# Upper Columbia Swallow Habitat Enhancement Project

# Year 2 (2022-2023)

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# Executive Summary

The Upper Columbia Swallow Habitat Enhancement Project (UCSHEP) is a five-year (2021-2026) initiative using a multifaceted approach to conserve and enhance habitat for two at-risk swallow species (Bank and Barn Swallow) facing sharp population declines. The UCSHEP is benefiting the Columbia Valley by; a) offering and providing a citizen-science opportunity to monitor swallows, b) erecting artificial nesting structures to increase habitat availability for Barn Swallows, c) enhancing slopes to become suitable nesting habitat for Bank Swallows, d) providing artificial nest cups to private landowners to attract Barn Swallows to nest on pre-existing structures, and; e) providing unprecedented information on the timing and locations of Bank Swallow movements using the Motus Wildlife Tracking System.

The UCSHEP has identified more than 160 swallow colonies in suitable Bank Swallow habitat (e.g., near vertical, friable soils) from Canal Flats to Donald; 114 of those have been confirmed as Bank Swallow colonies. Our data helped identify the area between Canal Flats and Edgewater as critical habitat for Bank Swallows, which was drafted in the 2021 proposed federal Recovery Strategy for this species. Barn Swallow nests have been discovered on 89 structures in the study area, at 47 unique locations (some locations have multiple structures with nests).

Buildings and barns are being replaced with structures not conductive to nesting as Barn Swallows cannot attach their nests to smooth lumber, steel or vinyl. To date we have erected five large swallow condos designed to attract Barn Swallows; one erected in 2021 produced four Barn Swallow chicks in a nest cup in August 2022. Twelve additional UCSHEP habitat enhancement projects have been completed (seven in 2022), including the removal of vegetation blocking Bank Swallow flightpaths at a colony at the Blaeberry River, roof replacement on an old barn that provides significant Barn Swallow habitat in Invermere, and installation of 70 nest cups on pre-existing buildings and artificial nesting structures (gives swallows a head start on nest building). Effectiveness monitoring occurred at all enhancement and restoration sites that have been implemented and this will continue until 2025. Eleven additional enhancement projects are in progress, schedules for completion in 2023-2025.

Through a collaboration with Environment and Climate Change Canada's Canadian Wildlife Service (ECCC CWS) and BC Parks, four Motus Wildlife Tracking Stations were installed in the Invermere region. Collaborating with ECCC CWS, 50 Bank Swallows were tagged with miniature digital radio transmitters (Motus tags) at two colonies near Invermere [Wilmer and Shuswap Band land (Secwépemc Nation)] in June 2022. This will provide unprecedented information on Bank Swallow post-breeding habitat, their migration route, and wintering grounds.

In 2022, 70 people volunteered to monitor swallows. The UCSHEP conducted 18 private landowner visits regarding co-existence and potential enhancements, and spoke with several additional individuals/stakeholders regarding strategies to co-exist with swallows. We hired the Ktunaxa Nation and Shuswap Band (Secwépemc Nation) who researched their traditional Indigenous perspectives on swallows and provided us with their content used on UCSHEP interpretive signage installed at enhancement projects. We developed posters, videos, website/social media content, press releases, interpretive signage, a swallow conservation brochure, hosted booths at farmer's markets and gave presentations on the project. Additional education and outreach activities occurred, such as 21 volunteer field training sessions and two field trips. Outreach was aimed towards conserving swallows and their habitats (e.g., promoting Best Management Practices for swallows) and building a volunteer base for swallow monitoring. All swallow monitoring data was submitted into the provincial data

warehouse and to the federal government to assist with the identification of critical habitat for the recovery of Bank and Barn Swallows.

This project most closely aligns with the Wetland and Riparian Action Plan, priority action 37. This is a habitat-based action working on enhancing wildlife habitat features (for swallows). Secondarily, the project most closely aligns with the Rivers and Riparian Action Plan, priority action 6. This is a habitat-based action working on the connectivity of habitat (for bank and barn swallows). Both of these actions have the highest level of priority (number one) within the FWCP action plans.

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# 1.0 Introduction

## 1.1 Background

A study from 2019 states that 2.9 billion birds of various species have disappeared in Canada and the United States since 1970 – a population decrease of 29 per cent (Rosenberg et al., 2019). Birdlife International's (2022) State of the World's Birds report states that "data from the IUCN Red List show that 49% of bird species worldwide (5,412) have declining populations, while 38% (4,234) are stable, just 6% (659) are increasing and 6% (693) have unknown trends. Declines are not restricted to rare and threatened species – even common and widespread species are declining rapidly in some cases." Avian aerial insectivores (birds that forage while flying, e.g., swallows and flycatchers) have been suffering large population declines for decades (Nebel et al., 2010). They have experienced the steepest population declines of any group of birds in Canada (North American Bird Conservation Initiative Canada, 2019). These alarming trends call for immediate responses such as retaining and restoring habitats, conserving important sites through community management, capacity building, education and raising awareness, monitoring and conservation action (enhancement, restoration) (Birdlife International, 2022). The UCSHEP is working on all of these action items over a five-year period.

### 1.1.1 Bank Swallow

The Bank Swallow (*Riparia riparia*) is facing one of the fastest population declines for a species in Canada with an estimated 93%-98% population loss in Canada over a forty-year period (Smith et al., 2020; COSEWIC, 2013). In 2013, the Bank Swallow was listed as a Threatened species by COSEWIC and was listed as Threatened on Schedule 1 of the Species at Risk Act (SARA) in 2017. Reasons for the significant population decline are not well understood, but are thought to be cumulative and include the loss of breeding, foraging and winter habitat, collision with vehicles, widespread pesticide use, population decline of aerial insects, climate change and destruction of nest sites during mining excavation (Berzins et al., 2020; COSEWIC, 2013). A draft Recovery Strategy was released for the Bank Swallow in June 2021 (Environment and Climate Change Canada, 2021) and contains proposed critical habitat including Columbia Lake and Lake Windermere (between Canal Flats and Invermere). Proposed critical habitat at both lakes is largely due to the high number of Bank Swallow colonies discovered through Wildsight Golden's Columbia Valley Swallow Project in 2020 (Darvill, 2021).

Bank Swallows are one of the most widely distributed birds in the world. They nest in burrows in near-vertical banks and sandy cliffs and in gravel or sand piles at construction sites and freight yards, but these latter sites are often destroyed. Control of water-level fluctuations and peak discharge rates (via dams) has substantially reduced stochastic bank erosion processes along many streams and rivers throughout North America (Poff et al., 1997). The construction of the Mica Dam likely destroyed Bank Swallow breeding habitat along the natural banks of the Columbia River in the stretch that is flooded and now known as the Kinbasket Reservoir. Breeding habitat is a limiting factor for Bank Swallows because they require low-elevation (<900m), large near-vertical banks, with specific substrates (i.e., silty-fine sand, exposed unconsolidated deposits of glacial lacustrine origin), that are exposed to erosional forces (COSEWIC, 2013; Garrison & Turner, 2020). This habitat type can be found in abundance on the valley bottom of the Columbia Valley, but some sites are experiencing threats that need to be addressed and habitat could be expanded in some areas. The UCSHEP is working to conserve, create and

enhance Bank Swallow breeding habitat. 114 Bank Swallow colony sites have been discovered in the USCHEP study area and citizen-scientists help to monitor enhancements and nests at pre-existing sites.

### 1.1.2 Barn Swallow

Barn Swallows (*Hirundo rustica*) have had an overall population decline of 76% in Canada in a forty-year period (COSEWIC, 2011); they are blue-listed in B.C. and were listed as Threatened on Schedule 1 of SARA in 2017. Reasons for Barn Swallow decline are not well understood, but declines are attributed in part to losses of important types of artificial nests sites (e.g., open barns) and decline of prey items (insects) (COSEWIC, 2011). They build mud nests on nearly any type of anthropogenic structure, as long as it is close to water (for drinking and mud) and open fields (for foraging), and has support (ledge, rough wall) for nest attachment and protection (from weather, predators) for their nest (Scordato & Safran, 2014). Barn Swallow nests are often re-used within a season (for multiple broods) or in subsequent seasons, therefore it is important to leave their nests intact throughout the year.

