Environment and Climate Change Canada

Canadian Nature Fund's Community-nominated priority places for Species at Risk

7DL SAR Beaver - Connectivity

Habitat connectivity in the lower Duncan-Lardeau: assessing priorities for stewardship and protection

Kootenay Connect is a program facilitated by the Kootenay Conservation Program

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British Columbia
Ministry of Water, Land and Resource Stewardship

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EXECUTIVE SUMMARY

In this final year of a 3-year project with Kootenay Connect, we overlaid present land ownership and protected status over mapped habitat features, species at risk locations and ecological rankings to assess gaps in protection and stewardship and to identify priorities for improvement. We found weak links in the protection of valley-bottom riparian habitats and riparian-upland travel connectivity for wildlife, but there are feasible options for addressing these gaps. The existing Nature Trust of BC titles and a loosely defined unit currently known as the Duncan Lardeau Conservation Properties (DLCPs) provide a foundation on which to build a viable habitat complex on the Duncan-Lardeau floodplain to endure into the future.

Priorities identified for attention include

1. Provincially-owned riparian areas

- Marshes, ponds and swamps around the edges of the floodplain
- Fluvial wetlands (islands; sandbars, willow/cottonwood ecosystems) along the river channel and Kootenay Lake
- Old/mature forested lots northeast of Meadow Creek and near Duncan Dam

These habitat components are integral to the floodplain ecosystem and to the function of adjacent and intertwined lands owned by the Nature Trust of B.C. At present, a lack of clear protected designation and management authority constrains habitat stewardship and protection and could pose a greater threat in coming decades.

2. Privately-owned floodplain lands

There a several undeveloped private lands that are also an integral part of the floodplain ecosystem. and used on a daily basis in conjunction with adjacent and intertwined NTBC lands . Any major habitat loss or development occurring on these lots would impact wildlife using the NTBC lands.

3. The Duncan Lardeau Conservation Properties

The geographical extent of this entity, its legal status and name are not clearly defined at present While these deficiencies may not pose a threat at present this could change in the future.

4. Connectivity between floodplain and uplands

There is no protected status associated with elevational connectivity for wildlife between the flats and adjacent slopes that link seasonal and daily habitats for wildlife and together function as landscape connectivity between the Purcell and Selkirk mountains. Most of these span several land ownerships titles and include Provincial land at mid to higher elevations.

To address the above priorities, it is recommended that a concerted effort be made in 2026-2027 to:

➔ Research and then act upon establishing a unified protected status and stewardship management authority for the provincial riparian lands identified on Figure 5 and the 'DLCP area beyond NTBC lands. The present deficiencies constrain habitat stewardship and could pose a greater threat in coming decades. Solidify the legal status of the DLCPs as part of this initiative.

➔ Initiate conversations and compile technical and legal details for at least 3 of the 10 identified Collaborative Landowner Stewardship arrangements in order of priority: Argenta

Slough// Hamill-Lake Ranch/Cooper-Lot 570 to address key riparian areas and elevational travel corridors where full securement is not feasible

➔ Communicate with MOF regarding protected or semi-protected status for the identified Provincially-owned surveyed lot and the non-legal OGMAs east of the floodplain which contribute to elevational connectivity.

1.0 Introduction

The importance of protecting and stewarding habitat for wildlife on the Duncan-Lardeau floodplain has been recognized and supported locally and throughout the Kootenay Region since the 1970s. As a rare, valley-bottom riparian area in an otherwise rugged, high elevation landscape, 'the flats' supports dynamic Black cottonwood ecosystems, wetlands and other habitat critical to Species at Risk; serves as a migration stopover for shorebirds, ducks and geese, as winter range for deer and elk and as habitat for a diversity of resident and transient mammals including large carnivores grizzly bears, cougars, lynx and wolves. Songbirds nest in the stands of black cottonwood and multilayered deciduous shrublands and rare marsh birds nest in the small wetlands around the floodplain edges. Of regional importance, the lower floodplain plays a vital role in landscape connectivity by providing a land bridge in between two large water bodies (Kootenay Lake and Duncan Reservoir), facilitating travel for terrestrial wildlife between the Purcell Wilderness Conservancy and the Goat Range Park in the Selkirks.

In this 3-year sub project we have tried to identify gaps in the presently protected status of key habitat features on the Duncan-Lardeau floodplain and adjacent lower slopes, including locations used by SAR and known wildlife travel corridors, in order to identify priorities for stewardship and improved protection.

2.0 Methods

Habitat features. Mapping of habitat features utilized inventory and other findings from the past three years of companion project 7 DLSAR Beaver and basic resource information from government databases, to portray:

Habitats used repeatedly by species at risk /of concern based on surveys 2023-2025 companion report DLSAR

Travel corridors known or very likely to be used by terrestrial mammals and in some cases amphibians and reptiles (based on observed track concentrations, worn trails and

sightings at low elevations and extrapolation based on topography and other factors at high elevations)

"Special Habitat" Features: e.g., mineral licks are based on local knowledge and chance field encounters.

