Non-Game Enhancement Project

COL-F25-W-4128-DCA

(F25) Activity Report

1 April 2024 to 31 March 2025

Prepared for: Fish & Wildlife Compensation Program

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Executive Summary

Non-Game Enhancement includes 7 different projects on non-game birds, mammals, amphibians and reptiles. Townsends Big-eared Bat maternity roosts were monitored and maintained in the East Kootenay. Fencing was maintained at a Highway underpass to reduce Badger Mortality in East Kootenay. Loon platforms were monitored at Whatshan Lake where all 5 nesting platforms were used by Loons. At Summit Lake, Western Toads were monitored during breeding and migration. In 2025, breeding was observed from April 14- April 27. Mark-recapture work on western toads continued with 347 Toads marked this year. Turtle nesting areas were monitored and maintained at Elizabeth Lake. At Elizabeth Lake, 570 turtle hatchlings were produced in spring 2024 from the 63 nests laid in 2023. 1 nest site was predated prior to emergence. The 2024 turtle breeding season had peak laying occur on June 12. A total of 34 turtle nests were documented and their nesting success will be followed in 2025. 18 Nesting boxes for Vauxs swifts were monitored in August 2024 and maintained in October 2024 and 1 nest site was documented in a Smallwood Creek nest box.

These seven non-game enhancement projects continue to address different priority actions across the upland Dryland, reservoir and Large lakes, Small lakes and Wetland action plans.

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1. Introduction

In the Columbia Region, annual and ongoing fish and wildlife projects are delivered with support from the Ministry of Water, Land, Resource Stewardship (WLRS) through a Letter of Agreement (LoA). The Non-game Enhancement Project is one such project delivered by WLRS staff, First Nations, contractors, and partnerships.

Non-Game Enhancement includes a group of long-term enhancement projects developed to benefit populations of non-game species and to enhance their habitats. Species that benefit from project actions include amphibians, reptiles, mammals, and birds that are provincially or federally listed at risk and have been impacted by reservoir habitat losses. Non-game enhancement projects focus on critical habitat features that are important for each species reproduction and/or survival including roosting, denning, nesting habitat and highway crossings infrastructure to reduce species mortality. Ongoing monitoring and maintenance of these habitat features and inventory and monitoring of the species that use them are required to ensure they continue to provide long term benefits.

The Non-Game Enhancement Project includes the coordination, oversight, and implementation of a wide variety of projects on non-game species that are impacted by reservoir habitat losses. Seven projects were implemented in 2024-2025 including the following:

1. EK Townsend's Big-eared Bat Roost Restoration and Monitoring
2. Badger Highway Crossing Structure Maintenance
3. Loon Platforms, Whatshan Reservoir
4. Western Toad mortality mitigation and population monitoring
5. Turtle nest site maintenance and monitoring Elizabeth lake
6. Argenta Turtle nesting habitat Enhancement
7. Vaux' Swift Nest box monitoring and maintenance.

2. Goals and Objectives and Linkage of FWCP Action Plans and specific action(s)

Seven Non-game enhancement projects address different priority actions across several different action plans. The primary action addressed is identified for each project in Table 1.

Table 1: List of Projects and Priority actions addressed for F24 Non-Game Enhancement Projects.

