

Columbia Valley Swallow Project – 2020



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Executive Summary

Globally speaking, biodiversity is declining at an alarming rate due to a number of threats including habitat destruction, recreational disturbance, invasive species and climate change. A recent study published in September 2019, estimates 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. According to BirdLife International, about one in eight bird species is threatened with global extinction due to factors such as the expansion of agriculture, logging, invasive species, hunting, and climate change.

There has been a documented historical and expected future decline in the population and distribution of a number of aerial insectivores, including swallow species. The Committee on the Status of Endangered Wildlife in Canada listed both barn swallow (*Hirundo rustica*) and bank swallow (*Riparia riparia*) as threatened in Canada in 2011 and 2013, respectively. These species were then listed on Schedule 1 of Canada's Species at Risk Act in 2017. This listing now requires the production of a federal recovery strategy for each species; these strategies are currently under development. In the recovery strategies, threats to species' will be defined and critical habitat identified.

It is well known that both bank and barn swallow species nest in the Columbia Valley, but there is a lack of information on the status of swallows in the Columbia Valley, including locations of their important habitats (nesting and roosting sites). There is a great need to undertake inventory work to determine the proximity of critical habitat and also a need for hands-on stewardship activities, such as enhancement (e.g., artificial nesting structures) to help conserve swallows and their critical habitat.

The Columbia Valley Swallow Project (CVSP) is a multi-year project that began in 2020. During this first-year inventories for nest sites were conducted. Ninety-six active bank swallow colonies were located, as well as 24 active barn swallow nest sites. Volunteer citizen-scientists were trained and involved with monitoring some of the discovered nest sites. Landowner outreach and stewardship activities within swallow habitat also occurred. Nest locations and nest success is being used to inform the management of nest sites, to determine where artificial nesting structures should be built in future. The CVSP data also contributes to provincial and federal recovery planning and implementation processes for swallow species in the Columbia Valley.

This project has and will continue to have long-term benefits on a large spatial scale (Canal Flats north to Donald). This project is working to conserve swallows, which are beneficial insectivores and iconic species that many Columbia Valley residents appreciate. In subsequent years (2021-2026) of the project the name will change to the Upper Columbia Swallow Habitat Enhancement Project (UCSHEP). The emphasis of the UCSHEP will be on-the-ground enhancement and restoration, including erecting artificial nesting structures for swallows on public and private land.

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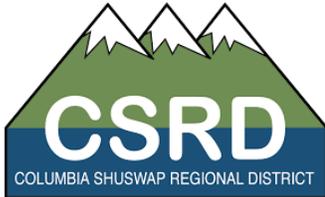
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1.0 Introduction

1.1 Background and context for the project

Biodiversity is declining at an alarming rate due to a number of threats including habitat destruction, recreational disturbance, invasive species and climate change (Butchart et al., 2010). A recent study estimates 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). According to BirdLife International (2018), one in eight bird species is threatened with global extinction due to factors such as climate change and the increasing effects of agriculture, logging, invasive species and hunting. Through modelling forecasts some scientists predict that global biodiversity will continue to decline throughout the 21st century (Pereira et al., 2010).

Populations of birds that catch insects on the wing (avian aerial insectivores) have been declining for decades (Nebel et al., 2010). Reasons for these declines are uncertain, but are thought to be cumulative over the course of a bird's life cycle; repeated migratory cycles with associated impacts between breeding and nonbreeding areas (Bowler et al., 2019). Potential drivers of aerial insectivore population decline include the loss of grassland habitat through agricultural intensification (Bowler et al., 2019), decreasing prey abundance, phenological changes due to climate change, and changing local conditions on stopover or wintering grounds (Spiller & Dettmers, 2019). Conservation actions must be put into place to help halt and reverse these trends.

Recent bird inventory projects in the North and Upper Columbia regions of British Columbia have indicated that two at-risk swallow species, bank swallow (*Riparia riparia*) and barn swallow (*Hirundo rustica*), breed in a number of locations in the Columbia Valley (Canal Flats to Donald). Yet, specific locations for most breeding colonies and nest sites were largely unknown prior to the year 2020 (Darvill, 2020a; Darvill & Westphal, 2020). Due to this lack of information on swallows, registered professional biologist Rachel Darvill developed and initiated the Columbia Valley Swallow Project (CVSP) in 2020 for the environmental non-governmental organization, Wildsight Golden.

The main purpose of the CVSP was to locate barn and bank swallows in the Columbia Valley, determine their nesting locations, and develop plans for on-the-ground conservation actions to be implemented in subsequent years. The public was asked to provide information to the CVSP regarding any known bank and barn swallow nesting locations. Volunteer citizen-scientists were trained to identify swallow species and their nests, leading to their involvement with monitoring identified nest sites. The illegal removal of swallow nests on private lands is of great conservation concern. Therefore, this project also provided educational information regarding the Migratory Birds Convention Act, including obligations and duties to protect birds, their nests, and eggs under this Act.

1.1.1 Bank swallow

The bank swallow, a species with intrinsic value that provides immense mosquito control, is facing one of the fastest population declines (if not the fastest) for a species in Canada with an estimated 98% population loss in Canada over a forty-year period (Committee on the Status of Endangered Wildlife in Canada (COSEWIC), 2013). In 2013, the bank swallow was yellow-listed in British Columbia (BC) and was listed as a threatened species by COSEWIC. This species 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 habitat for breeding, foraging and winter use, as well as collisions with vehicles, widespread pesticide use, population decline of aerial insects (prey), climate change and the destruction of nest sites during mining excavation (Berzins et al., 2020; COSEWIC, 2013). With only 2% of their population remaining in Canada, bank swallows require urgent conservation attention and action.

Bank swallows are one of the most widely distributed birds in the world. They nest in burrows in banks, cliffs or bluffs with friable soils (Garrison & Turner, 2020). In recent years, they have been nesting in gravel and sand piles at construction sites and freight yards, but these sites are often destroyed (Garrison & Turner, 2020). These small birds dig burrows themselves using their feet, wings, and bills. They generally arrive on breeding grounds in North America during early spring and depart late summer to midfall. They migrate from breeding range to winter range widely through the southern United States to South America (Imlay et al., 2020). The exact route of migration is unknown.