Wetlands: Marshes, Swamps and Ponds with known or potential for amphibian breeding (based on previous 2012 wetland classification, reconnaissance-level field checks and inventory updated with June 2025 Google Earth)

Contiguous valley bottom forest areas, mixed species mature and old and large stands of pure Black Cottonwood were mapped separately based on direct field verification and ortho- photo location due to the recognition that such stands are increasingly rare provincially/regionally.

Mapping of ownership / protected status and enabling links between map layers and database information (which remain in place for updates and future use) was undertaken by GIS Analyst Marie-Ange Fournier-Beck (Vivid Geographic) utilizing publicly available B.C. government data sources.

Ranking areas and properties for overall ecological value

Based on the above mapping and basic resource inventory information and on-site assessments, six criteria were used to rank habitat (ecological) value and these were qualitatively coalesced into an overall ranking of VH, H ,MH, and M . (No ML or L values are shown on maps or listed.)

- Old forest and potential for older (moist relatively cool microsites rich sites)
- Riparian
- Landscape context - Connectedness - Function in relation to surroundings and existing protected or critical areas
- Area size especially old or mature unbroken forest
- Critical habitat or special habitat feature/function
- Use by Species at Risk

Ranking threats

Threat ranking has taken a "best guess" assessment of overall landscape (and social) context into consideration. There are no known large mega projects currently proposed for the project area. There was a massive 'threat' (now impact) event in the form of a wildfire on the east edge of the project area in 2024, some of which is currently being salvage-logged (which is a threat for certain species, but that lies outside the scope of this project). There was a recent round of timber harvesting on Greyhorse ridge northwest of Meadow Creek which has very likely impacted connectivity. Along the valley bottom and lower slopes, there appears to be an ongoing need for new sand and gravel deposits on the part of MOT, private contractors and others that should perhaps be flagged for attention in long-term planning.

Much of the privately-owned land in the lower Duncan Lardeau is classed as agricultural under the BC Agricultural Land Commission Act which limits subdivision and number of homes. Development of lands at low floodplain elevations is restricted by a number of RDCK and provincial regulations. The majority of local residents appear to want to stay, or at least keep property in their names, and prefer semi-wooded or farm surroundings rather than big developments or sales, at present. Many of these owners would, in the assessment of this report, be receptive to some forms of collaborative stewardship for wildlife.

3.0 Results

3.1 Map layers

Figure 1. Project area. This map illustrates the relative rarity of the project area as a flat, low-elevation valley bottom in an otherwise rugged, high-elevation region. The potential for the Duncan Lardeau flats to function as a land bridge for large mammal travel between mountain ranges and wilderness areas is also well-illustrated by this map.

Figure 2. Special habitats, SAR and surveyed species locations

This map includes

- Focal species at risk: repeat sightings and/or survey detections, from companion subproject
- Wetlands / riparian features in 3 categories:
    - Marshes, Ponds and Swamps (known or potential amphibian breeding habitat)
    - Fluvial wetlands (channel and lake edges; young islands)

- Rivers and streams

- Travel corridors/connectivity in two categories
  - Topo/anthro-restricted travel corridors
  - General wildlife travel routes
- Contiguous, old-mature valley-bottom riparian forests have been mapped in two categories
  - Mixed species old-mature stands (Cedar, Spruce, Birch, Cottonwood)
  - Black Cottonwood stands (no conifers, strongly dominated by Cottonwood)

Figure 3. Land Status

This map portrays Provincially-owned lands in three categories: Protected, Partially Protected and Unprotected. The partially protected category includes a variety of tenures, labeled on Figure 4 as 1 to 4 and listed below. Private lands on this map show as transparent, with 4 parcels owned by the Nature Trust of BC labeled with 'NTBC' The NTBC parcels are considered fully protected, but the remaining private land is unprotected.

Partially Protected (unclear) provincial tenures include:

1 'Duncan Flats TAC' Tenure type: 'Transfer of administration under the BC Wildlife Act'' Management authority: "null". Geographical extent unclear; reference to a Schedule A map that we could not locate

2 Goal 2 Candidate areas. Mapped during the KBLUP process. Meaning/status unclear.

3 'Duncan Flats MR' Tenure type: Map Reserve. Management authority: null

3a Hamill Creek MR (very narrow strip along creek). Tenure type: Map Reserve

4 Non-legal Old Growth Management Areas (OGMAs)

5. Cooper Creek '3TR2 Kootenay' Status very unclear.

- All above provincial surveyed lots on the flats appear to remain within timber harvesting license areas. It is unclear whether they remain in AAC calculations
- Lands (waters) within the 20- year flood level of Kootenay Lake or Duncan River are classed in government files as Unsurveyed Provincial and do not appear to have any status or constraints assigned to them. These are shown as light brown on Figure 3. One portion in that category is shown as a 'Goal 2 candidate area' but we have been unable to learn any details on what this actually means.

An informal unit referred to in early years as the Duncan Lardeau Flats Wildlife area and more recently as the Duncan Lardeau Conservation Properties (DLCPs) includes the NTBC lands and, informally, is thought to also include #1 and # 3 tenures. Available information suggests, however, that the DLCP's may not have any formal legal status. There are records of Advisory Committee discussions from 1990 regarding its establishment as a legal Wildlife Management Area, for which there was broad public and Ministry support, but this has not been pursued in recent decades. There are many questions regarding definition, legal status and extent of the DLCPS that are beyond this report to elaborate on or further investigate that are strongly recommended for follow-up.

