraded wetland ponds by reducing disturbance of sensitive riparian habitat by motorized vehicles, increasing the duration of water inundation of the upper pond, and planting native plants to replace those that have been removed by both disturbance and illegal manual clearing of vegetation on the foreshore area.

The project has successfully achieved the following goals:

1. Reduce threats to natural values and improve fish and wildlife habitat of Kootenay Lake
2. Eliminate ATV access to sensitive riparian habitat
3. Re-vegetate the disturbed area with native trees and shrubs with high wildlife values.
4. Increase the duration of water inundation in wetland area to support western toad rearing habitat
5. Foster a stewardship ethic in lakeside communities by educating and engaging the public
6. Engage community members and key interest groups in wetland restoration project through planning meetings (including ATV user group), and by promoting project through local media.
7. Provide opportunities for community members to take action through planting and amphibian monitoring activities.

The restoration project improved habitat for several species including juvenile fish, waterfowl, great blue heron and painted turtle. A Harrop Amphibian Monitoring Team comprised of local citizen-scientist will be assisting with monitoring for amphibians as part of the post-project evaluation. The Harrop Wetland Restoration project had measureable, positive impacts on the environment and provided opportunities for community members to take action and create long-lasting environmental protection and enhancement of a critical wetland area.

A total of 0.5 hectares of wetlands were restored, 290 native trees and shrubs were planted and over 108 participants were involved in project planning, planting, and monitoring. Six interpretive signs were created and installed to showcase wetland values and encourage people to not disturb the sensitive wetland area. Over $23,000 worth of in-kind services and goods were donated by local businesses and individuals for the project.

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Introduction

In 2013, Friends of Kootenay Lake was contacted by several Harrop community members who were concerned about ATV activity in the local wetland as well as tadpoles dying in great numbers due to the wetland drying up prior to the tadpoles emerging as toadlets.

In response to these concerns, Friends of Kootenay Lake initiated the Harrop Wetlands Restoration Project. With a total of $35,799 of funding from the Fish and Wildlife Compensation and Environment Canada, the project began in 2014 with the goal of restoring degraded wetland habitats in the Harrop portion of Sunshine Bay Regional Park and the adjacent Harrop Point foreshore. These ephemeral wetlands are part of the under-represented riparian habitat that is becoming rare along the West Arm of Kootenay Lake due to extensive foreshore development. The wetlands provide habitat for 45 animal species including the following provincially blue-listed species: barn swallow, breeding western toad, and great blue heron (McKenzie, E. & Dulisse, J., 2011). This habitat-based restoration project will help to recover several Fish and Wildlife Compensation Program focal species including western toads, painted turtles, and great blue herons (FWCP, 2011b).

Hundreds of people use the trails around the Harrop wetland area. These wetlands have been impacted by both historic and current uses including farming, logging, and recreation (McKenzie, E. & Dulisse, J., 2011). Impacts include disturbance to waterfowl, shorebirds, juvenile fish and amphibians. This project addressed long-standing human disturbance issues, and restored wetland areas so they can be more biologically productive and aesthetically pleasing, as well as increasing the opportunity for wildlife viewing.

The purposes of the restoration project were to reduce biodiversity loss, protect wildlife and plants, and improve habitat for a multitude of species. The purposes were achieved by:

1. Protecting two wetland ponds by installing an exclusion device for All Terrain Vehicles (ATVs) so they can no longer “mud bog” in the sensitive riparian area.
2. Increasing duration of water inundation in the upper wetland by raising height of outflow and reconnecting a drainage ditch to the wetland. This restoration activity was aimed at improving habitat for the breeding western toads. Western toads are federally listed as a "species of special concern" and are blue-listed in BC and have been documented on site (McKenzie, E. & Dulisse, J., 2011). Anecdotal evidence from the Harrop Riparian Society indicates western toads have attempted to breed in the upper wetland, but it does not

retain water long enough for the toad maturation cycle to complete. By restoring this upper wetland we can promote conditions conducive to successful western toad breeding.

3. Educating and engaging community members about the values of wetlands and how individuals can make a difference in their community. The project will provide opportunities for community members to take action that will result in positive, long-lasting environmental change. This will include opportunities for community members to assist with planting native plants and monitoring western toads using protocol from the Frog Watch BC program

The project is aligned with the following FWCP's strategic objectives:

- Columbia Basin Plan – Conservation Objective - maintain/improve the status of species or ecosystems of concern and maintain/improve the integrity of productivity of ecosystems and habitats (FWCP, 2011a).
- Species of Interest Action Plan - Conservation Objective 1– maintain/improve the status of species of interest by improving the distribution and abundance of recovery of focal species through habitat-based actions (FWCP, 2011b).
- Riparian and Wetlands Action Plan - Objective 1- maintain productive and diverse ecosystems by restoring degraded wetland habitat and to maintain or improve the status of priority species (FWCP, 2012).

Goals and Objectives

The goals and objectives of the Harrop Wetlands Restoration Project were to:

1. Reduce threats to natural values and improve fish and wildlife habitat of Kootenay Lake
2. Eliminate ATV access to sensitive riparian habitat
3. Re-vegetate the disturbed area with native trees and shrubs with high wildlife values.
4. Increasing duration of water inundation in wetland to turn site from a Western Toad population sink to a population source.
5. Foster a stewardship ethic in lakeside communities by educating and engaging the public
6. Engage community members and key interest groups in wetland restoration project through planning meetings (including ATV user group), and by promoting project through local media.
7. Provide opportunities for community members to take action through planting and toad monitoring activities.