Breeding habitat is a limiting factor for bank swallows because they require low-elevation (<900 meters), large, near-vertical banks, with specific substrates (fine friable soils, exposed unconsolidated deposits of glacial lacustrine origin) that are exposed to erosional forces (COSEWIC, 2013; Garrison & Turner, 2020). Control of water-level fluctuations and peak discharge rates (via dams) has substantially reduced the stochastic processes regulating bank erosion that bank swallows require along many streams and rivers throughout North America (Poff et al., 1997). There is a high probability that construction of the Mica Dam and Kinbasket Reservoir, with associated valley-bottom flooding, resulted in the destruction of ample bank swallow habitat along the natural banks of the Columbia River.

1.1.2 Barn swallow

The barn swallow is blue-listed in BC. It was listed as threatened by COSEWIC in 2011 and is listed as threatened on Schedule 1 of SARA as of 2017. Barn swallows have had an overall population decline of 76% in Canada in a forty-year period (COSEWIC, 2011). Reasons for barn swallow decline are not well understood, but declines are attributed in part to losses of important types of anthropogenic and artificial nests sites such as open wooden barns and bridges (COSEWIC, 2011). Prior to European settlement, barn swallow nesting habitat was associated with and characterised by natural features such as holes, caves, crevices and ledges on rocky cliff faces (Campbell et al., 1997; COSEWIC, 2011). Since European settlement, barn swallows have largely shifted their habitat preference to human-made structures such as bridges, buildings and ledges, but they also continue to nest in natural habitats located in relatively 'pristine' areas (COSEWIC, 2011; Speich et al., 1986). Barn swallows will often nest solitarily, but nesting more often occurs in colonies that are mixed with other species, such as cliff swallow (*Petrochelidon pyrrhonota*). Barn swallows feed almost entirely on flying insects, mainly those in the order Diptera (true flies), but they will also consume other insects (Beal, 1918). They usually forage within 500 meters from their nest site (COSEWIC, 2011; Moller, 1987).

2.0 Study Area

The study area for the CVSP is the Columbia Valley, from Canal Flats north to Donald (50°51'37.31"N, 116°20'12.06"W). This valley is situated at the northern end of the Rocky Mountain Trench, in southeastern BC, Canada. Swallows are strongly associated with wetland ecosystems because of the associated abundant food supply (e.g., mosquitoes, midges, dragonflies). Much of the CVSP's inventory

and monitoring work took place along the valley bottom of the Upper Columbia River in a wetland ecosystem known as the Columbia Wetlands, although higher elevation sites were reported occasionally (some sites were situated at the Kinbasket Reservoir).

The Columbia Wetlands are one the largest contiguous wetland complexes in western North America and the largest within the southern interior of BC (Hammond, 2007), making them an important refuge for species which rely on wetlands for important stages of their life history. The Columbia Wetlands is an essential habitat component of the Pacific Flyway. In North America, this is the furthest west primary migratory bird corridor of which there are four (Wilson, 2010). This wetland ecosystem plays an important role as migration stopover habitat for birds (Darvill, 2020a; Kaiser, McKelvey & Smith, 1977). 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).

3.0 Methods

3.1 Bank swallow inventory and monitoring

The eBird database was used to assist in planning the inventory work. All bank swallow data that had been entered into eBird to date was collated, including potential colony locations within the study area. Data from the Kootenay Bank Swallow Project identified 35 confirmed or potential bank swallow breeding locations (Arndt, 2020). Combined, this information helped guide the project in terms of initial inventory locations for breeding colonies. A poster was also developed to solicit nesting location information from the public (Appendix 1).

Bank swallow inventories were conducted on foot or by kayak depending upon the location of the colony. For example, remote and steep river banks (e.g., Athalmer to Radium, Radium to Edgewater) were inventoried by kayak. Inventory and monitoring activities for Columbia Lake and Lake Windermere were conducted by motorboat with the assistance of the Columbia Lake Stewardship Society and Lake Windermere Ambassadors. On private land, the CVSP 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 Indian Band (SIB) for bank swallow inventories on SIB reserve lands).

In order to provide information on breeding success at colonies, the CVSP aimed to monitor all bank swallow colonies at least three times per year. Site visits to colonies aimed to be evenly spaced apart (every 14 days). The number of times colonies were visited, as well as how far apart survey dates were spaced, varied widely according to volunteer availability. We delineated three survey date range periods for guidance and used the following to determine those time periods: eBird records, nesting calendar for the ecodistrict, and expert advice provided by Environment and Climate Change Canada's Canadian Wildlife Service's landbird biologist (Dr. Tara Imlay). 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)
- If it was possible to visit a colony only once per year, the fourth week of June was the target period.
- Any monitoring activities beyond these three periods provided additional information but was not required.

Bank swallow monitoring protocols largely replicated what had been developed previously by Bird Studies Canada (2010) and the Bank Swallow Technical Advisory Committee Research and Monitoring Subcommittee (Golet et al., 2017). Monitoring methods and standard field data sheets were provided to CVSP 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) was completed at each 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 interesting 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) and to Environment and Climate Change Canada’s Canadian Wildlife Service.

3.2 Barn swallow inventory and monitoring

The eBird database was used to assist in planning in terms of gaining knowledge of where barn swallows had been detected during previous breeding seasons in the study area. A poster was also developed to solicit nesting location information from the public (Appendix 1). This combined information guided the project in terms of potential locations for barn swallow nest sites or breeding colonies. Data was collected at a select number of sites in the Columbia Valley where barn swallows were known to be breeding.

Barn swallow nest site monitoring was undertaken from approximately early-May until late August, capturing the majority of nesting activities between the start (nest building) and end (fledging of

juveniles) of the nesting season. This time period also captured pairs with multiple broods. Volunteers were requested to visit nest sites on a weekly basis to obtain continuous and precise data. However, the frequency of monitoring varied based on volunteer capacity (time, motivation). 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 outlined in the 'Columbia Valley Swallow Project Barn Swallow Nest Monitoring Methods' which largely replicated methods 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. Volunteers were responsible for completing nest site maps in the field when possible (to show where nests were located) and/or for taking nest site photos of the structures (bridges/barn/shed) used for nesting. The project biologist assisted with these photographs when needed.

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 field data collected related to nest monitoring and nest descriptions were transcribed into digital databases and submitted to the provincial government (wildlife species inventory – WSI) and to Environment and Climate Change Canada's Canadian Wildlife Service.