Project	Objective	Primary action addressed
1. EK Townsend's Big-eared Bat Roost Restoration and Monitoring	Monitor and maintain Townsend's big-eared bat maternity roosts near Cranbrook.	COLUPD.SOI.SB.26.01 Support for BC Bat initiatives-P1 Support the conservation of bat species present in the Columbia Region. Examples include baseline data knowledge gaps (including monitoring/inventory), Whitenose Syndrome response, habitat protection, and restoration, and outreach and stewardship.
2. Badger Highway Crossing Structure Maintenance	Maintain Badger crossing structures at highway mortality locations in the East Kootenay	COLUPD.SOI.SB.21.01 Support strategies and initiatives outlined in the SARA and BC Recovery Strategy for American Badger that relate to compensation for dam impacts. Where possible, link project work to the connectivity of this species across ecosystems and collaborate with recovery team specialists.
3. Loon Platforms, Whatshan Reservoir	Monitor and maintain nesting islands installed in Whatshan Reservoir	COLRLL.ECO.ME.33.01 Conduct effectiveness monitoring and evaluation of FWCP habitat-based projects.
4. Western Toad mortality mitigation and population monitoring	Continue ongoing population assessment of Western Toads at Summit lake. Construct maintain and monitor highway fencing at crossing sites. Support Western Toad Festival	COLSLK.SOI.HB.20.01 Connectivity of breeding and overwintering sites for Western Toad populations-P1 Maintain/enhance Western Toad populations in small lakes by working with the Province of B.C., partners and the public to improve connectivity between breeding and overwintering sites.
5. Turtle nest site maintenance and monitoring Elizabeth lake and Argenta	Control vegetation and monitor use of alternate nest sites created for turtles at Elizabeth Lake, Cranbrook.	COLWRA.SOI.ME.38.01 Monitor wildlife use of created/restored habitats-P1 Monitor fish and wildlife species' use of improved wetland and riparian habitat that was created or restored with support from the FWCP (i.e. past projects).
6. Turtle nest site enhancement and monitoring Argenta	Control vegetation and monitor use of alternate nest sites created for turtles at Elizabeth Lake, Cranbrook.	COLWRA.SOI.ME.38.01 Monitor wildlife use of created/restored habitats-P1 Monitor fish and wildlife species' use of improved wetland and riparian habitat that

		was created or restored with support from the FWCP (i.e. past projects).
7. Nest box monitoring and maintenance	Monitor, maintain nest boxes; includes nest boxes installed for Vaux's Swift.	COLUPD.ECO.ME.18.01 Effectiveness monitoring of past projects-P1 Monitor wildlife use of created/restored habitats-P1 Monitor and evaluate the effectiveness of previous FWCP upland and dryland ecosystems projects (for monitoring of species see Action #32 below). Include an approach for adaptive management, information sharing, and collaboration among agencies and public stakeholders to increase the efficacy of conservation actions.

3. Study Area

Non-Game Enhancement projects occur at several locations throughout the West and East Kootenay (Figure 1).