Study Area

The study area for this project was in Harrop, British Columbia. Figure 1 shows the wetland restoration sites at Sunshine Bay Regional Park and on Provincial foreshore of Kootenay Lake.

Figure 1 - Harrop BC Wetlands Restoration Project Location, Image Credit: iMapBC

Methods

Community and Stakeholder Consultation

Friends of Kootenay Lake consulted extensively with community members and stakeholders during the project planning process. Four community planning sessions were held to solicit input into the wetland restoration design as well as garner community support for the project. A total of 58 participants attended the planning sessions. The planning sessions allowed Friends of Kootenay Lake to educate and engage community members about the values of wetlands. Three of the sessions were held at the Harrop Community Hall and one was held at the restoration site.

Friends of Kootenay Lake identified and consulted with the following stakeholders:

1. Adjacent land owners
2. BC Wildlife Federation
3. Central Kootenay Invasive Plant Committee
4. Community Members
5. Fish and Wildlife Compensation Program
6. Friends of Sunshine Bay
7. Harrop Riparian Society
8. Kootenay Native Plant Society
9. Ktunaxa Nation Council
10. Main Jet
11. Ministry of Forests Lands Natural Resource Operations
12. Regional District of Central Kootenay
13. Sunshine Bay Regional Parks Commission
14. Sunshine Bay Riding Club
15. West Arm Outdoors Club
16. Yaqan Nukiy

Wetland Restoration Design

Our method to design the wetland was to assemble a diverse and skilled team of people with expertise in wetland restoration, wildlife enhancement and land management. The design team included:

- Amy Waterhouse – Ministry of Forests Lands and Natural Resource Operations, provided mapping services
- Cary Gaynor - Regional District of Central Kootenay, provided expertise in park management and planning.
- Irene Manley - Ministry of Forests Lands and Natural Resource Operations, provided expertise in wildlife biology
- Jakob Dulisse – Dulisse Consulting, amphibian and species-at-risk expert, helped ensure there were no impacts to species-at-risk during wetland construction as well as provided advice on ways to enhance wildlife values.
- Neil Fletcher and Jason Jobin - BC Wildlife Federation, provided expertise in wetland restoration
- Robin Annschild - provided expertise in wetland restoration
- Terry Anderson and Harry Biallas - Ministry of Forests Lands and Natural Resource Operation, provided expertise in prevention strategies for ATV use in wetland.
- Tom Biebighauser - Center for Wetlands and Stream Restoration, a world-renowned wetland restoration expert led the design process.

Friends of Kootenay Lake oversaw the project planning, implementation, and brought together the design team mentioned above.

Permitting and Permissions

A Section 9 Notification of the Water Act was submitted for the project. The Notification for changes in and about a stream was submitted by the Ministry of Forests Lands and Natural Resource Operation in partnership with the Regional District of Central Kootenay and Friends of Kootenay Lake. Lands Authorization was also contacted to obtain permission to plant shrubs and install signs on the foreshore.

The Ktunaxa Nation Council and the Yaqan Nukiy were consulted to ensure that the wetland restoration would not impact any First Nations archaeological sites.

Foreshore Wetland Restoration

To protect the two large ephemeral wetland ponds on the Provincial foreshore, a combination of native shrubs and interpretive signage was used to eliminate ATV access in this sensitive area. Drought and flood tolerant *Cornus sericea* (redosier dogwood) and *Salix sitchensis (*sitka willow) were selected to create the natural barrier and provide wildlife values.

A community planting day was hosted on November 15th, 2014 to assist with planting the shrubs. When planting the shrubs holes were dug slightly larger than the root balls and organic 4-4-4 fertilizer was mixed into the hole. The shrubs were planted with a slight depression around the base to allow for water retention. The large rooted cuttings were between six-nine feet tall. After being planted, a drop cloth was placed around each shrub and a thin mixture of sand and latex paint was applied with gloves to prevent beaver and deer browsing.

A total of seven interpretive signs (five made by Friends of Kootenay Lake and two made by Redfish Elementary School) were designed and installed around the outer perimeter of the two wetlands to raise awareness about wetland values and the importance of not disturbing this sensitive habitat.

Upland Pond Restoration

Pond Enhancement for Western Toad and Painted Turtle

In order to improve the upland pond for western toads and painted turtles, several actions were taken. The first step was to increase the duration of water inundation in the upper wetland. A 325 Cat excavator was used to increase the height of the

outflow, pack clay on the bottom of the wetland basin, remove sand pockets that were draining the water, and increase the size and depth of the wetland area. A team of three people including Tom Biebighauser, Irene Manley, and Claire de la Salle supervised the machine work (Figure 2).

Figure 2 - Restoration Team who Supervised the Restoration of the Upland Wetland with a 325 Cat Excavator – Image Credit: Angus Glass

The wetland was made shallow so it dries by the end of September. This will prevent fish from living in the wetland that prey on western toad (and other amphibian) eggs, larvae, and adults. The wetland area was expanded by approximately 6 times the original size.

Several habitat features were created, including toad hibernation sites made of mounds of loose soil and large woody debris. Large woody debris was brought in to create loafing structures for western painted turtle and waterfowl as well as provide cover for amphibians. The loafing logs were anchored with a pile of soil so they will stay in place. One large log was installed vertically to provide the mounting for a bat box. During the excavator work any sand that was found was set aside and used at the end to create western painted turtle nesting habitat by half covering large woody debris with fine sand. Additional turtle nesting and loafing sites were created by shaping ridges and mounds of sandy-loam texture soil. These were placed in sunlit areas above the water level.