4.0 Results and Outcomes

4.1 Bank swallows

It was not always during possible swallow monitoring to get close enough to colonies to see if cobwebs or other minor obstacles were present at burrow entrances. Also, repeat visits were not possible for many of the colony sites due to limited resources (e.g., time, trained volunteers). Despite these limitations, 135 swallow colonies were detected in vertical banks in alluvial, friable soils within the Columbia Valley in 2020. Ninety-six of those were confirmed as active bank swallow colonies (Appendix 2) and 15,909 burrows were counted at those bank swallow colonies. Some colony sites with multiple

entrance holes had no apparent swallow activity. Whereas at some colonies, burrows were active with northern rough-winged swallows, but no bank swallows were seen. It is important to note that not all colonies were able to be monitored sufficiently (i.e., visited only one or two times not three), and in some cases, volunteers had a difficult time determining the number of active bank swallow pairs. Some volunteers reported bank swallows to be very fast flyers making it hard for some people to accurately differentiate between bank and northern-rough winged swallows. Therefore, sometimes the number of active burrows was not reported from a monitored colony.

Active burrows were usually clustered in a specific area of the colony; for example, active burrows were often clustered in the center of the colony or along the upper edge. The largest number of bank swallow burrows (n=1,389) was situated north of Radium in a series of 12 sub-colonies, all located on the same steep bluff face (Figures 1 and 2). The majority of the bank swallow colonies were clustered between Canal Flats and Edgewater, with only five colonies confirmed with bank swallows were located north of Edgewater. However, the sections of river between Edgewater and Brisco, and Fairmont to the south end of Lake Windermere, were the only sections of valley bottom unable to be monitored in 2020 due to funding constraints. Completing the bank swallow nesting site inventory of the upper Columbia Valley by conducting bank swallow inventories in these two stretches of river/wetlands will be an objective in the year 2021.



Figure 1. One of the 12 sub-colonies at the largest bank swallow colony situated in the Columbia Valley.



Figure 2. Landscape view of the area containing the highest concentration of bank swallows in the Columbia Valley.

4.2 Barn swallows

The 2020 CVSP discovered barn swallow nests at 24 different locations in the Columbia Valley (Appendix 3). There were two large barn swallow colonies discovered, one of which was situated at Kicking Horse Mountain Resort (KHMR). The KHMR colony was monitored 12 times by a volunteer between June 7, 2020 and August 8, 2020. These monitoring activities determined that at least 28 active barn swallow nests and 42 barn swallow nests were present at KHMR in 2020 (Figure 3 and Figure 4). The nests were built on 12 different buildings situated at the base area of the ski resort. An additional twenty-four cliff swallow nests were identified at KHMR, with an unknown number of tree and violet-green swallow nests.

The other large colony discovered was located at the Brisco Wood Preservers Ltd., which encompasses 43 acres near Brisco. This company is a major Canadian pole producer, supplying treated wood poles to Western utilities and communications companies since 1989 (Brisco Wood Preservers Ltd., 2013). This colony was monitored five times between May 30, 2020 and July 26, 2020. Through those observations it was determined that there were at least 31 active barn swallow nests, with at least 46 barn swallow nests detected in total (Figure 5). The nests were built on 7 different buildings situated on the private property. There were an additional 32 cliff swallow nests located on Brisco Wood Preservers buildings, with violet-green swallow nests (number is unknown) also present.

In addition to the two large colonies, 22 additional barn swallow nest sites were found in the Columbia Valley in 2020. One of these sites (Donald Mill Site) could have a 'large' barn swallow colony associated with it. Several adults were seen at the Donald Mill Site in 2020 and eBird records indicate that there were up to 45 barn swallows at that site between 2012 and 2017. However, access to this private property was not permitted to the CVSP due to liability concerns with a dilapidated building where the birds were thought to be nesting. The additional nest sites were monitored between 1 and 13 times during the breeding season depending on volunteer capacity, providing information on nest success and other variables as listed in the methods section. All nests were described according to monitoring methodology unless a nest was unable to be accessed for viewing, for instance under a bridge with fast and flowing water (e.g., Bush Arm Causeway).



Figure 3. Barn swallow nests found on top of light fixtures located on a building at a ski resort near Golden.



Figure 4. Pair of barn swallows perched below their nest situated in a large machinery shed on a private ranch in Invermere.



Figure 5. View under the roof of the large, open building at the Brisco Pole Preservers where the majority of barn swallows built their nests in 2020 on metal truss connector plates (red arrows indicate some of the nest sites).

4.3 Cliff swallows

While not a focus of the CVSP, data was also collected at major cliff swallow nest sites that were found in 2020 (Appendix 4). At most of the cliff swallow nest sites the total nest count was obtained, but at the Parson and Nicholson bridge sites more detailed monitoring information was collected. The Parson area had the highest abundance of nests throughout the study area with 69 nests on the main bridge over the Columbia River, and another 9 nests were discovered at a second bridge nearby (Figure 6).



Figure 6. Cliff swallow 'condo' in Parson showing five mud nests sharing walls with swallow neighbors.

4.4 Data management

All bank and barn swallow data were submitted to the provincial government (wildlife species inventory – WSI) and to Environment and Climate Change Canada’s Canadian Wildlife Service. Photographs of all bank swallow colonies and barn swallow nest sites were organized and stored in multiple formats and are available upon request.

4.5 Volunteer training and outreach

All in-class training sessions for volunteers that were scheduled to occur during the spring of 2020 were cancelled due to the Covid-19 pandemic. The training sessions (class and in-field) were meant to describe the six different swallow species in the Columbia Valley, train volunteers on nest inventory/monitoring protocols and provide the necessary equipment and data forms to volunteers. In order to maintain Covid-19 safety protocols set out by the provincial government, the program biologist went into the field with one or two people at a time and trained them in this way. Some volunteer training sessions occurred on the phone after monitoring protocols were provided and reviewed by volunteers.

Public outreach and communications occurred through press releases, newspaper articles (Appendix 5), a brochure (Appendix 6), social media posts, a webpage on the Wildsight website, and video creation assisted by Kootenay Conservation Program. The major goals of outreach was to educate citizens on the variety and identification of swallow species in the valley, on the significant population decline facing swallows, along with strategies for swallow conservation including opportunities to volunteer on the project. The CVSP provided education and solutions to private landowners with swallows on their land, and to those interested in swallow conservation (e.g., KHMR, Rocky Mountain School Board) (Appendix 8). Best Management Practices for swallow conservation were promoted including the following: build nest platforms such as ledges under eaves, minimize disturbance at colonies, maintain food sources, eliminate pesticides, and develop bird-friendly yards.