Using a structured approach, the UCSHEP is testing four different building designs for Barn Swallow artificial nesting structures (ANS). These designs have three differing parameters that are thought to influence Barn Swallow site selection for nesting: overall size of structure, roof type, and the amount of openness (e.g., two small window-type openings versus one open wall). Three ANS were built in 2021 and they will be monitored for 2-3 years (depending on when the ANS was erected) in a coordinated manner to determine what structure type is most effective at attracting nesting Barn Swallows. Two were built in 2021 (Darvill, 2022), three more in 2022 and three more will be built in 2023-24. We are also piloting a new and innovative structure with the Wildlife Conservation Society. We have worked together to design a structure that satisfies the habitat requirements for both bats and swallows (Barn and Cliff Swallow). There are no national guidelines for building compensatory Barn Swallow habitat. The results of this project will help to inform future habitat enhancement/compensation efforts for Barn Swallows in B.C. and around the world.

The UCSHEP is conducting effectiveness monitoring at all these structures until 2025. The UCSHEP has discovered multiple locations with active (and non-active) Barn Swallow nests; 89 structures had nests in the study area, at 47 unique locations. Citizen-scientists have been helping with weekly monitoring of nearly all of the located nests, and at all ANSs built for Barn Swallows.

### 1.1.3 Motus Wildlife Tracking

The Motus Wildlife Tracking System is an international collaborative research network that uses a coordinated automated radio telemetry array to track the movement and behaviour of small flying animals. Currently, there is no information on the migratory pathway used by western Canada's Bank Swallow populations. Scant data is available on where most populations from Canada are located during migration or on the wintering grounds, making it challenging to assess which stressors (e.g., habitat loss, climate change) are having the strongest effects on Bank Swallow population declines.

Bank Swallows have suffered steep population losses in Canada, but events occurring outside of Canada (e.g., land use changes) could possibly be driving declines. Knowing the migratory pathway and locations of wintering grounds will provide insight into prevailing threats on Bank Swallow habitat outside of breeding areas. This knowledge can direct where relationship building should occur with potential

international collaborators, which could provide landscape level benefits on an immense spatial scale (Upper Columbia Valley to South America). Understanding where birds go post breeding and what types of land use happens outside of breeding habitat could be critical to having insight on the species' decline.

We can work to conserve, enhance, and restore critical breeding habitat for Bank Swallows in the East Kootenay and Upper Columbia, but threats during migration and on wintering grounds are largely unknown. Working to conserve and connect important habitats where the birds are distributed can help halt and reverse Bank Swallow population declines. The UCSHEP is working with Environment and Climate Change Canada (ECCC) on evaluating migratory connectivity for Bank Swallows throughout Canada. The UCSHEP is also working to learn more about habitat use at the local scale, which will involve the use of statistical software in future years. Knowledge of local movements and important areas (e.g., foraging grounds, roosting areas) can lead to strengthening local land use plans and regulations (e.g., Regional District of East Kootenay's Official Community Plans, Management Plan for the Columbia Wetlands Wildlife Management Area) for Bank Swallows.

### 1.1.4 Statement of need

With fewer than 10% of the Bank Swallow population remaining in Canada and with critical habitat in the study area, we have a duty to protect and enhance/restore/create important habitat. Larger and more contiguous breeding habitat patches for swallows help facilitate connectivity networks for these birds with fewer gaps in the East Kootenay and North Columbia. This will increase foraging efficiency, decrease breeding costs, and provide more overall available habitat. Shanahan et al. (2011) "suggest[s] that greater connectivity enhances the habitat area that colonists [e.g., Bank and Barn Swallow] can arrive from (resulting in greater species richness), whereas increased patch area allows for increased abundance by expanding the habitat available to species already present in a patch. A combined approach where connectivity and overall habitat area is enhanced across the landscape is likely to be necessary to meet long-term conservation objectives."

The UCSHEP provides opportunities for volunteer citizen-scientists to be involved with a bird conservation project that provides landscape level benefits. Human interactions with birds have been identified as one of the most readily recognised wildlife interactions that most urban and rural residents experience regularly, and have been linked with benefits to psychological well-being and a sense of connectedness to nature (Cox & Gaston, 2018). Observing birds can lead to a greater conservation ethic and increased sustainable behaviours. Wildsight Golden's Columbia Wetlands Waterbird Survey (2015-2019), saw 230 volunteers participate as citizen-scientists to collect data on birds (Darvill, 2020a). The Wings Over the Rockies Festival is widely popular, attracting numerous visitors each year to view and learn more about birds in this region. With at least 35 at-risk bird species utilizing habitat in the Upper Columbia Valley (FWCP's North Columbia/East Kootenay regions), and the Columbia Wetlands currently being considered as a Key Biodiversity Area, many people in the local communities recognize the ecological values of this area and appreciate the intrinsic value of birds (Darvill, 2020b).

The UCSHEP is a five-year (2021-2026) initiative using a multifaceted approach to conserve and enhance habitat for two at-risk swallow species (Bank and Barn Swallow) in FWCP's East Kootenay and Columbia North regions. The project is benefiting the region by; a) offering and providing a citizen-science

opportunity to monitor swallows, b) erecting artificial nesting structures to increase habitat availability for Barn Swallows, c) enhancing slopes to become suitable nesting habitat for Bank Swallows, d) providing artificial nest cups to private landowners to attract Barn Swallows to nest on structures already standing, and; e) providing unprecedented information on the timing and locations of Bank Swallow movements using the Motus Wildlife Tracking System.

## 2.0 Goals and Objectives and Linkage of FWCP Action Plans and specific Action(s)

This project most closely aligns with the Wetland and Riparian Action Plan, on a habitat-based action (#37 in the plan) working on enhancing wildlife habitat features for swallows. Three artificial nest structures (ANS) for Barn Swallows were erected in year two (2022- 23) (five in total). Available wetland/riparian areas were improved by creating and enhancing at-risk Barn Swallow breeding habitat with 25 additional nest cups in 2022 (70 in total). Additional habitat features (nest cups) will be installed in year 3, with effectiveness monitoring at all structures in years 3-5 (2023-2025). Enhancing Bank Swallow habitat has begun in the Invermere area, and an innovative bat/swallow condo is being initiated with Wildlife Conservation Society.

Secondarily, the project most closely aligns with the Rivers and Riparian Action Plan, priority action 6. This is a habitat-based action working on the connectivity of habitat (for bank and barn swallows). The Utilizing nearly 100 volunteers since 20201, significant habitat for Bank Swallows have been identified in the region. Some sites are under threat and there is a lack of suitable breeding habitat north of Brisco. Creating/restoring Bank/Barn Swallow breeding habitat in the East Kootenay produces more contiguous breeding habitat patches helping facilitate connectivity networks for these species that are facing severe population declines with limited habitat. A combined approach where connectivity and overall habitat areas are enhanced across the landscape is necessary to meet long-term conservation objectives for at-risk swallows. The five-year project is working on habitat enhancement at multiple sites in the East Kootenay and North Columbia leading to more large-scale habitat connectivity for two at-risk swallow species

## 3.0 Study Area

The study area is in the East Kootenay and North Columbia (FWCP regions) between Canal Flats north to Donald (50°51'37.31"N, 116°20'12.06"W) in southeastern British Columbia (BC), Canada, within the Columbia Valley. The valley bottom contains one of the largest wetland complexes (Columbia Wetlands) within the southern interior of BC (Hammond, 2007). The wetlands are an important refuge for species that rely on wetlands for important stages of their life history (Darvill, 2020a) and are designated with Ramsar status which is a designation that acknowledges this wetland system has international significance.

Swallows are strongly associated with wetland ecosystems because of the abundant food they supply (e.g., mosquitoes, midges, dragonflies). The Columbia Wetlands play an important role as migration stopover habitat for birds (Darvill, 2020a; Kaiser, McKelvey & Smith, 1977) and it provides a refuge where birds can fuel up and rest during the necessary long migratory flights that require substantial amounts of energy. The Columbia Wetlands also provide vital habitat for a number of ungulate,

mammal, amphibian, reptile, invertebrate, fish and plant species, several of which are at risk (Darvill, 2020b). The area is part of the traditional and unceded territory of the Ktunaxa Nation (Akisqnuk First Nation), Secwepemc First Nation (Shuswap Band), Sinixt Nation, and current home to the Metis Nation Columbia River Society.

# 4.0 Methods

## 4.1 Project start-up

- Hired local contractor to build 2022 artificial nest structures and to sketch designs/plans of structures so that plans can be used elsewhere by other organizations.
- Ordered building materials for two structures.
- Communication and coordination with the Shuswap Band and Ktunaxa Nations to get 'letters of agreement' signed with Indigenous groups for Indigenous knowledge on swallows to be developed by the groups and incorporated into UCSHEP interpretive signage.
- Developed and printed interpretive metal signage to accompany all structures.
- Assess feasibility/budget associated with potential Bank Swallow artificial structure at Reflection Lake.
- Developed communications – social media, poster, press releases, brochure, website updates, interviews.
- Online folder created with photos, video clips, and narrative scripts developed for Wildsight Regional and the Kootenay Conservation Program to create short videos on the UCSHEP.
- Coordinated with the Lake Windermere District Rod and Gun Club to acquire the 25 nest cups that they built for the UCSHEP project.
- Liaised with all partner groups to ensure effective communication and collaborations during the project, including collaborations with ECCC CWS on the Motus Wildlife Tracking Station installation and Bank Swallow mist netting and banding/tagging.
- Research done for equipment needed for Motus station for subsequent purchase of multiple pieces of equipment and installation of one Motus station that BC Parks had paid for, installed at Windermere Lake Provincial Park.

## 4.2 Field work

- Worked with local contractors to ensure two artificial nesting structures were erected in the chosen locations. Met with private landowners to determine precise locations for the buildings on private land. Landowner agreements drafted and signed by both parties.
- Met with Columbia Shuswap Invasive Species Society at Birchlands Creek to discuss possible management strategies for invasive plant removal at the Bank Swallow enhancement site.
- Inventoried and/or monitored a subset of Bank and Barn Swallow colonies/nests in the region and coordinated 70 volunteers to assist with this. Barn Swallow nests were monitored weekly in most cases (mid-May to mid-August), and Bank Swallow colonies were normally monitored three times during the breeding season (mid-June to late July). Some nesting sites were only visited once due to restricted time availability; we were only able to determine if Bank Swallows

were present or absent during these visits, not occupancy. Total burrow counts were also obtained.

- Installed 25 nest cups (provided by the Lake Windermere District Rod and Gun Club) for private landowners and on artificial nest structures.
- Collaborations and work with ECCC CWS and BC Parks to install four Motus Wildlife Tracking Stations in the region (Brisco, Shuswap Band land (x2), Windermere Lake Provincial Park). This will provide unprecedented information on post-breeding habitat and the Bank Swallow migration route.
- Used mist nets to capture, measure, remove feather samples (for stable isotope analysis that ECCC is doing) and tag/band. Captured birds were from colonies on Shuswap Band land and Columbia National Wildlife Area – Wilmer Unit.
- Worked with Lake Windermere Ambassadors and Columbia Lake Stewardship Society to monitor a subset of natural colonies at Lake Windermere (three times during breeding season) and Columbia Lake (two times during breeding season).

## 4.3 Data collection

### 4.3.1 Bank Swallow inventory and monitoring protocols

Bank Swallow inventories were conducted on foot, motorboat or by kayak depending upon the location of the colony. The UCSHEP monitored a subset of nesting sites according to resource availability including volunteer numbers and contractor time. Inventory and monitoring activities for Columbia Lake and Lake Windermere were conducted by motorboat. Boat use was coordinated by the Columbia Lake Stewardship Society (for Columbia Lake) and Lake Windermere Ambassadors (for Lake Windermere). On private land, the project biologist ensured that all nest inventory and/or monitoring activities were undertaken with landowner's permission and ensured that any necessary authorizations were obtained ahead of time (e.g., permission requested and approved by the Shuswap Band (SB) for Bank Swallow inventories on SB reserve lands).

Survey periods for inventory and/or monitoring at Bank Swallow colonies were as follows:

• First visit: second week of June

• Second visit: fourth week of June

• Third visit: early July – mid July (before July 21st)

Monitoring methods and standard field data sheets were provided to volunteers in digital format or hard copy format, whichever was preferred. Volunteers were required to review monitoring protocols and data forms prior to conducting surveys in the field. A Bank Swallow colony record form developed by Bird Studies Canada (2010) (and modified by UCSHEP) was completed at each Bank Swallow colony site with the following information recorded: date, time, geographical (UTM) coordinates (using a GPS in NAD83), photo documentation (yes/no), site access, colony habitat type, dominant habitat features, breeding evidence, the number of pairs and active nests, and total burrows observed. Comments included any useful information about the colony, site, or habitat, as well as other burrow-nesting species seen at the colony [e.g., northern rough-winged swallow (*Stelgidopteryx serripennis*), belted kingfisher (*Megaceryle alcyon*)] and the habitats being used by foraging Bank Swallows. Colonies were viewed from a distance, to reduce colony disturbance, but close enough to be able to view burrows.

When counting burrows, every attempt was made to count only those that appeared to be recently constructed (within the current breeding season). Slumped and deteriorated burrows were presumed to have been created in previous years. At colonies that were monitored more than once, a photograph of the colony was taken during the first site visit, subsequently printed, and taken into the field for the second and third monitoring periods. These photographs were used in the field to document active burrows: a burrow was circled on the colony photograph when a Bank Swallow was seen flying in or out of it or if chicks were seen at the burrow entrance. An active nest was defined as a burrow from which an adult was seen to enter or exit from or as a burrow that had nestlings visible at the entrance. On the colony photo 'map,' it was also indicated where other species were seen entering or exiting a burrow, such as belted kingfisher or northern rough-winged swallow. Volunteers were advised to spend a minimum of 30 minutes at each colony. All data that was transcribed onto the Bank Swallow colony record forms in the field was subsequently entered into an excel database. All field data collected related to colony monitoring and site descriptions were transcribed into digital databases and submitted to the provincial government (wildlife species inventory – WSI).

### 4.3.2 Barn Swallow inventory and monitoring protocols

Barn Swallow nest site monitoring was undertaken from approximately early-May until late August. This time period allowed for observation of pairs with multiple broods. Volunteers were asked to visit nest sites on a weekly basis to obtain continuous and precise data, but the frequency of monitoring varied based on volunteer availability and capacity. When necessary, the project biologist ensured that all nest monitoring activities were undertaken with the landowner's permission and that any necessary authorizations were obtained. Barn Swallow nest monitoring followed protocols developed by the British Columbia Swallow Conservation Project (n.d.).

Monitoring methods and standard field data sheets were provided to volunteers in digital format or hard copies were mailed, whichever was preferred. Volunteers were required to review monitoring protocols and data forms prior to conducting surveys in the field. For each monitored nest site, volunteers were asked to record the actual or estimated arrival and departure date of Barn Swallows to that nest site, if possible. All nests present (new, active, old) were recorded as best as possible. Volunteers were asked to survey nests from a distance to avoid any negative effects associated with disturbance. If nests were deemed as inactive, then this status was recorded to ensure complete and consistent nest site monitoring. During each nest monitoring visit the following details were recorded: nest attempt if known (1, 2, 3), survey date, nest condition (new nest, reused nest, damaged nest), nest activity (e.g., courtship, alarm calls, nest building, adult flushed from nest, nest with young seen or heard, nest occupied, unknown nest use, etc.), nest with young seen or heard (if known), nest disturbance (e.g., predation, human disturbance - intentional, human disturbance – unintentional, etc.), any relevant comments, etc. All swallow nests at each nest site structure were described, such as nest type [new, reused, old (abandoned, damaged/degraded)], location in structure (interior, exterior), support structure (horizontal ledge, vertical wall (no ledge), horizontal post/pole/pipe, light fixture, etc.), ledge width, ground to nest bottom, nest bottom to overhang, nest top to overhang, closest nest, visual barrier between adjacent nest, and any relevant comments. All Barn Swallow field data collected was transcribed into digital databases and submitted to the provincial government (wildlife species inventory – WSI).

### 4.4. Data entry and analysis

- All data was recorded onto online excel spreadsheets.
- Data was also formatted into the provincial database standard (SPI/WSI), and submitted to provincial government.
- Spatial data was used to update shapefiles for Bank and Barn Swallow nesting locations.

### 4.5 Extension/Community/Outreach

- UCSHEP engaged with local communities by providing educational opportunities (training, webinar, market tables, field trips) to the public and local groups, and by engaging through building the conservation conversation through landowner outreach visits.
- Continued to build partnerships with landowners, agriculturalists, and other land users/managers (e.g., Ministry of Water, Lands and Resource Stewardship, Windermere Distinct Farmers Institute) that have can have large impacts on swallow habitat in wetlands/riparian areas, which creates opportunities to work on lands which partners would not otherwise be able to access or influence at a meaningful geographic scale.
- Engaged the public by offering volunteer opportunities to participate in swallow monitoring surveys and training opportunities. This enabled the public of the East Kootenays to participate in and gain a greater understanding of the scientific process and, in many cases, a greater connection to the natural world.