Snake Hibernaculum

A snake hibernaculum (see Figure 3) was built based on the "How to Create a Snake Hibernaculum" guide (Long Point Basin Land Trust, 2013). The basic methodology was as follows:

1. Select a south facing site that is well drained and far from roads and other hazards.
2. Dig a large hole 10'wide x 10'long x 6'deep. Ensure the hole will extend well below the frost line.
3. Get the excavator to sort out the rock into both a small and large rock piles. Place a layer of the small rock about 1'-2' deep at the bottom of the hole to guard against flooding.
4. To ensure the snakes can access all levels of the structure place 2 x 10', 4" perforated PVC piping at an angle from the bottom of the hole to ground level. To perforate pipe drill ½" holes throughout the surface of the pipe.
5. Start filling the hole with large flat rocks and large root masses trying to make as many chambers as possible within the structure. For a hibernaculum of this size approximately 2 large roots wads can be used with 18 tonne of rock (try to get mostly large flat rocks).
6. Once you have filled the hole to ground level mound the rocks an additional 3ft above grade. Place a piece of thick landscape fabric down the middle of the structure leaving the sides of the hibernaculum (including where the PVC pipe entrance) open. Cap the fabric with 1ft of soil to help to insulate the structure and plant with a native grass seed mix.
7. Place a few of the largest flattest rocks on top of the structure to provide habitat for snakes to warm themselves up on the rocks.
8. Cover the entrance to the hibernaculum with branches to protect the snakes from predators as they emerge.

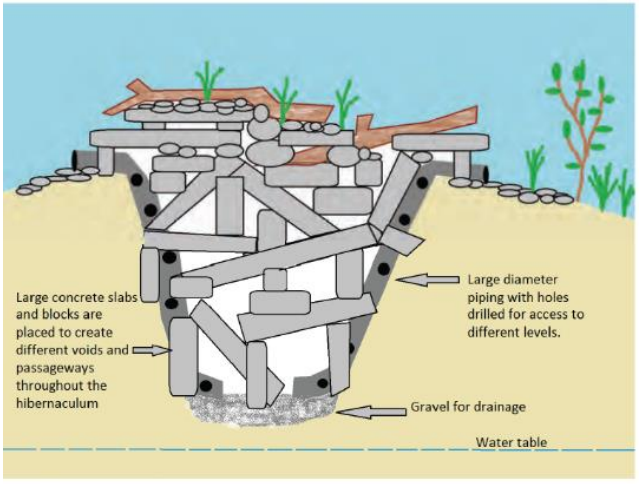

Figure 3 - Snake Hibernaculum Design (Long Point Basin Land Trust, 2013)

Native Plants and Invasive Plant Management

Prior to the excavator work, native sedge seeds were collected, dried, and stored. After the excavator had completed the work three types of seeds were broadcasted including a riparian wetland reveg seed mix, sedge seeds, and an oat cover crop. The entire wetland area was seeded to reduce the chance of invasive plant species establishing. A layer of straw was placed over all disturbed surfaces to promote seed growth and stabilize the soil until the seeds had grown. A fence was installed along one edge of the wetland to reduce disturbance to the newly restored and seeded area as well as to reduce the chance of dogs running into the wetland and eating waterfowl chicks (which had been documented several times by local residents).

When we were restoring the wetland a lot of vegetation was scalped off the surface of the ground. Any native species like sedges were placed to the side to be reset once the pond had been created. In order to deal with all the invasive *Phalaris arundinacea* (reed canary grass) scalped from the wetland pond we piled it in two large mounds, capped the mounds with soil and planted with riparian wetland reveg seed mix and *Cornus sericea*.

80 *Populus trichocarpa* (black cottonwood trees) were planted to provide habitat for Great Blue Heron in five clusters just west of the upper pond area. A soil auger was used to dig the holes as the ground was extremely hard. After being planted, a drop cloth was placed around each shrub and a thin mixture of sand and latex paint was applied with gloves to prevent beaver and deer damage. Browse protectors were placed at the base of the trees as well as snow fencing placed around each cluster.

Native plants were planted with guidance from native plant expert Thor Smestad from Tree Bear Native Plant nursery to ensure the highest possible survival rate

Amphibian Monitoring Program

A long-term citizen science amphibian monitoring group was established to monitor for amphibians pre and post restoration. Jakob Dulisse and Claire de la Salle ran a one day training workshop with 15 participants to give local residents knowledge of wetland values and the skills needed to monitor for amphibians at the upland pond. The group will monitor for amphibians from May-September each year to determine if the restoration was successful in its goal to enhance western toad breeding habitat. The data will be reviewed by Friends of Kootenay Lake and data will be submitted to Frog Watch BC on an annual basis.

Results

Community and Stakeholder Consultation/Wetland Restoration Design

During the Community Consultation process, 58 participants were educated about wetland values and provided input to the wetland restoration design. In total, there were community consultation sessions. In addition, several on-site visits were conducted with key stakeholders to assist with the design.