5.0 Discussion and Conclusion

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 et al., 2018). This project has been important for helping to conserving two at-risk species and for continuing to provide opportunities for volunteers to be involved with a bird conservation project that provides landscape level benefits. Private landowner and swallow volunteer outreach helped to increase the awareness of the “at-risk” status of swallows, their nesting habits, their habitat connectivity needs, and the importance of these birds in the ecosystem. This project has also been beneficial in terms of providing 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.

The high number of bank swallow colonies identified in the Columbia Valley indicates that this region provides significant habitat for this species. The CVSP data may lead to the recovery strategy delineating bank swallow critical habitat in the Columbia Valley in future years. However, at the time of writing, only data collected prior to 2018 is going to be considered for critical habitat selection. Nest locations

and nest monitoring information for both bank and barn swallows are being used to inform the management of nest sites and contribute to provincial and federal recovery planning and implementation processes in the Columbia Valley.

At Kicking Horse Mountain Resort, at least one group that manages condominium properties had been removing barn and cliff swallows' nests due to aesthetic and health concerns. They were unaware that migratory birds along with their nests and eggs are protected under the Species at Risk Act and the Migratory Birds Convention Act. Nests are to be left in place once nest building commences. After learning about obligations to protect nests and eggs under the act, the management group immediately ceased the removal of nests. The management groups have asked the CVSP project biologist and Environment and Climate Change Canada for advice on how they could reduce impacts to swallows while improving the building aesthetics and health concerns regarding bird droppings. The management group has been advised to build and install supplemental artificial nesting structures before the breeding season and prior to the removal of any swallow nest. Kicking Horse and the CVSP have reached an agreement to work together to build and erect one to two artificial nesting structures at the resort through a program that will begin in 2021.

Based on the high number of colonies identified through the 2020 CVSP, the significant population declines facing bank and barn swallows, and identified threats to colonies (including future decommissioning at several barn swallow nest sites and nest removal planned at KHRM and other areas), this project deserves more merit and time than originally anticipated. As such, the CVSP has transformed into a five-year project (2021-2016) called the Upper Columbia Swallow Habitat Enhancement Project (UCSHEP).

The UCSHEP will use a multifaceted approach to conserve and enhance habitat for both bank and barn swallows. Bank swallow breeding habitat that has been lost will be restored, and artificial nesting structures will be built to expand and connect habitat in a region known to provide significant breeding habitat for this at-risk species facing a sharp population decline. Also, using a structured approach, the UCSHEP will also erect and monitor artificial nesting structures for barn swallows in places where nests are known to be removed due to health/aesthetic concerns and where current nesting structures are going to be destroyed in future. Greater connectivity and larger breeding areas enhance the area that colonists such as bank and barn swallows can use, allowing for increased bird abundance (Shanahan et al., 2011). Habitat conditions in the lower Columbia are important to maintain and enhance for the recovery of at-risk swallow species. The important breeding habitat needs to be protected, restored in some cases, and enhanced in others - the UCSHEP aims to do this.

6.0 Acknowledgements

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This swallow conservation project and its results are dedicated to my mother, Donna Mendes-Frobb, who passed away from breast cancer on September 26, 2020. She was a dedicated volunteer of this project and of other bird projects that I managed. She always believed in my work, she was my field assistant on a number of occasions - a kind, loving and sharing person who is missed very dearly by many.

7.0 References

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Appendix 1. Poster developed to solicit public information on bank and barn swallow nest sites.



WANTED: Bank and Barn Swallow nesting locations

Do you know where these species are nesting?
Do you have barn swallow nests on your land?
If so, we want to hear from you!

If you know the location of any Bank or Barn Swallow nesting/roosting sites in the Columbia Valley (Canal Flats to Donald) or Kinbasket Reservoir area, or if you are interested in monitoring a known nest site this spring/summer, please contact the Program Biologist at racheldarvill@gmail.com



Financial support for the Columbia Valley Swallow Project is provided by:



Appendix 2. Identified swallow colonies in steep banks with associated burrow numbers.

Identifier	N = No BANS detected Y = active BANS colony confirmed	# burrows	# active BANS burrows	Descriptive location
Donald Mill Site 2	N	14	0	Donald
Blaeberry Washout 1	N	25	0	Blaeberry
Blaeberry Washout 2	N	51	0	Blaeberry
Golden MCG - 1	Y	50	7	Golden
Golden MCG - 2	Y	27	5	Golden
Golden MCG - 3	Y	45	25	Golden
Reflection Lk	Y	200	27	Golden
Reflection Lk 2	N	2	0	Golden
Birchlands Ck	Y	5	0	South of Golden
Radium to Edge 7	N	20	0	Radium to Edgewater
Radium to Edge 6	Y	575	*288	Radium to Edgewater
Radium to Edge 5	Y	270	*135	Radium to Edgewater
F19-4	N	57	0	Radium to Edgewater
F19-3	Y	457	*229	Radium to Edgewater
Radium to Edge 4	Y	294	*147	Radium to Edgewater
Radium to Edge 3	Y	96	*48	Radium to Edgewater
Radium to Edge 2	Y	105	*53	Radium to Edgewater
Radium to Edge 1	Y	234	*117	Radium to Edgewater
F19-2	Y	1022	*511	Radium to Edgewater
F19-1	Y	367	*184	Radium to Edgewater
S. Hay Property	N	9	0	Radium
Ath-Radium 16	N	45	0	Invermere to Radium
Old Coach Trail - Radium Trailhead	Y	15	2	Just south of Radium
F1893	N	n/a	n/a	Invermere to Radium
Ath-Radium 13	Y	160	*80	Athalmer to Radium
Ath-Radium 12	Y	140	*70	Athalmer to Radium
Ath-Radium 11	Y	200	*100	Athalmer to Radium
Firlands Ranch	Y	230	*115	Athalmer to Radium
Ath-Radium 15	N	17	0	Athalmer to Radium
Ath-Radium 10	Y	170	*85	Athalmer to Radium
Ath-Radium 9	Y	320	*160	Athalmer to Radium
Wilmer 2	N	17	0	Off Westside Rd
Wilmer 1	N	200	0	Off Westside Rd
Ath-Radium 14	N	14	0	Athalmer to Radium
Ath-Radium 8	Y	170	*85	Athalmer to Radium
Ath-Radium 7	N	22	0	Athalmer to Radium
Ath-Radium 6	Y	100	*50	Athalmer to Radium
Wilmer 4	N	28	0	Columbia NWA
Wilmer 3	Y	78	45	Columbia NWA
Ath-Radium 5	Y	175	*88	Athalmer to Radium
Ath-Radium 4	Y	85	*43	Athalmer to Radium