## 5.0 Results and Outcomes

### 5.1 Bank Swallow

- The number of colonies monitored for presence/absence of Bank Swallows in 2022 was 95; 61 of those colonies were confirmed to be active with Bank Swallows. Since 2020, Wildsight Golden's Columbia Valley Swallow Project (Darvill, 2021) and UCSHEP have identified 114 active Bank Swallow colonies in the study area.
- 33 people volunteered to monitor Bank Swallows in 2022.
- Effectiveness monitoring (five site visits) at Windermere Lake Provincial Park. This is the site of restoration work (re-sloping) that was done at a Bank Swallow colony in 2021 (Darvill, 2022) (Figures 1 and 2).
- Removed vegetation (tall trees) blocking Bank Swallow flightpaths at a habitat area along the Blaeberry River (Figures 3 and 4).
- Progress made on plans for Bank Swallow habitat enhancement at Birchlands Creek; on-the-ground work has been postponed. The site is on Provincial crown conservation lands (Columbia Wetlands Wildlife Management Area). Government staff explained that many requests were coming in for work on conservation lands and they were internally refining the process. New requests have come (e.g., archeological report, First nations consultation with several Nations, etc.). UCSHEP will continue work on this, but on-the-ground work won't happen before the 2023 breeding season starts.
- The UCSHEP located an active Bank Swallow colony in a substrate pile on land owned by the District of Invermere (DOI) (Figures 5 and 6). The DOI had planned to remove the dirt pile as part of a plan they developed with the community (Athalmer Neighborhood Plan). UCSHEP brought the opportunity for colony conservation and breeding habitat enhancement (re-sloping nesting

substrate to have a near vertical face) to their attention in September 2022. Extensive progress has been made working with the DOI on a Bank Swallow conservation and enhancement initiative, an innovative project. The property is within proposed critical habitat for Bank Swallows. The DOI now plans to conserve the area that had active Bank Swallows in 2022, enhance (re-slope) a 30-meter section of the substrate that was to be removed, and fence the enhanced area with interpretive signage in place. The project is set to be completed in 2023-24.

- The data on Bank Swallow colony locations and sizes in the study area was provided to the Key Biodiversity Area (KBA) Regional Coordinator with Wildlife Conservation Society Canada. The Bank Swallow counts should meet the KBA threshold to have the Columbia Wetlands designated as a KBA.

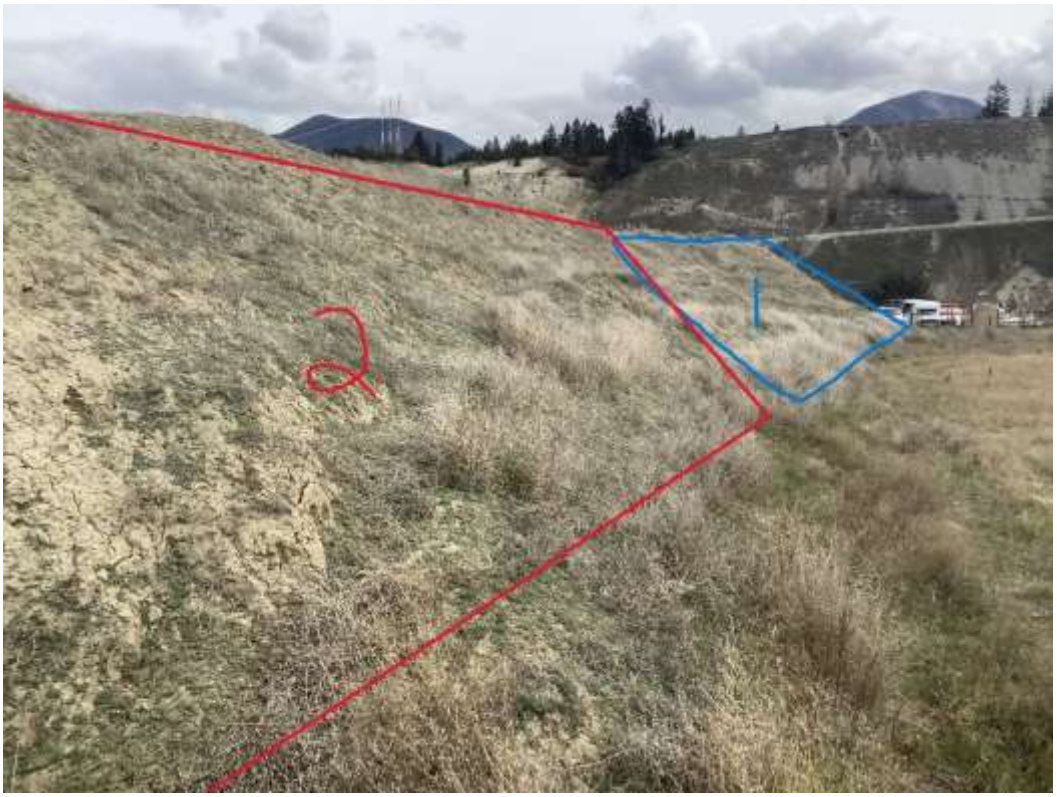
*Figure 1. Bank Swallow colony impacted by a walking path through colony. Photo taken prior to restoration at Windermere Lake Provincial Park.*

*Figure 2. Colony habitat after restoration (re-sloping, invasive plant removal) at Windermere Lake Provincial Park.*

*Figure 3. Swallow colony prior to habitat enhancement (vegetation removal).*

*Figure 4. Swallow colony after habitat enhancement (vegetation removal).*

a)




b)


*Figure 5. a) Bank Swallow habitat enhancement planned to take place at Athalmer (Invermere) in 2023. Section #1 will be removed; section #2 will be re-sloped to provide suitable breeding habitat; and photo #3 (b) is the active colony to be conserved.*

## 5.2 Barn Swallow

- Five artificial nest structures have been erected for Barn Swallows (three in 2021; two in 2022) (Figures 6a and 6b).
- The UCSHEP made modifications to the Creston 'Swallow Hotel' design, as well as input from ECCC CWS Dr. Tara Imlay (Landbird Biologist), and input from other agencies who had been buildings swallow structures (e.g., BC Hydro). Final plans for the different designs of the artificial nest structures will be provided in the 2025-2026 UCSHEP final report for the entire project.
- A new and innovative bat/swallow structure is being designed with the Wildlife Conservation Society (WCS). UCSHEP and WCS collaborated in 2022 to design a structure that satisfies the habitat requirements for both bats and swallows (barn and cliff swallow). The Lake Windermere Rod and Gun Club is building and installing the structure with other local partners and it is expected to be installed in Parson in 2023.
- 45 artificial nest cups went up for Barn Swallows in 2021; 25 more in 2022-23. Five artificial nesting structures and nine pre-existing structures have been enhanced with nest cups.
- One artificial nesting structure (erected in 2021) produced 1 successful nest in a nest cup, with 4 Barn Swallow chicks in August 2022 (see cover photo).
- 47 unique nesting locations have been discovered by the UCSHEP. Most nests were visited weekly by a volunteer, producing 685 monitoring records that have been sent to the provincial governments online database (SPI).
- 384 nests in total (including unused nests) were recorded in 2022.
- There were 131 nest attempts producing chicks in 2022 (some were double broods). There were 57 additional nests that were only monitored once, so the nest activity was unknown.
- The number of volunteers monitoring Barn Swallow nests in 2022 was 34.

a)  b) 

c) 

*Figure 6. a) Interior of artificial nest structure (ANS), b) exterior of flat roofed ANS, and c) exterior of gable-roofed ANS.*

## 5.3 Motus Wildlife Tracking Stations

Four Motus Wildlife Tracking Stations were installed in 2022. Two (one omnidirectional and one Yagi station) on Shuswap Band lands (Figure 7a), one Yagi station at Brisco on private land (Figure 7b), and one Yagi station at Windermere Lake Provincial Park (BC Parks) (Figure 7c). Using mist nests to capture Bank Swallows (Figure 8), we banded 62 Bank Swallows (with metal leg bands), tagged 50 Bank Swallows (with mini Motus radio transmitters) (Figure 9), and collected feathers from 54 Bank Swallows. There was one individual that was badly entangled in the net that we decided to simply band and release, rather than tag. We also captured one individual with a pre-existing eye infection, this bird was also not banded.