Figure 4. Special habitat features, SAR and surveyed species locations and land status

Combining mapped habitat features/SAR and land status information reveals certain important gaps in formal protected status.

1. The above discussed uncertainty regarding the DLCPS as unit is in itself considered a priority gap or weakness, although this cannot be mapped. The uncertain status of Tenure 1 and 3, their relationship to the NTBC lands and lack of unspecified management authority is also considered a priority gap/ weakness.

It will be noted that the NTBC lands are generally characterized by high-bench riparian ecosystems, including mixed species mature-old conifers and open meadows. *Most of the younger, low-bench, flood-prone fluvial wetlands and marshes ponds and swamps are located on un- protected provincial (Crown) lands.* The Argenta Slough (AS on map) is the most notable area in this regard, as this water body supports a diverse and productive wetland complex that is unique in the context of the project area and beyond.

It is also evident that there *is no protection beyond the valley bottom for any of the travel corridors that link the DL flats with upland habitats.* These zones typically span several private land ownerships. Most of them extend onto Provincial land at mid and higher elevations. All of them are becoming increasingly 'anthro-restricted' at low elevations. The past 10 years have seen several historically-used corridors newly impacted by extensive clearing, new residences, road-building and/or tree removal and / or excessive unmanaged dog presence.

Special habitat features and SAR locations fully on private lands include Great Blue Heron winter roost trees and mineral licks.

Figure 5. Priorities for stewardship and protection

This map portrays an interpretation of priorities emerging from Figures 3 and 4. Most of the high priority areas identified for protection are Provincially-owned riparian lands, including the 'partially protected'' areas as well as the unprotected areas, due to the uncertainty of their status, their ecological importance, and the expected relative ease of solidifying legalities.

The other high priorities noted are travel corridors that span several ownership titles. These are suggested as 'Collaborative Landowner Stewardship Areas'. Nine CLSAs have been identified on Figure 5 with all except one being proposed to have 'suitability for secure wildlife travel' as their primary management objective. One of the CLSAs would have an added objective of Great Blue Heron winter roost tree conservation. The CLSA along Argenta Slough would address the need for collaboration over beavers and water levels.

The Nature Trust of BC and / or the Province (MWLRS) are owners/managers of portions of three (3) of the CLSAs.

4.0 Discussion

Riparian lands

It has been argued that the riparian lands intertwined with the DLCPs are "defacto" protected, lying within the riparian zone of the river and Kootenay Lake, and some would argue that the vagueness of status of the DLCPs as a unit is also of no consequence; however, the lack of formal protection / designation leaves open the possibility of future threats to this unique and vital area in an unpredictable future world, in addition to posing present and near-future problems.

At present, a lack of clear authority over Crown riparian areas is a problem, as it means there is no authority to regulate human recreational use or "squatter" use, or to enhance habitat for wildlife in these areas or to develop collaborative stewardship agreements with landowners from a position of authority. There is an urgent need to develop collaborative stewardship arrangements with private landowners where private, Crown and/or NTBC lands are closely intertwined, for example along the Argenta Slough in the case of beavers and wetlands. Clarifying management authority over Crown floodplain areas is a key part of this process.

Connectivity and Travel Corridors

Most of the corridors mapped in this project are elevational, topographically determined linkages between seasonal and daily ranges for terrestrial mammals that are required for adaptation to changing conditions. Trails that link the Duncan-Lardeau flats with the uplands are the essential small pieces in the big landscape picture of connectivity between the Purcell and Selkirk mountains, a function that likely now has added importance in aiding post-fire recovery on the Purcell side.

North-south travel by wildlife along the valley bottom of the project area is topographically unrestricted, determined more by avoidance of minor obstacles, channel crossings, dense human settlement areas and daytime human activity around roads. There are numerous game trails on the flats, and most of these have not been mapped

It is recognized that the mapped travel corridors are not the "only" routes traveled by all forms of wildlife, and that habitat requirements for travel and movement vary between species groups and even within species. In rugged topography, however, such as the Duncan-Lardeau, there are definite constraints on travel for terrestrial animals. While cliffs and canyons form absolute barriers, there are also significant areas occupied by conditions that are difficult, at least for ungulates, such as loose talus or dense blow-down. At low elevations, wildlife typically need to adjust routes and timing around anthropogenic disturbances to the extent possible.

There are a number of threats to connectivity in the project area that cannot be addressed by changes in land ownership status but may be possible to address through stewardship initiatives. One example of this is uncontrolled domestic dogs dominating wildlife travel corridors where they intersect with private land.

Private Lands

It will be noted that private land securement is not emphasized in the present report due to a realistic assessment of near-future securement funds and local conditions. There is several high-priority private lands identified, and rankings for additional properties are available as GIS files on request, but for the foreseeable future, landowner stewardship arrangements are the recommended strategy or protecting wildlife and habitat on private lands.

5.0 Conclusions and Recommendations

We conclude that there are weaknesses and gaps in formal protection of valley-bottom riparian habitats and elevational travel corridors, but the existence of the four, fully protected Nature Trust of BC titles and a loosely defined unit currently known as the Duncan Lardeau Conservation Properties (DLCPs) provides a foundation on which to build a viable habitat complex. Identified priorities in the following categories are shown on Figures 3, 4 and 5.

1. Provincially-owned riparian areas

- Marshes, ponds and swamps around the edges of the floodplain
- Fluvial wetlands (islands; sandbars, willow/cottonwood ecosystems) along the river channel and Kootenay Lake
- Old/mature forested lots northeast of Meadow Creek and near Duncan Dam

These habitat components are integral to the floodplain ecosystem and to the function of adjacent and intertwined lands owned by the Nature Trust of B.C. Solidifying and establishing a protected designation and management authority for these Crown-owned riparian areas is important while pressure on them is minimal. The present deficiencies constrain habitat stewardship and could pose a greater threat in coming decades.

2. Privately-owned floodplain lands

The undeveloped privately-owned riparian lands shown in Figure 5 are also an integral part of the floodplain ecosystem. Most of them are used on a daily basis in conjunction with adjacent and intertwined NTBC lands and any major habitat loss or development occurring on these lots would impact wildlife using the NTBC lands.

3. The Duncan Lardeau Conservation Properties

The geographical extent of this entity and its legal status are not clearly defined at present beyond the core 4 properties owned by NTBC. Since establishment in 1979 it has been named variously a Management Area and a Wildlife Area and has been referred to most recently as the Duncan-Lardeau Conservation Properties. While at present the vague status may not pose a threat, it could pose problems in the future and ideally this should be addressed.

4. Connectivity between floodplain and uplands

There is no protected status associated with elevational connectivity for wildlife between the flats and adjacent slopes that link seasonal and daily habitats for wildlife and together function as landscape connectivity between the Purcell and Selkirk mountains. Most of these span several land ownerships titles and include Provincial land at mid to higher elevations. Known travel corridors used by large mammals are shown on FigureS 2 and 3.

To address the above priorities, it is recommended that a concerted effort be made in 2026-2027 to:

➔ Research and then act upon establishing a unified protected status and stewardship management authority for the provincial riparian lands identified on Figure 5 .

➔ As part o the above initiative, address the legal status of the DLCPs

➔ Initiate conversations and compile technical and legal details for at least 3 of the 10 identified Collaborative Landowner Stewardship arrangements: Argenta Slough// Hamill-Lake Ranch//Cooper-Lot 570 to address key riparian areas and elevational travel corridors where securement is not feasible

➔ Communicate with MOF regarding protected or semi-protected status for the identified Provincially-owned surveyed lot and the non-legal OGMAs east of the floodplain which contribute to elevational connectivity.

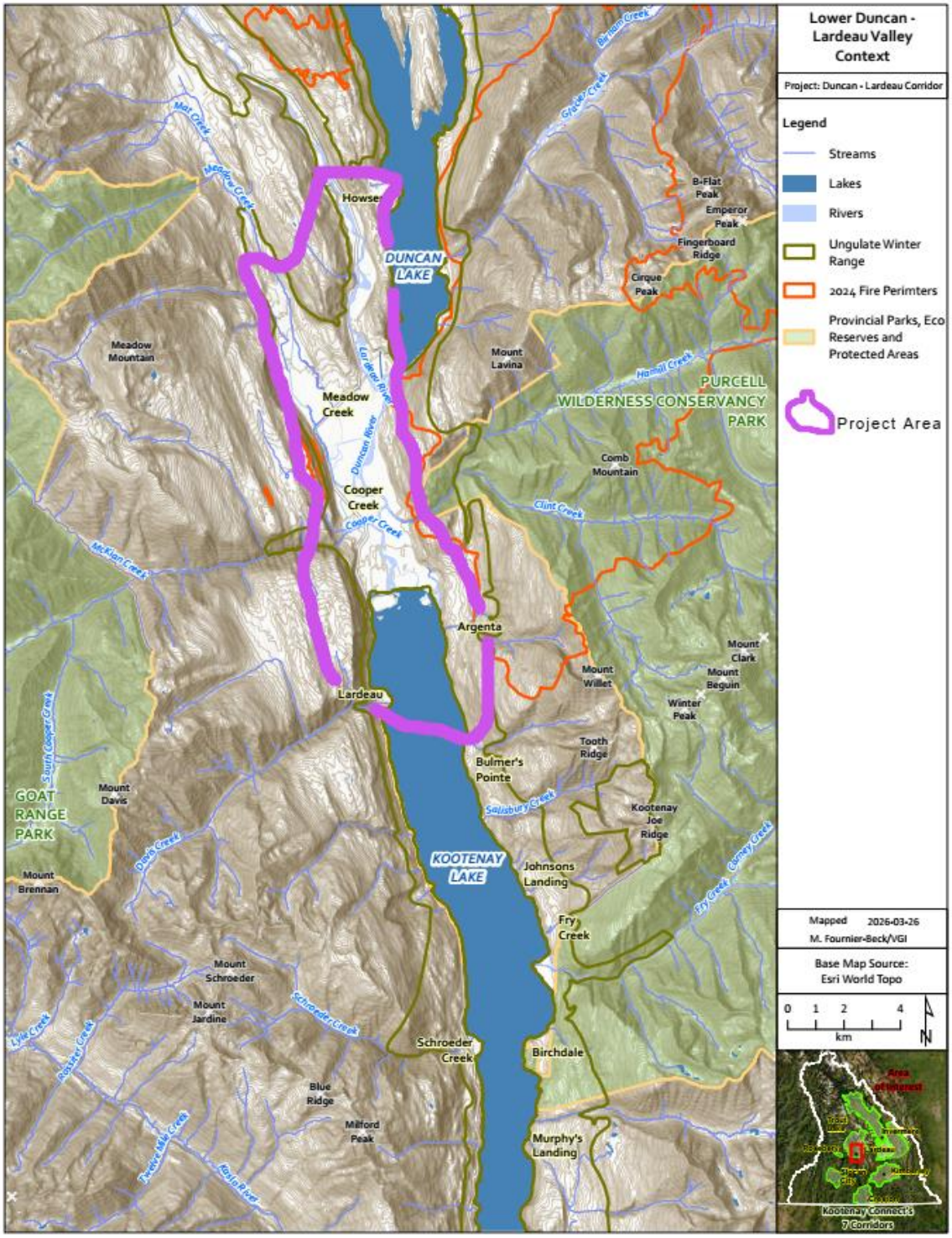

Figure 1. Project Area

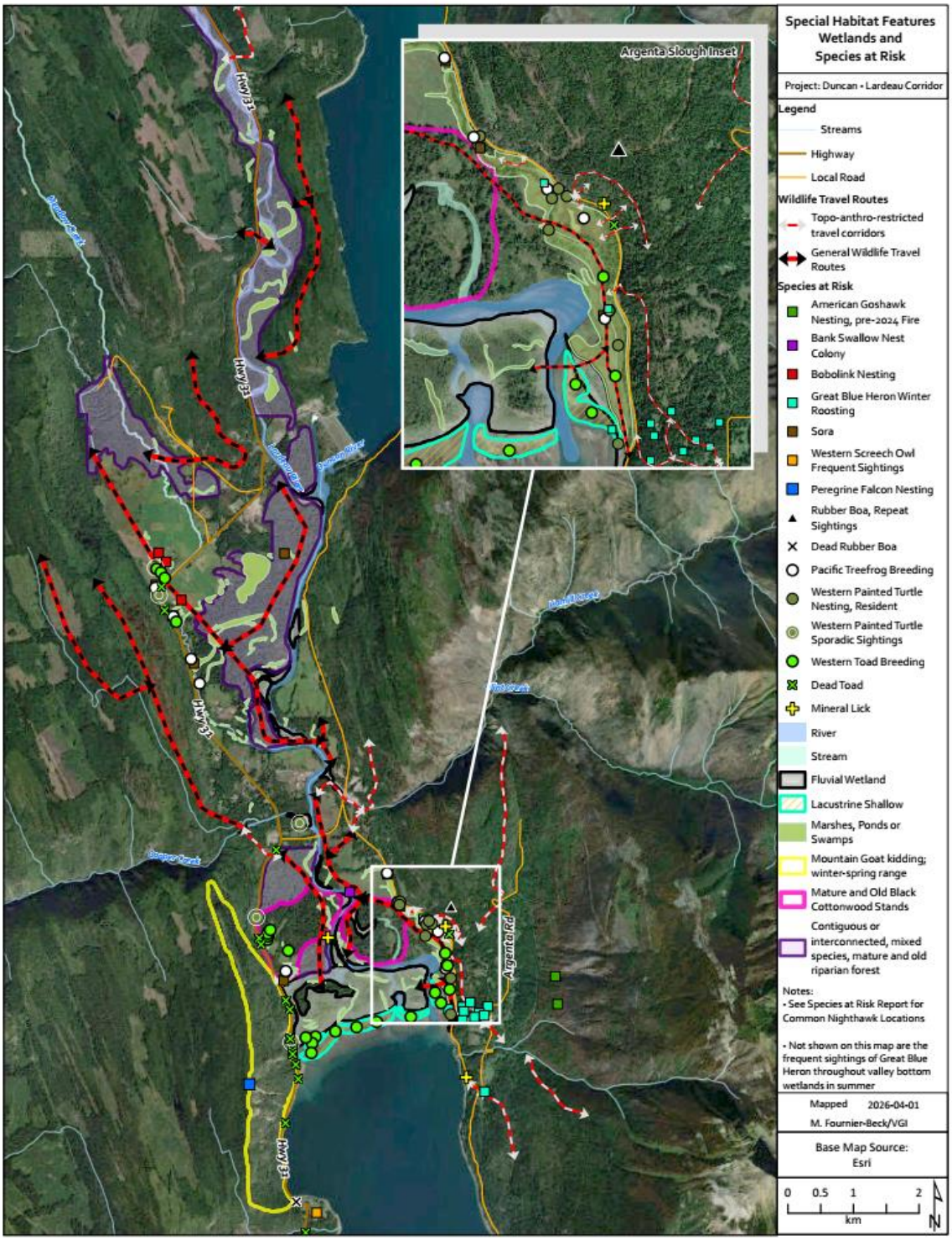

Figure 2. Special habitat features, SAR and surveyed species locations

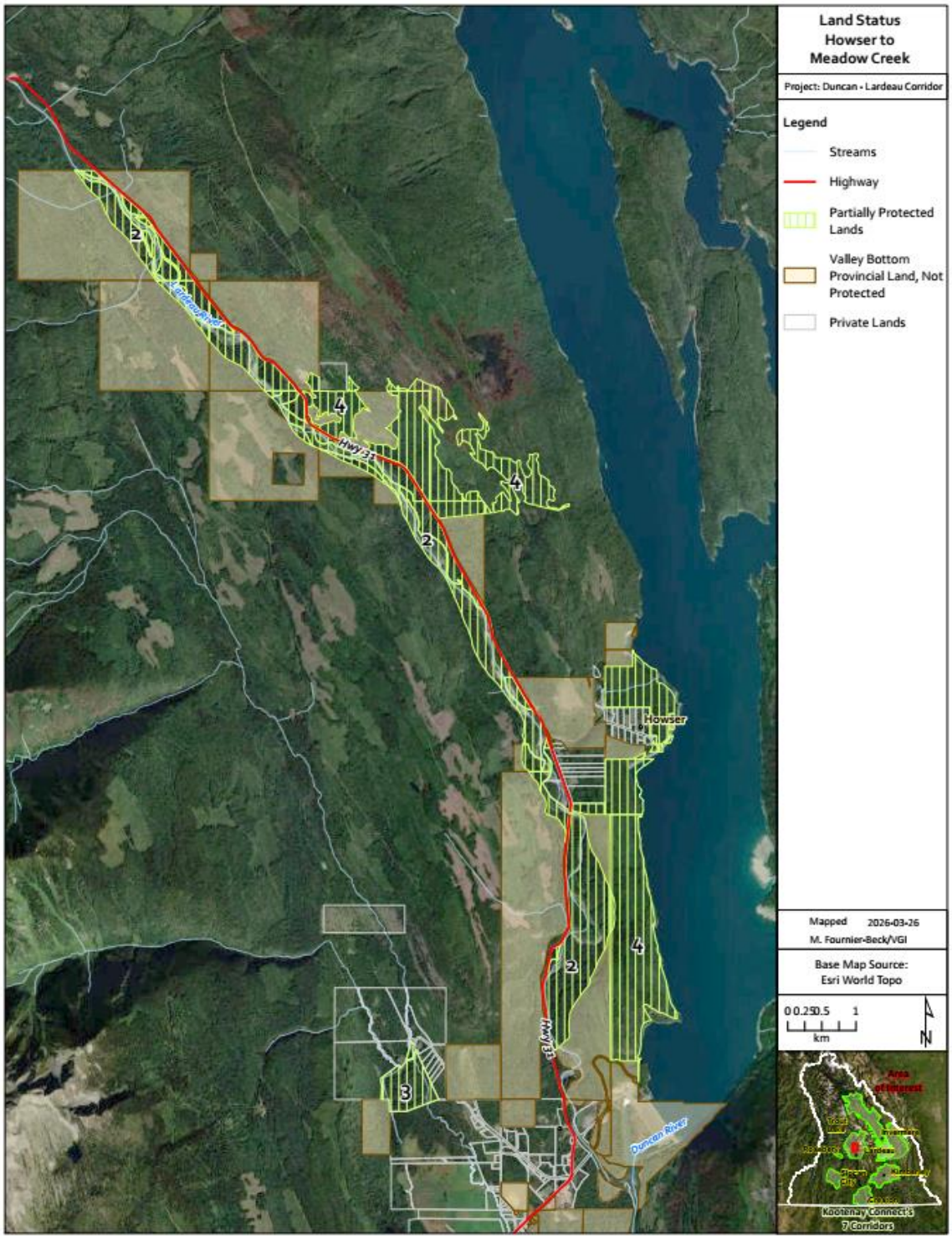

Figure 3a North. Land Status

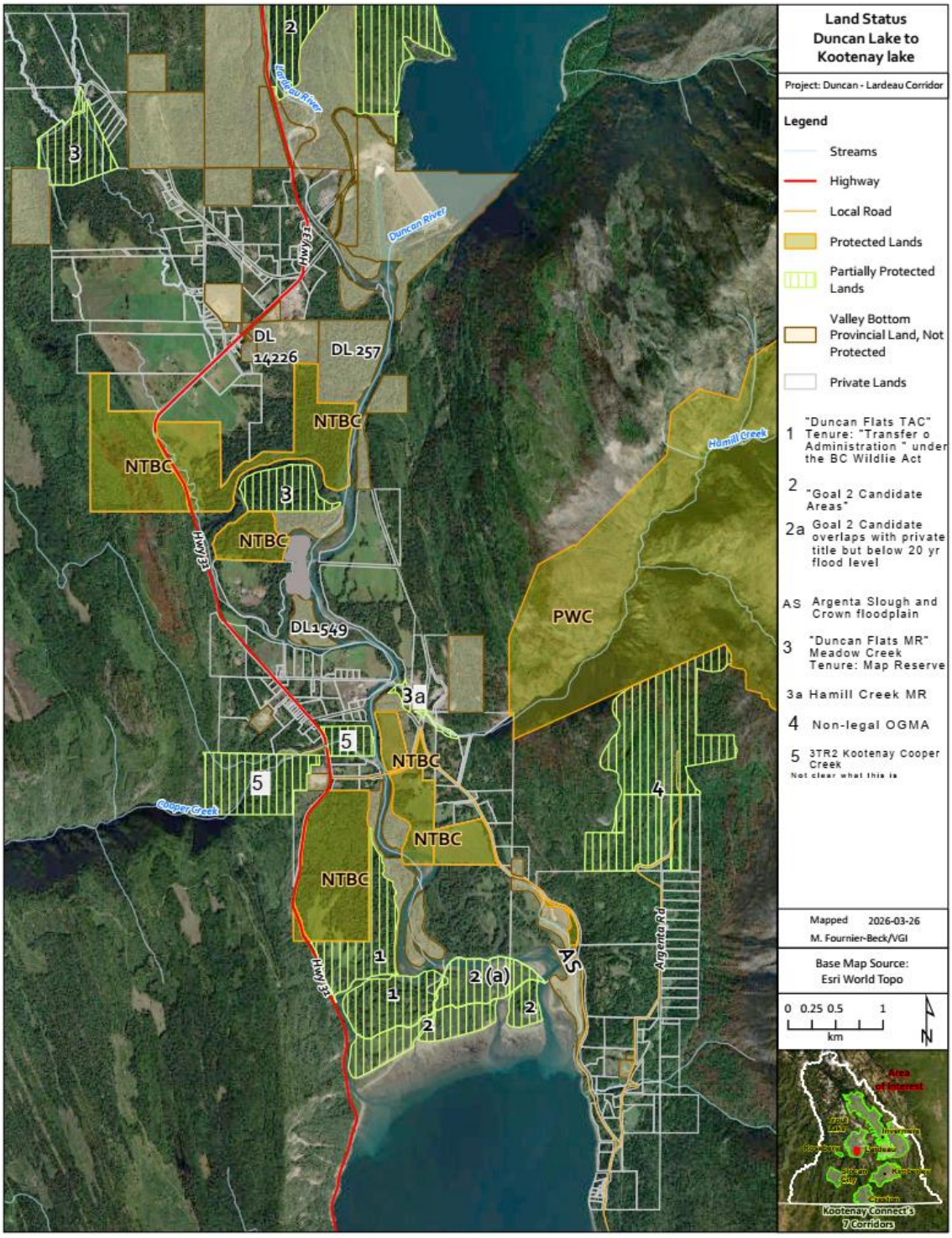