Ath-Radium 3	N	124	0	Athalmer to Radium
Ath-Radium 2	Y	340	*170	Athalmer to Radium
Ath-Radium 1	Y	56	*28	Athalmer to Radium
F1863	Y	9	*5	Althalmer Slough
S 19 Site 3	Y	10	*5	Athalmer Slough
Athalmer Bridge	Y	16	5	Athalmer Bridge
JC01	Y	18	*9	near James Chabot Provincial Park
JC02	Y	41	*21	near James Chabot Provincial Park
Lakeview Meadows	Y	65	10	Windermere Lk
Timber Ridge	Y	31	*16	Lk Windermere
Baltac Beach	N	12	0	Lk Windermere
Akisknook Resort- South	N	70	0	Lk Windermere
Lk Wind 0	N	30	0	Lk Windermere
Lk Wind 1	N	50	0	Lk Windermere
Lk Wind 2	N	55	0	Lk Windermere
Lk Wind 17	Y	160	*80	Lk Windermere
Lk Wind 18	Y	148	*74	Lk Windermere
Lk Wind 19	Y	120	*60	Lk Windermere
Lk Wind 20	Y	400	n/a	Lk Windermere
Lk Wind 3	N	40	0	Lk Windermere
Lk Wind 21	Y	78	*39	Lk Windermere
Lk Wind 23	Y	86	*43	Lk Windermere
Lk Wind 22	Y	16	*8	Lk Windermere
Lk Wind 24	Y	245	*123	Lk Windermere
Lk Wind 25	Y	114	*57	Lk Windermere
Winder LK PP	Y	164	*82	Windermere Lk Provincial Park
Lk Wind 26	Y	145	*73	Lk Windermere
Lk Wind 4	Y	46	*23	Lk Windermere
Lk Wind 16	Y	43	*22	Lk Windermere
Lk Wind 15	Y	48	*24	Lk Windermere
Lk Wind 14	Y	27	*14	Lk Windermere
Lk Wind 13	Y	180	*90	Lk Windermere
Lk Wind 12	Y	128	*64	Lk Windermere
Lk Wind 11	Y	115	*58	Lk Windermere
Lk Wind 10	Y	130	*65	Lk Windermere
Lk Wind 9	Y	125	*63	Lk Windermere
Lk Wind 8	Y	328	*164	Lk Windermere
Lk Wind 7	Y	107	*54	Lk Windermere
Rushmere	N	12	0	Lk Windermere
Lk Wind 6	Y	170	*85	Lk Windermere
Lk Wind 5	Y	100	*50	Lk Windermere
Fairmont D	N	40	0	Fairmont
Fairmont C	Y	300	250	Fairmont
Fairmont B	N	98	0	Fairmont
Fairmont A	Y	216	39	Fairmont

Fairmont Meadows	N	45	0	Fairmont
Fairmont E	Y	430	*215	Fairmont
Col 4 N	Y	480	30	Columbia Lk
Col 3 N	Y	100	25	Columbia Lk
Col 2 N	Y	43	25	Columbia Lk
Col 1 N	Y	75	10	Columbia Lk
Col Lk 20-21	N	10	0	Columbia Lk
Col Lk M 17-5	Y	120	*60	Columbia Lk
Col Lk 20-1	Y	60	25	Columbia Lk
Col 1 S	Y	50	10	Columbia Lk
Col Lk M 17-4	Y	84	*42	Columbia Lk
Col Lk S 19-3	N	29	0	Columbia Lk
Col Lk M 17-3	Y	86	*43	Columbia Lk
Col Lk M 17-2	N	63	0	Columbia Lk
Col Lk M 17-1	Y	230	*115	Columbia Lk
Col Lk 20-3	Y	50	*25	Columbia Lk
Col Lk 20-4	U	33	0	Columbia Lk
Col Lk 20-20	N	88	0	Columbia Lk
Col Lk 20-5	N	76	0	Columbia Lk
Spirits Reach	Y	207	*104	Columbia Lk
Columbia Ridge	Y	102	*51	Columbia Lk
Col Lk 20-6	Y	110	*55	Columbia Lk
Col Lk 20-19	Y	113	*57	Columbia Lk
Col Lk 20-18	Y	65	*33	Columbia Lk
Pebble Beach	N	50	0	Columbia Lk
Col Lk 20-17	N	55	0	Columbia Lk
Col Lk 20-16	N	42	0	Columbia Lk
Col Lk 20-7	Y	135	*68	Columbia Lk
Col Lk 20-15	Y	90	*45	Columbia Lk
Col Lk 20-14	Y	105	*53	Columbia Lk
Col Lk 20-12	Y	200	*100	Columbia Lk
Col Lk 20-13	N	20	0	Columbia Lk
Col Lk 20-11	Y	425	*213	Columbia Lk
Col Lk 20-8	Y	200	*100	Columbia Lk
Col Lk 20-10	Y	150	*75	Columbia Lk
Col Lk 20-31	N	42	0	Columbia Lk
Col Lk 20-9	Y	115	*58	Columbia Lk
Col Lk 20-30	N	50	0	Columbia Lk
Col Lk 20-29	Y	70	*35	Columbia Lk
Col Lk 20-28	Y	190	*95	Columbia Lk
Col Lk 20-27	Y	95	*48	Columbia Lk
Col Lk 20-26	Y	404	*202	Columbia Lk
McKersie's	Y	504	*252	Columbia Lk, Gravel pit
Col Lk 20-25	N	53	0	Columbia Lake Provincial Park
Col Lk 20-24	Y	128	*64	Columbia Lk

Col Lk 20-23	Y	418	*209	Columbia Lk
Col Lk 20-22	Y	72	*36	Columbia Lk
Canal Flats 1	Y	185	*93	Canal Flats
Canal Flats 2	Y	70	*35	Canal Flats

Note - * indicates that the 50% criteria was used to estimate the number of active nest sites.

Appendix 3. Barn swallow nests located in 2020 in the Columbia Valley.