The key outcomes of the design consultation were:

- Changing the original plan from using rip-rap to protect the foreshore wetland ponds to using a natural barrier made of *Cornus sericea* (redosier dogwood) and *Salix sitchensis (*sitka willow) as well as installing interpretive sign. Friends of Kootenay Lake believes that by combining education about wetland values and making a natural physical barrier, we can prevent disturbance to the wetland area.
- Learning from locals that many years ago there used to be a great blue heron rookery in a stand of cottonwood in a nearby property that is now cut down. To mitigate this loss for great blue heron habitat, 80 black cottonwood trees were planted in clusters near the upland pond. In the long-term the goal is to re-establish a heron rookery by combining the additional roosting habitat and increasing their food supply by improving the condition of the nearby wetland ponds.
- Addressing a long-standing concern about off-leash dogs eating waterfowl chicks by installing a fence along the upland wetland.
- Identifying that over the last twenty years there has been a large reduction of snake hibernacula on the West Arm of Kootenay Lake mainly from increased development. It was determined that creating a snake hibernaculum near the upland pond was a priority for local residents.

Figure 4 shows the results of the Harrop Wetland Restoration Project. A total of 0.5 hectares of wetland was restored.

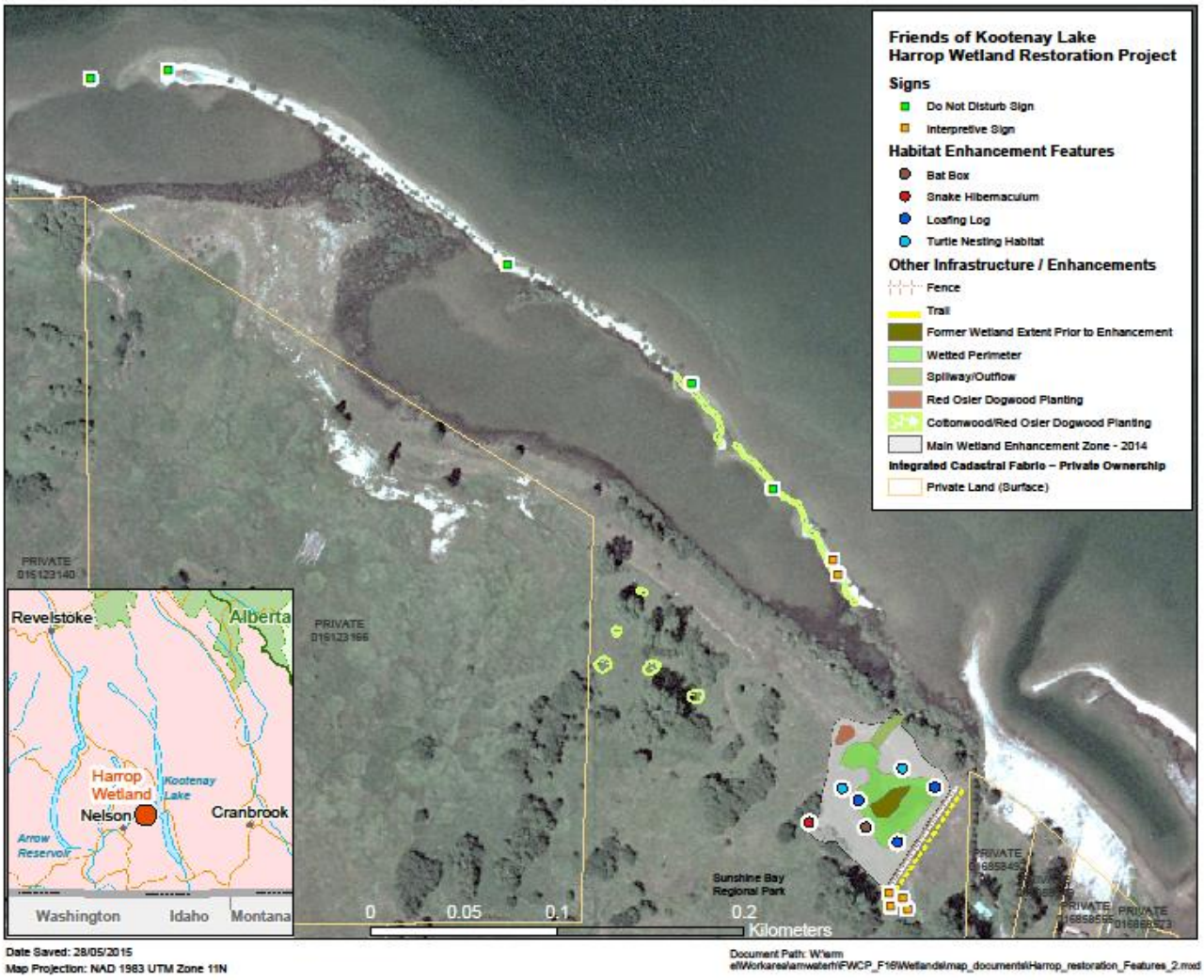

Figure 4 - Harrop Wetlands Restoration Project

Permitting and Permissions

A Section 9 Notification of the Water Act was approved for the project. As seen in Figure 3 we were not able to continue the native shrub barrier on the foreshore ponds in front of the privately owned property adjacent to the Regional District of Central Kootenay land. This change was due to the Lands Authorization not providing permission for Friends of Kootenay Lake to plant shrubs in this area as this work may have potentially been an infringement of the neighbour's riparian rights. Fortunately, the riparian right did not prevent the installation of interpretive signage along the entire perimeter of both foreshore ponds.

After an archaeological assessment was conducted, it was determined that there was no risk of the project impacting an archaeological site.