Figure 3b South. Land Status

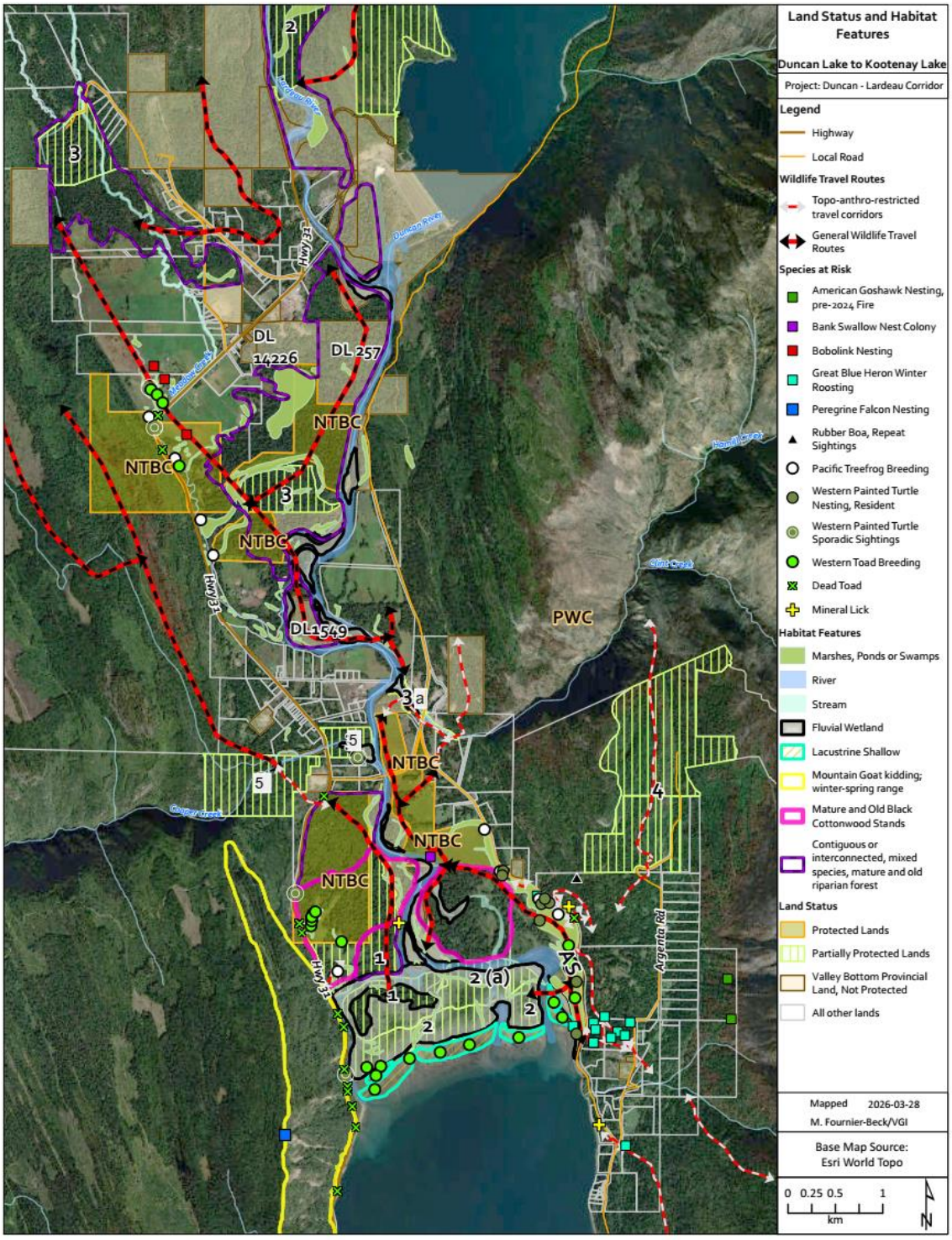

Figure 4. Special habitat features, SAR and surveyed species locations and