Environment and Climate Change Canada
Canadian Nature Fund Community-nominated priority places for Species at Risk

DL SAR Beaver 2025-2026
Species at Risk in the lower Duncan-Lardeau Valley

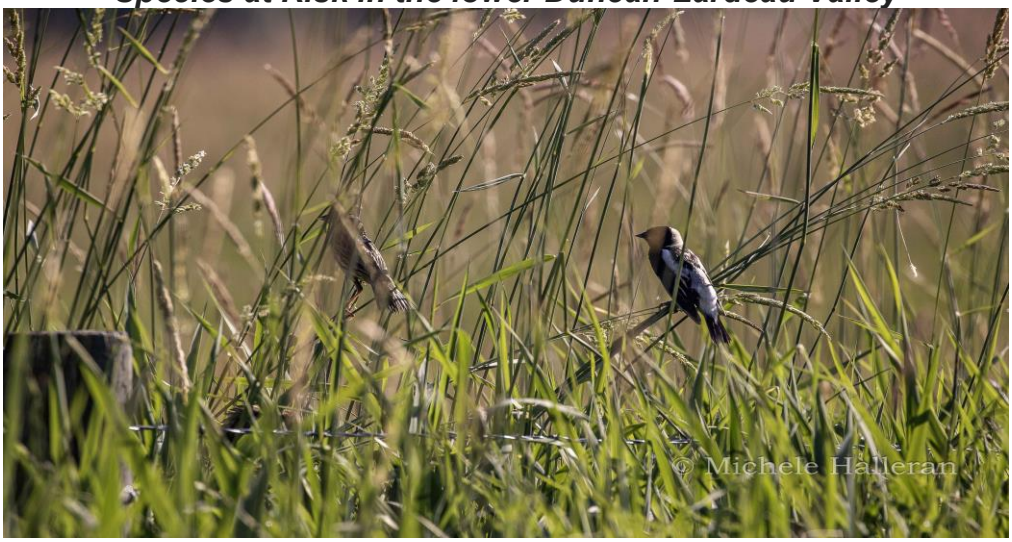


Photo: Michele Halleran

Photo: Michele Halleran

Photo: Amy Wilson

Kootenay Connect is a program facilitated by the Kootenay Conservation Program

Environment and Climate Change Canada / Environnement et Changement climatique Canada

British Columbia
Ministry of Water, Land and Resource Stewardship

Contents

Figures and Tables

Executive Summary

The 3-year subproject DL SAR Beaver has been part of a landscape-scale initiative with Kootenay Connect at the north end of Kootenay Lake. Surveys and investigations for a small subset of 'umbrella' and 'indicator' species classed federally or provincially at Risk (SAR) and/or locally of concern have been undertaken, in an effort to assess threats and related needs for protection and stewardship.

Surveys have confirmed breeding locations used by Pacific Treefrog and Western Toads; confirmed the presence of Sora and other marsh bird species in 13 out of 14 surveyed wetlands; confirmed nesting by 20 Bank Swallows at one riverbank nest site; confirmed nesting by 2+ pairs of Common Nighthawk and detailed winter roost tree use by Great Blue Herons.

Available information indicate that numbers and diversity of the wetland-dependent species have declined over the past 10 to 15 years, and that particularly sensitive indicator species such as Pied-billed grebe and American Bittern may no longer be present. Assessments by the present report suggest that threats, limiting factors and problems affecting the project focal species may include (1) wetland deterioration due to low inflows/ground water as a result of low winter snow packs, dry hot summers and management regime of the lower Duncan River; (2) direct mortality on Highway 31, a problem for Western Toads in particular; and (3) reduction of aquatic insect populations through mosquito control program. Recreational disturbance in key locations in sensitive seasons is an emerging issue. The lack of management authority and clear protected status for many of the wetlands on the Duncan flats is also an ongoing threat.

Recommended measures for the coming years include:

1. Continue to encourage beavers and marsh wetland recovery/expansion along Argenta slough and elsewhere.
2. Continue annual surveys of marsh birds as important indicators of habitat conditions, as well as listening to surveys for Pacific Treefrogs and Western Toad tadpole surveys applying protocols consistent with 2023-2025 surveys.
3. Address Western Toad mortality along Highway 31 by continued monitoring of mortalities and educating drivers.
4. Initiate more formal protection and management authority over riparian lands on the Duncan Lardeau floodplain as described in DLSAR – Connectivity project.

1.0 INTRODUCTION

The lower Duncan Lardeau has long been recognized for its importance to wildlife, yet very little site-specific information is available to resource managers, permit reviewers, highways contractors or landowners on the occurrence of species at risk and critical habitats in this area to consider in planning. This is a problem, as increasingly the needs of wildlife and people intersect in this rugged region, where the flats and lower hillsides are the human focal zones as well as being critical for wildlife.

One of the objectives of the 3-year DLSAR subproject has thus been to update occurrence and habitat use information for species at risk SAR on the Duncan - Lardeau floodplain and adjacent lower slopes, and to make this information available to relevant agencies or property owners interested in stewardship. The focal species list represents a small fraction of the species present in the project area, but most of the focal species are considered to be indicators (of environmental conditions) or 'umbrella' species, so meeting their needs for stewardship may also meet the needs of others. All are closely associated with the riparian zone, in decline based on anecdotal observations over the past 30+ years, and either listed Provincially and/or Federally At Risk or of Special Concern or locally of concern /at risk. Surveys for SAR were undertaken in all 3 years.

A second objective and the focus of 7DLSAR Beaver (2025-26) has been to incorporate the findings of the SAR subproject into the work of two companion subprojects DLAR Connectivity and Beavers/Wetlands. Incorporating species-specific needs (especially indicator species) into landscape- scale approaches to connectivity, protection and stewardship can be a good cross-check on likely (or actual) effectiveness.