The feathers were collected from captured birds because they were grown on the wintering grounds. Feathers have a unique isotopic signature from the region in which they were grown, allowing an estimation to be made on where the birds were located when they grew their feathers on their wintering grounds in South America. The evaluation of migratory connectivity for Bank Swallows using Motus is now a Canada-wide collaboration. Over 1.5 million hits at Motus stations came in for our project by February 2023. The ECCC has coordinated for a Master's student at Cambridge University to work on data analysis (using RStudio) to determine the long-distance migratory route taken by Bank Swallows that breed in Canada. The student will also be doing the stable isotope analysis on Bank Swallow feathers in 2023-24.

a) 

b) 

c) 

*Figure 7. Motus Wildlife Station installation at a) Shuswap Band land, Brisco and Windermere Lake Provincial Park.*

*Figure 8. Using a mist net to capture Bank Swallows at a colony on Shuswap Band land.*

*Figure 9. Fitting a Motus tag (with leg-loop harness) on a Bank Swallow..*

## 5.4 Outreach, education and volunteer training

Outreach and educational activities and events were targeted towards swallow education including ways to co-existent with swallows, and potential enhancements on private land.

- UCSHEP conducted 18 private landowner visits as either a response to requests to inventory land for swallow nests, assess habitat suitability for erecting nest cups, or the potential for swallow enhancements. Private landowners with nesting swallows were visited with outreach materials about swallows, including their status and what individuals can do to help reverse their decline.
- Eight additional private landowners were contacted regarding permission requests for land access for swallow monitoring/inventory work.
- A pamphlet on how to co-exist with messy swallow nests was created and distributed on social media and to landowners.
- 20 individuals had on-site training with the program biologist to learn how to monitor swallows and record/submit data.
- One group training session took place at Columbia Lake, with 12 participants. This event was co-coordinated with the Columbia Lake Stewardship Society (CLSS).
- The Ktunaxa Nation and Shuswap Band conducted research regarding their traditional cultural story regarding the swallow. A Traditional Knowledge and Language Advisor translated the swallow species into Ktunaxa language. Ktunaxa and Shuswap work entailed research hours, interviews and meetings with the Traditional Knowledge and Language Advisory. The UCSHEP designed and erected interpretive signage at each of the swallow restoration and enhancement sites and Indigenous interpretations were included on the signage (Appendix 1).
- Swallow education and volunteer opportunities were developed for use on social media, Wildsight website updates, posters (Appendix 2), press releases (Appendix 3-6), and several eBlast and email communications with Wildsight Golden volunteers.
- Three event tables at the Golden Farmer's Market.
- Wildsight Golden's summer coordinator led an interpretive talk at the Golden Municipal Campground to look at Bank Swallow colonies and talk about the UCSHEP - 12 participants (Figure 10).
- One field trip to an artificial nesting structure in Golden – 7 participants (Figure 11).
- Program biologist delivered one webinar on the swallow project hosted by Wildsight Golden – 38 participants.
- Updated UCSHEP swallow conservation brochure that was printed and distributed to partner groups [CLSS, BC Parks, Lake Windermere Ambassadors(LWA)]. Available on UCSHEP webpage.
- Trained LWA staff on how to complete effectiveness monitoring at the restoration site at Windermere Lake Provincial Park.
- Interview with writer from Canadian Wildlife Magazine. In the May 2022 edition, a story called 'Acrobats of the Air' featured Barn Swallows and the UCSHEP. Available on UCSHEP webpage.
- Interview with EcoFriendly West that published an online story regarding some of the conservation successes on the UCSHEP. Available on UCSHEP webpage.
- Short video made by Wildsight Regional for social media. Another video on the 2022 UCSHEP was made by the Kootenay Conservation Program.

- A publication,‘ Natural and human-made nesting habitat use by Bank Swallow (*Riparia riparia*) in Canada, ‘ used UCSHEP data and was published in the Canadian Field Naturalists journal (Pelletier et al, 2022).

*Figure 10. Field trip at the Golden Municipal Campground.*

*Figure 11. Field tour to a Barn Swallow artificial nest structure.*

## 5.5. UCSHEP Completed Enhancement Projects

Since the inception of the UCSHEP, 17 enhancement projects have been completed, 11 more are in progress (i.e., additional communications with private landowners, required Indigenous consultation, tenure application needed, etc.). A list of completed works including what type of enhancement occurred at each site and the rationale behind that work is shown in Table 1. A map accompanies this table to show where each project (or site) occurs on the landscape is seen in Figure 12. This map also provides an overview for where future enhancement projects are expected to take place, in addition to where Bank and Barn Swallow nesting sites have been discovered in the UCSHEP study area.

*Table 1. List of completed UCSHEP enhancement projects.*

| Site | Name | Type of work | Species to benefit | Description of work | Nest cup # | Area enhanced or restored (ha) | Landowner or jurisdiction | Date of completion | Status | Rationale |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Donald ANS | enhancement | barn swallow | 12x18 ANS/nest cup installation | 8 | 75 | Ministry of Transportation | Jul-21 | completed | Large structure in area provides significant barn swallow habitat. Property for sale and will likely be removed. Provides compensatory habitat. |
| 2 | Zehnder ANS | enhancement | barn swallow | 12x18 ANS/nest cup installation | 8 | 75 | private | Jul-21 | completed | Create additional breeding habitat in area occupied by barn swallows. |
| 3 | Golden ANS | enhancement | barn swallow | 18x24 ANS/nest cup installation | 8 | 75 | Town of Golden | Apr-22 | completed | Create additional breeding habitat in area occupied by barn swallows. |
| 4 | Soles ANS | enhancement | barn swallow | 12x18 ANS/nest cup installation | 8 | 75 | private | Jul-22 | completed | Create additional breeding habitat in area occupied by barn swallows. |
| 5 | Nature's Paradise ANS | enhancement | barn swallow | 12x18 ANS/nest cup installation | 8 | 75 | private | Sep-22 | completed | Barn swallows were being excluded from buildings where they were attempting nests. ANS provides safe nesting habitat. |
| 6 | Edgewater TNT | enhancement | barn swallow | barn enhancement | 8 | 0 | The Nature Trust of BC | Sep-21 | completed | Modified structure to make it more suitable for barn swallow nesting. |
| 7 | Windermere Lk PP | restoration | bank swallow | resloping breeding habitat, ropes/signage installed | n/a | 75 | BC Parks | Oct-21 | completed | Large colony with little burrow use, likely due to human disturbance observed at colony. Restored steep face, removed trails on colony and ropes up to prevent access onto colony habitat. |
| 8 | Blaeberry BANS colony | enhancement | bank swallow | trees/brush removed from area in front of colony | n/a | 7 | private | 04-Oct-22 | completed | Vegetation blocking flightpath to colony. Removed vegetation in front of colony. |
| 9 | Burkart Barn | enhancement | barn swallow | barn enhancement, roof replacement | 4 | 75 | private | Fall 2022 | completed | Old barn was collapsing mainly due to lack of sturdy roof. Replaced roof on barn that provides barn swallow habitat to several breeding pairs. |
| 10 | Fairmont Hot Springs Resort | enhancement | barn swallow | nest cup installation | 3 | n/a | private | Jul-22 | completed | Create additional breeding habitat in area occupied by barn swallows. |
| 11 | Parson Air B&B (bat/swallow) | enhancement | barn swallow | bat/swallow ANS | 8 | 75 | crown provincial | | in progress | Create additional breeding habitat in area occupied by barn swallows. |
| 12 | Pole barn - Hwy 95 | enhancement | barn swallow | nest cup installation | 4 | n/a | private | May-21 | completed | Create additional breeding habitat in area occupied by barn swallows. |
| 13 | Horse Creek (private property) | enhancement | barn swallow | nest cup installation | 2 | n/a | private | May-21 | completed | Create additional breeding habitat in area occupied by barn swallows. |
| 14 | Zehnder Ranch Pumphouse | enhancement | barn swallow | nest cup installation | 2 | n/a | private | Apr-22 | completed | Create additional breeding habitat in area occupied by barn swallows. |
| 15 | Zehnder Ranch Wood Shed | enhancement | barn swallow | nest cup installation | 3 | n/a | private | Apr-22 | completed | Create additional breeding habitat in area occupied by barn swallows. |
| 16 | Warner's (hay shed) | enhancement | barn swallow | nest cup installation | 3 | n/a | private | May-21 | completed | Create additional breeding habitat in area occupied by barn swallows. |
| 17 | Tobler Farm Garage/Wood Shed | enhancement | barn swallow | nest cup installation | 5 | n/a | private | Jun-21 | completed | Create additional breeding habitat in area occupied by barn swallows. |
| 18 | Kettleston Rd (Blaeberry) | enhancement | barn swallow | nest cup installation | 1 | n/a | private | 24-May-22 | completed | Create additional breeding habitat in area occupied by barn swallows. |