Foreshore Wetland Restoration

For the foreshore restoration 290 *Cornus sericea* (redosier dogwood) and *Salix sitchensis (*sitka willow) shrubs were planted along the perimeter (Figures 6 and 8). Figure 5 and 7 shows area pre-restoration. Since the restoration was completed in the fall of last year there has been zero incidence of motorized intrusion.

Figure 5 - West View of Foreshore Pond Pre-Restoration, November 3rd, 2015

Figure 6 - West View of Foreshore Pond Post-Restoration, November 15th, 2015

Figure 7 - East View of Foreshore Pond Pre-Restoration, November 3rd, 2015

Figure 8 - East View of Foreshore Pond Post-Restoration, November 15th, 2015

Figure 9 shows Terry Anderson (Ministry of Forests, Lands and Natural Resource Operations) assisting with installing signage along foreshore ponds. Friends of Kootenay Lake produced five of these signs to place along the perimeter of the foreshore ponds. Figure 10 shows a close up of the sign, which used Redfish Elementary School student artwork. Figure 9 shows the area Friends of Kootenay Lake were not permitted to plant on the foreshore due to the upland property owners riparian rights.

Figure 9 - Terry Anderson Assisting with Installing Signage

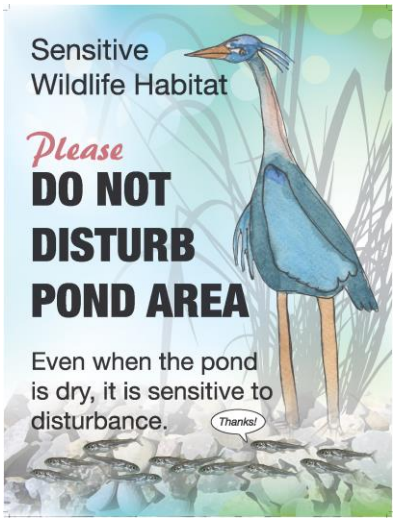

Figure 10 - Do Not Disturb Sign Placed Along Foreshore Ponds

During the restoration project Redfish Elementary School worked on a project to create interpretive signs for the wetland area (see Figure 11). The signage used the students artwork and showcases the importance of wetlands for great blue heron, western toad, painted turtle, and dragonflies.

Figure 11 - Redfish School Interpretive Signs on Foreshore Wetland with Native Shrub Barrier in Background

Upland Pond Restoration

The upland pond was restored to increase the duration of water inundation. The wetland was designed to be ephemeral (dry out for part of the year). Figures 12 and 13 show the area pre- and post-restoration. One of the project goals was for the duration of water inundation to increase to 15cm-30cm deep from end of February to mid-May as well as ensuring the water remains a minimum of 15cm deep from mid-June to mid-September. During February, the water level (measured from deepest point) was 20cm but in May the water level was only 10cm. This may have been due to the extreme lack of precipitation in April and May 2015. Despite the dry conditions, some water was still present in the wetland. Without the restoration work, the area of the wetland pond would have had no water at all.

Figure 12 - Upland Pond Pre-Restoration, August 26th, 2015

Figure 13 - Upland Pond Post-Restoration, October 17th, 2015

Figure 14 shows one of the areas created for painted turtle nesting habitat which was created by partially covering large woody debris with fine sand.

Figure 14 - Painted Turtle Nesting Habitat

Figure 15 shows the snake hibernaculum that was created to provide overwintering habitat for snakes.

Figure 15 - Snake Hibernaculum

Redfish Elementary School granted Friends of Kootenay Lake permission to use the student artwork to create an interpretive sign (see Figure 16) located at the upland pond. The sign outlines the restoration work completed as well as highlights the values of wetlands.