A third and perhaps most important objective of the SAR subproject has been to identify and carry out 'hands-on' measures for addressing threats and issues. In this 3rd and final year, we have continued hands-on projects begun in 2024 and have identified a few priority measures to carry on into the future.

Focal species have included Bank Swallow (BANS), Bobolink (BOBO, Common Nighthawk (CONI, Great Blue heron (GBHE) Western Painted Turtle (CHPI), Western Toad (ANBO), Pacific Treefrog (HYRE) and the 'Secretive Marsh Bird' group (Sora (SORA)(Virginia Rail, American Coot, Pied-billed Grebe). Additional reports of "new" SAR reported to the author by reliable observers from 2023 through 2025 have also been recorded, and that list includes Rubber Boa, Peregrine Falcon, Lewis's Woodpecker and Western Screech Owl.

2.0 METHODS

All surveys were intended to confirm occurrence, i.e., they were 'Presence/Not Detected' surveys, and do not purport to be measures of abundance.

Surveys included call play-back surveys for 'Secretive Marsh birds' repeated at 14 stations 3 times per year for all 3 years applying a slightly adapted version of the Prairie and Parkland March Monitoring protocol (Birds Canada 2010) consistent with the methodology recommended by Conway et al (2011) and very similar to methodology used in the Columbia Wetlands by Darvill et al (2022).

'Listening surveys' were conducted for Pacific Treefrog presence as a potential surrogate for quiet Western Toads with 3 surveys per year in 2023 and 2025 at the same 12 stations. Tadpole searches were conducted at the same wetlands, as well as at the head of Kootenay Lake. Stations used for Marsh birds, frog-listening, and tadpole searches are shown in Figures 1 and 2. Wing-boom surveys for Common Nighthawk were conducted in all 3 years applying the Canadian Nightjar Survey Protocol (2020). All other species were documented by deliberate searches and observations in known or potential locations.

3.0 RESULTS

Figure 2 shows the locations of all the focal species resulting from surveys, searches and repeat incidental sightings by reliable observers during the study period. Figure 1 also portrays wetlands (marshes, swamps and ponds) and the locations of the 14 marsh bird and amphibian monitoring stations to provide perspective. It is important to note that both that survey locations and incidental locations have been influenced by accessibility and /or, in the case of incidental locations, by where people go recreationally or where their homes are. And in the case of amphibians and marsh birds detected or not detected at monitoring stations it is important to recognize that there are additional wetlands on the floodplain.

The key findings of this 3-year project are summarized in Table 1, followed by expansion on the Marsh bird survey results as these were not discussed in Year 2 or 3 and are of interest.

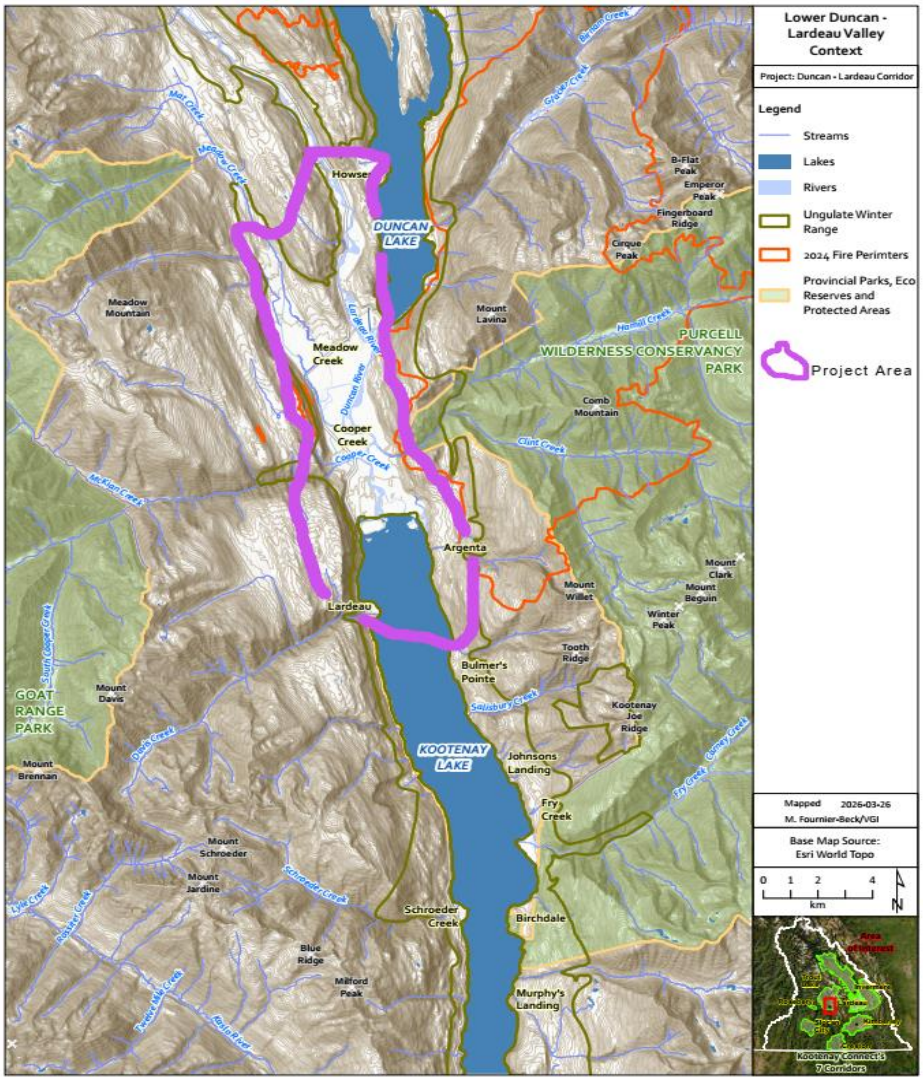


Figure 1. Project area of DL projects part of Kootenay Connect in 2023-2026.