Identifier	# Active BARS Nests	Total # BARS nests on building (includes un-used nests)	Descriptive Location	Land Jurisdiction	Regional District
Bush Arm Causeway	4	4	Kinbasket Reservoir	n/a	CSRD
Valenciennes River bridge	unknown	unknown	Valenciennes River Recreation Site	n/a	CSRD
Donald Mill Site 1	unknown	unknown	Donald	private	CSRD
Donald Mill Site 2	3	3	Donald	private	CSRD
Kettleston Rd	4	4	Blaeberry	private	CSRD
Golden and District General Hospital	1	1	Golden	n/a	CSRD
KHMR Mountaineer Lodge	3	8	KHMR	tenured crown	CSRD
KHMR Gondola Station	2	4	KHMR	tenured crown	CSRD
KHMR Jellybean Lift	1	1	KHMR	tenured crown	CSRD
KHMR Retail Store	2	2	KHMR	tenured crown	CSRD
KHMR Palliser Lodge	1	2	KHMR	tenured crown	CSRD
KHMR Storage Shed	1	1	KHMR	tenured crown	CSRD
KHMR Day Lodge	14	13	KHMR	tenured crown	CSRD
KHMR Glacier Lodge	3	10	KHMR	tenured crown	CSRD
KHMR Catamount Lift Station	1	1	KHMR	tenured crown	CSRD
Nicholson Bridge	2	3	Nicholson	Min of Transportation	CSRD
St. Pierre farm	2	1	Campbell Rd area	private	CSRD
Mitchell Rd-Palumbo Estates	unknown	unknown	Mitchell Rd	private	CSRD
Tobler farm - Campbell Rd	3	3	Campbell Rd	private	CSRD
Columbia Wetlands Outpost structures	unknown	unknown	Parson	CWWMA - crown	CSRD
Philips - private property	1	1	Parson	private	CSRD
Canfor property	2	2	Parson	Canfor - private	CSRD
Jack's Barn	4	4	Parson	private	CSRD
Warner's	0	3	Brisco	private	RDEK
Brisco Barns	unknown	unknown	Brisco Wood Preservers Ltd.	private	RDEK
BPP Green	1	1	Brisco Wood Preservers Ltd.	private	RDEK
BPP Mid	1	5	Brisco Wood Preservers Ltd.	private	RDEK
BPP-STS	1	2	Brisco Wood Preservers Ltd.	private	RDEK
BPP Wetland	2	2	Brisco Wood Preservers Ltd.	private	RDEK
BPP Shack	1	1	Brisco Wood Preservers Ltd.	private	RDEK
BPP Main	25	32	Brisco Wood Preservers Ltd.	private	RDEK
Brisco Riding Club	1	1	Brisco	private	RDEK
Zehnder Brisco Farm	1	1	Brisco	private	RDEK
Kindersley Rd	5	3	Edgewater	private	RDEK

Zehnder Ranch	10	4	Invermere	private	RDEK
Home Hardware	6	7	Invermere	private	RDEK
Town and Country Feeds	1	1	Invermere	private	RDEK
Fairmont Barn	1	3	Fairmont Hot Springs Resort	private	RDEK
Fairmont HS Resort 1	5	5	Fairmont Hot Springs Resort	private	RDEK
**Fairmont HS Resort 2	1	1	Fairmont Hot Springs Resort	private	RDEK
**Fairmont HS Resort 3	1	1	Fairmont Hot Springs Resort	private	RDEK
Fairmont HS Resort 4	1	1	Fairmont Hot Springs Resort	private	RDEK
Fairmont HS Resort 5	2	1	Fairmont Hot Springs Resort	private	RDEK
Fairmont HS Resort 6	1	1	Fairmont Hot Springs Resort	private	RDEK

Appendix 4. Cliff swallow nest sites detected during the 2020 CVSP.

Location name	Survey Date	# of nests observed	Notes
Donald Bridge	May 24	10	13 partially or completed nests on north side, none on south side.
Donald Bridge	July 3	24	1 nest on upstream (north) side. On westbound (downstream) side: cluster of 4, cluster of 7, cluster of 3, one, cluster of 6, one. 4 active, others unknown.
Blaeberry bridge	May 24	13	13 partially built nests on south side of bridge
Blaeberry bridge	June 11	63	
Blaeberry bridge	June 26	66	Most nests occupied with swallows, but not all could be seen. Some swallows still foraging.
Blaeberry bridge	June 30	66	66 nests fully built nests, unsure of occupancy.
KH Palliser Lodge	May 30	4	Estimated survey date. Main surveying was done for BARS.
KH Retail Store	May 30	1	This nest was built on top of an old BARS nest. Estimated survey date. Main surveying was for BARS.
KH Storage Shed	May 30	3	Estimated survey date. Main surveying was for BARS.
KH Day Lodge	May 30	2	Estimated survey date. Main surveying was for BARS.
Glacier Lodge	May 30	14	Estimated survey date. Main surveying was for BARS.
Nicholson bridge	June 5	27	Windy, 4 nests seem to be occupied, more nests likely occupied.
Nicholson bridge	June 10	23	Warm evening. More nests completed and additional nests. 23 seen to be occupied.
Nicholson bridge	June 19	35	Another nest completed. 2 more nests, no apparent adults within. 27 seen to be occupied.
Nicholson bridge	July 20	35	27 seen to be occupied.
Parson Bridge east	May 19	63	48 on the south side and 15 on the north side. 63 active, most still being actively built.
Parson Bridge east	May 24	69	North side remained at 16. South adjusted to 53. Once again, we saw many busy swallows building nests.
Parson Bridge east	June 2	69	nest building
Parson Bridge east	June 9	69	High water and not having "good" binoculars made viewing more difficult. Breezy and overcast. Only saw 3 swallows. Wondered if the lack of sighted birds meant they were sitting on eggs.
Parson Bridge east	June 16	61	North side: Birds flying in and out of some nests. Head sticking out of nest and appears to be sitting on eggs. South side: Birds flying in and out of some nests. # 53 had babies as mom threw poop out. Nest # 32 looked like a tea cup. The following nests failed 13, 14, 16, 25, 28, 30, 51 & 52. Nest 33 is now 2 nests named A and B.
Parson Bridge east	June 30	61	North side: Feeding was happening in nests # 1, 8, 9, 10, & 11. Babies heads were sticking out of # 4 & 5. South side: Feeding going on in nests 2, 4, 5, 7, 20, 21, 26, 27, & 33. The following nests were active but not clear if still egg sitting or feeding babies 1, 19, 23, 24, 31, 34, 35, 37, 38, 40, 42, 43. # 12 had a head sticking out. It appeared in the following nests the babies were just about ready to fledge as mom was sitting on the outside of the nest with the babies peeking out # 45, 46, 47, 48, 50. It appeared that the babies in nest 49 fledged as we watched.
Parson Bridge east	July 14	59	North side: Nests 1, 2, 3, 4, 5, 7, 10, 11, 12, 14, 15, 16 were active with feeding. # 8 and 9 had failed. South side: Nest 1, 1 A & B, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 23, 24, 15, 26, 28, 29, 30, 31, 33, 34, 37, 38, 39, 40, 41, 42, 44, 45, 46, 47, 48, 49, 50, 51, 52 were active with feeding. Nests 33, 34 and 44 were teacup shaped and had birds sitting in them. It seemed that these could be beginning to fail although it was difficult to tell.
Parson Bridge east	July 28	0	There were no swallows remaining in any of the nests on either bridge. Some nests had already collapsed. We were surprised to see so many collapsed and realized just how fragile these nests are. North side: Nests 8 and 9 had collapsed. South side: Nests 9, 10, 12, 24, 28, 30, 33, 35, 37, 38, 39, 40, 43, 44, 48, 50, 51, and 52 had collapsed.
Parson Bridge middle	May 19	0	No swallows were seen at the middle bridge although there were remains of 2 CLSW nests from previous years.
Parson Bridge west	May 19	0	There were no swallows or activities on the West Bridge.
Parson Bridge west	May 24	0	No activity.