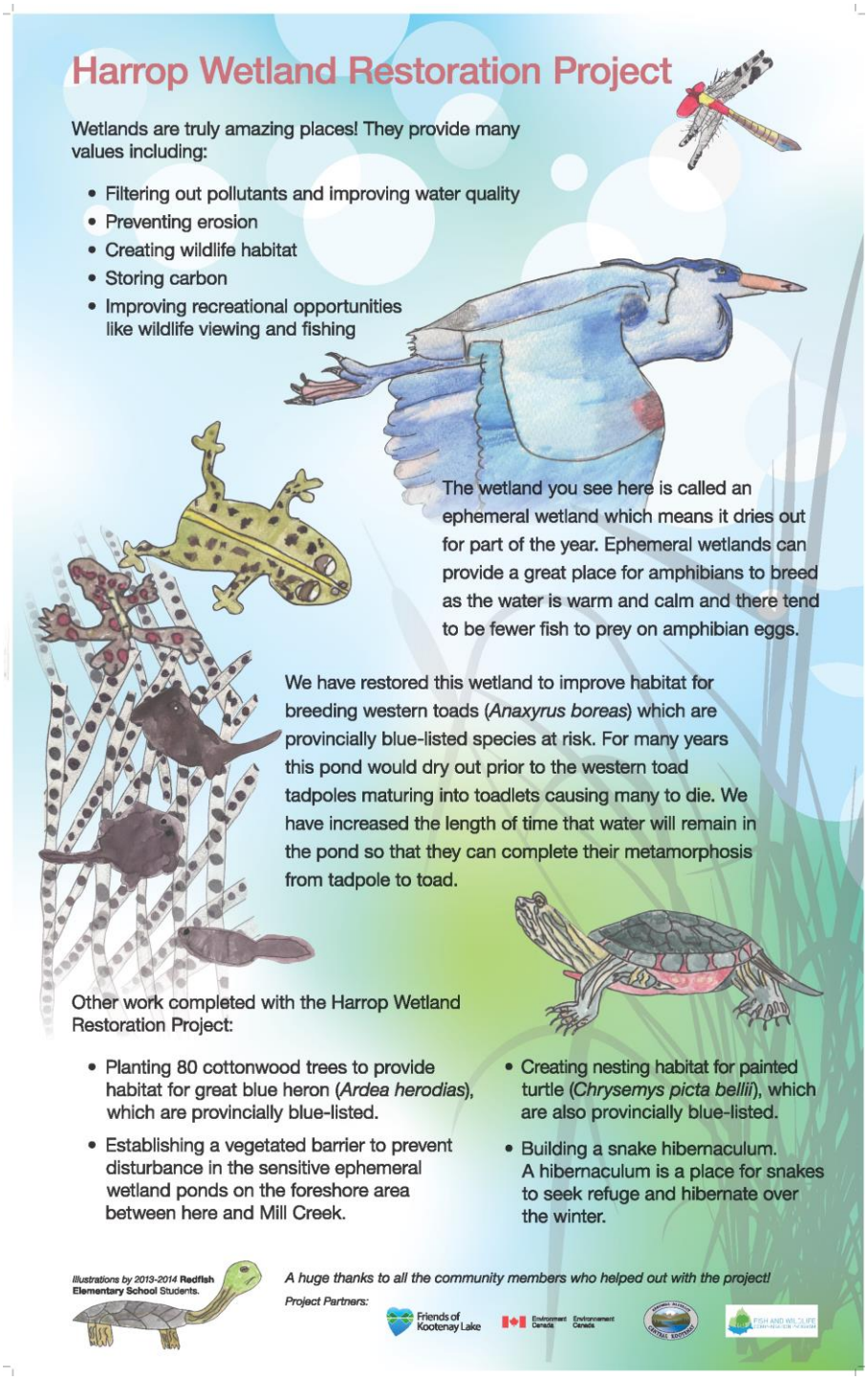

Figure 16 - Interpretive Sign Made for Upland Pond

Amphibian Monitoring Program

In 2014 a citizen-science amphibian monitoring group was established. Figure 17 shows the training workshop where 15 participants were trained to monitor for amphibians at the upland pond. This group has committed to long-term amphibian monitoring at the site to assess the effectiveness of the restoration. In 2014 western toads were documented on-site. In May of 2015 volunteers did not see any amphibians. This may have been due to the extremely dry spring conditions. Monitoring will continue monthly until September. The data will be reviewed by Friends of Kootenay Lake and data will be submitted to Frog Watch BC on an annual basis.

Figure 17 – Volunteers being Trained by Jakob Dulisse at Amphibian Monitoring Workshop

Community Wetland Celebration Event

To celebrate the completion of the wetland restoration project, a Community Wetland Celebration event was hosted by Friends of Kootenay Lake and Redfish Elementary School. Figure 18 shows the 83 students looking at their artwork included in the interpretive signs. Every student at the school had the opportunity to have their painting included in the signage.

Figure 18 - Harrop Wetland Celebration

In summary, the results of the Harrop Wetlands Restoration Project are as follows:

- 0.05 hectares of shoreline protected
- 0.5 hectares of restored habitat
- 4 Community Planning Sessions were held
- 290 indigenous trees and shrubs were planted
- 86% of indigenous trees and shrubs planted survived
- Successful elimination of motorized vehicles in targeted sensitive riparian habitat area.
- 108 participants in planning, planting, and monitoring
- 0.5 jobs created (person/year)
- 76 volunteers participated directly in project totalling 215 volunteer hours
- 2 newspaper articles were written about the project and 4 radio interviews were conducted
- Approximately 45% of foreshore ponds are protected by a perimeter of native shrubs and interpretive signs in order to eliminate impacts to wetlands caused by rutting and soil compaction and disturbance of saturated soils caused by ATV and horse traffic.
- Total cash costs = $35,799
- Total in-kind contribution = $23,536
- Total project costs = $59,335

Discussion

Community consultation and involvement was a very important part of this project. Friends of Kootenay Lake hosted an additional community planning session to meet the needs of community members. Through extensive community consultation locals had a chance to provide meaningful input into this restoration project. After 58 community members provided feedback the design was stronger and community support for the project had increased dramatically.

One unanticipated roadblock to planting a native shrub barrier the full perimeter of the two foreshore ponds was the Lands Authorization not providing permission to plant shrubs on provincial foreshore where there was private upland ownership. The reasoning behind this decision was that the shrubs may infringe on the neighbour's Riparian Rights. This decision was unexpected as the work proposed was only to fortify the existing shrub border on the perimeter of the wetlands on provincial land.

There is a lot of opportunity at the Harrop portion of Sunshine Bay Regional Park future wetland development. While Tom Biebighauser was designing the upland pond restoration he also designed a potential phase 2 for the project which would create a large deeper water pond.

In summary, the Harrop Wetlands Restoration Project has increased opportunities for wildlife viewing, added to the beauty of a community, and raised community members' awareness about wetland values. Community members were engaged through planning meetings, a community planting day, an amphibian monitoring workshop and a wetland celebration event. A total of 215 volunteer hours were logged.

The project reduced threats to natural values and improve fish and wildlife habitat of Kootenay Lake by eliminating ATV access to sensitive riparian habitat. Over 290 native trees and shrubs were planted to re-vegetate disturbed areas and create wildlife habitat. The duration of water inundation has been increased in the upland wetland although the water levels during 2015 have so far been lower than expected. It will take a couple years of monitoring to determine if the project has achieved its goal of turning the upland pond from a western toad population sink to a population source.