Table 1. Abbreviated summary of 2023-2025 SAR Results

Species	Surveys 2023-2025	Status / Findings	Apparent Threats, Deficiencies and Problems	Potential Measures Comments
ANBO Western Toad	Searches or tadpoles and dispersing toadlets in know and potential locations. 'Listening surveys' for HYRE as potential surrogate 3 time per year for 2 years.	Noticeable decline especially on east slope and east side wetlands in past 20 years. Breeds in wetland on flats and disperses to/on flats and to hillsides. Also breeds in upland wetlands about little known. Monitoring at small wetland pools showed major drop in tadpoles in 2024-25, but thousands of tadpoles were present in the shallows at the head of Kootenay Lake/DL Delta June-July from which successful toadlet dispersal occurred.	**Desiccation of wetlands and microhabitats **Reduction of aquatic/semi-aquatic insect populations (toad food) due in part to mosquito abatement program **Removal of woody debris by fire smarting (and fire) **Mortality on Highway 31. Nineteen (19) dead toads were found and mapped by cyclist M.Johnston in 2024-25 Locations of dead toads are on Figure 2.	*Identify and protect moist micro-refugia and networks for toads *Recognize role of delta shallows in dry years and assert conservation management authority. *Fire-smart education * Driver awareness efforts. Further research potential for barriers along Highway 31.
BANS Bank Swallow	Yearly monitoring 2023-2025	One known nest colony with 20- nests and 40 + BANS present along lower Duncan River. Historically occupied locations not currently suitable	Lack of stable, fine silt banks locally; ongoing erosion and breakage of riverbank at present nest site Fewer flying insects for food than 20-30 yrs ago	Although on the edge of NTBC-owned land, there appears to be no good solution to the bank erosion here.
BOBO Bobolink	Intensive monitoring from May-Aug 2024 in 2024. Incidental records other years.	Known nesting in Meadow Creek hayfields since 1980s. The NTBC meadow supported 5 + nesting pairs of BOBO in 2024, with additional nesting pairs in surrounding hayfields	Hay-cutting too early: Fledglings recorded learning to fly July 20-26 and using long grass to do so. Family groups still using long grass into August This is later in the season than indicated by the mid July Federal guidelines which at least some of farmers are following.	Large meadows: 5-10 ha patches with frequent cutting; leave other patches long, ~ 3 + yr rotations. Small meadows: leave clumps for structure; cut late (August+) nourish soil to keep grass lush.

Species	Surveys 2023-2025	Status /Findings	Apparent Threats, Deficiencies and Problems	Potential Measures Comments
CONI Common Nighthawk	Wing-boom listening surveys using standard protocol 2023,2024, 2025.	Two or three nesting pairs of CONI indicated by surveys Concentrated in the Meadow Creek area. See Figure 3.	There is no protection for the vulnerable ground nests in these open, somewhat industrial areas, and landowners/managers in most cases are not aware	Research ownership of the identified nesting vicinities and communicate appropriately.
CHPI Western Painted Turtle	Counts on basking logs, searches for nests/effort in created nest bed and other sites. Records of incidental sightings are reported.	One known nest site and resident population on Argenta Slough and sporadic occurrence reported throughout the project area. Major decline in nest #s at the Argenta site since 2021. High recent count of turtles on basking log = 32 in 2024. There were ~ 18 nest efforts (unsuccessful) in <u>other</u> locations along Argenta slough in 2025, most of them ~ 500m. north of the old nest site on the 'Wasden roadway'	Desiccation of wetlands, conversion to Reed canary-grass. Lack of deep ponds for over wintering Skunks preyed heavily on eggs when nesting #s were high. Anthro -disturbance on roadside too close to nest site	Support pond and wetland restoration; beavers. Supplement water supply as needed. Continue investigating turtle presence elsewhere on the floodplain. Encourage diversity of nest site locations. Reduce human disturbance near nest sites.
HYRE Pacific Treefrog	'Listening surveys' in May and June. Same stations as Marsh Birds	In 2023 and 2025 there were HYRE detected at all 12 monitoring stations.	Desiccation of wetlands and woodland microhabitats. Reduction in insect populations. No evidence of highway mortality which is of interest.	Identify and protect moist/wet refugia: Riparian zones; shaded deciduous woodlands

Species	Surveys 2023-2025	Status / Findings	Apparent Threats, Deficiencies and Problems	Potential Measures Comments
GBHE Great Blue heron	Nest searches by vantage point overviews before leaf emergence Dawn and dusk surveys for roosting herons in winter.	Known to occur locally for decades; no nesting yet confirmed. Feed in marsh wetlands, ponds and delta shallows in summer-fall. Roost November-March (daytime) in mature conifers on hillsides east of the flats. Estimated maximum of 10 herons roosting in 2023-2025. Juveniles are present in winter and in July on the lower flats.	In addition to wetland loss, herons are vulnerable to tree loss and human disturbance on private land in the vicinity of winter day-roost trees. Lack of knowledge on nest site location(s) is a weakness (do they fly to Balfour?)	Protection and stewardship of delta shallows and all wetlands will assist herons. For winter day roosts On hillsides , "Collaborative landowner stewardship initiatives" are proposed
'Presence-Not Detected' surveys were conducted by call playback surveys for the 3 species below at 14 stations surveyed 3 times per year or 3 years in May-June, 2023-2025. Seven (7) of the stations overlapped with stations sampled by J. Arndt 2013-2018 using the same survey method. Figure 2 and 3 show locations of monitoring stations.				
SORA **S**ora	As above	The most frequently detected species, at 13 out of 14 stations, highest counts along Argenta slough 2013-2018	Loss of tall emergent mixed-pond wetland area through desiccation resulting from climatic and water management factors Reduction in aquatic insect populations via mosquito abatement program	Restoration of tall emergent wetlands and ponds through encouragement of beavers and supplemental water supplies as needed. Start monitoring impacts of mosquito abatement program Continue call playback surveys
VIRA Virginia rail	As above	Detected at 6 out of 14 stations; mainly prior to 2015, but 10 detections at 4 stations on AS in 2023-25		
PIPG Pied-billed grebe	As above	Detected at 5 out of 14 stations, all on Argenta slough and all in years 2013-2014, none since		
AMCO American coot	As above	Detected at 6 out of 14 ; highest #s on Argenta slough 2013-15; 13 cumulative detections along AS in 2024-5		