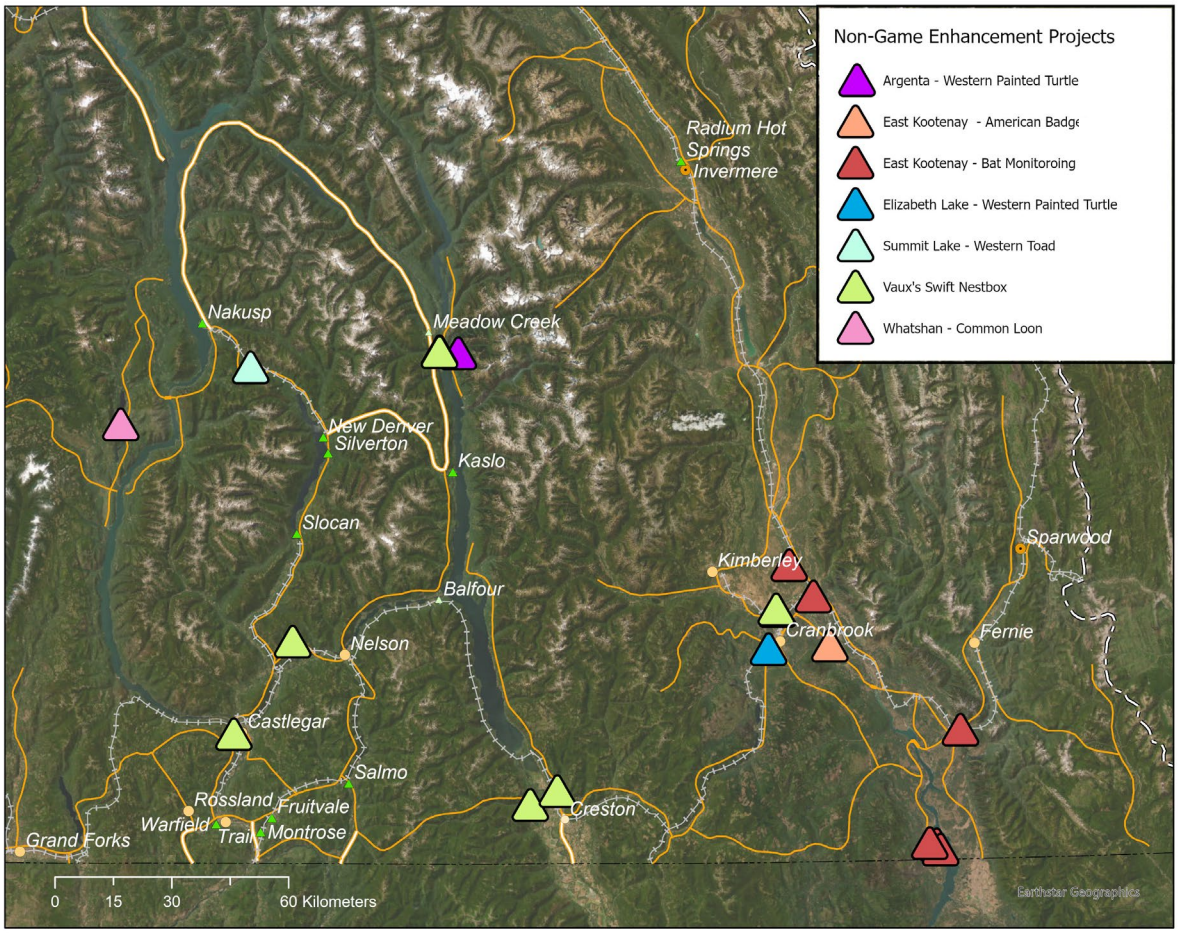

Figure 1: Non-Game Enhancement Project location map.

4. Methods Results and Outcomes

As the seven projects included in Non-Game Enhancement are diverse, the methods and results for each project are briefly summarized here. Please refer to specific project report references where applicable. All project data, spatial study areas, and reports are available on Species Inventory web Explorer.

4.1 East Kootenay Townsends Big-eared Bat Roost restoration and Monitoring

Townsends Big Eared bats have been monitored as part of FWCPs compensation actions since the St Eugene maternity roost was discovered in 1996. Subsequent bat telemetry work located additional maternity roosts in old buildings and sheds in the south country area. Monitoring and maintenance of these sites ensures that Townsends Big-eared bats continue to have suitable maternity habitat in the area.

Townsend's Big-eared Bat maternity roost investigations were completed in the East Kootenay at 8 roost sites in July and August of 2024, with the assistance of the Ktunaxa nation. These investigations were completed to observe if Townsend's Big-eared Bats were present or absent, provide an estimate of abundance and document if any maintenance to the roosting structures were necessary. Sites monitored included Cherry Creek, St. Eugene Hotel, Fort Steele, Bull River, Newgate 1,2,3, and 4. The newest shed roost constructed especially for Townsend's Big-eared Bats and that was placed on the northeast corner of the Earl Ranch Conservation Property continue to be used as a maternity structure . At the St Eugene Golf Resort and Hotel there seems to be increased use of the external constructed roost with more observations of maternal groups. One emergence count was also completed at the Hotel. Total numbers are comparable to the number seen last year (450-500 individuals).

http://a100.gov.bc.ca/pub/siwe/details.do?projectId=5419&pagerOffset=30

Lewis, R.D. 2024a

Figure 2: Townsends Big Eared bat Maternity roost (left) and roosting bats (right)