Recommendations

It is recommended that any restoration project include an archaeological assessment in their budget as historically First Nations people frequented many wetland areas. Friends of Kootenay Lake had not anticipated this cost and were fortunate that the Ktunaxa Nation Council and the Yaqan Nukiy were generous enough to provide this service in-kind.

For future wetland restoration projects, it is recommended that 10% of the total budget be allocated towards project maintenance and effectiveness monitoring. For this project, only $500 was allocated to maintenance in year 2. To meet the shortfall in maintenance funds both the Central Kootenay Regional District and Tree Bear Native Plants and Ecological Services are providing services in-kind for maintenance in 2015.

To provide additional protection on the foreshore ponds it is recommended that the Province place a Section 16 on this area. In the long term, it would be beneficial if this area were to receive protected status under a designation such as an Ecological Reserve.

March, April, and May of 2015 were extremely dry. The result of the dry spring was that the upland wetland pond was dryer than expected. If climate change causes trends of dryer conditions, it is important to design wetlands to be able to thrive even in low water years. Friends of Kootenay Lake will continue to monitor water levels and amphibians in the upland pond to determine if the water levels are high enough to promote western toad breeding.

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Appendix A - Confirm FWCP Recognition

Friends of Kootenay Lake

CKIPC

MEDIA ADVISORY FOR IMMEDIATE RELEASE **July 17, 2014**

Friends of Kootenay Lake Summer Events Announcement

Summer is here and Friends of Kootenay Lake are planning the following fun free events around the lake:

- Western Toad Monitoring Workshop in Harrop - This workshop will be lead by amphibian expert Jakob Dulisse and will train citizens how to monitor for western toads. After the workshop we will be looking for volunteers to conduct regular toad monitoring at the Harrop wetlands from June-September for the next couple of years.
  - July 22nd - 1pm-3pm
  - 16 spots available (8 spaces will be reserved for residents of Harrop and Procter)
  - Event is free but registration required - email info@friendsofkootenaylake.ca to register today

- Harrop Wetlands Restoration Project Update
  - July 24th - 7pm-8pm
  - Harrop Hall - everyone welcome

- Wildlife Tree Mapping Workshops - The workshops will teach attendees how to identify important wildlife trees, and record their locations using
  GPS and GIS technology. Wildlife trees are integral to maintaining a healthy ecosystem. Over 70 species of vertebrates depend upon wildlife trees. Osprey and eagles perch on the snags, many birds build nests in their branches, and amphibians use them for shade and shelter. Mapping and recording important wildlife trees allows for these trees to be protected, in turn protecting vital wildlife habitat. The workshops are located as follows:
  - July 28th - Argenta Community Hall, Argenta, 7pm – 9pm
  - July 29th - Langham Theatre, Kaslo, 7pm – 9pm
  - July 31st - Nelson Rod and Gun Club, Nelson, 7pm – 9pm
  - August 2nd - Gray Creek Hall, Gray Creek, 2:30pm – 4:30pm
  - Event is free but registration required - email summerstaff@friendsofkootenaylake.ca or call 250-777-4100 to register today

- SAVE THE DATE October 18th for the 2nd Annual Kootenay Lake Summit in Kaslo, B.C.

Special thanks for our funders the Columbia Basin Trust, Environment Canada, Small Change Fund, Regional District of Central Kootenay, Real Estate Foundation of BC, and the Fish and Wildlife Compensation Program for making these events possible.

Many thanks,

–
Claire de la Salle, BSc
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Friends of Kootenay Lake

MEDIA ADVISORY FOR IMMEDIATE RELEASE May 7, 2014

Seeking Community Input into the Harrop Wetlands Restoration Project

The Friends of Kootenay Lake are pleased to announce they have received $35,800 from the Fish and Wildlife Compensation Program and Environment Canada to restore the Harrop wetlands in Sunshine Bay Regional Park.

"This is a huge opportunity to improve the fish and wildlife habitat on one of the few remaining wetland areas on the shores of Kootenay Lake. The project will focus on restoring 3 existing wetland ponds as well as planting native trees and shrubs. The restoration will improve habitat for provincially blue-listed species including western toads, great blue heron, and painted turtle. There will be many opportunities for community members to take action and create long-lasting environmental protection and enhancement of a critical wetland area. We are committed to making this project inclusive and collaborative and are looking forward to working with the public to make sure the project meets the needs of the community." – Claire de la Salle, Friends of Kootenay Lake Program Manager

The Friends of Kootenay Lake are seeking community input into the design of the restoration project. Community members are invited to three planning meetings:

- Tuesday May 20 from 7:00pm-9:00pm Harrop Hall
- Sunday May 25 from 2:30pm-4:30pm Harrop Hall
- Sunday May 25 from 4:45pm-6pm meet at trail head by the Sunshine Bay Riding Club in the Harrop portion of Sunshine Bay Regional Park
- Submit feedback anytime by emailing info@friendsofkootenaylake.ca

Many thanks,
Claire de la Salle
Program Director, Friends of Kootenay Lake
(250)777-2955
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Friends of Kootenay Lake

MEDIA ADVISORY FOR IMMEDIATE RELEASE April 20, 2015

April 24th Community Celebration for Harrop Wetland Restoration Project

Friends of Kootenay Lake would like to invite you to attend a community celebration on Friday April 24th from 9am to 12pm at the newly restored Harrop wetlands in the Harrop portion of Sunshine Bay Regional Park (trail head at 6375 Erindale Rd).