In examining the Marsh bird data at the end of the DLSAR 3rd year, we have included the 2013-18 surveys set (with permission from Janice Arndt) along with our 2023-25 set and have generated a number of graphs, provided in Appendix A. A map (Figure SAR2) depicts the number of years that each species was detected at each station (out of 8 total survey years). There are graphs provided by species (cumulative detections per station, per year) and by station (cumulative species detections at each station per year).

In the 2013-2018 monitoring period, the highest numbers and diversity of the focal species were found at stations along Argenta slough (I to N) and especially at station K the "turtle pond". The numbers and diversity of species showed a general decline over the period, most marked in the last 2 years. During the DLSARBeav 2023-2025 monitoring period, the highest numbers and diversity continued to be detected at the Argenta slough stations I to N, although in 2023 these numbers were much lower than had been recorded at the same sites in 2013-18. Data from Stations I and J in 2024 and especially 2025 looked better in terms of species diversity and numbers, suggesting the ponds created by the translocated beavers may be exerting a positive and measurable influence. This positive finding concurs with reports from local birders.

It is not likely a coincidence that the highest numbers and diversity of this species group were found along Argenta Slough from Stations I to N in both monitoring periods. The Argenta Slough supports the only extensive area of tall emergent/open pond wetlands on the Duncan - Lardeau floodplain. This is -the 'hemi-marsh' state that Darvill et al (2024) refer to as preferred by many marsh bird species.

4.0 DISCUSSION

Virtually any effective restoration or protection of wetlands and riparian ecosystems in the Duncan-Lardeau can be expected to contribute to the conservation of the project focal species, as most are wetland-dependent. Beaver dams constructed in the 1980s along Argenta slough formed ponds that were held for decades afterwards, and the numbers/diversity of marsh birds, amphibians, dragonflies, painted turtles and other species during that period reflected healthy wetland conditions until approximately 2015. The new beaver occupants on Argenta Slough are gradually reviving those same conditions and need to be allowed to do so without human interference (dam destruction). See companion report 7DLSARBeaver _ Beav

Conserving special upland habitat elements required by species such as Western Painted Turtle (dry land nest sites) and Great Blue Heron (winter day-roost conifers) poses another challenge. One of the most concerning upland habitat requirements is the need by Western Toads for safe travel across Highway 31. Based on what we have learned so far, they do not cross in a sufficiently concentrated zone for barriers to be effective, so the only recourse may be to try to influence driver awareness.

A significant, additional, potential threat to local wetland ecosystem processes that is easier to ignore than acknowledge is the RDCK mosquito abatement program. Considering that mosquito larvae are the foundation of the wetland food chain and that most water birds - including the Marsh birds surveyed in the present project - feed on aquatic and semi aquatic insects that eat mosquito larvae, and that many young water birds feed directly on mosquito larvae, should the real impacts of this alteration to the system not be better monitored? The program is strongly and emotionally supported by a segment of the local residents. Many others have expressed their concerns regarding impacts on other species to the author privately, but they do not want to stir up controversy publicly. It would be easier if outside agencies took responsibility for examining this.

5.0 CONCLUSIONS and RECOMMENDATIONS

In conclusion, we found that indicator species Western Toad, Pacific Tree Frog, Great Blue Heron, Western Painted Turtle, and surveyed marsh birds Sora, Virginia Rail, American Coot, and Wilson's Snipe continue to be present in Duncan-Lardeau floodplain marshes, ponds and swamps. Western Toad breeding and successful tadpole metamorphosis also occurred in the delta shallows at the head of Kootenay Lake, and in 2024 and 2025 the greatest concentrations were located there, as many inland pools were dry. Common Nighthawk and Bobolink nesting occurred in all 3 study years in high-bench riparian meadows. Upland species of interest using habitats immediately adjacent to the floodplain includes Rubber Boa, Peregrine Falcon and Mountain Goat. Figures 2 and 3 together provide an overview of surveyed species locations and the graphs in Appendix A provide comparisons in marsh bird diversity and detections between monitoring stations.

Comparing 2013-2018 marsh bird data recorded by Janice Arndt to our 2023-2025 data and incorporating additional long term observations it appears that numbers and diversity of wetland -dependent species have declined over the past 10 to 15 years, and that certain

particularly sensitive species such as Pied-billed grebe and American Bittern may no longer be present. Wetland deterioration is believed to be the primary cause of the declines given that most valley bottom wetlands have been visibly deteriorating in the same period due to drought, high summer temperatures and flow regulation and the resulting dominance by Reed canary-grass. Wetland revitalization is thus the action that will provide the greatest benefit to their recovery, and marsh bird survey results from our 3rd year indicate there is great potential for this with the help of beavers.