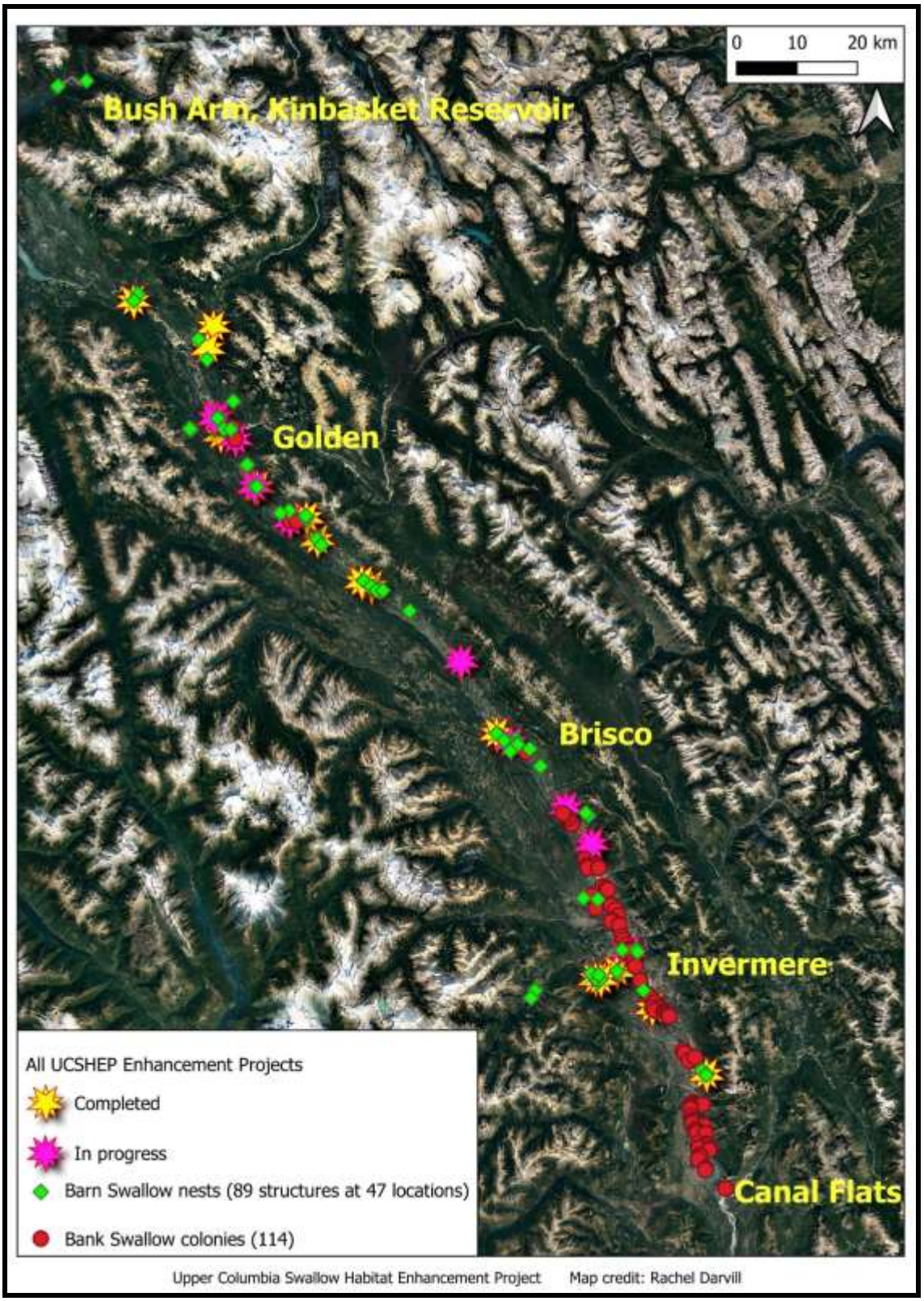



*Figure 12. Map that shows the locations of enhancement projects completed, in progress, and at the investigative stage; swallow nest locations are also shown.*

## 5.6 Number of hectares enhanced

Foraging distances from the nest site, during the breeding season, are roughly 500-600m for both the Bank and Barn Swallow with some individuals foraging greater distances (>22km), especially outside of the breeding season. To determine the number of hectares enhanced or restored, we drew a polygon with a 1-kilometer circumference around a Barn Swallow condo (which is where the swallows forage during breeding). We used this area as the amount of habitat enhanced – it was enhanced by providing a structure for the swallows to breed. The polygon drawn around one Barn Swallow ANS is 75 hectares per site, so that total amount of hectares enhanced with the five completed artificial nesting structures is 375 hectares.

# 6.0 Discussion

Greater connectivity of breeding areas and creating more breeding habitat enhances the area that colonists (Bank and Barn Swallow) can use, allowing for increased at-risk bird species abundance. The UCSHEP is adding new available habitat and expanding pre-existing breeding areas. This enhances the area that Bank and Barn Swallows can use, which allows for increased species abundance. The Upper Columbia Swallow Habitat Enhancement Project (UCSHEP) is benefiting the Columbia Valley by providing education about swallows, a citizen-science opportunity to monitor swallows, erecting artificial nesting structures for Barn Swallows, enhancing slopes to create Bank Swallow breeding habitat, providing artificial nest cups for Barn Swallows to private landowners, and working with partners to help provide unprecedented information on the timing and locations of Bank Swallow movements using the Motus Wildlife Tracking System.

Additional benefits of the UCSHEP come from providing information regarding the Species at Risk Act and Migratory Birds Convention Act including obligations under this Act by educating private landowners regarding their duties to protect nests (the illegal removal of swallow nests on private lands is of great conservation concern). Volunteers are gaining considerable appreciation and knowledge of swallows through citizen-science participation and this project retains ecological experts, naturalists and volunteers that are dedicated to pursuing long-term conservation goals related to biodiversity values.

# 7.0 Recommendations

The availability of human-made swallow habitat has likely declined over the past 50 years (Pelletier et al., 2022). Human-made habitats are expected to contribute to supporting the breeding population of swallows given that appropriate stewardship measures are in place, such as minimizing colony disturbance (COSEWIC 2013; Falconer et al. 2016a; Pelletier et al., 2022). While creating anthropogenic habitats will make an important contribution to the recovery of Bank Swallows, the preservation of natural nesting habitats is the most critical to the recovery and conservation of Bank Swallows in Canada (Pelletier et al., 2022). The maintenance and preservation of natural Bank Swallow colony sites should be highly promoted with all levels of government, communities and other stakeholders. The UCSHEP should continue to provide information on Bank Swallow colony locations to the Key Biodiversity Area network, land trust organizations, environmental groups developing conservation plans for the area.

Using a multifaceted approach to conserve and enhance habitat for two at-risk swallow species (Bank and Barn Swallow), the UCSHEP is contributing to supporting the breeding population of swallows in the

East Kootenays and North Columbia. The project should continue to benefit the region by; a) offering and providing additional citizen-science opportunities to monitor swallows, b) constructing artificial nesting structures to increase habitat availability for Barn Swallows, c) enhancing slopes to become suitable nesting habitat for Bank Swallows, d) providing artificial nest cups to private landowners to attract Barn Swallows to nest on structures already standing, and; e) working with the Federal government to provide unprecedented information on the timing and locations of Bank Swallow movements using the Motus Wildlife Tracking System.

## 8.0 Acknowledgements

We acknowledge that this project takes place on the unceded and traditional territory of the Ktunaxa, Secwépemc and Sinixt Nations. Gratitude to the Shuswap Band (Secwépemc Nation) who contributed to this project in terms of monitoring Bank Swallow colonies on band land, land access permissions, working towards having the Indigenous perspective on interpretive signage related to swallows, and providing permission for Motus Wildlife Tracking Stations on band land. This project would not be possible without the generous financial contributions of several groups. Wildsight Golden graciously acknowledges the financial support of the following: Columbia Basin Trust Ecosystem Enhancement Program, Fish and Wildlife Compensation Program, Regional District of East Kootenay's Local Conservation Fund, the Province of British Columbia Gaming Grant and BC Parks Licence Plant Program.

The project would also not be possible without the work and volunteer contributions of many individuals. Special thanks to Verena Shaw, program assistant to the Upper Columbia Swallow Habitat Enhancement Project (UCSHEP) who contributed significantly to this project. I'd like to thank Wildsight Golden branch manager Leslie Adams and the entire team with Wildsight Golden, Wildsight Invermere and Wildsight Regional that assisted with various funding, administrative and communication aspects of this project. Thank you to Dr. Tara Imlay of the Canadian Wildlife Service who was always willing to provide her guidance and advice as a swallow expert in Canada. Gratitude is also extended to the Lake Windermere District Rod & Gun club who provided the UCSHEP with Barn Swallow nest cups. Thank you to the many individuals for contributing their valuable volunteer time.

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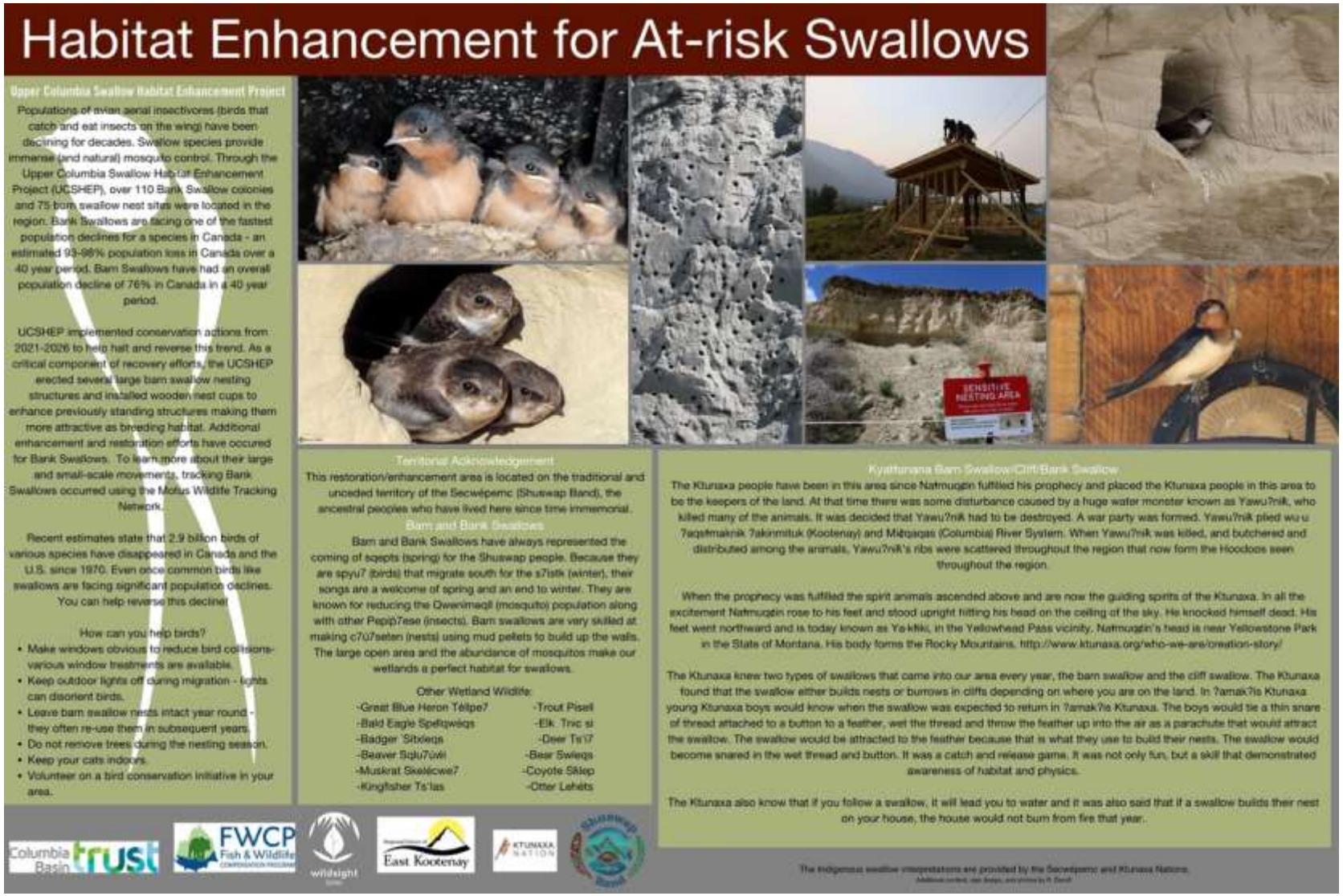
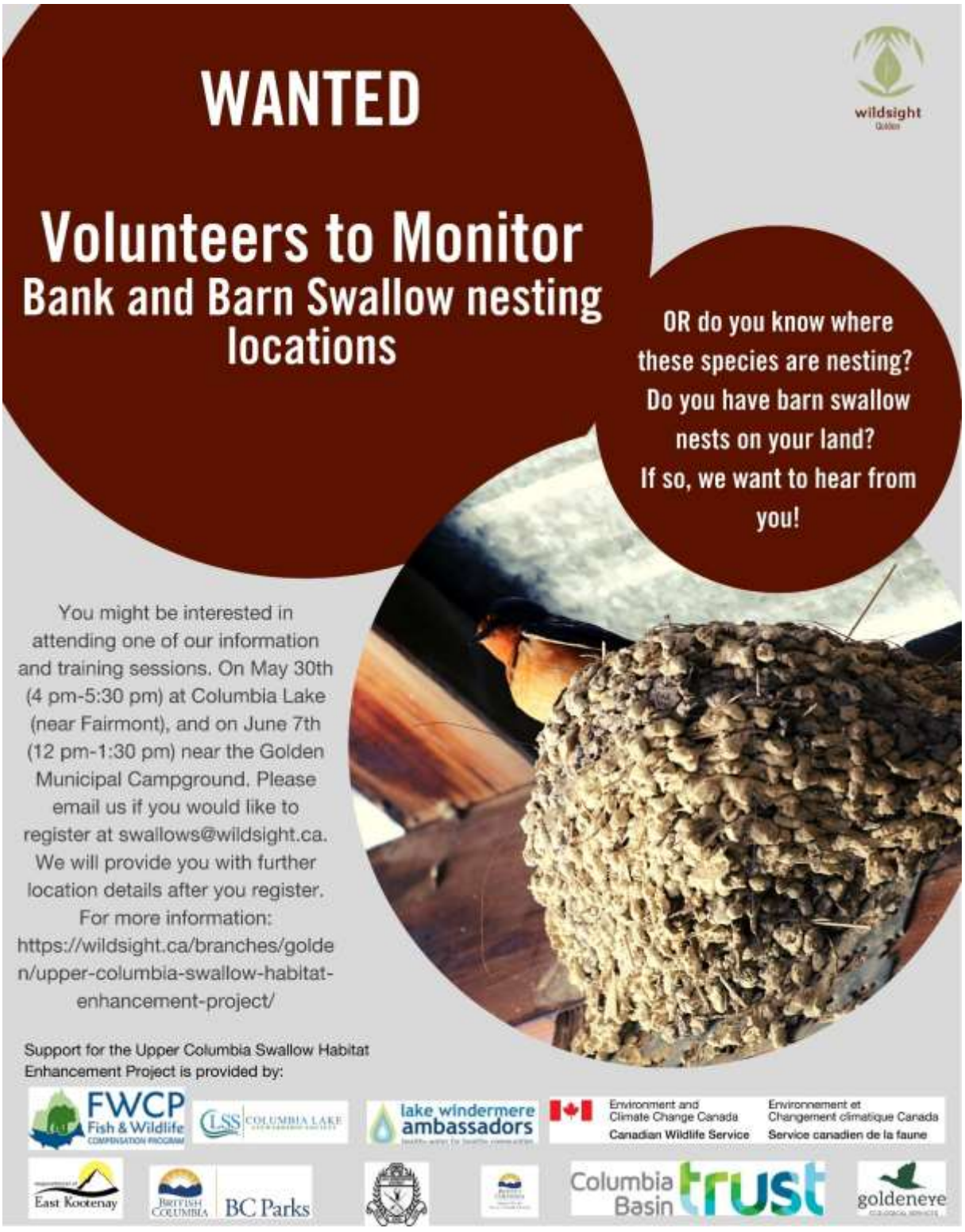
# 10.0 Appendices

## Appendix 1. Interpretive signage for UCSHEP enhancement projects, with Indigenous perspectives on swallows provided.



## Appendix 2. Poster to request volunteers and offer training sessions.



## Appendix 3 Press release in the Golden Star, June 2022.

# Motus network established in the Columbia Valley used to track Bank Swallows

Motus technology is helping track bank swallows in the Columbia Valley. (Rachel Darville photo)

Submitted by Wildsight

In late June 2022, Wildsight Golden started a new thread of the Upper Columbia Swallow Habitat Enhancement Project by putting 50 Motus tags (wildlife tracking devices) on 50 individual threatened Bank Swallows.