Over the last year many people have helped out with restoring the Harrop Wetlands and raising awareness about their values. Come and see what we have been up to including the unveiling of the beautiful interpretive signs made with artwork from Redfish Elementary School students.

In total the project's cash costs were $35,800. Funding was provided from the Fish and Wildlife Compensation Program and Environment Canada. In-kind donations were given by Dosenberger Excavating Ltd, Harrop Procter Forest Products, Beck Designs, BC Wildlife Federation, Province of BC, Harrop Riparian Society and the Fish and Wildlife Compensation Program. The goal of the wetland restoration project was to improve the fish and wildlife habitat on one of the few remaining wetland areas on the shores of Kootenay Lake.

The project focused on:

- Restoring 3 existing wetland ponds
- Building a snake hibernaculum
- Establishing a long term citizen science amphibian monitoring group
- Raising community awareness about the values of wetlands
- Creating painted turtle nesting habitat
- Planting native trees and shrubs.

The restoration will improve habitat for provincially blue-listed species including western toads, great blue heron, and painted turtle. A special thanks to our Funders the Fish and Wildlife Compensation Program and Environment Canada for making this project possible!

Photo: Volunteer Eric helping to plant native plants.

Contact: Claire de la Salle • Program Director, Friends of Kootenay Lake
PHONE: (250)777-2955 • info@friendsofkootenaylake.ca

Harrop Wetland Restoration Project

Wetlands are truly amazing places! They provide many values including:

- Filtering out pollutants and improving water quality
- Preventing erosion
- Creating wildlife habitat
- Storing carbon
- Improving recreational opportunities like wildlife viewing and fishing

The wetland you see here is called an ephemeral wetland which means it dries out for part of the year. Ephemeral wetlands can provide a great place for amphibians to breed as the water is warm and calm and there tend to be fewer fish to prey on amphibian eggs.

We have restored this wetland to improve habitat for breeding western toads (*Anaxyrus boreas*) which are provincially blue-listed species at risk. For many years this pond would dry out prior to the western toad tadpoles maturing into toadlets causing many to die. We have increased the length of time that water will remain in the pond so that they can complete their metamorphosis from tadpole to toad.

Other work completed with the Harrop Wetland Restoration Project:

- Planting 80 cottonwood trees to provide habitat for great blue heron (*Ardea herodias*), which are provincially blue-listed.
- Establishing a vegetated barrier to prevent disturbance in the sensitive ephemeral wetland ponds on the foreshore area between here and Mill Creek.
- Creating nesting habitat for painted turtle (*Chrysemys picta bellii*), which are also provincially blue-listed.
- Building a snake hibernaculum. A hibernaculum is a place for snakes to seek refuge and hibernate over the winter.

Illustrations by 2013-2014 **Redfish Elementary School** *Students.*

A huge thanks to all the community members who helped out with the project!

Project Partners:

Friends of Kootenay Lake

Environment Canada / Environnement Canada

The Fish and Wildlife Compensation Program's contribution was recognized during the following radio interviews:

- May 7, 2014 -Mountain FM re: Community Planning Session for Harrop Wetland Restoration Project
- May 9, 2014 - EZ Rock re: Community Planning Session for Harrop Wetland Restoration Project
- May 14, 2014 – Kootenay Co-Op Radio re: Community Planning Session for Harrop Wetland Restoration Project
- July 17, 2015 - EZ Rock re: Community Planning Session for Harrop Wetland Restoration Project

Appendix B - Project Tasks and Schedule

Project Tasks and Schedule		
Break the project into discrete sequential tasks and provide the anticipated task date.		
Tasks (e.g. Project Mobilization, Start of Field Work, End of Field Work, Data Entry and Analysis, Report Writing, etc.)	**Description (Includes the gathering of equipment, data forms, coordinating team, etc.) Example - site preparation and gathering**	**Start Date**
Project Planning/Community Engagement	Host 3 community planning meetings that solicit input for the design of the wetlands restoration project as well as recruit volunteer labourers for planting native plants and wetland monitoring. Hire contractor with wetland restoration expertise to create restoration design	4/26/2014
Project mobilization	Conduct onsite inspection with project manager, consultant and Dosenberger Excavating Ltd. to determine best route for machine access to wetland and where rip-rap staging areas should be located and to overview work plan, order plants, schedule dates for volunteer planting.	5/26/2014
Start of Field work	Citizen-scientists will be trained to monitor for the presence or absence of western toads in the upper pond. The toad monitoring will use the protocol from BC Frog Watch program to conduct visual surveys once a month from June-Sept. Commence work end of August 2014 to increase duration of water inundation on upper wetland area, place a barrier around the perimeter of both wetlands, re-vegetate the disturbed wetland area with native trees, emergent wetland plants, and shrubs.	7/26/2014
End Field Work	Final site visit with Program Manager and Consultant to ensure that the design was followed and that all aspects were completed to a high quality.	11/15/2014
Host a volunteer appreciation event	Celebration event after wetland restoration is complete	4/24/2015

Monitor post-project effectiveness	Conduct effectiveness monitoring including survival rate of plants and toad monitoring (in upper wetland) water level (in upper wetland).	4/30/2015
Report writing	Click here to enter text.	5/1/2015
Click here to enter text.	Click here to enter text.	Click here to enter a date.
Click here to enter text.	Click here to enter text.	Click here to enter a date.