Stewardship and protection of species at risk in the Duncan-Lardeau should ideally be addressed on a number of fronts concurrently.

Recommended measures for the coming years include:

1. Continue to encourage beavers and marsh wetland recovery/expansion along Argenta slough and elsewhere.
2. Continue annual surveys of marsh birds as important indicators of habitat conditions, as well as listening to surveys for Pacific Treefrogs and Western Toad tadpole surveys applying protocols consistent with 2023-2025 surveys.
3. Address Western Toad mortality along Highway 31 by continued monitoring of mortalities and educating drivers.
4. Initiate more formal protection and management authority over riparian lands on the Duncan Lardeau floodplain as described in DLSAR – Connectivity project.

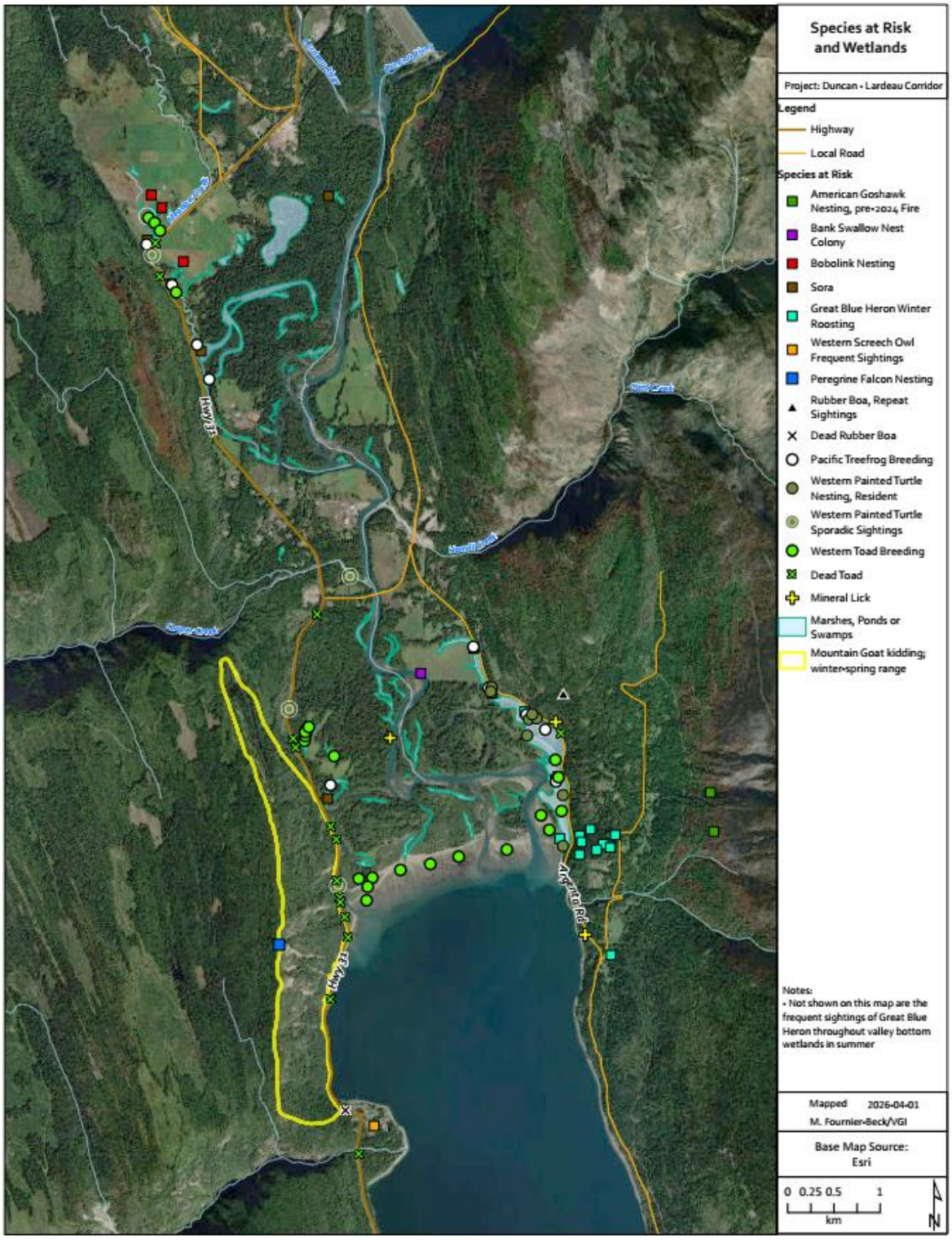


Figure 2. Species at risk: repeat sightings and survey detections.