land status ***(Note: Sora missing from this map)***

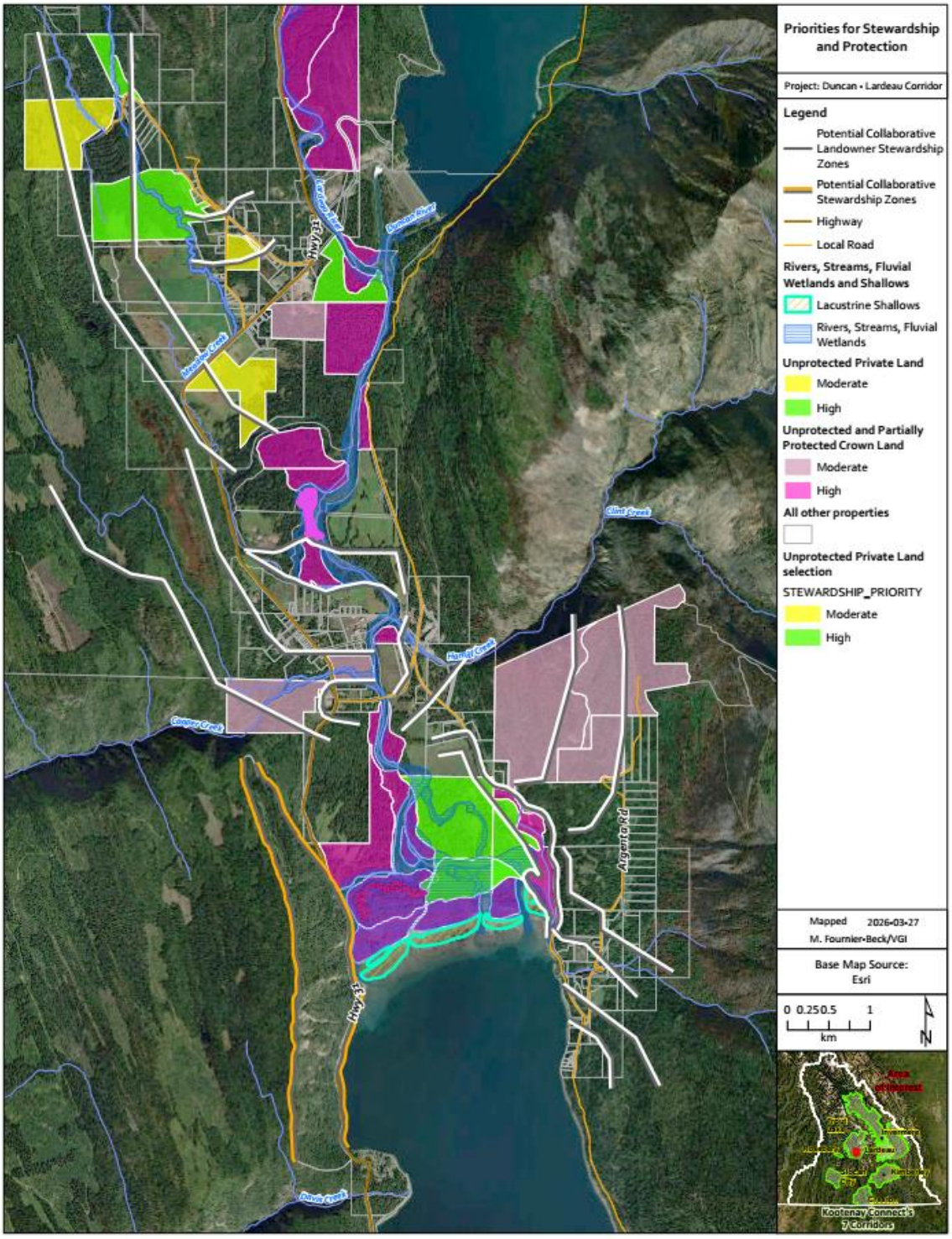

Figure 5. Priorities for stewardship and protection