4.2 Badger Highway crossing maintenance

In the late fall of 2010, a badger fence with connections to two highway culverts was constructed north of Cranbrook in the Mayook area alongside the highway. A low-profile fence was placed for approximately three hundred meters along each side of the right of way in an area heavily used by badgers, determined from a previous telemetry study. There was an additional 75 meters of fencing added in 2020 to each end of the existing fence (n= 150m). This fence was tied into two existing dry culverts that went beneath the highway, providing a safe travel corridor to reduce highway mortality for these free-ranging badgers. Sand was placed at each end of the culverts to detect tracks for monitoring proposes. Several days are required each year to keep this fence functioning and maintained for this long-term project. There has been active badger use on both sides of the highway and the fence seems to be working as there has been no known highway mortalities in the area since the fence was deployed.

The badger fence was maintained in early April 2024. The maintenance work consisted of replacing stakes, fixing and repairing the existing fence, cleaning out the culverts for easy travel and making sure there were no blockages. Crossing points were also maintained by fixing, replacing or firming up all structures. Wooden mechanical run outs were also checked to make they were clear and functioning. Badger tunnels under the private fence were also checked and cleared to ensure everything was open and ready for the summer season. No badger mortality has been documented at the crossing area since it was constructed.

Lewis, R.D. in prep. 2024

Figure 3 : Badger fence along Hwy 3

4.3 Loon Platform monitoring and maintenance Whatshan Lake

Platform maintenance was generally performed during the first site visit early into the nesting season. Site visits and monitoring occurred four times in 2024 from early May to early August. In contrast to previous years, monitoring occurred in August specifically to confirm survival of chicks to juvenile stage, as per Canadian Lakes Loon Monitoring Survey protocols.

Five loon pairs were observed during the monitoring period, with one pair occupying each of the five known territories. All five pairs made nesting attempts, and all nesting occurred on artificial platforms.

Four of five loon nests hatched in 2024, based on the presence of eggshell fragments in one nest (White Grouse) and observations of young loon chicks in three territories (Flicker Lagoon, Loongoon and South End). Of the four nests that hatched young, three were confirmed to each produce a single juvenile loon. The one unsuccessful nest (North End) was an abandoned nest, with an unhatched egg remaining on the platform during the final monitoring visit in August.

Artificial nesting platforms continue to be used by loons and appear to be improving nesting success and productivity of loons on Whatshan Reservoir. Productivity remains above the pre-2011 platform installation rates when nests often failed and/or were delayed due to reservoir fluctuations. Since platforms were first available to loons, nesting success has increased from 29% to 68% of nesting pairs successfully hatching young, and productivity has also increased from an average of 0.42 to 0.69 chicks per nesting pair. Continued efforts to support the nesting success and productivity of loons by monitoring and maintaining artificial platforms at Whatshan is recommended as evidence of loon population declines have been noted across British Columbia and throughout Canada in recent years.

Deliverable reference- Phaenuf and Kellner (2025)
http://a100.gov.bc.ca/pub/siwe/details.do?projectId=4871&pagerOffset=0

Figure 4: Loon nest on floating platform.

4.4 Summit Lake Toads

Summit Lake hosts a significant breeding population of western toads (*Anaxyrus boreas*). The western toad is federally listed as Special Concern by the Committee on the Status of Endangered Wildlife in Canada. Substantial numbers of adult and juvenile toads (toadlets) are killed by vehicle traffic every year on Highway 6 as adults move to and from the lake for breeding and toadlets leave the lake for upland habitat.

This ongoing project was initiated in 2010 to assess road mortality on long-term western toad population trends. The objectives are to estimate the location, timing, direction, and severity of highway mortality; increase the efficacy of three underpass tunnels; and investigate and outline potential remedial measures. In 2011, we began efforts to identify the breeding distribution and adult abundance using mark-recapture techniques, and through the 2024 field season, we have continued to document nocturnal adult migration locations.