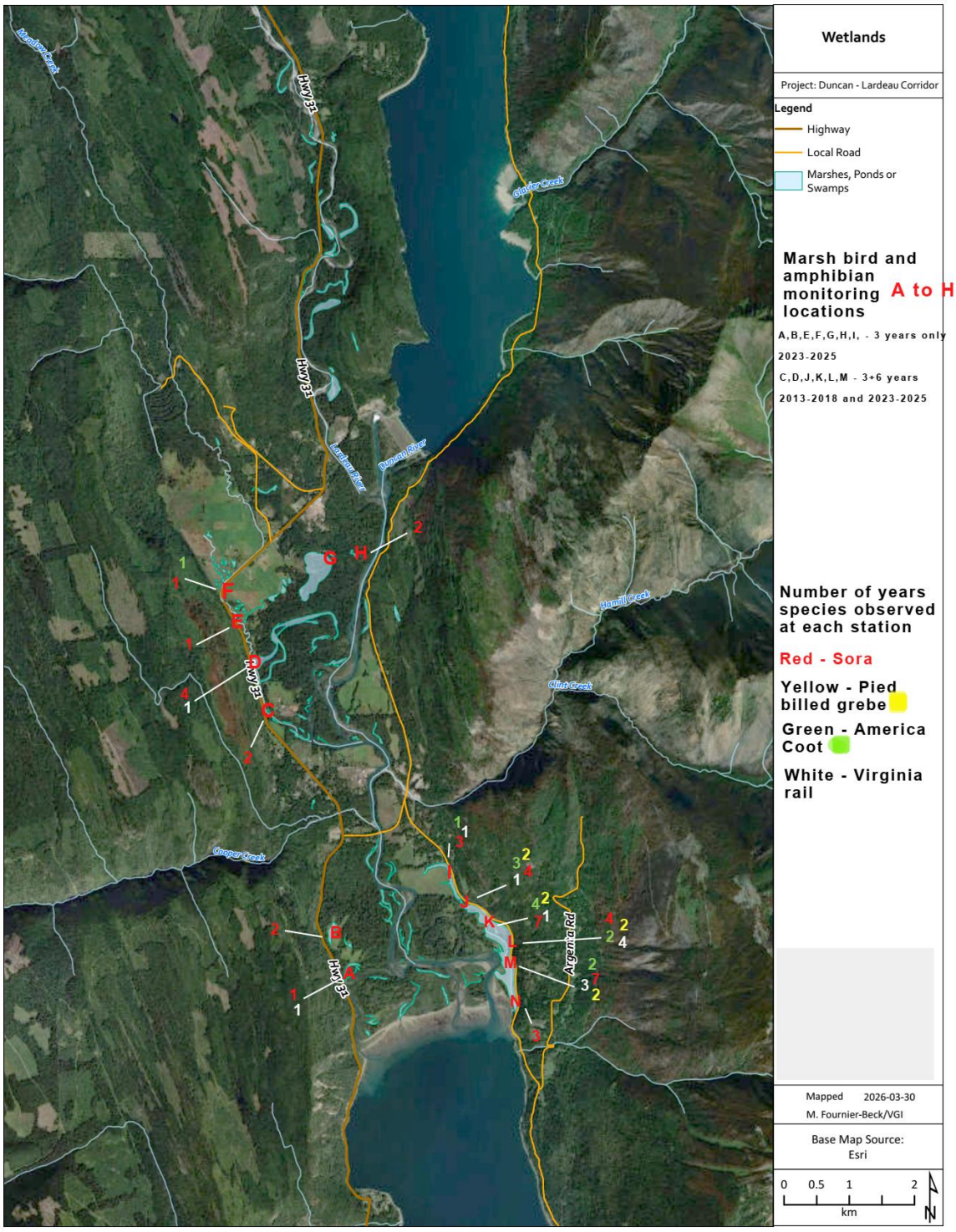
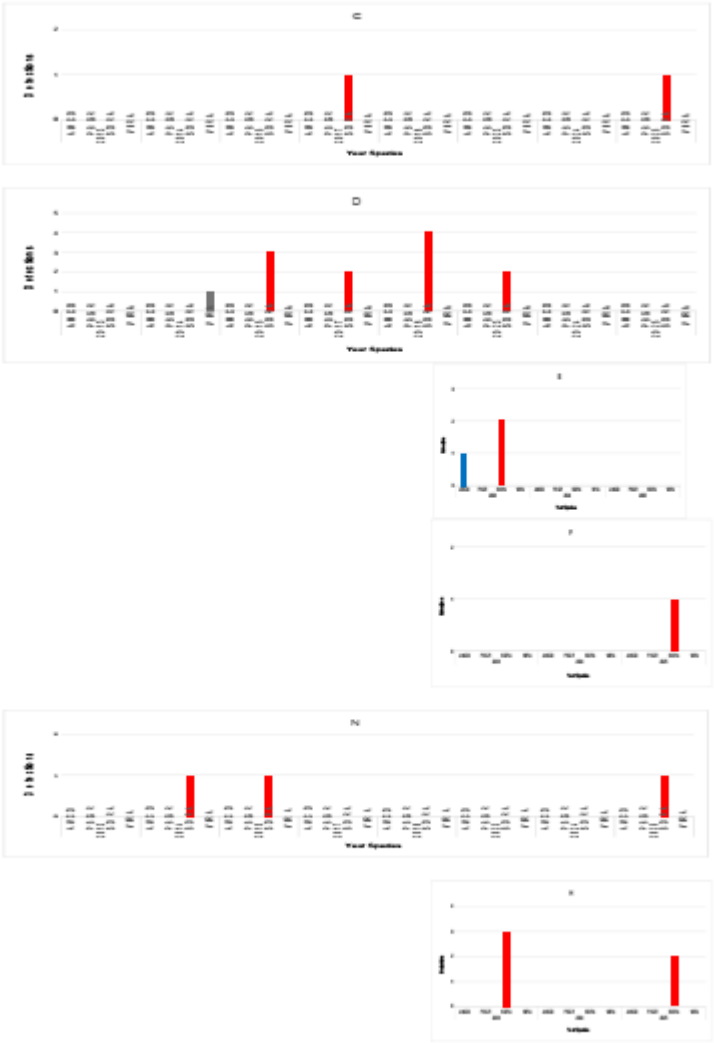