This was done in partnership with Environment and Climate Change Canada's Canadian Wildlife Service.

The collaboration also installed three large Motus wildlife tracking stations in the Columbia Valley, along with a smaller tower at one of the colonies located on Shuswap Band land, with their permission.

Motus wildlife tracking technology is being used to help identify the areas used during the breeding and postbreeding period (i.e., prior to fall migration) by Bank Swallows. This information is key for helping to protect Bank Swallows within the North Columbia/Upper Columbia (e.g. by learning what areas are important to conserve, enhance, or restore for Bank Swallows) and at other breeding locations across Canada.

In addition, using Motus receiving stations located throughout the western hemisphere tagged individuals will be tracked during fall migration providing unprecedented information on migratory timing, routes, stopover locations, and winter areas. This information is key for forming international collaborations that will conserve and recover swallow habitats and populations throughout the year.

This work is being financially supported by the Columbia Basin Trust's Ecosystem Enhancement Program, Fish and Wildlife Compensation Program, and the Columbia Valley Local Conservation Fund. Our sincere gratitude goes out to these funders.

The Shuswap Band (Secwepeme Nation) is supporting this program including permission for land access and use.

# Wildsight Golden: 'Don't mess with Swallow's nests'

By Claire Palmer

Wildsight Golden is reminding residents to not mess with swallow's nests, as the endangered birds return to the Columbia Valley for spring.

Swallows and other populations of birds that catch insects while flying are on the decline, with bank swallows being reduced to just two per cent of their population over the last 40 years in Canada, according to Wildsight.

Barn swallows are now at 25 per cent of their population over the same time frame.

Barn swallow nests may appear messy to the untrained eye, but the value that these birds bring by eating up to 850 insects a day is of huge benefit to the Columbia Valley, especially when mosquitos make their appearance in mid-July.

Swallows are protected by the Migratory Bird Act, a law established in 1917 and updated in 1994 which contains regulations to protect migratory birds, their eggs, and their nests from destruction by wood harvesting, hunting, trafficking and commercialization.

This means that the nests of these endangered birds are protected year round – it is illegal to damage, destroy or remove non-active nests without a permit or without authorization.

If convicted under the Migratory Bird Act, penalties include significant fines or even jail time.

Wildsight Golden has contracted independent local biologist Rachel Darville to start a five-year study of barn and bank swallows in the Columbia Valley, a territory that spans from Canal Flats to the Kinbasket Reservoir.

Swallows have seen a large drop in their populations in recent years, and Wilsight is working to see their numbers rebound in the Columbia Valley. (Rachel Darville photo)

The project includes plans to install at least eight artificial nesting structures for barn swallows, with the first two installed this past summer.

Greater connectivity and larger breeding areas enhance the area that colonists such as bank and barn swallows can use, allowing for increased bird abundance.

The partnership between Darville and Wildsight is not new – the two have previously collaborated on a Swallow project that wrapped up with a final report in January of this past year, which concluded that the Columbia Wetlands were a vital habitat for bank and barn swallows.

Research from this previous project has now transferred into the five-year Upper Columbia Swallow Habitat Enhancement Project.

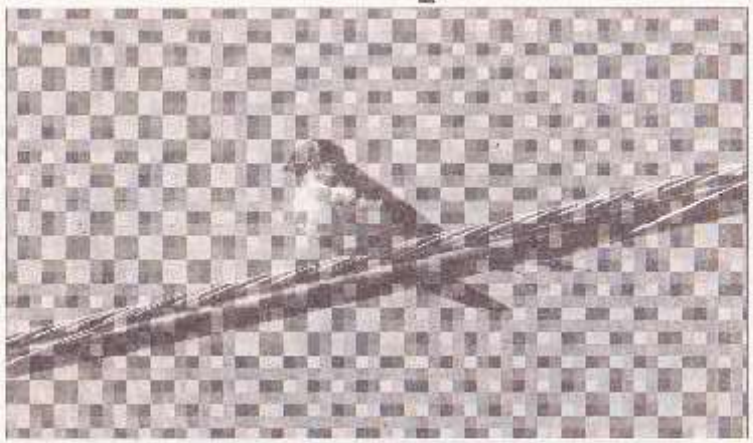
To learn more, visit https://wildsight.ca/branches/golden/upper-columbia-swallow-habitat-enhancement-project/.

# Local conservation project seeking volunteers to help monitor swallows

By Claire Palmer

As weather warms, the Upper Columbia Swallow Habitat Enhancement Project (UCSHEP) is set to resume as migratory birds return to the north for summer.

The project, which is in year two of five, is looking for volunteers to help with barn and bank swallow nest monitoring. The commitment would be between early spring in April and May, until September for barn swallows and from June to July for bank swallows.



Swallows have been experiencing a steep decline in numbers over the last few years across Canada. (Rachel Darvill photo)

Biologists are also looking for the location of any new barn and bank swallow nesting sites in the Columbia Valley, and are asking residents and volunteers to keep their eyes peeled.

"The swallow project has lots of exciting things lined up for 2022, including the installation of Motus Wildlife Tracking Stations in the Columbia Valley," stated project biologist Rachel Darvill.

"These stations, along with the tagging of about 100 bank swallows, will help us track local swallow movements during breeding periods, during post-breeding, and will identify migration routes and winter areas."

The project was will study swallows from Canal Flats to the Kinbasket Reservoir, as their populations decline across Canada.

The Columbia Wetlands and surrounding areas are amongst the best places to target swallow recover efforts, says Wildsight Golden, who contracted Darvill for the project.

The project is also working on erecting more artificial nesting structures for barn swallows in strategic locations of the Columbia Valley, on restoring bank swallow breeding habitat that has been altered, and effectiveness monitoring at artificial nesting structures built in 2021.

Additionally, private landowner outreach and nest monitoring with volunteers will continue.

Regarding interpretive signage designed and installed for swallows, the UCSHEP will work with Indigenous peoples to share their perspectives on swallows.

Stay tuned to more updates about some of these exciting initiatives.

There two events coming up and April 11 and April 29, both led by the project biologist. Registration is required and to register for either event visit the UCSHEP website.

The partnership between Darvill and Wildsight is not new the two have previously collaborated on a swallow project that wrapped up with a final report in January of this past year, which concluded that the Columbia Wetlands were a vital habitat for bank and barn swallows.

The project provided information to communities regarding the Migratory Birds Convention Act, including obligations under this Act by assisting private landowners with empowering education regarding their duties to protect nests.

Research from this previous project has now transformed into the five-year Upper Columbia Swallow Habitat Enhancement Project.

If you are interested in participating in this project or want more information, please contact the project biologist at rachelldarvill@gmail.com.

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# wallow habitat restored with help of volunteers

Press Media

nother year is ged up for the Upper mbia Swallow Habi- hancement Project SHEP)

e Wildsight project, rom 2021 to 2026, itors and collects with the help of nteers.

date, five large con- for barn swallows been erected and ugust, one produced barn swallow chicks ildsight is working the Environment Climate Change Can- 's Canadian Wildlife rice and BC Parks on project.

Rachel Darvill and team installed four tus Wildlife Track- Stations in the region subsequently tagged barn swallows at two pies near Invermere me," explained Wild- t.

tagging these swal- s, it allows for infor ion on post-breeding itat and the bank llow migration route. he UCSHEP also ped restore bank llow colony habitat in Windermere Lake vincial Park, removed vegetation blocking bank swallow flightpaths at a blackberry colony, assisted with a barn roof replacement that provides significant barn swallow habitat in Invermere and installed 63 nest cups on pre ex isting buildings and artificia nesting structures.

There were 70 volunteers involved in the swallow monitoring during the spring and summer. UCSHEP worked with the Ktunaxa Nation and Secwepeme Nation (Shuswap Band) who re-assessed their traditional Indigenous perspectives on swallows and provided content to be used on UCSHEP interpretive signage.

"Through this project, numerous swallow colonies in suitable bank swallow habitats from Canal Flats to Donald have been recorded. About 100 of those have been confirmed as bank swallow colonies," explained Wildsight.

This data has helped identify the area between Canal Flats and Edgewater as a critical habitat for bank swallows, as drafted in the federal recovery strategy for this species.

Swallows from the Upper Columbia Swallow Habitat Enhancement Project. (Rachel Darvill photo)