In 2024, Toad breeding activity was earlier than most other years with breeding first observed on April 14. Free swimming tadpoles were first observed May 25, 2024. Toadlet emergence from the lake and migration peaked on August 3-4 with large numbers at Camp Valhalla. Although toadlets were observed until late September, most of them occurred in low numbers (< 50) after August 8th. Toadlet emergence and migration in 2024 was initiated and completed much earlier compared to other years.

PIT tagging for Mark Recapture was completed during spring breeding aggregations prior to egg laying. This year 347 toads were newly marked and 97 marked toads were recaptured. Since 2011 a total of 4789 toads in the Summit Lake population have been tagged. Recaptures have documented the species longevity including a **13+ year old female toad** (adult female when tagged in 2012, recaptured in 2022) and **10+ year old male toad** (adult male when tagged in 2011, recaptured in 2019).

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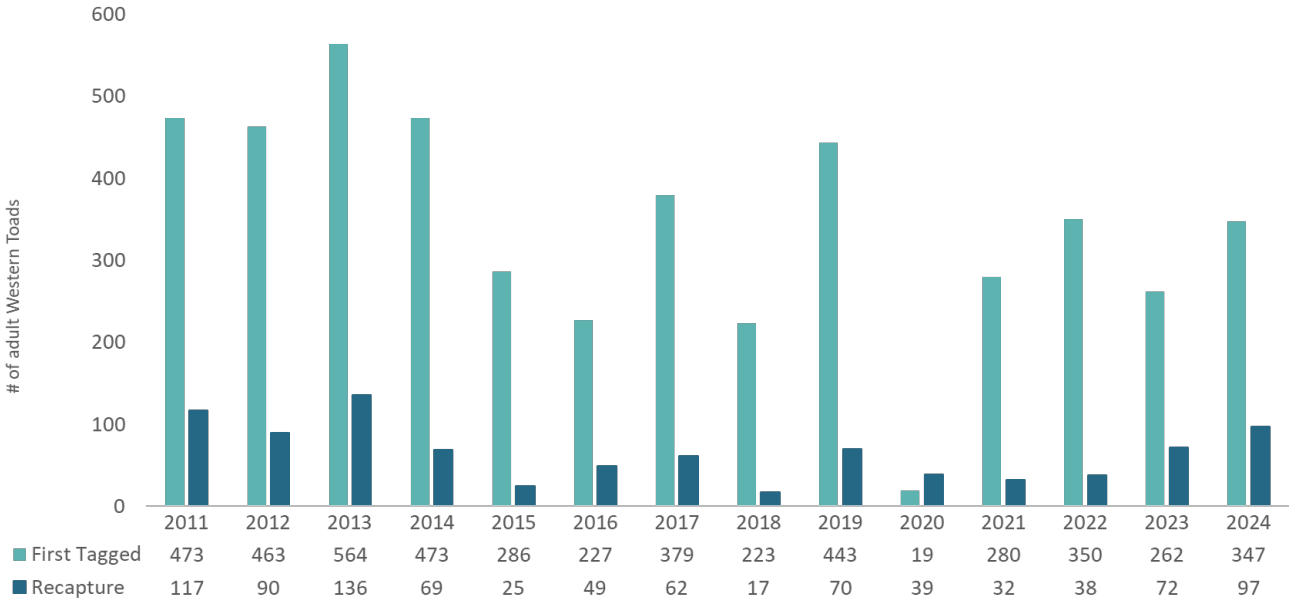
Figure 5. Summary of adult western toads PIT-tagged at Summit Lake, 2011-2024



[1]breeding sites and shoreline; [2] highway, subdivision, rest area, provincial park, rail trail, forest service road; [3] PIT-tagging efforts greatly reduced because of COVID-19 protocols

In the fall of 2024, a permanent fence was installed running parallel to the boat launch between the riparian area and the road for a total of 240 m (Figure 6). Two different materials were used: Animex and Aco. Animex comes in 40-foot rolls of flexible plastic and has an anti-dig lip

and an anti-climb lip on one side, which prevents toadlets from crossing on either side of the fence. To mitigate the toadlets getting caught on the road side of the fence, crossings were installed every 40 feet using ACO panels for a total of six crossings (Figure 7).