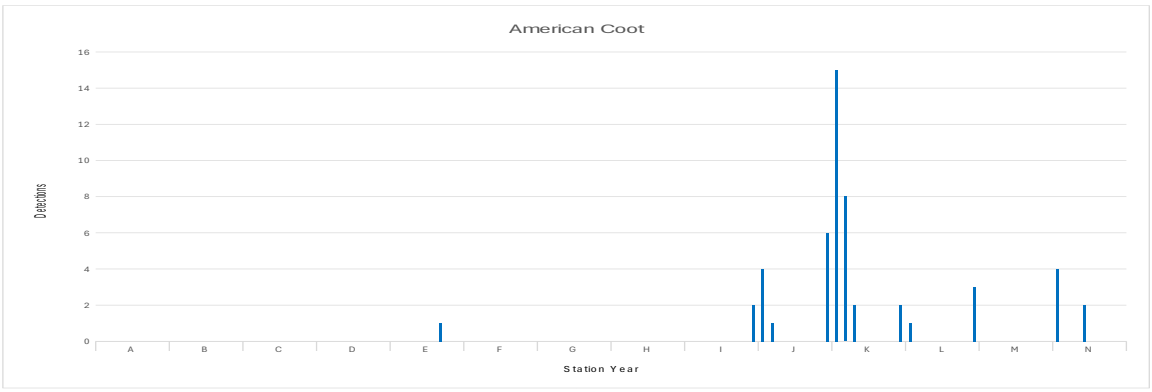
Figure 3. Marsh Birds survey stations and number of years each species detected at each station (8 survey years total, 2013-2018 and 2023-2025).

Figure 4. Cumulative annual detections at Argenta Slough marsh monitoring stations (north to south).

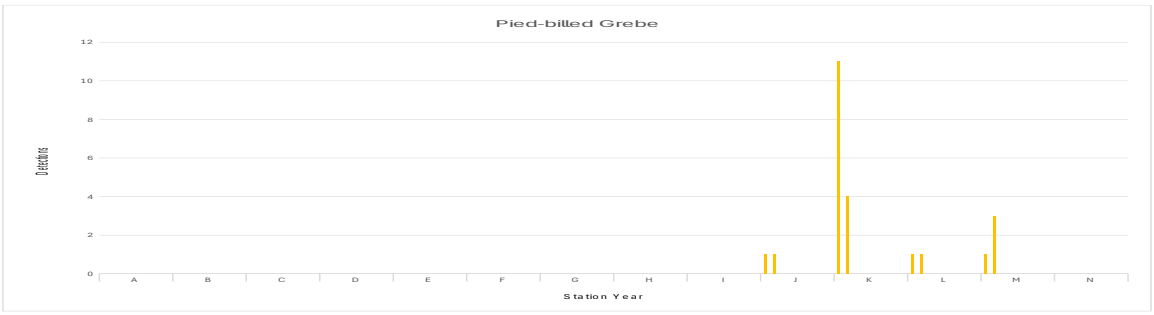


Cumulative annual species detections at various marsh monitoring sites on west side of DL floodplain

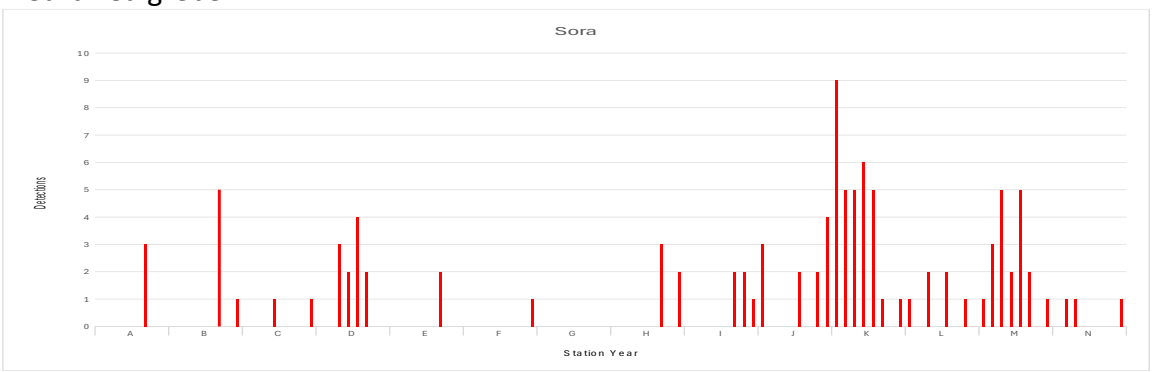
Figure 5. Cumulative annual detections at various marsh monitoring stations on the west side of the DL floodplain.