Parson Bridge west	May 31	0	swallows nest building. Not a monitoring day but happened to be in the area.
Parson Bridge west	June 2	9	Swallows nest building. Water rising with spring runoff. North side: 5 active nests and 3 nest building. South side: 4 active nests and possibly 1 nest building.
Parson Bridge west	June 16	7	North side: Nests 1, 2 & 7 had birds in the nest. # 4 A & B are teacups. # 5 is still not finished. South side the condo in the middle contains at least 4 nests, possibly 5, of which 3 have birds sitting in them. Nest # 1 failed.
Parson Bridge west	June 30	8	North side: nests # 1, 2, 3, 4, and 6 were active. South side: Of the 4 nests 3 were active.
Parson Bridge west	July 14	9	North side: Nests 1, 2, 3, 4, 5, and 7 were active with feeding. South side: Nests 2, 3 and 4 were active with feeding.
Parson Bridge west	July 28	0	North side: Nests 3, 4, 5 and 6 had collapsed. South side: Nests 2, 3, 4, and 5 had collapsed.
Columbia Valley Elementary School	May 30	1	On the school building only 1 active nest stayed all summer beginning in May. May 30 the nest was close to complete and after that we saw the swallows busy every time we visited the site. Estimate there were 4 or 5 fledglings.
Canfor building - Parson	May 25	unknown	Volunteer looked through photos and saw 3 CLSW on a photo at the same time at Canfor. Unsure about nest # as I can not see inside those buildings there. We do not have permission to go into the Canfor building, although permission was requested.
Canfor building - Parson	May 30	unknown	Volunteer looked through photos and saw 3 CLSW on a photo at the same time at Canfor. Unsure about nest # as I can not see inside those buildings there. We do not have permission to go into the Canfor building, although permission was requested.
Spillimacheen Bridge	July 16	32	Cliff swallows at Swing Bridge on Westside Road. 1100 to 1200 July 16, 2020. 32 nests counted on south side of bridge. Gerhardt observed a sample of 13 nests to see if swallows were coming and going from the nest. Adult swallows were observed at all the nests within a 5-minute time period.
Brisco Barns	July 20	6	Several cliff swallow nest in building.
Brisco Bridge (Botts Channel)	July 5	3	2 nests are active.
Brisco Bridge (Main)	May 14	10	n/a
Brisco Bridge (Main)	July 5	7-8	Many nests looked like they had been active this year, but already fledged.
Brisco Pole Plant	July 5	32	10 on main building with 32 BARS nests. 19 CLSW nests on building as you enter work site, 1 at shack near wetlands to north, 2 on main BARS building at back. All CLSW gone by July 26/20.
Athalmer Bridge N side	June 13	6	Adults seen entering/exiting nests. 28 total nests.
Athalmer Bridge N side	June 27	13	As above but more entries/exits seen.
Athalmer Bridge N side	July 14	0	No birds seen.
Athalmer Bridge S side	June 13	9	Adults seen entering/exiting nests. 25 total nests.
Athalmer Bridge S side	June 30	8	American Kestrel put its head into at least 6 nests but did not extract any chicks.
Athalmer Bridge S side	July 15	0	No activity. 2 BANS seen flying over river.
Zehnder Ranch main shop	July 5	17	Total nests seen were 17. All cliff swallows gone by Aug 10.
Zehnder Ranch farm house	July 5	1	Was a barn swallow nest, which was taken over by CLSW and turned into CLSW nest.
Zehnder Ranch barn	July 5	6	Total active nests seen were 2. Put up ledges to hold up nests. Still one nest with young Cliff swallows in it on August 23rd 2020
Zehnder Ranch private house	July 5	4	Total active nests seen were 2. Found 2-3 dead young on the ground. All nests fell down.
Canal Flats bridge	July 7	19	No swallows seen at nests, could have been on eggs or out foraging. All nests were either underneath the bridge, or on the east side

Wildsight launches Columbia Valley Swallow Project

By Claire Palmer

The Columbia Valley Swallow Project (CVSP), a two-year project with the purpose to determine the locations of nest sites to aid in the conservation of swallows and their habitats is set to begin this year.

Nest locations and nest success will be used to inform the management of nesting sites in the Columbia Valley (Canal Flats to Donald).

Collected data will also contribute to provincial and federal recovery planning and implementation processes.

In year two, the emphasis of the CVSP will be on-the-ground stewardship and conservation activities such as erecting artificial nesting structures on private land.

This swallow project will also be beneficial in terms of providing information to the public about the Migratory Birds Convention Act and the obligations it administers.

This will assist private landowners, empowering them regarding their responsibilities to protect nests.

Recently, both the Barn Swallow and Bank Swallow were listed as threatened



The Barn Valley Swallow is one of many endangered species in the Columbia Valley a bird conservation project will help to protect. (Contributed)

species under the Canada's Species at Risk Act. There is a lack of information on the status of swallows in the Columbia Valley, including

where important habitats (such as nesting and roosting locations) are located, but it is well known that both Bank and Barn Swallows do breed

and feed in the Columbia Valley, according to Rachel Darvill, the program biologist. "There is a need to undertake inventory work to determine nesting locations so that hands-on stewardship activities, such as habitat enhancement (i.e. artificial nest-

ing structures), can be best directed in 2021 to conserve swallows and their habitat," wrote Darvill in a statement. "Many bird populations are declining at an alarming rate due to a number of threats including habitat destruction, recreational disturbance and

climate change."