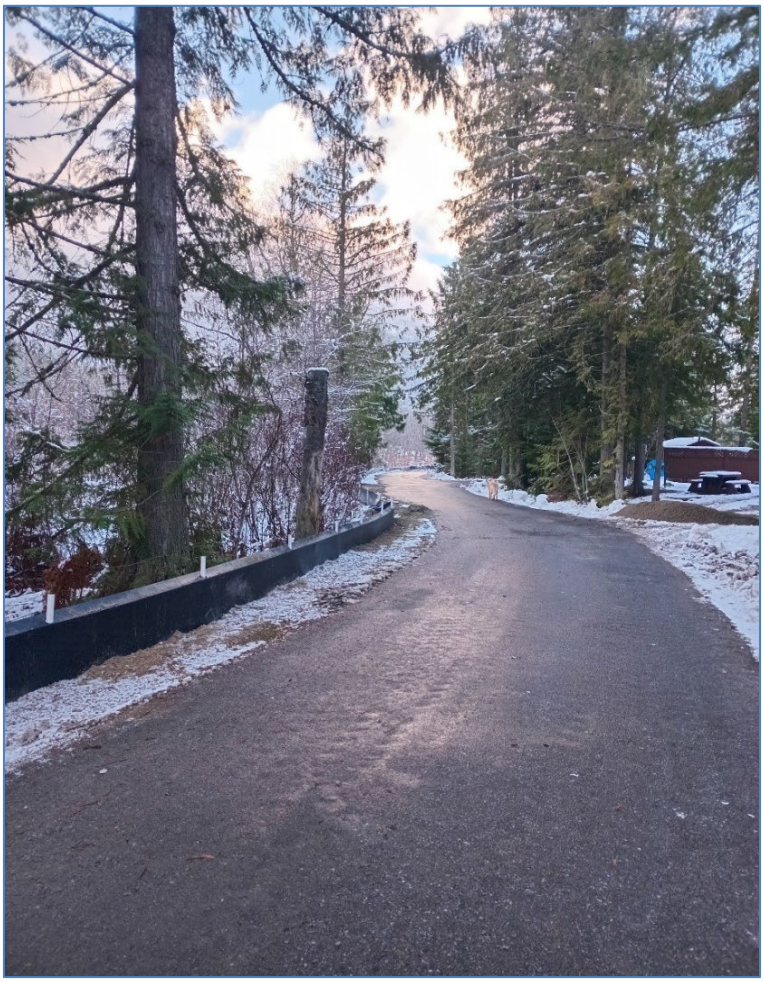


Figure 6: Permanent fence installed in Summit Lake Provincial Park in 2024.

Figure 7: Animex fence with an ACO panel as a toad crossing in Summit Lake Provincial Park, 2024.

Deliverable reference- Allen 2025

4.5 Elizabeth Lake Painted Turtle Nesting Area

Western Painted Turtles have been monitored at Elizabeth Lake near Cranbrook for over 20 years. Nesting beds were constructed, and fencing was installed to prevent substantial mortality of adult turtles observed in the 1990s. The project is completed through project partners (the Rocky Mountain Naturalists) who provide local stewards to maintain and monitor this nesting area.

Nestling emergence from 2023 nests was monitored between April 18th and May 3rd. The first visit April 18 found that 3 nests had emerged in the fall of 2023 and 21 nests had emerged in the spring of 2024 (prior to April 18th). Remaining nests were excavated and documented. A total of 570 hatchlings were documented from the 2023 nests with survival from egg to emergence and 70%.
Turtle egg laying occurred from June 2 to July 12 2024. A total of 34 nests were documented.

Turtle Day was held on April 23. Rocky Mountain Naturalists provided 32 hours of volunteer time towards this event.

Ross, G 2024. Elizabeth Lake Turtles 2024 Fall Report. Unpublished report prepared for WLRS. 4pp.

http://a100.gov.bc.ca/pub/siwe/details.do?projectId=5087&pagerOffset=20

4.6 Vaux Swift Nest Box monitoring and maintenance

Vaux's Swifts are small aerial insectivores that nest and roost in large hollow wildlife trees and may use old brick chimneys. In 2008, 24 nest boxes were installed for Vaux Swift at 4 different locations in the West Kootenay. These nest boxes are monitored and maintained annually since their installation.

In 2024, monitoring occurred at Smallwood, Merry Creek and Creston. Monitoring consists of observing boxes for 40 minutes during the late nestling stage when broods can easily be heard begging when adults enter the nest box to feed them.

One nest box (VASW BX4) in the Smallwood area was confirmed to be occupied on August 14th with several nestlings heard and adult observed feeding the young .

Swift Nest box maintenance was completed in the Nelson, Castlegar, Creston and Lower Duncan areas in the Fall of 2024. Existing boxes were checked by having a tree climber climb the tree to check for nesting evidence or use by other species and clean the box if needed. Monitoring has shown that most (7 of 9) of the nestboxes need major repairs or need replacing. Fallen branches and/or downed neighboring trees, decay, broken tops and dead trees have contributed to the need for replacement.

It is recommended that access to some nest boxes is restored by pruning adjacent tree branches that have grown in since installation.

http://a100.gov.bc.ca/pub/siwe/details.do?projectId=5680&pagerOffset=50

5. Discussion and Recommendations

Non-game project work continued the ongoing monitoring and maintenance of important habitat features. Project work is completed efficiently thanks to partnerships with local organizations and local contractors. Some projects require daily attention during the nesting season so these can only be successfully maintained with dedicated local personnel.

Most of these projects have been ongoing for upwards of 10-20 years. Even with annual maintenance additional work replacing fencing or structures is required to keep projects functioning. Fencing located near roads at nest areas or crossing locations has a limited lifespan due to impacts of snow plowing and sand and gravel deposition. Installation and maintenance of fencing at road crossing locations ensures that these mitigation measures continue to reduce species mortality on Badgers, Toads and Turtles. Upgrading fencing to more permanent options like Animex fencing is expensive but reduces significantly the amount of maintenance required.

Ongoing monitoring has confirmed that Townsends Big-eared bats continue to use constructed Maternal roosts and an external roost at the St Eugene Mission. Similarly monitoring of Loon platforms confirms that they continue to support increased reproductive success. Monitoring efforts are and ongoing part of our Non Game enhancement efforts. Increased First Nations involvement has increased the amount of monitoring occurring and the number of people experienced with monitoring methods.

Turtle nesting areas like the ones at Elizabeth Lake have been successful at reducing adult road mortality. However, concentrating nesting turtles can lead to impacts from nest predators like raccoons and skunks. With nest sites located in a concentrated area, a predator can have a significant impact in a short amount of time. Ongoing monitoring, nest protection, and predator removal are needed for project success.

6. Acknowledgements

This project was prepared with financial support Fish & Wildlife Compensation Program on behalf of its partners, BC Hydro, the Province of B.C., Fisheries and Oceans Canada, First Nations, and Public Stakeholders to conserve and enhance fish and wildlife in watersheds impacted by BC Hydro dams. We would like to acknowledge the many biologists, contractors and project partners that have initiated and maintained Non-Game projects. We would like to recognize the following individuals and groups that have made significant contributions to these projects; BC Parks staff and contractors, Greg Ross and Katrin, Kingbird Biological consultants, Yucwmenlúcwu, Okanagan Nation Alliance, Dave Lewis, Thomas Hill, Jakob Dulisse, Anna Dulisse, Ministry of Transportation, YRB.

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