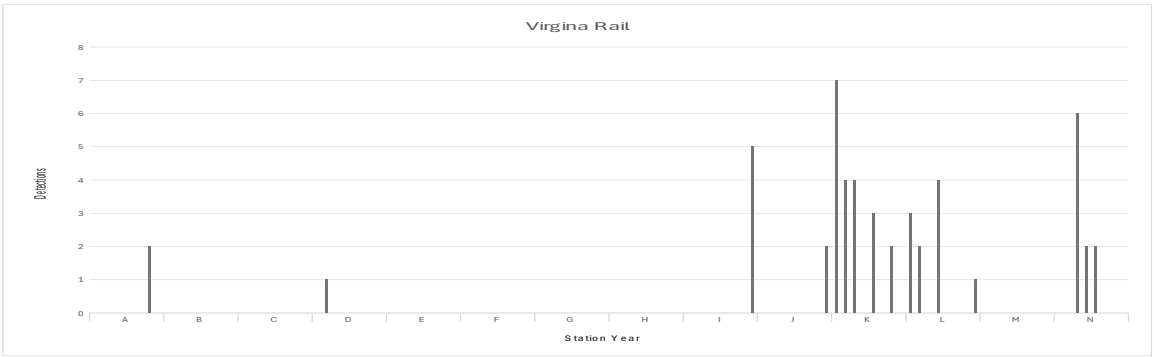
American coot



Pied-billed grebe

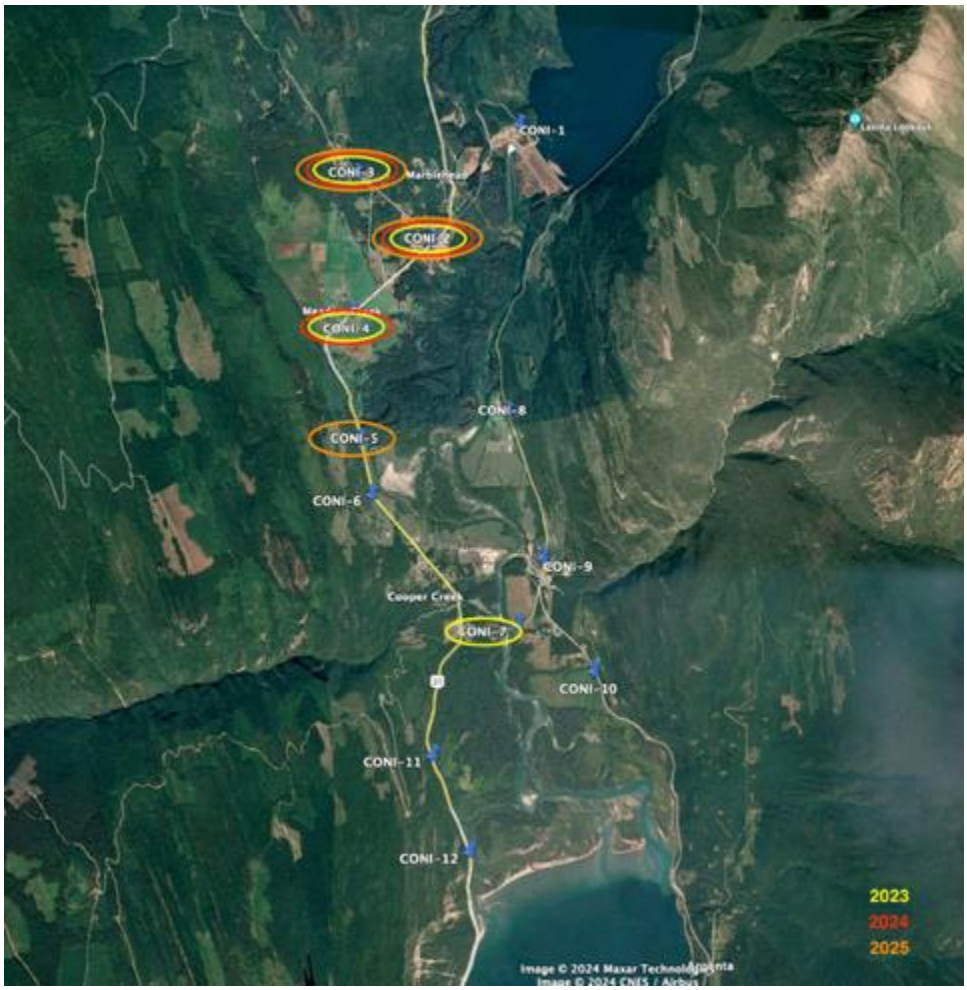


Sora



Virginia Rail

Figure 6. American Coot, Pied billed grebe Sora, Virginia rail: cumulative annual total detections per station.



June 2023, 2024, 2025 CONI detections showing survey station numbers

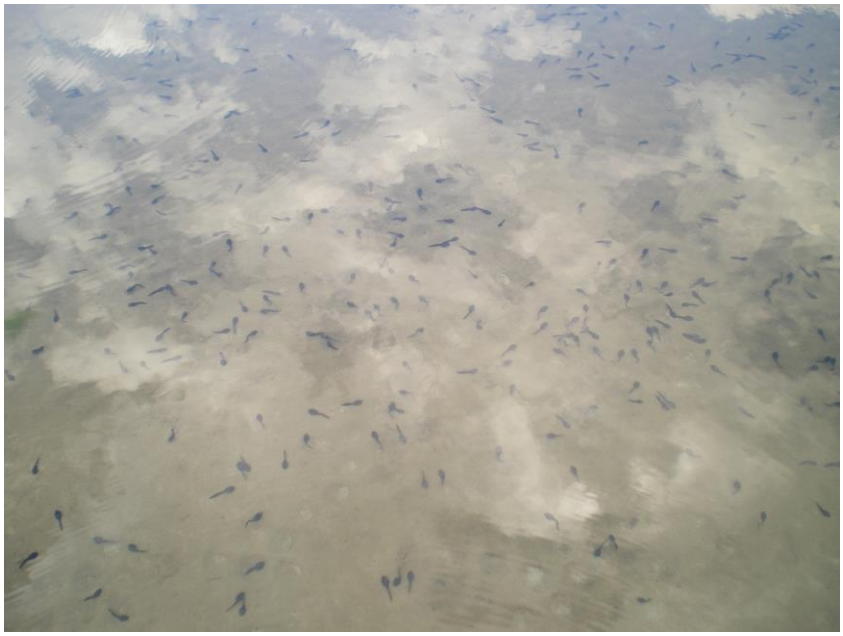
Common Nighthawk (CONI) - Cumulative detections per stop per year

Surveyors Amy Wilson 2023 - Sachi Snively 2024, 2025

Stop #	2023	2024	2025
1			
2	3	1	2
3	3	1	2
4	2	1	
5			1
6			
7	1		
8			
9			
10			
11			
12			
TOTAL	9	3	5

Figure 7. Nightjar (Common Nighthawk) Detections 2023, 2024, 2025.

Photos of interest



Western Toad tadpoles. Photo: B. Herbison

Both above photos: Michele Halleran
Bobolink illustrating use of fences and other structures in the meadows.

Photo: Amy Wilson
The one known bank swallow nest site along the lower Duncan River.

Fledgling and family using the tall grass July 11