A new study published in September 2019 estimates 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.

Even the more common bird species such as swallows are facing population declines.

Swallows are beneficial insectivores and iconic species that many Columbia Valley residents appreciate. Swallows have intrinsic value and play an important role in pest management.

One individual bird eats up to 850 insects such as mosquitoes daily.

The CVSP is project of Wildsight Golden, developed and managed by contractor Goldeneye Ecological Services with financial support from Columbia Basin Trust, Columbia Wetlands Stewardship Partners, RDEK's Columbia Valley Local Conservation Program, Wildsight Invermere and Wildsight Regional.

For those who would like to participate in monitoring activities, know of any Bank or Barn Swallow nest sites or want more information, contact the program biologist Rachel Darvill at rachedarvill@gmail.com.

Columbia Valley Swallow Project going strong

By Claire Palmer

In April 2020, biologist Rachel Darvill launched the Columbia Valley Swallow Project (CVSP), to increase awareness for swallow species and their conservation status as the numbers of swallows continues to decline across Canada.

The project came about as a result of Darvill's previous research, where she dedicated five years to studying wetland birds up and down the Columbia River, from Canal Flats to Donald.

The main goals of the CVSP are to build increased awareness, coordinate volunteers to inventory and monitor swallow nests, with plans in the next year to erect artificial nesting structures for swallows to increase habitat availability.

With the help of 69 volunteers this spring and summer, the team located 134 swallow colonies in sandy banks, with 98 con-

firmed to be active bank swallow colonies. The high number of bank swallow colonies in the Columbia Valley indicates this region provides significant habitat for this species, according to Darvill.

Volunteers also located 17 barn swallow nest sites, including a significant colony in Brisco with at least 32 active nests.

Nesting sites are of particular interest to Darvill, saying while individual birds may or may not return to reuse a specific nest or burrow, nesting colonies are reused by swallows year after year. Threats to nesting sites could further reduce population numbers of these at-risk birds.

"This area is critical for bank swallow populations because of the unique habitat found here," said Darvill.

She noted the vertical, glacial, clay-like banks adjacent to the Columbia Wetlands and lakes are perfect

for colonies – soft enough for nest digging, but hard enough so that they don't collapse.

The adjacent grasslands and marshy areas are prime foraging habitat for these aerial insectivores (birds that eat insects) like the swallow, whose average weight is only 10-18 grams, but can eat up to 850 insects, such as pesky mosquitoes, per day.

Darvill will soon send the recently compiled CVSP data to Environment and Climate Change Canada, which assesses potential areas for bank and barn swallow critical habitat designation.

She has applied for funding to launch a five-year follow-up project, which will oversee the installation and monitoring of artificial nesting structures at sites where current nests are unwanted due to health or aesthetic concerns.

She also aims to restore degraded

breeding sites, monitor existing colonies, and eventually plans to tag bank swallows to learn where they go during winter and to better understand movement patterns around their breeding colonies.

For those eager to help assist swallow conservation, Darvill suggests keeping your outside lights off at night, as exterior light pollution can strongly disrupt nocturnal migratory behaviour through disorientation.

She also encourages bird-friendly yards by

installing nest cups or boxes and by keeping cats away from nests and young newly fledged birds.

People can also participate in volunteer projects such as the Christmas Bird Count or the swallow citizen science project with Wildsight Golden.

To learn more about this swallow project, visit: <https://wildsight.ca/branches/golden/columbia-valley-swallow-project/>.

A final report on all the project will be available by the end of the year.



Appendix 7. Swallow conservation brochure created by the CVSP.



2.9 Billion Birds Gone
 A recent study estimates that 2.9 billion birds of various species have disappeared in Canada and the United States since 1970. Even once common birds like barn swallows are facing significant population declines. You can help reverse this decline!

Interested in becoming involved with swallow conservation in the Columbia Valley, or in swallow habitat enhancement on your private land? If so, please contact us.

Contact information:
 Rachel Darvill, Project Biologist
 e: racheldarvill@gmail.com

COLUMBIA VALLEY SWALLOW CONSERVATION
 FOR SPECIES AT RISK

Here are some things you can do to help birds:

- Make your windows obvious - there are a variety of window treatments available.
- Keep outdoor lights off during migration, lights can disorient birds.
- Keep your cats indoors.
- Volunteer on a bird conservation initiative in your area.

Photographs and brochure design by R.Darvill. Support for the Columbia Valley Swallow Project was provided by:





A single Barn Swallow can consume 60 insects per hour or a whopping 850 per day!

Prior to European settlement, barn swallow's nesting habitat was associated with natural features such as holes, caves, crevices and ledges on rocky cliff faces. Since European settlement, barn swallows have largely shifted their habitat preference to human-made structures, such as bridges, buildings and ledges, although they do still nest in natural habitats too. Their population has declined by **76%** over a 40 year period in Canada.

The barn swallow (*Hirundo rustica*) is a blue-listed species in BC and is classified as threatened federally, under the Species at Risk Act.

The bank swallow population in Canada has declined by **98%** over a 40 year period. Reasons for this significant decline are not well understood, but are thought to be cumulative, including loss of breeding and foraging habitat, collision with vehicles, widespread pesticide use, climate change and destruction of nest sites. The bank swallow (*Riparia riparia*) is yellow-listed in BC and is classified as threatened federally, under the Species at Risk Act.



In 2020, the Columbia Valley Swallow Project located 134 swallow colonies in sandy banks, with 96 confirmed to be active bank swallow colonies and an estimated 7,578 active burrows! This high number indicates that the Columbia Valley provides significant habitat for bank swallows. The project also located 17 barn swallow nest sites, including two large colonies, but it's highly likely there are more remaining to be discovered.

All migratory birds, their nests and their eggs, are protected by provincial and federal laws and are not to be disturbed during the breeding season.

Did you know the Columbia Valley is home to six species of swallow!

Please Protect Swallow Nests

Did you know that swallows are facing severe population declines around the world?

Did you know that the productivity of nesting swallows is associated with the presence of previous years' nest structures?

Did you know that nests of migratory birds are protected all year, whether they are being used or not?

Please leave swallow nests intact.

It's the right thing to do,
and it's the law.

The Columbia Valley Swallow Project is working to identify and protect swallow nesting sites.

If you have any questions, please contact the Program Biologist at racheldarvill@gmail.com.



Financial support for the Columbia Valley Swallow Project is provided by:

