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Environmental Assessment for Proposed Strata Subdivision at 1750 Highway 3, Regional District of Okanagan-Similkameen

Presented To: **Steinar Johnsen**

Dated: March 19, 2021

Ecora File No.: 180379

ENGINEERS & GEOSCIENTISTS BRITISH COLUMBIA

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0	20 NOV 2020	SL	AP	Final for submission
1	19 MAR 2021	SL	AP	Revision to incorporate RDOS feedback

Executive Summary

Ecora Engineering & Resource Group Ltd. (Ecora) was retained by Steinar Johnsen (the Proponent) to complete an environmental assessment (EA) for proposed re-zoning and subdivision at a privately held parcel at 1750 Highway 3, near Osoyoos (hereafter referred to as 'the Property'), within the Regional District of Okanagan-Similkameen (RDOS). The Property is legally described as Lot 15, Plan 21789, Sublot 2, DL 2709, SDYD, except Plan KAP90322 (see Property Location Figure 1.0). The Property overlaps the Environmentally Sensitive Development Permit Area (DPA) and is currently zoned as LH1 (Large Holdings), as described in the RDOS Electoral Area 'A' Osoyoos Rural Official Community Plan (OCP) Bylaw 2450 (2008) and the recent Draft Bylaw 2905 (2020). The Draft 2020 OCP describes new Watercourse DPA that include areas that overlap a 30 m setback from the High Water Mark (HWM) of a stream, which includes Bourguiba Creek along the southern boundary of the Property.

The RDOS Development Procedures Bylaw (Bylaw No 2500) requires that the Proponent have an environmental assessment completed by a Qualified Environmental Professional (QEP) to address proposed land use changes within a DPA, as defined in the OCP. The Proponent had Ecora prepare an Environmental Impact Assessment (EIA) report in January 2015 to address the construction of a single-family residence, driveway access, and installation of utilities. Ecora issued an addendum to the EA in March 2016. RDOS issued ESDP No. 2014.132-ESDP in June 2016. This report has been prepared as per the Development Procedures Bylaw requirements to address potential impacts of future land uses that result from the subdivision of the Property (i.e., residential development).

The approximately 12.6 ha (31 acres) Property occurs along Highway 3, east of the Town of Osoyoos. The Property is surrounded by natural (undeveloped), rural residential, and agricultural properties, and is bordered by the highway corridor along the western boundary. Following ESDP No. 2014.132-ESDP being issued in 2016, work was completed on the road access and residence, including clearing, grading, and blasting. The ESDP allowed for construction of the single-family residence with outdoor pool, as well as the access roadway and servicing, including storm, sanitary sewer, and other utilities. The access road will become a future strata roadway, pending approval of the re-zone and subdivision. Works are ongoing, with additional grading and blasting being conducted at the time of writing. Construction of the residence has not yet commenced.

The proposed development includes subdividing the Property into six Strata Lots (SL), with one of the lots (SL 5) incorporating the existing building permitted under ESDP No. 2014.132-ESDP (Appendix A). Another one of the lots (SL 6) will be designated as a Conservation Area, subject to a covenant limiting future development. This would amount to a proposed approximately 5.6 ha dedicated to conservation, or approximately 45% of the Property. The terms of registering the covenant have yet to be defined at the time of writing, although it is intended to become the responsibility of the strata. Each of the five developable SL will be around 1 ha in size and each includes a flat, bench area suitable for a future single-family dwelling within an area previously identified as Low to Moderate sensitivity, based on the ESA analysis (Ecora 2015; Ecora 2016).

The proposed development at this stage is subdivision only and therefore there is no development footprint to consider. The single family residence associated with SL 5 and the access roadway are all being constructed under the terms and conditions of the existing ESDP and following the recommendations of that report, including site restoration. It is understood that following re-zone and subdivision, each of the future SL will be developed with a single-family residence, driveway, septic system, and landscaping. The potential spatial extents and timing of development is not known at this time. As such, each new development may trigger the RDOS ESDP process at the time of development. In each case, site specific measures can be implemented to ensure the development is consistent with the recommendations made in the original EA, this EA, and ESDP guidelines.

Overall, the Property is considered a suitable location for the proposed re-zone and subdivision from an environmental perspective as the additional 4 residences (besides the single-family residence already permitted) will occur within relatively lower ecologically valuable areas and maintain the majority of the natural setting (i.e.,

cluster development style). The proposed SL 6 will be dedicated to conservation and represents almost half of the Property area, including 84% of the designated ESA 2 areas. As such, the contribution to cumulative local and regional impacts is considered negligible, as long as the higher value rock outcrop, shrub-steppe, and riparian habitats are maintained or enhanced and mitigation practices are followed, as described below. Overall, the proposed development is considered reasonable for the Property for the following reasons:

- The 12.6 ha Property is roughly comprised of 2.8 ha of ESA 2 (22%), and 9.8 ha of ESA 3 (78%).
- Approximately 5.6 ha (SL 6) will be dedicated to conservation which represents 44% of the total Property area and includes 2.3 ha (82%) of the ESA 2 present within the Property.
- The proposed dedication of SL 6 representing almost half of the Property area to conservation will help avoid impacts to the ESA 2 areas and other sensitive features and will ensure effective protection of those environmental values in perpetuity.
- The proposed re-zone appears to be suitable for the Property based on the Regional Growth Strategy and support from the Area Director (pers. comm. with Proponent).
- The proposed subdivision density appears to be generally consistent with other development in the area, including at higher elevations along HWY 3 and nearby residential development along the west-facing slopes of Anarchist Mountain.
- The Proposed subdivision is compliant with the Riparian Areas Protection Regulation (RAPR) and does not result in conflicts with the proposed setback (i.e., SPEA and/or RAA).
- Ecora has been retained to provide environmental monitoring services under the current ESDP and will continue to monitor during future works.
- Future development in each Strata Lot will follow the form and character guidelines developed by the Strata and will include low-maintenance landscaping (i.e., low water use, heat, and drought tolerant plants), native plants, efficient homes, and other features to reduce impacts to the environment

As long as future development is conducted following the mitigation and recommendations provided in this report and adhering to the conditions of the ESDP and other pertinent legislations, regulations, and BMPs, the potential for adverse environmental impacts on environmentally sensitive areas will be appropriately mitigated. Additional site specific Environmental Management Plans (EMP) may be implemented as development plans for each lot are proposed or at the time of construction to address the RDOS ESDP guidelines, as required.

Limitations of Report

This report and its contents are intended for the sole use of Steinar Johnsen (Proponent) and their agents. Ecora Engineering & Resource Group Ltd. (Ecora) does not accept any responsibility for the accuracy of any data, analyses, or recommendations contained or referenced in the report when the report is used or relied upon by any Party other than the Proponent, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user.

Where Ecora submits both electronic file and hard copy versions of reports, drawings and other project-related documents, only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by Ecora shall be deemed to be the original for the Project. Both electronic file and hard copy versions of Ecora's deliverables shall not, under any circumstances, no matter who owns or uses them, be altered by any party except Ecora.

Table of Contents

List of Tables in Text

Appendix Sections

Figures

Appendices

Acronyms and Abbreviations

ALR	Agricultural Land Reserve
BEC	Biogeoclimatic Ecosystem Classification
BMP	Best Management Practices
BLUE LIST	*any ecological community, and indigenous species and subspecies considered to be of special concern (formerly vulnerable) in British Columbia. Elements are of special concern because of characteristics that make them particularly sensitive to human activities or natural events. Blue-listed elements are at risk, but are not Extirpated, Endangered or Threatened (http://www.env.gov.bc.ca/atrisk/red-blue.htm)*
CDC	BC Conservation Data Centre
CH	Critical Habitat
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CWS	Canadian Wildlife Service (Environment Canada)
DPA	Development Permit Area
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EM	Environmental Monitor
EMP	Environmental Management Plan
ESA	Environmentally Sensitive Area
ESCP	Erosion and Sediment Control Plan
ESDP	Environmentally Sensitive Development Permit
HWM	High Water Mark
MFLNRO	Ministry of Forests, Lands, and Natural Resource Operations
MOTI	Ministry of Transportation and Infrastructure
MSDS	Materials Safety Data Sheets
OCP	Official Community Plan
QEP	Qualified Environmental Professional
RAA	Riparian Assessment Area
RAPR	Riparian Areas Protection Regulation
RDOS	Regional District Okanagan Similkameen

RED LIST	*any ecological community, and indigenous species and subspecies that is extirpated, endangered, or threatened in British Columbia. Extirpated elements no longer exist in the wild in British Columbia, but do occur elsewhere. Endangered elements are facing imminent extirpation or extinction. Threatened elements are likely to become endangered if limiting factors are not reversed. Red-listed species and subspecies may be legally designated as, or may be considered candidates for legal designation as Extirpated, Endangered or Threatened under the Wildlife Act (http://www.env.gov.bc.ca/atrisk/red-blue.htm)*
R.P.Bio	Registered Professional Biologist
SARA	*Species at Risk Act*
SEI	Sensitive Ecosystem Inventory
SER	Sensitive Ecosystem Rank
SL	Strata Lot
SPEA	Streamside Protection and Enhancement Area
TEM	Terrestrial Ecosystem Mapping
TOR	Terms of Reference
WSA	*Water Sustainability Act*
WSI	Wildlife Species Inventory

1. Introduction

Ecora Engineering & Resource Group Ltd. (Ecora) was retained by Steinar Johnsen (the Proponent) to complete an environmental assessment (EA) for proposed re-zoning and subdivision at a privately held parcel at 1750 Highway 3, near Osoyoos (hereafter referred to as 'the Property'), within the Regional District of Okanagan-Similkameen (RDOS). The approximately 12.53 ha Property is legally described as Lot 15, Plan 21789, Sublot 2, DL 2709, SDYD, except Plan KAP90322 (see Property Location Figure 1.0). The Property overlaps the Environmentally Sensitive Development Permit Area (DPA) and is currently zoned as LH1 (Large Holdings), as described in the RDOS Electoral Area 'A' Osoyoos Rural Official Community Plan (OCP) Bylaw 2450 (2008) and the recent Draft Bylaw 2905 (2020a). The Draft 2020 OCP describes new Watercourse DPA that include areas that overlap a 30 m setback from the High Water Mark (HWM) of a stream, which includes Bourguiba Creek along the southern boundary of the Property.

The RDOS Environmentally Sensitive DPA requires the Proponent submit an environmental assessment completed by a Qualified Environmental Professional (QEP) to address proposed land use changes within the DPA, as defined in the OCP and the Development Procedures Bylaw (Bylaw 2500, 2011). Ecora has prepare a previous Environmental Impact Assessment (EIA) report in January 2015 to address the construction of a single-family residence, driveway access, and installation of utilities. Ecora issued an addendum to the EA in March 2016. RDOS issued ESDP No. 2014.132-ESDP in June 2016, and work has commenced on the driveway, storm water management system, and house building pad.

This report has been prepared in accordance with the requirements for an Environmental Assessment Report outlined in Schedule 3 of the Development Procedures Bylaw. includes a review of the site's existing biophysical resources at the local level to document the current site conditions and assesses potential impacts that may result as from the subdivision of the Property (i.e., future residential development). A Mitigation Plan has also been prepared as part of this report and recommends a mitigation strategy to guide future development of the Property to avoid, prevent, or manage potential adverse impacts. Where adverse impacts cannot be fully avoided through project design, the methodology and/or timing of development activities, mitigation measures have been recommended to minimize the potential for, and severity of the adverse effects along with enhancement opportunities for the identified feature values. This report provides a summary of the environmental assessment, including desktop review, biophysical inventory, ecosystem mapping, environmentally sensitive area (ESA) ranking, and impact assessment and analysis. The scope of this report is to address potential impacts that may arise from the land use change resulting from the subdivision of the Property. Impacts that may result from ongoing works on the Property under the existing development permit are outside of the scope of this report, and are addressed in separate environmental monitoring reports, as required by the terms of the existing ESDP.

1.1 Scope of Work

The environmental assessment has been prepared to address potential impacts as a result of land use changes resulting from the proposed subdivision of the Property and is based on the following scope of work:

- Review existing publicly available land parcel information and previous environmental assessment results, including the terms and conditions of the ESDP No. 2014.132-ESDP.
- Complete a desktop assessment of the Property, including reviews of previous biophysical assessments and inventories, publicly available ecosystem mapping and inventory data, federally designated Critical Habitat, and other online resources to identify potential and known species and ecosystems at risk occurrences.

- Complete biophysical inventory and site assessment of the Property, including identification of existing terrestrial, riparian, and aquatic values, and the presence of unique or important wildlife species and/or habitat features.
- Complete a review and/or update to the previously completed terrestrial ecosystem mapping, ESA classification, and conservation areas, based upon the identified ecological values.
- Conduct Riparian Area Protection Regulation (RAPR) assessment to determine setbacks from identified streams, as described in the RAPR and verify that the proposed layout and development plans will conform to the setbacks prescribed in the RAPR assessment.
- Conduct an impact assessment of the subdivision and resulting land use changes, in consideration of the existing site conditions, ongoing development, identified environmental values, and sensitive areas (ESA).
- Prepare a report and mapping deliverables to incorporate into the re-zoning and subdivision development permit application, mitigation planning and future design of the proposed development within the Property.
- RAPR assessment report and *Water Sustainability Act* (WSA) Section 11 applications for works associated with stream crossings or storm sewer outfalls will be submitted to the respective provincial regulators separately (if required).

1.2 Study Area

The approximately 12.5 ha (31 acres) Property occurs along Highway 3, east of the Town of Osoyoos. The Property is currently zoned as Large Holdings (LH1) and is outside of the ALR. The Property is surrounded by natural (undeveloped) areas to the north and east with rural residential and agricultural properties occurring to the west. The Property is bordered by the highway corridor along the western boundary. Following ESDP No. 2014.132-ESDP being issued in 2016, work was completed on the road access and residence, including clearing, grading, and blasting. The ESDP allowed for construction of the single-family residence with outdoor pool, as well as the access roadway and servicing, including storm, sanitary sewer, and other utilities. The access road will become a future strata roadway, pending approval of the re-zone and subdivision. Works are ongoing, with additional grading and blasting being conducted at the time of writing. Construction of the residence has not yet commenced.

The Property occurs within the Okanagan Very Dry Hot Bunchgrass Variant (BGxh1) which is defined by the Biogeoclimatic Ecosystem Classification (BEC) program (Lloyd et al. 1990). The BGxh1 zone generally occurs between 250 to 200 m above sea level. The BG zone has the hottest and driest zone in British Columbia, and the BGxh1 zone typically has less extreme winter weather than the similar BGxh2 variant, occurring in the Thompson Valley.

The Property is generally characterized by gently sloping to steeper gullies, which continue westwards down towards Highway 3. The gullies, including Bourguiba Creek along the south boundary of the Property, discharge to Haynes Creek which drains into Osoyoos Lake. Potential important habitat and habitat features for a range of sensitive wildlife species, including wildlife trees and rare ecosystem communities, occur throughout the Property. Site and soil disturbance and degradation occurs in association with the ongoing work on the house pad and driveway.

1.3 Proposed Development

The proposed development includes subdividing the Property into six Strata Lots (SL), with one of the lots (SL 5) incorporating the existing building permitted under ESDP No. 2014.132-ESDP (Appendix A). Another one of the lots (SL 6) will be designated as a Conservation Area, subject to a covenant that will retain the lot as a natural area. This Conservation Area would result in the preservation of approximately 5.6 ha, or approximately 45% of the Property. The terms of registering the covenant have yet to be defined at the time of writing, although it is intended to become the responsibility of the strata. Each of the five developable SL will be around 1 ha in size and each includes a flat, bench area suitable for a future single-family dwelling within an area previously identified as generally Low sensitivity, with two lots having relatively small pockets of Moderate sensitivity habitat, based on ESA analysis completed as part of the previous EIA reports (Ecora 2015; Ecora 2016). Development plans for these lots will be addressed in future phases in consultation with RDOS and may require subsequent assessment and/or ESDP applications. The Proponent has expressed that the objective of future development on the Property is to follow a minimal disturbance approach, with future residences built on Lots 1-4 being custom designed, located in areas of Low sensitivity, and constructed using methods to limit the extent of disturbance, in order to retain the natural landscape as much as possible.

The proposed SL will be accessed from Highway 3 by a common driveway, being developed under the conditions of ESDP No. 2014.132-ESDP. Access has been designed to meet Ministry of Transportation and Infrastructure (MOTI) standards, including the turning radius required at the intersection with the highway and a “jug-handle” constructed along the opposite side of the highway to allow for safe access to the property by east-bound travellers. Stormwater along the access driveway will be in a ditch along the east edge, with culverts and infiltration tanks facilitating drainage off of the Property. The design of the stormwater system is currently under development at the time of writing, but will be designed to MOTI standards, with culverts and outfall structures permitted as required under the WSA and associated regulations.

Water for the proposed strata will be obtained from wells and sewer will be provided by septic systems on each proposed SL. The Proponent has also indicated that a 10,000 gallon water tank will be maintained on the proposed SL 5 (the lot where the Proponent is currently building a residence under the original ESDP). The tank will be used to supply water to fire hydrants along the strata roadway and ensure recommended fire protection measures are met. Other utilities (e.g., electricity, phone) will service the property via a common, underground corridor along the driveway right-of-way.

The construction and development-related activities on-going on the Property under the existing ESDP, in anticipation of the subdivision and future development include:

- Continuation of site preparation along the driveway and SL 5 house footprint, including vegetation clearing, stripping, and grubbing (completed under the existing ESDP);
- Upgrades to the access driveway to meet MOTI standards, including grading, cuts, fills, and retaining structures; and
- Completion of restoration activities as required, including slope stabilization / re-contouring, grass seeding, planting of native species, and habitat enhancements.

Current design drawings showing the proposed extents of work, including the maximum extents of cuts, fills, retaining walls, ditches, culverts, and other features necessary to provide equipment and vehicle access are provided as Appendix A. Additional detailed designs for the stormwater system, as well as assessments completed by other professionals to address other DP requirements (i.e., civil engineers, geotechnical engineers) are provided under separate cover and not included with this report.

2. Site Review and Methods

The following section provides a summary of the regulatory context and sources of information used during the completion of the assessment.

2.1 Regulatory Overview

The environmental assessment requirements are outlined in the Schedule 3 of the RDOS Development Procedures Bylaw (Bylaw No. 2500, 2011). The overarching legislation that pertains to the proposed developments includes the federal and provincial acts identified in Table 2.1.

Table 2.1 Federal and Provincial Legislation Applicable to the Project

Jurisdiction	Applicable Legislation	Agency	Summary
Provincial	*Wildlife Act; Wildlife Amendment Act*	Ministry of Environment	Protection of wildlife and wildlife habitats including the protection of raptors, owls, herons and nests during nesting periods.
	Water Sustainability Act	Ministry of Forests, Lands and Natural Resource Operations	Ensures protection of water quality, quantity and riparian habitat for works in about a stream.
	Riparian Areas Protection Act	Ministry of Forests, Lands and Natural Resource Operations	Protects riparian areas during development by ensuring that a Qualified Environmental Professional (QEP) conducts a science-based assessment of proposed activities
	Environmental Management Act	Ministry of Environment	Prohibits causing pollution by regulating the discharge or emissions of contaminants or waste and requires spill reporting regulations.
	Local Government Act	Ministry of Environment	Provides local governments with a legal framework and foundation to represent the interests and acknowledge the needs of their communities.
	Land Act	Ministry of Forests, Lands and Natural Resource Operations	Protection and conservation of any land owned by the Province such as foreshore and the beds of lakes, rivers and streams.
Federal	*Fisheries Act*	Fisheries and Oceans Canada (DFO)	Section 35 for the management through the conservation and protection of fish and fish habitat.
	Migratory Birds Convention Act	Environment Canada (Canadian Wildlife Service)	Prevents capturing, injuring, killing or disturbing migratory birds as well as damaging, destroying, removing or disturbing their nests.
	Species at Risk Act	Fisheries and Oceans Canada (DFO), Environment Canada (EC)	Provides legal protection of wildlife and their habitats designated under Schedule 1.

Other relevant regulations include municipal bylaws and policies such as the OCP, as well as regional Best Management Practices (BMP) and guidelines.

2.2 Information Sources

Information sources used in the desktop assessment and background review of the Property include:

- RDOS Electoral Area A OCP (Bylaw No. 2450) and associated ESDP guidelines;
- South Okanagan Reginal Growth Strategy Bylaw No. 2770, 2017;
- RDOS Development Procedures Bylaw (Bylaw No. 2500, 2011) (2020b);
- RDOS Public Parcel Viewer (accessed November 12, 2020);
- ALR Property and Map Finder (accessed November 12, 2020);
- Ecora memo to RDOS entitled 'Re: Osoyoos Lot 15 site assessment of environmentally sensitive areas' (June 2012);
- Ecora memo to RDOS entitled 'Re: Osoyoos Lot 15 Riparian Areas Regulation Assessment' (July 2012);
- Ecora Environmental Impact Assessment Report - Lot 15, Osoyoos, B.C. (January 2015);
- Ecora Environmental Assessment for Osoyoos Property Lot 15 – Addendum 1 (January 2016);
- RDOS ESDP No. 2014.132-ESDP (issued June 9, 2016);
- Ecora Geotechnical Report 'Preliminary Geotechnical Assessment Relating to Construction of the Proposed Development at Lot 15, Plan 21789, Highway 3, Osoyoos, BC' Ecora File No.: PE-13-177-JOH (December 2016);
- Ecora Geotechnical Report 'Geotechnical Assessment Report for the Proposed Development at 1750 Highway 3, Osoyoos, BC' Ecora File No.: 201589 (November 2020);
- CWS memo to RDOS entitled 'Re: Amendment of the Electoral Area "A" OCP Bylaw No. 2450, 2008, & Zoning Bylaw No. 2451, 2008' (June 12, 2020);
- Conservation Data Centre Species and Ecosystems Explorer (accessed November 12, 2020);
- Okanagan Habitat Atlas web application (accessed November 13, 2020);
- iMapBC web application (accessed November 13, 2020);
- Environment Canada (Canadian Wildlife Service) Critical Habitat Mapping for Species At Risk; and
- Provincial and federal Best Management Practices (BMP), including Develop with Care (2014) and Keeping Nature in Our Future: A Biodiversity Conservation Strategy for the South Okanagan Similkameen (2012).

2.3 Terrestrial Ecosystem Mapping and Sensitive Ecosystem Inventory

Terrestrial Ecosystem Mapping (TEM) is a landscape level inventory of ecological communities. Built upon the provincial BEC framework, TEM 'polygons' represent homogeneous areas of the landscape that support relatively consistent vegetation communities and that are the result of local topography (slope gradient and landscape position) and are subject to similar climate and soil development processes. In an ideal situation, a single ecosystem label will describe the conditions in the entire polygon; however, as landscape complexity typically results in microsites with differences in soil moisture and nutrient availability, most TEM polygons will contain more than one unique ecosystem and hence requires a complex label. TEM scales vary depending on the project size and requirements, although mapping at a scale of 1:5,000 or larger is typically utilized to provide a baseline inventory for smaller environmental inventories and detailed assessments of environmental effects.

Existing ecosystem mapping by Iverson and Haney, completed in 2005 covers the Property. Given the smaller scale at which their mapping was conducted, the individual identified ecosystem polygons are fewer, larger and less suitable for assessing environmentally sensitive areas at the scale required for development planning. Similarly, a Sensitive Ecosystem Inventory (SEI) was completed by Iverson and Haney in 2010 and updated in 2012 to provide an inventory of the rare ecosystems and wildlife habitat throughout the south Okanagan (Iverson and Haney 2012). The objective of this process was to serve as a platform upon which to develop local land use plans and to ensure the effective stewardship of private lands.

During the initial EIA completed by Ecora, the ecosystem polygons were reviewed, and adapted as required. As part of the assessment completed in this report, the existing ecosystem polygons (publicly available and used in the previous EIA) within the Property were reviewed and updated to reflect site conditions as they exist at the time of writing (Figure 2.0). Polygons were delineated and attributed by a Professional Biologist with extensive experience mapping and describing terrestrial ecosystems throughout BC, including the southern Okanagan. The protocol for ecosystem delineation was conducted in accordance with the Standard for Terrestrial Ecosystem Mapping in BC (Resources Inventory Committee (RIC) 1998). Mapping was conducted using ArcGIS v.10, and the data was subsequently cleaned and validated to ensure there were no remaining errors in topology and/or ecosystem database codes and attributes.

The terrestrial ecosystem site series codes and map labels were developed through assessment of and reference to the following documents:

- Standard for Terrestrial Ecosystem Mapping in BC (RIC 1998)
- A Guide to Site Identification and Interpretation for the Kamloops Forest Region. Land Management Handbook 23 (Lloyd et al. 1990)
- Site Classification for 52 Biogeoclimatic Units in the Southern Interior Forest Region (Lloyd et al. 2005; Draft)
- Provincial Site Series & Map Code List (available at: http://www.env.gov.bc.ca/ecology/tem/list.html)

Coding of the ecosystems and associated map labels is consistent with the codes used by Iverson and Haney (2005, 2015), with minor classifications updates to the mapping completed during the initial assessment to better describe the SEI based on present site conditions.

2.3.1 Conservation Ranking

The South Okanagan-Similkameen Conservation Program has developed a Biodiversity Conservation Strategy for the Okanagan (SOSCP 2012). As part of this strategy, Conservation Ranking Polygons based on provincial Conservation Frameworks and local sensitive ecosystem management objectives have been delineated throughout the Okanagan Valley. The Conservation Rankings are divided into categories based on environmental sensitivity, and rare or ecologically important habitat features, with the categories defined as low, moderate, high, and very high. The conservation ranking provides a measure of relative value of ecosystems for conservation and land use planning, and through this mapping, almost 60% of the Okanagan has been identified as a "high" or "very high" ranking. The conservation ranking for the Property and surrounding area is presented in Figure 3.0.

2.4 Species and Ecosystems of Conservation Concern

The BC CDC iMap web application was queried for sensitive environmental occurrences and areas of conservation concern, and the BC CDC's Species and Ecosystems Explorer web tool was searched to provide a list of species at risk with the potential to occur in the area. Species at risk are determined using the provincial and national ranking systems. The provincial system applies to species that have been assessed by the BC Conservation Data Centre Species and Ecosystems Explorer (CDC) and are categorized as Yellow (Not Considered At Risk), Blue (Of special concern), or Red (Endangered or Threatened).

The national ranking system applies to species that have been assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Queries were run to identify all known sensitive plant, ecosystem and animal occurrence records using the CDC data and the Wildlife Species Inventory (WSI) data. Mapped critical habitats were searched using the Canadian Wildlife Service (CWS) database.

The findings of the data searches are presented in Figure 4.0 and described in detail in Section 3.3.1. A list of species with the potential to occur in the area is provided in Appendix B.

2.5 Environmentally Sensitive Areas

The RDOS Development Procedures Bylaw, in conjunction with other local government policies were used to define a four-class Environmentally Sensitive Area (ESA) ranking system. The four classes of ESA classification are described below:

- **ESA 1 (High)** – areas that provide significant local and/or provincial environmental value, due to the presence of rare physical features, rare ecosystems, or rare plants and animals. These areas represent habitat of great importance to the functioning of natural ecosystems and may include habitat of critical importance to wildlife. Various types of habitat will qualify as ESA 1 based on sensitivity, vulnerability, connectivity and biodiversity. For example, federally identified occurrence-based Critical Habitat, all wetlands, rare plant communities, and habitat for rare animal species have high value. Avoidance and conservation of ESA-1 designations is the primary objective.

- **ESA 2 (Moderate)** – areas that provide significant local and/or provincial environmental value, including ecosystems that are uncommon and important for rare plants and wildlife. These areas contain physical features, plants, animals and habitat characteristics that contribute towards the overall diversity and contiguous nature of the surrounding natural features. These will include sensitive ecosystems, as refined according to the ESA stratification criteria for the scale of mapping, or federally identified attribute-based Critical Habitat. They also include areas used to buffer ecological functions of high value

(ESA 1) ecosystems. ESA 2 designations should be avoided, but if development is pursued, portions of the habitat must be retained and integrated to maintain the contiguous nature of the landscape.

- **ESA 3 (Low)** – areas that may contain important features or remnant stands/sites with ecological value but are of low to moderate conservation value and considered neither locally nor regionally rare. Areas mapped as ESA 3 may be in a stage of succession that provides limited value to local wildlife species and expresses a level of previous disturbance.
- **ESA 4 (Not Sensitive)** – areas that contribute little or no value to the overall diversity of vegetation, soils, terrain, and wildlife characteristics of the area. Areas mapped as ESA 4 typically include heavily disturbed ecosystems, previously cleared areas (gravel pits, exposed soil, etc.) and areas of existing infrastructure such as roads.

Factors considered in the classification of ESA values include a review include habitat quality and suitability for species at risk, rare and endangered (i.e., Red or Blue-listed) species or ecosystems occurrence and/or potential, landscape context (e.g., proximity to other high value ESA areas, presence/abundance of significant landscape features), general condition (i.e., degradation, disturbance, isolation, connectivity, fragmentation), successional stage, regional rarity, relative biodiversity, presence of ecologically significant features (e.g., wildlife habitat features like corridors or wildlife trees, identified Critical Habitat) and professional judgment.

The Environmentally Sensitive Area (ESA) values determined during the initial EA were reviewed to determine whether the classifications are representative to current conditions. Figure 5.0 depicts the findings of the ESA mapping update within the Property, and the results of the updated ESA assessment is provided in Section 3.5.

3. Environmental Assessment

Ecora has completed seven site visits to inventory ecosystems, vegetation, and wildlife habitat features, as well as monitor construction activities associated with the previous DP works:

- April 26, 2012
- June 5, 2012
- June 3, 2020
- August 20, 2020
- September 24, 2020
- March 11, 2021
- March 17, 2021

The April 26th and June 5th, 2012 were completed by former Ecora staff members Dan Bernier R.P.Bio., Robyn Lauman R.P.Bio., and Mitchell Grant, TFT. The results of the 2012 site visits were used to prepare the previous EA. A site visit and meeting with the Proponent was conducted by Ecora on June 3, 2020 by Ecora biologist Adam Patterson, R.P.Bio. The site visit was conducted to assess any changes to the condition of the Property from the conditions observed in 2012. Follow-up visits were completed by Adam Patterson, R.P.Bio on August 20, 2020, September 24, 2020, and March 11, 2021 to further assess the site condition and conduct environmental monitoring during the approved works on the access roadway. A final site visit was completed on March 17, 2021

by Ecora biologist Scott Layher, R.P.Bio. to gather additional inventory data, refine ecosystem mapping, and oversee habitat enhancements being carried out as part of the previously permitted works.

This section describes the environmental context of the Property as determined by summarizes the findings of the background reviews, and field visits completed by Ecora, as well as provides the results of the ecosystem mapping and ranking of ESAs.

3.1 Ecosystem Communities

The Property was delineated into 4 discrete ecosystem polygons, which were refined and re-drawn from the original polygons within the Property, based on the results of the original EIA and the existing site conditions, with emphasis on capturing changes in slope position and gradient, soil nutrient and moisture regime, and vegetation community structure and composition (Table3.1; Figure 2.0). Classification of TEM and SEI values within each ecosystem polygon was done based on methodologies outlined in Lloyd et. al. (1990, 2005), and the Standard for Terrestrial Ecosystem Mapping in BC (RIC 1998), with polygons drawn to represent relatively homogenous ecosystems, and areas with multiple site series components proportioned out by decile.

Table 3.1 Summary of mapped ecological communities within the Property

Polygon Number	TEM Code	Site Series Name	SEI Code	SEI Name
1	6[SW]3 / 4[SB]2	Big sagebrush – bluebunch wheatgrass / Selaginella – bluebunch wheatgrass	6SS:st / 2SV:ro	Sagebrush steppe: steep slope/ Sparsely Vegetated: rock outcrop
2	9[SW]3 / 1[SB]2	Big sagebrush – bluebunch wheatgrass / Selaginella – bluebunch wheatgrass	9SS:st / 1SV:ro	Sagebrush steppe: steep slope/ Sparsely Vegetated: rock outcrop
3	9[SW]3 / 1[ES]	Exposed Soil	9SS:st / 1NS	Sagebrush steppe: disturbed / Not Sensitive
4	[RZ]	Roadway	10NS	Not Sensitive

A total of 2 vegetated ecological communities and two non-vegetated community were identified within the Property as shown in 3.2 (Figure 2.0).

Table 3.2 Summary of mapped ecological communities within the Property

Map Code	Site Series	Structural Stage	Site Series Name	Provincial Status[1]
SW	01	3: Shrub	Big sagebrush – bluebunch wheatgrass	Red
SB	03	2: Herbaceous	Selaginella – bluebunch wheatgrass	Yellow
ES	-	N/A	Exposed Soil	-
RZ	-	N/A	Roadway	-

1 Source: http://www.env.gov.bc.ca/cdc/
Blue: Of special concern. Red: Endangered or threatened.

The big sagebrush – bluebunch wheatgrass (SW) community is Red-listed in BC, endangered or threatened, given the rarity of this ecosystem provincially, and their importance for uncommon and rare wildlife species. Selaginella – bluebunch wheatgrass (SB) ecosystem is Yellow-listed in BC and is considered to be not-at-risk. The Road (RZ) and Exposed Soil (ES) communities occur as a result of anthropogenic activity and are considered of relatively low habitat value and not sensitive to development.

A total of 4 ecosystem classes were identified within the property. 3 of the classes are considered to be sensitive ecosystems, with the fourth being a non-sensitive classification. The sensitive ecosystem classifications identified are defined in Table 3.3 (Figure 2.0)

Table 3.3 Summary of sensitive ecosystem inventory mapping within the Property

SEI Code	SEI sub-code	Site Series Name
SS	dg	Sagebrush Steppe – disturbed
SS	st	Sagebrush Steppe – steep slope
SV	ro	Sparsely Vegetated – rock outcrops
NS	-	Not Sensitive

The Property is primarily dominated by sagebrush steppe ecosystems, with elements of sparsely vegetated communities occurring in pockets of rock outcrops throughout the property. The ecosystem community on the southwest portion of the Property (Polygon 4) shows evidence of disturbance due to past land use and its proximity to the highway right-of-way, with invasive species prevalent and patches of disturbed, exposed soil and pieces of garbage and debris occurring intermittently throughout the polygon. Much of the sagebrush community exists on a slope (Polygon 1 and 3), and so has been classified as being a steep subclass overall. Polygon 2 represents the existing disturbance from the driveway within the Property and is generally unvegetated due to the recent disturbance from construction.

3.1.1 Conservation Ranking

The Property is located within an area that has been previously designated as a High Conservation Value (Figure 3.0). This High Conservation Value area extends north, south, and east, along Highway 3, and encompasses the generally undisturbed ecosystems, and high value habitat present along the slope that continues east above the property. High Conservation rankings were assigned based on the at-risk status of ecosystem communities present within the Property, wildlife habitat values, and the ecological sensitivity of the inventoried ecosystems (SOSCP 2012).

3.2 Vegetation

The Property is generally in a natural state with the exception of the current development occurring within the driveway corridor. The vegetation present within the property is typical of a dry sagebrush steppe, primarily consisting of shrubland and grasses, with pockets of sparse vegetation and rock outcrops. Within the gully to the north end of the Property, the vegetation communities are more typical of moister soils, and while containing sagebrush, has a higher diversity of shrubs present. The vegetation community in the gully in the middle of the property is generally continuous with the surrounding shrubland, with evidence of moister soils due to the topographical change. The middle gully did not show evidence of water flow, and no riparian or moisture tolerant species were observed. Trees are sparse within the Property, with some standing wildlife trees observed during the 2020 site visit, as well as documented in the previous EA (Figure 4.0).

The vegetation descriptions below are summarized from the previous EA and the 2020 site visits and are not intended to form an exhaustive inventory of plant species throughout the Property. Targeted rare plant surveys were not conducted. It is recognized that highly suitable habitat exists, especially within and adjacent to the riparian ecosystem present along Bourguiba creek to the south. As currently proposed, the layout of the subdivision will largely avoid these sensitive areas of the Property.

3.2.1 Shrubland Ecosystems

The Property is predominated by sagebrush steppe ecosystems, and occurs in Polygons 1, 3 and 4 (Figure 2.0). Big sagebrush (*Artemisia tridentata*) with cheatgrass (*Bromus tectorum*) and bluebunch wheatgrass (*Pseudoroegneria spicatum*) provides the majority of ground cover in these communities, with cheatgrass being more prevalent in Polygon 4, and along the edges of disturbances within the Property. Sparse Ponderosa pine (*Pinus ponderosa*) trees were present in Polygon 3, as well as species such as common rabbit-brush (*Ericameria nauseosus*), antelope-brush (*Purshia tridentata*) arrow-leaf balsamroot (*Balsamorhiza sagittata*), pasture sage (*Artemisia frigida*), brittle prickly-pear cactus (*Opuntia fragilis*), slender hawksbeard (*Crepis atribarba*) thread-leaved phacelia (*Phacelia linearis*), yarrow (*Achillea millefolium*), long-leaved phlox (*Phlox longifolia*), silky lupine (*Lupinus sericeus*), snow buckwheat (*Eriogonum niveum*), sagebrush buttercup (*Ranunculus glaberrimus*), Saskatoon (*Amelanchier alnifolia*), currants (*Ribes spp.*), pussytoes (*Anennaria spp.*), junegrass (*Keleria macrantha*), and fescues (*Festuca spp.*). Polygons 1 and 4 are similar in vegetation composition to Polygon 3, however no Ponderosa pine trees were observed, and as the rock outcrops were less abundant, the vegetation community was observed to be more homogenous, with rabbitbrush growing more prevalently than in Polygon 3, but dominant vegetative cover was primarily big sagebrush with bluebunch wheatgrass and cheatgrass.

Within the gully on the north end of the Property, vegetation observed was similar to the shrubland ecosystems, with mock orange (*Philadelphus lewisii*) and cliff ferns (*Woodsia spp.*), trembling aspen, Saskatoon, currants, and common snowberry (*Symphoricarpos albus*) occurring in higher abundance along with sagebrush. The vegetation community in the middle gully was generally consistent with the surrounding shrubland, with a higher density of sagebrush and herbaceous species reflecting the cooler, moister microsite created by the topography.

The shrubland communities showed evidence of colonization of invasive species, with cheatgrass commonly occurring throughout the property, and other weedy species, such as great mullein (*Verbascum thapsus*), Scotch thistle (*Onopordum acanthium*), dandelion (*Taraxacum officinale*), tumble-mustard (*Sisymbrium* spp.), and hound's tongue (*Cynoglossum officinale*) observed within the Property, generally at low densities in Polygons 1 and 3, but in higher abundance in Polygon 4 as a result of the higher levels of disturbance.

While antelope-brush occurs within the Property, and antelope-brush dominated ecosystem communities have been documented in proximity to the Property, there is no defined antelope-brush steppe ecosystems present as the antelope-brush present in the property is sporadic and relatively sparse in abundance.

Photo 3.1 View of the typical sagebrush steppe habitats throughout the Property and within proposed future conservation area within SL 6 (June 3, 2020)

3.2.2 Sparsely Vegetated Ecosystems

Rocky outcrops and areas of exposed silty soils are present in patches throughout the Property, occurring in higher abundance in Polygon 3, with some outcrops present in Polygon 1, and not substantially present in Polygons 2 or 4. These areas provide habitat for unique plant species not occurring elsewhere in the Property including selaginella (*Selaginella spp.*), haircap mosses (*Polystichum spp.*), bitterroot (*Lewisia rediviva*), and lichens. Ponderosa pine, grasses such as bluebunch wheatgrass, fescues, and cheatgrass, and cacti also occur within these sparsely vegetated areas within Polygon 3, and sparse grass patches on outcrops in Polygon 1.

Photo 3.2 View of the patches of rock outcrop features identified as ESA 2 located throughout the upper portion of the Property and within proposed future conservation area within SL 6 (June 3, 2020)

3.2.3 Disturbed Areas

Areas disturbed by human activity generally occur as graded or cleared areas such as the driveway, Lot 5 building pad and spoil pile (Polygon 2), as well as general degradation observed throughout Polygon 4. The areas within Polygon 2 were impacted by the excavation and blasting approved under the ESDP, with construction still underway at the time of writing. There is evidence of encroachment of non-native and invasive species within and along the fringes of disturbance, such as along the edges of Polygon 2 and in Polygon 4 due to the influence of the Highway, including knapweed (*Centaurea spp.*), great mullein, cheatgrass, and Russian thistle (*Salsola kali*).

Photo 3.3 View of the driveway looking southeast towards Highway 3 (June 3, 2020)

3.3 Wildlife and Habitat Observations

Animal species observed during the site assessments include bird species such as California quail (*Callipepla californica*), red-tailed hawk (*Buteo jamaicensis*), western bluebird (*Siala mexicana*), song sparrow (*Melospiza melodia*), vesper sparrow (*Pooecetes gramineus*), mourning dove (*Columba macroura*), Clark's nutcracker (*Nucifraga columbiana*), western meadowlark (*Sturnella neglecta*), black-billed magpie (*Pica pica*), bank swallow (*Riparia riparia*), rock wren (*Salpinctes obsoletus*), dark-eyed junco (*Junco hyemalis*), turkey vulture (*Cathartes aura*), northern flicker (*Coleaptes auratus*), American robin (*Turdus migratorius*), European starling (*Sturnus vulgaris*), canyon wren (*Catherpes mexicanus*), house finch (*Haemorhous mexicanus*), Say's phoebe (*Sayomis saya*), black-capped chickadee (*Poecile atricapillus*), and American kestrel (*Falco sparverius*). Scat of mammal species such as deer (*Odocoileus spp.*) and coyote (*Canis latrans*) were documented during the 2014, 2020, and 2021 field visits, an unknown species of rabbit was observed during the 2020 field visit, and feline tracks, likely cougar (*Puma concolor*), as well as rodent tracks and burrows were observed along the driveway during the March 17, 2021 visit. Yellow-bellied marmots using the riprap along the driveway along with their burrows made into cut banks, tracks, and scat were also observed in 2021. No reptiles were observed during surveys; however, tracks of an unidentified reptile were observed during the 2020 site visit.

Sites of wildlife habitat value within or adjacent to the Property include crevices in the rock outcrops, the riparian community associated with Bourguiba Creek, shrub thickets, areas associated with antelope-brush, and mammal burrows. Trees with wildlife value, including veteran trees were observed during the surveys, and provide opportunity for bird and small mammal nesting and roosting (Figure 4.0). Northern flickers were observed using the wildlife trees during the 2021 site visits. Opportunities for ground nesting bird species were also abundant, within low herbaceous vegetation as well as shrub and riparian vegetation communities. Sparsely vegetated areas and rock outcrops provide potential for reptiles, as well as small mammal denning and shelter.

A potential wildlife corridor exists along the slope on the east side of the Property, within the area designated as SL 6 (Figures 4.0, 7.0). During the March 17, 2021 field visit, an extensive ungulate trail network was observed with regular use indicated by the high degree of trail erosion. Direction of travel was observed to generally be cross slope (north/south), with travel between Bourguiba Creek and the gully on the north end of the Property and use of the gully or creek assumed to provide cover and for travel up or down slope. Wildlife use elsewhere on the property was generally scattered, with deer tracks and scat throughout the property, and tracks present on the driveway. Some faint game trails exist on the west side of the driveway, but consistent use of trails seems to be infrequent, given the lack of substantial erosion along any trail. Large mammal use on the west side of the driveway appears to be primarily grazing, as no bedding areas were observed, and vegetation provides sparse cover relative to the area east of the driveway.

Cut banks created during initial works on the driveway have created opportunities for mammals to dig burrows and bank swallows to nest. A bank swallow colony was observed to have formed near a temporary cut bank near the start of the driveway that was created during construction (Figures 4.0, 7.0) during the 2020 site visits and has been noted by RDOS and the Canadian Wildlife Service (CWS) and the importance of retaining the habitat feature has been conveyed to the Proponent and the contractors completing the work. In order to construct the driveway to specifications outlined by the geotechnical engineer, the slope the swallow colony was established on needed to be graded back further. Ecora consulted with CWS and RDOS on the management of the swallow colony, and it was determined that a replacement bank following a no net loss principle would be an acceptable means to allow the road to be safely finished. Following the construction of erosion protection works, Ecora attended the site on March 17, 2021 to oversee the creation of a replacement colony, following available Best Management Practices from Environment Canada, and the Ontario Ministry of Natural Resources on the creation of bank swallow habitat (ECCC 2020; OMNRF 2017). As the work was undertaken as part of the existing ESDP, a detailed summary of the restoration works have provided in a separate Environmental Monitoring report.

Photo 3.4 View of the site entrance from the eastern edge of Highway 3. Note the presence of cavities in the exposed cut bank which are associated with a colony of bank swallows (June 3, 2020)

Photo 3.5 View of the enhanced swallow habitat at the same location as Photo 3.4, moved higher up the slope (March 17, 2021)

3.3.1 Species and Ecosystems at Risk

The Environmental Sustainability and Strategic Policy Division of the provincial Ministry of Environment, along with the BC CDC collect and disseminate information on plants, animals and ecological communities (ecosystems) in British Columbia. The CDC assigns species and ecosystems to one of three lists (Red, Blue or Yellow), depending upon their assessed provincial status and management priority. This information is compiled and maintained in a database that provides a centralized source on the status, location and recommended level of protection for both species and ecosystems. The CDC's publicly-accessible database search program: Species and Ecosystems Explorer, is used to generate lists of vertebrates, dragonflies, damselflies, tiger beetles, butterflies, non-marine molluscs, vascular plants, mosses, as well as ecosystems in British Columbia.

Species and ecosystems assigned on the provincial Red list are at risk, being endangered, threatened or extirpated. Where extirpated, they no longer occur in the wild in British Columbia, but may occur outside of the province. Endangered implies that species or ecosystems are facing imminent extirpation or extinction in BC. Threatened implies that species or ecosystems are likely to become endangered in BC unless the issues limiting their presence are remediated. Species and ecosystems assigned on the provincial Blue list are also at risk, defined as being of special concern in BC (formerly termed vulnerable). Species and ecosystems that are assigned on the provincial Yellow list are considered to be secure in BC and not at risk.

BC presently has no stand-alone protective species legislation. Red and Blue-listed species may be legally designated, or be candidates for legal designation, under the BC Wildlife Act and the Forest and Range Practices Act. Red and Blue-listed species and subspecies also have guidance policies for their protection as described in Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in BC (MOE 2014). At risk species and ecosystems enhance an area's natural biodiversity. Guidelines, provided within Section Four: Environmentally Valuable Resources, address their protection through:

- Site planning & design;
- Buffer establishment;
- Protection / avoidance during development; and
- Enhancement / restoration of disturbed areas.

Prior to the site visits in 2012 and 2020, Ecora conducted a background review of the BC CDC Species and Ecosystems Explorer and the iMapBC web application to identify the Blue- and Red-listed plants, vertebrate and invertebrate species with potential to occur within or near the Property. The results of the query were based on the following parameters:

- Regional District Boundary (RDOS);
- Bunchgrass (BG) BEC Zone;
- Habitat Types: Forest, Grassland/Shrub, Rock/Sparsely Vegetated, Riparian; and
- Red and Blue-listed species.

The results of the query include 79 species, which are summarized in Appendix B. The large number of potential species, including insects, birds, plants, mammals, reptiles and amphibians, provides an indication of the sensitivity of habitats within the Bunchgrass Zone throughout the south Okanagan.

Figure 4.0 displays the results of a search of identified element occurrences (from the CDC), or their ranges, using the public iMapBC online database, based on a 250 m buffer distance from the Property boundary. The search included both publicly available and masked (confidential) records. The known occurrence records and/or population boundaries for species and ecosystems are identified in Table 3.4. below.

Table 3.4 Known Public Occurrences within 1 km of the approximate centre of the Property

English Name	Scientific Name	Class (English)	BC List	COSEWIC List
CDC Element Occurrences				
American Badger	*Taxidea taxus*	mammals	Red	Endangered
Lewis's Woodpecker	*Melanerpes lewisii*	birds	Blue	Threatened
Whited's Fissurewort	*Sandbergia whitedii*	plant	Blue	-
Antelope-brush / Needle-and-thread Grass	*Purshia tridentata / Hesperostipa comata*	ecosystems	Red	-
Big-Sagebrush / Bluebunch Wheatgrass	*Artemisia tridentata / Pseudoroegneria spicata*	ecosystems	Red	-
Federal Critical Habitat				
Desert Nightsnake	*Hypsiglena cholorphaea*	reptile	Red	Endangered
Western Rattlesnake	*Crotalus oreganus*	reptile	Blue	Threatened
Great Basin Gophersnake	*Pituophis catenifer deserticola*	reptile	Blue	Threatened
Lewis's Woodpecker	*Melanerpes lewisii*	birds	Blue	Threatened
Western Tiger Salamander	*Ambystoma mavortium*	amphibians	Red	Endangered
WSI Incidentals				
Bank Swallow	*Riparia riparia*	birds	Yellow	Threatened

The search yielded two vertebrate and one plant species at risk and two ecosystems at risk documented in the vicinity of the Property (Figure 4.0).

The American badger element occurrence (Occurrence 74373) consists of a single 868,222-hectare polygon that depicts an estimated range boundary of the Okanagan-Boundary subpopulation, extending from the US border to the north end of Okanagan Lake. There is potentially suitable burrowing habitat within the Property along the natural hill slopes and constructed cut banks. However, the abundance of American badger in BC is low, and the proximity to the highway and activity on the Property suggests the likelihood of the Property sustaining a population of badgers is low. There were no badger burrows or signs of digging observed within the Property during the site visits.

The Lewis's Woodpecker element occurrence (Occurrence ID 7410) occurs north of the Property and represents and area where nesting has been documented to occur, with the last observation occurring in 2006. Critical Habitat (CH) attributes associated with this species include veteran trees that provide potential cavity nesting habitat and fruit-bearing shrubs suitable for foraging. These features, including the scattered mature trees, are present, generally within the proposed SL 6, and will be retained within the Property where they occur. In addition, it is recommended that any landscaping or restoration measures include the planting of berry bushes, such as tall Oregon grape or Saskatoons, to enhance habitat values for Lewis's woodpecker.

Whited's fissurewort (Occurrence ID 7528) occurs southeast of the Property and represents observations of Whited's fissurewort growing on dry, exposed sites along Highway 3 and in proximity to big sagebrush. The last documented observation occurred in 1995. Detailed habitat information is limited, apart from an association with big sagebrush, and occurrence of dry, rocky slopes (Klinkenberg 2020). Habitat for Whited's fissurewort may be present within the property, however it has been noted that it is rare in South-Central BC and so the likelihood of occurrence within the Property is low.

Two Ecosystem polygons Antelope-brush / Needle-and-thread Grass (Occurrence ID 48619) and Big Sagebrush / Bluebunch Wheatgrass (Occurrence ID 111712) have been documented as occurring across Highway 3 from the Property. Big Sagebrush / Bluebunch wheatgrass is the predominant ecosystem type on the subject property, however the Antelope-brush / Needle-and-thread Grass community was not observed on the property during ecosystem mapping.

Federally identified Critical Habitat (CH) exists in within the Property for the following species:

- Western Tiger Salamander;
- Lewis's Woodpecker;
- Desert Nightsnake/Western Rattlesnake/Great Basin Gophersnake

Western Tiger Salamanders are found in a variety of open habitats, including grasslands and semi-deserts. They require sandy or friable soils for burrowing and will utilize vacant burrows created by small mammals. Generally, they occupy terrestrial habitats within 250 m of suitable breeding ponds, which are characterized by still or slow moving permanent or semi-permanent waterbodies without fish and persisting for at least 3-7 months in order to allow for juveniles to metamorphosize, although in high-elevation areas, juveniles mature slowly, or remain as neotenic adults, and so require permanent waterbodies (COSEWIC 2012). While terrestrial conditions (i.e., soils, availability of burrows, ecosystem characteristics), there is no suitable breeding sites present within range of the Property, as determined by aerial imagery, or observations during site visits. Bourguiba Creek is unlikely to provide quality breeding habitat due to its ephemeral nature, and flow characteristics.

As described above, Critical Habitat values for Lewis's woodpecker are present within the Property, and will be retained during future developments, largely as a result of occurring almost exclusively within the proposed Conservation Area of SL 6.

Desert Nightsnake, Western Rattlesnake, and Great Basin Gophersnake Critical Habitat polygons are mapped as a 10 km x 10 km square that encompasses the Property and surrounding area. Critical Habitat is identified as areas with suitable habitat features, within proximity to known or likely hibernacula. These snakes require suitable overwintering habitats (i.e., hibernacula) and adjacent terrestrial habitat for foraging, basking, and migration. Critical habitat features include a matrix of rock outcrop and other sparsely vegetated sites (cliff, talus), grassland and shrub-steppe ecosystems, open forest, and riparian or wetland areas to meet all the life-history needs (COSEWIC 2019). These features were observed to be present within the Property, as the rock outcrops and talus piles may provide suitable overwintering or summer shelter, and the surrounding area and proximity to riparian habitats provide foraging opportunities. No snakes or sign were observed during the site visits, but there is a high likelihood of snakes being present within the Property. As such, future developments should ensure that the design and construction activities are conducted in accordance with the recommendations in Section 5 to avoid potential impacts to snakes.

Each of the recovery strategy documents must be reviewed during future development activities to ensure compliance and to avoid impacts to identified attributes of the CH.

As discussed in the previous section, bank swallow habitat has been created by cut banks constructed during the es tablishment of the road corridor. While issues of relocation may arise with temporary steep silt banks, an opportunity exists to create bank swallow habitat on the property that was not present prior to the initiation of works.

3.4 Aquatic Habitats and Riparian Areas Assessment

There were no surface waterbodies observed within the Property boundary. Two gullies cross the Property on the north end and in the middle of the Property, and Bourguiba Creek occurs immediately south of the southern Property boundary. The gully on the north end of the Property likely meets the *Water Sustainability Act* definition of a stream, as does Bourguiba Creek.

The middle gully, while a TRIM line is present on mapping of the property, was observed to have no sign of regularly flowing water, as evidenced by the lack of any defined scour or erosion, sediment deposition, presence of xeric species such as sagebrush growing in the bottom of the gully where water would be anticipated to flow, and the lack of any signs of water moving organic debris like leaf litter, sticks, or dead grass, either built up along the edge of the path of water flow or caught on the shrubs growing at the bottom of the gully. The gully may collect water during very heavy rainfall or snowmelt events given its topography, but given the lack of evidence of flow, it is anticipated that much of this runoff quickly drains into the soils and flows subsurface. As such, it does not meet the definition of a stream under the *Water Sustainability Act*.

Given the ephemeral nature of Bourguiba Creek and the north gully, there is not expected to be fish present in any of the streams, though this has not been definitively determined by Ecora. Bourguiba Creek does provide some ephemeral aquatic habitat, likely for invertebrates. Any future works that may impact Bourguiba Creek or the north gully will be undertaken in accordance with the conditions outlined in the *Water Sustainability Act* and subsequent regulations.

3.4.1 Riparian Assessment

The gullies within the Property as well as Bourguiba Creek fall within the identified Riparian Assessment Area (RAA) outlined in the OCP. The previous EA concluded that none of the gullies or Bourguiba Creek meet the criteria of a stream, as defined by the Riparian Area Regulations (RAR) that were in place at the time the report was prepared, as none of them provided fish habitat, or contributed water to a fish bearing stream.

Following the 2020 site visit, it was determined that Bourguiba Creek falls within the definition of a stream, as there is potential to convey surface flows to downstream fish habitat (i.e., Osoyoos Lake). The Streamside Protection and Enhancement Area (SPEA) was determined pursuant to the Riparian Areas Protection Regulation (RAPR) and is shown in Figure 5.0. The RAA and SPEA for Bourguiba Creek do not overlap the Property and, as such, do not trigger the RAPR process. The proposed subdivision will not result in sterilised lots resulting from the SPEA, and so development is anticipated to be compliant with the RAPR.

3.5 Environmentally Sensitive Areas

The ESA identified during the original assessment range are comprised of Moderate (ESA 2) and Low (ESA 3) values. The sensitivity rankings or polygons were not changed from the original EA, as it was deemed that, based on the evaluation criteria specified in Section 2.5, the rankings are still reflective of current site conditions. Figure 6.0 illustrates the ESA values present within the Property. The ESA definitions and summary of the mapped area, and percentage of the Property, are outlined in Table 3.5.

Table 3.5 Environmentally Sensitive Area Coverage within the Property

ESA Value	ESA Class / Value	Area (Ha)	% Property
1	High	0	0
2	Moderate	2.8	22
3	Low	9.8	78
4	Not sensitive	0	0
Total		12.6	100.0

The Property was divided into 28 polygons, with the breakdown of each polygon, and ranking criteria are given in Table 3.6.

Table 3.6 Environmentally Sensitive Area Classification Rationale

ESA Value	Polygon	Description	Rationale
2	2	Subhygric draw	• Wildlife Corridor, and connectivity to adjacent drainages. • Provides abundant shrubby cover. • Relatively higher plant biodiversity than surrounding area. • Provides complex habitat for wildlife nesting and feeding. • Critical Habitat Features for Lewis's Woodpecker (berry bushes, perches), and snakes (travel corridor, hunting).
	3-28	Rock outcrops and sparsely vegetated communities	• Provides unique habitat values for rare plant species, and wildlife such as canyon wren, small mammals, and reptiles. • Fragile plant communities. • Critical Habitat Features for Lewis's Woodpecker (wildlife trees). Provides basking and potential overwintering habitat for snakes. • Some fragmentation or disconnection present, especially towards west half of property.
3	1	Shrubland	• Within Critical Habitat polygon for Lewis's Woodpecker western salamander, and snakes, however, generally lacks key features. Provides opportunities for foraging, but minimal nesting, or overwintering potential. • Relatively homogenous vegetation community dominated by big-sagebrush. Some invasive species presence throughout (e.g., cheatgrass), particularly on southwest portion near highway. • Red-listed ecosystem community, however locally abundant

ESA 2 areas correspond to the north gully within the Property (2% of the area) as well as areas of rocky outcrops and sparsely vegetated communities (20% of the Property). The gully provides for wildlife movement, as well as feeding habitat and nesting or shelter habitat for bird, reptile, and mammal species. The sparsely vegetated and rocky areas provide habitat to many species at risk, as well as provides basking and denning opportunities for reptiles and small mammals. The remainder of the Property has been assigned as ESA 3, given the local abundance of big-sagebrush shrubland habitats in the area, the presence of some invasive species, and the lack of Critical Habitat key features. ESA 1 areas associated with Bourguiba Creek and the drainage to the north of the Property were identified during the previous assessment, however these occur outside of the parcel boundary and will not be impacted by the development.

4. Impact Assessment

The proposed development addressed by this report is subdivision only and therefore there is no development footprint to consider for habitat impacts. The subdivision has been planned in such a way that approximately 84% of the ESA 2 area is contained within SL 6, which is designated as a Conservation Area that will be protected by a title covenant limiting development and use of the area and administered by the Strata. Table 3.7 presents the composition of ESA values within each proposed lot.

Table 4.1 Environmentally Sensitive Area Coverage within the Property

Surface Lot	ESA 2 Area (ha)	ESA 3 Area (ha)	ESA 2 Percentage	ESA 3 Percentage	Total Area (ha)
1	0	1.09	0	100	1.09
2	0	1.01	0	100	1.01
3	0.10	1.06	8	92	1.16
4	0.09	0.97	8	92	1.06
5	0.02	1.13	2	98	1.15
6	2.34	3.24	42	58	5.57
Common	0.22	1.27	15	85	1.49
Total	**2.77**	**9.76**	**22**	**78**	**12.53**

The single-family residence associated with SL 5, the common driveway and servicing are all being constructed under the terms and conditions of the existing ESDP and following the recommendations of that report, including site restoration. It is understood that following re-zone and subdivision, each of the future Strata Lots will be developed with a sing-family residence, driveway, septic system, and landscaping. The spatial extents and timing of development is not known at this time, however a concept of the layout of each lot, with disturbance footprints, has been shown on Figure 7.0. It is anticipated that each new development may trigger the RDOS ESDP process at the time of development. In each case, site specific measures can be implemented to ensure the development is consistent with the recommendations made in the original EA, this EA, and ESDP guidelines. Future activities with potential to adversely affect the local plants, ecosystems and wildlife include:

- Clearing, grubbing, and earthworks for house footprint and driveway access at each subdivided Strata Lot, blasting is not anticipated;
- Site servicing, including stormwater and sewer septic systems for each subdivided Strata Lot;
- Residential construction and paving of roads, and retaining walls; and
- Site remediation, including re-grading and hydroseeding.

The potential direct and/or indirect impacts resulting from potential future residential development following re-zone and subdivision upon local plants, ecosystems and wildlife include:

- Loss and degradation of vegetation, including sensitive and at risk plants and ecosystems;
- Introduction and spread of invasive plants;
- Loss and degradation of soil;
- Loss of potential nesting, denning, and/or basking habitat or habitat features for sensitive species; and
- Changes to wildlife movement and or habitat use patterns, i.e., through visual and/or auditory disturbance;

A site plan showing the proposed SL subdivision and currently permitted driveway work is provided in Appendix A. There is no new disturbance proposed at this time. A concept development plan outlining a development scenario that avoids ESA 2 areas has been prepared to highlight potential future development in the context of the environmental values on the Property (Figure 7.0), however this concept is preliminary, and has not been reviewed by civil or geotechnical engineers. As such, the ultimate development footprint on each lot is subject to change, however the Proponent has expressed that the objective is to build custom homes using low impact designs and construction methods.

The riparian trigger (i.e., RAA) and setback (i.e., SPEA), pursuant to the RAPR, is also shown on Figure 7.0. As the 30 m RAA from the Bourguiba Creek channel does not overlap the Property, there is no trigger for the RAPR assessment. The proposed subdivision conforms to the RAPR and there will be no encroachment on the RAA or SPEA.

4.1 Environmental Effects

Potential environmental impacts may arise during the future residential construction activities described above. The avoidance and protection of identified environmental values within the Property will help mitigate potential adverse environmental impacts. Provincial best management practices (BMP) and other suitable mitigation measures must be incorporated into the development planning to avoid the following impacts:

- Release of fine sediments to adjacent natural habitats (i.e., Bourguiba Creek) during clearing, grading, stripping, hauling, and other onsite construction works.
- Improper handling, storage, or disposal of waste materials and/or construction debris that results in the release of deleterious substances to adjacent natural areas and causes subsequent negative impacts to wildlife and/or habitat.
- Spills or leaks of deleterious substances (e.g., fuel, oil, hydraulic fluid) to the environment as a result of improper storage, vehicle and equipment re-fueling, and/or poorly maintained equipment.
- Direct or indirect impacts to wildlife and wildlife habitat, including species at risk, important habitats, and other sensitive features (e.g., plants, burrows, nests, wildlife trees, etc.).
- Disturbance beyond the identified development limits that facilitates encroachment of non-native and invasive plant species, which degrades the ecological values of adjacent natural communities.

The Property is generally in a natural state with some disturbance from the previous land clearing and excavation for the single residence and access roadway, under the ESDP. The areas planned for future houses within each of the proposed SL appear to be suitable based on the ESA rankings and other observations. The proposed conservation SL will preserve the majority of the ESA 2 and sensitive features (riparian areas, rock outcrop) and maintain connectivity between Bourguiba Creek, the unnamed drainage to the north, and natural areas to the east.

Approximately 84% of the areas within the Property that consist of natural and undeveloped lands that are labeled ESA 2 will be retained during future development through a covenant, however some slight encroachment into ESA 2 areas within SL 3 and 4 may occur pending civil and geotechnical review of the future development to ensure that development occurs in a safe manner. A standard practice throughout the Okanagan Valley is for local municipalities (e.g., West Kelowna, Regional District of Central Okanagan) setting thresholds for acceptable degrees of retention of environmentally sensitive areas during development. Generally, the threshold of disturbance for ESA 2 is retaining 80% of the area present within a subject property, and ESA 3 areas set a target of 60% retention. Given that 84% of the ESA 2 area is contained within the proposed Conservation Area, minor encroachments to the ESA 2 areas present on SL 3 and 4 are would be within an acceptable tolerance, and generally insignificant, however should be reviewed by a QEP prior to occurring to ensure that no other alternative exists. No plans have been proposed at this stage, and the lots will be developed on a lot-by-lot basis. Therefore, RDOS should work with the Proponent to set conditions within the ESDP to ensure that development proceeds in a manner deemed reasonable to RDOS.

4.2 Impact Summary

From an environmental perspective, the proposed re-zone and subdivision of the Property is considered a suitable location for the proposed re-zone and subdivision from an environmental perspective as the additional 4 residences (besides the single-family residence already permitted) will occur within the relatively lower ecologically valuable areas and maintain the majority of the natural setting (i.e., cluster development style). The proposed SL 6 will be dedicated to conservation and represents almost half of the Property area, including approximately 84% of the designated ESA 2 areas. As such, the contribution to cumulative local and regional impacts is considered negligible, as long as the higher value rock outcrop, shrub-steppe, and riparian habitats are maintained or enhanced and future development follows the recommendations outlined in the mitigation plan, as described below. Overall, the proposed development is considered reasonable for the Property for the following reasons:

- The 12.6 ha Property is roughly comprised of 2.8 ha of ESA 2 (22%), and 9.8 ha of ESA 3 (78%).
- Approximately 5.6 ha (SL 6) will be dedicated to conservation which represents 44% of the total Property area and includes 2.3 ha (84%) of the ESA 2 present within the Property.
- The proposed dedication of SL 6 representing almost half of the Property area to conservation will help avoid impacts to the ESA 2 areas and other sensitive features and will ensure effective protection of those environmental values in perpetuity.
- Potential exists for extending the Conservation Area, as well as enhancing habitat for species at risk, such as Lewis's woodpecker or bank swallow, as a means to offset any future impacts as required.
- The proposed re-zone appears to be suitable for the Property based on the Regional Growth Strategy and support from the Area Director (pers. comm. with Proponent).
- The proposed subdivision density appears to be generally consistent with other development in the area, including at higher elevations along HWY 3 and nearby residential development along the west-facing slopes of Anarchist Mountain.
- The Proposed subdivision is compliant with the Riparian Areas Protection Regulation (RAPR) and does not result in conflicts with the proposed setback (i.e., SPEA and/or RAA).
- Ecora has been retained to provide environmental monitoring services under the current ESDP and will continue to monitor during future works.
- Future development in each Strata Lot will follow the form and character guidelines developed by the Strata and will include low-impact designs, low-maintenance landscaping (i.e., low water use, heat, and drought tolerant plants), native plants, efficient homes, and other features to reduce impacts to the environment.
- As long as future development is conducted following the mitigation and recommendations provided in this report and adhering to the conditions of the ESDP and other pertinent legislations, regulations, and BMPs, the potential for adverse environmental impacts on environmentally sensitive areas will be appropriately mitigated. Additional site specific Environmental Management Plans (EMP) may be implemented as development plans for each lot are proposed or at the time of construction to address the RDOS ESDP guidelines, as required.

5. Mitigation and Recommendations

The following recommendations and mitigation strategies for proposed development within the Property are based on the current condition of the Property and results of the environmental sensitivity analysis. Avoidance of impacts through planning and design is the most preferable method of preventing adverse impacts to the environment. As avoidance is not always possible or realistic, impacts should be reduced or eliminated through the use of procedures and planned mitigations. The recommendations in this section are provided as a guide for future development within the Property to reduce or avoid potential impacts and to maintain consistency with municipal and regional guidance documents and provincial Best Management Practices (BMP), as described in Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia (2014) and Keeping Nature in Our Future: A Biodiversity Conservation Strategy for the Okanagan (2012).

5.1 Environmental Monitoring

Ecora has been retained as the environmental monitor (EM) for ongoing works being conducted under the current ESDP, including the house construction and access road upgrades. Ecora will continue to provide EM services for work under the existing ESDP, including site inspections and documentation of compliance with BMPs, permit conditions, and other guidelines and recommendations. It is recommended that an EM be retained to oversee future development, as it occurs. In the event that greater disturbance occurs due to unforeseen circumstances, the EM will recommend measures to protect or restore the natural integrity of the site.

- The EM will attend regular meetings, as required. The EM will conduct a site inspection on a minimum monthly basis during active or high-risk construction.
- The EM will be an appropriately qualified environmental professional (QEP) authorized to halt construction activities as deemed necessary to prevent harm to terrestrial, aquatic, or riparian resource values.
- A copy of this report describing mitigation measures and BMPs must be kept readily available at the site for reference while the work is being conducted. Copies of relevant permits and emergency contact information must also be kept on site and readily available.
- Summary monitoring reports will be submitted on a regular basis to the contractor and the RDOS. A final report will be generated upon the substantial completion of construction works summarizing the project activities and listing any deficiencies noted throughout the works.
- The EM will be responsible for conducting pre-construction wildlife surveys and/or salvage, as required based on the timing of works. Permits will be applied for as needed if salvage is required.

5.2 Site Preparation

All mitigation measures must be in place and functioning as required prior to the initiation of construction activities. Mitigation measures must be maintained, repaired, replaced, or otherwise adapted as necessary to ensure appropriate protection of the natural environment.

- Staging, parking, storing of equipment, and stockpiling of materials must be within designated areas within the construction footprint and not encroaching beyond the disturbance limits associated with the construction project. Staging, parking, and storage areas must be situated at least 30 m from watercourses and drainage features, including stormwater features (i.e., catch basins).

- Phasing of construction activities will be utilized to reduce the amount of time soils remain exposed to erosion potential. Clearing, stripping, grubbing and other earthworks should be completed in as short a time period as possible.
- The completion of geotechnical surveys (e.g., boreholes, drilling, etc.) and other investigations that require ground or vegetation disturbance must avoid the sensitive ecosystems and features described in this report. Disturbance within areas identified as ESA 2 to be retained must be restored to natural conditions under the direction of the EM.

5.3 Reduced Risk Timing Windows

There is a potential for disturbance to sensitive wildlife during works. As such, least-risk timing windows should be followed to reduce the potential to adversely affect wildlife directly or indirectly during the works. Least-risk windows for each species or wildlife group are discussed further below.

5.3.1 Birds

The breeding bird window for this part of the province generally occurs from March 15 to August 31, although there are species that may begin nesting earlier and finish nesting later. Guidelines for specific species or species groups will be determined using the Environment Canada general nesting periods of migratory birds in Canada (available: https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods.html) for the 'South Okanagan Basin' eco-district. According to this site, the least-risk window for birds is from September through February.

- To maintain compliance with the federal *Migratory Birds Convention Act*, all vegetation and ground disturbance for construction must be completed during the least-risk period. Vegetation clearing or removal activities that are proposed within the breeding bird window will require approval from the RDOS and/or CWS.
- If permission to clear trees or other vegetation outside of the least-risk period is granted, pre-construction surveys to identify active nests will be completed by the EM. Surveys will include searches for nests, snags, and cavities that may be used over multiple years or year-round.
- If active nests are found within the proposed disturbance footprint, construction may not continue in that area. The EM will establish and clearly delineate a buffer around the nest until such time that the EM can determine that nest has become inactive. The size of the buffer will depend on the species and nature of the surrounding habitat. Buffer sizes will generally follow provincial BMP guidelines or other accepted protocol (e.g., Environment Canada). In general, a minimum 20 m buffer will be established around songbird nests or other non-sensitive (i.e., not at risk) species.
- Wildlife trees with cavities, stick nests, or other active breeding habitats must be retained. Depending on the activity at the nest and species associated with it, the nest may be protected by the provincial Wildlife Act, the federal Migratory Birds Convention Act, and/or the Species at Risk Act. Recommended buffers for raptor nests are provided in Table 6 of the 2013 Guidelines for Raptor Conservation BMP. According to this document, raptor nests within rural areas should be protected with a no-disturbance buffer of 100 to 200 m, depending on the nature of the species (i.e., ability to co-exist). During the breeding season, an additional 100 m noise buffer is recommended.

5.3.2 Aquatic Resources

The riparian and aquatic communities must be conserved for the important benefits to wildlife habitat and diversity within the Property.

- Proposed alterations to Bourguiba Creek that have the potential for downstream and/or subsurface effects will be subject to the WSA. As such, additional assessment and/or permitting will be required at the time of development to ensure compliance with regulations.
- To maintain the integrity of Bourguiba Creek and other watercourses and associated riparian areas, a development buffer should be maintained, consistent with the RAPR. Where suitable, restoration of degraded riparian areas should be considered (e.g., planting native vegetation, removing invasive species).
- Stormwater drainage should be discharged to the stormwater system or to ground wherever possible and not to existing surface water features or watercourses.

5.3.3 Reptiles and Amphibians

Sensitive times for reptiles generally occur in the late spring during emergence from hibernacula and early fall during the return to hibernacula. The overwintering period is also a vulnerable time for reptiles. General mitigation measures that should be followed are provided in Guidelines for Amphibian and Reptile Conservation during Urban and Rural Development in British Columbia (2014).

- Suitable denning and foraging habitats were observed within the Property, including the rock outcrops, and other sparsely vegetated areas, shrub-steppe, and riparian communities. These areas mostly occur within the proposed Strata Lot intended for conservation.
- Suitable habitats and cover (e.g., fractured rock outcrops, large woody debris, snags, herbaceous and shrub cover) should be retained to the extent possible.

5.4 Plants and Ecosystems

During the design of development within each lot, ESA 2 areas should be conserved as much as is feasible, as maintaining these areas is anticipated to maintain suitable habitat for potentially occurring rare plants and other important vegetation and ecosystem communities.

- The clearing and grubbing limits of disturbance footprints will be clearly identified in the field and there will be no-disturbance permitted beyond those limits. Impacts to native vegetation and soils beyond the project boundary must be avoided at all times.
- All existing native vegetation outside of the permitted disturbance footprint, including trees, snags, shrubs, grasses, and groundcover, must be retained. Soil disturbance must be limited to the disturbance footprint.
- Flagging or snow fencing will be used to clearly delineate the construction limits prior to the commencement of works. The EM will review the clearing limits with the contractor to ensure a common understanding of the works, the type of boundary marking used (flagging, fencing, or other), and to prevent encroachment beyond the identified disturbance footprint. Areas at risk of sediment and erosion

related issues will be identified and silt fencing or other appropriate mitigation measures (e.g., filter fabric, ditches, berms, poly sheeting, sandbags, etc.) will be installed.

- All contractor vehicles and equipment will be operated or stored within the construction limits. All stockpiles and storage of other materials will occur within the construction limits.

5.5 Wildlife and Species at Risk

Important wildlife habitat, including nests, dens, burrows, wildlife trees, coarse woody debris, and other unique features (if any), will be identified by the EM prior to the initiation of construction works, and if necessary, a wildlife sweep will occur prior to works commencing. Encroachment beyond the identified construction limits may not occur at any time.

- A bank swallow colony had established in a temporary cut slope and was relocated in consultation with RDOS and CWS to ensure no net loss of habitat and allow for the construction of the road to meet the geotechnical safety requirements. Prior to the original cut, no habitat or colony existed for bank swallows in this area, so the original cut for the access road created habitat for the swallows that did not previously exist. Future development, cuts, and spoil piles will be graded to slopes less than 70 degrees or covered to prevent bank swallows from nesting in temporary work areas (ECCC 2020, OMNRF 2017).

- Future upgrades of the access roadway or cuts should ensure that the final design strives to create a vertical, exposed silt banks where possible. The final design of the vertical banks will be done in a field-fit manner under the direction of the geotechnical engineer and a Qualified Environmental Professional (QEP) to ensure new habitat that is created is suitable for the bank swallows.

- The identified CDC Element Occurrences, federally designated CH, and other identified values for species at risk must be reviewed and addressed during future development. This may include further inventory, assessment, and/or refinement of development plans based upon the identified habitat suitability and presence of habitat attributes, as defined in the recovery strategy documents for each species.

- Identified wildlife trees, including standing dead or partially dead trees (snags), trees with cavities, and/or trees with stick nests or other unique cover features for wildlife must be conserved. Construction works will be conducted within the least-risk window for breeding birds, described above and using the appropriate disturbance and noise buffers.

- If stick nests are found to occupied and/or active at the time of construction, no-disturbance buffers will be implemented surrounding the tree. The minimum recommended buffer for raptors with a moderately high tolerance to human activity in a rural setting is 100 m (MOE 2013). The noise buffer recommended during the breeding season (generally March to September) is an additional 100 m (200 m total buffer).

- Wildlife related BMPs and guidelines that should be followed during planning and construction include Best Management Practices for Bats in British Columbia (2016), Guidelines for Amphibian and Reptile Conservation during Urban and Rural Development in British Columbia (2014), and Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia (2013), each of which is available at http://www.env.gov.bc.ca/wld/BMP/, in order to limit wildlife disturbances and mortalities as a result of construction and earthworks.

5.6 Aquatic Resources

The riparian communities must be conserved for the important benefits to wildlife habitat and diversity within the Property. Any proposed disturbance to aquatic resources must be compensated for with restoration and/or enhancement efforts elsewhere within the Property.

- The gully to the north end of the Property and Bourguiba Creek are subject to the provincial WSA and/or the RAPR. As such, additional assessment and/or permitting may be required at the time of development to ensure compliance with these provincial regulations.
- For conceptual purposes, a 30 m setback has been shown in association with Bourguiba which represents the Riparian Assessment Area (RAA) trigger and may constitute works 'in and about a stream' as per the WSA (Figure 6). The prescribed 10 m SPEA associated with the creek is also shown. The current development plan does not conflict with these setbacks.
- Residential stormwater drainage should be discharged to ground wherever possible and not to existing surface water features or watercourses. Proposed stormwater outfalls will follow the guidelines and recommendations provided in the provincial standards and best practices for instream works, as they pertain to urban stormwater management.

5.7 Erosion and Sediment Control

Erosion and sediment control mitigation measures are based upon the Develop with Care series, Standards and Best Management Practices for Instream Works, and the Land Development Guidelines for the Protection of Aquatic Habitat (Chilibeck et al. 1993). The Erosion and Sediment Control Plan (ESCP) described below provides mitigation measures that must be followed throughout construction to protect environmentally sensitive habitats.

- Sediment-laden flows must not be conveyed directly towards Bourguiba Creek. If encountered, sediment-laden waters must be contained within the project site by conveying flows to a sediment trap, tank, or sump, which must be of sufficient capacity to collect waters and allow settling of fine materials prior to discharge.
- Erosion control measures must prevent any increase to the NTU/TSS background level of Bourguiba Creek. The maximum allowable instantaneous increase is 25 mg/L over background levels, when background is <250 mg/L or a 10% increase in TSS when background is >250 mg/L. Turbidity levels must also conform to standard guidelines:
  - During clear flow periods, induced turbidity should not exceed background levels by more than 8 NTU during any 24-hour period. For sediment inputs that last between 24 hours and 30 days the mean turbidity should not exceed background by more than 2 NTU.
  - During turbid flow periods, induced turbidity should not exceed background levels by more than 5 NTU at any time when background turbidity is between 8 and 50 NTU. When background exceeds 50 NTU, turbidity should not be increased by more than 10% of the measured background level at any one time.
- Construction activities must not be conducted during heavy rains to reduce the potential for conveying silt and other sediment beyond the construction limits and/or Property boundary. Exposed soils and stockpiles must be stabilized and covered using geotextile fabric, poly sheeting, tarps, or other suitable materials to reduce the potential for erosion and/or mobilization of sediment resulting from rainfall,

seepage, or other sources of surface water flows. Exposed embankments shall be covered and stabilized immediately following stabilization.

- The implementation of mitigation measures will be discussed between the EM and contractor prior to the initiation of works to ensure a common understanding of methods of installation and expectations of effectiveness. The contractor shall inspect the mitigation measures daily and additional measures will be installed, maintained, and repaired or replaced as required using a field-fit, adaptive management approach.
- The ESCP will be followed as required to mitigate risks throughout construction works. The plan is based upon provincial BMPs and other specifications and includes the following principles:
  - Major earthworks will not be conducted during periods of heavy rain;
  - Natural drainage patterns will be maintained;
  - Existing native vegetation outside of the development footprint will be retained;
  - Stormwater and sediment-laden runoff must be directed away from exposed soils within the construction area;
  - Sediment-laden water must not be directed to any surface water feature or other drainage system;
  - Slopes must be stabilized as soon as possible following construction; and
  - Other erosion and sediment control measures will be implemented, inspected, maintained, and/or replaced as required to provide appropriate mitigation.
- Silt fencing will be installed as directed by the EM along the construction limits to mitigate the risks associated with surface runoff and sediment transport and to provide a visual barrier delineating the disturbance boundary. Fencing will be staked into the ground and trenched a minimum of 10 cm to prevent flow underneath the fence, as per the manufacturer's specifications. Silt fencing will be monitored on a regular basis and any damages or areas where the integrity and function of the fencing have been compromised will be promptly repaired or replaced. It will remain in place until the completion of the project.
- The contractor must have the following erosion and sediment control measures readily available onsite:
  - Several rolls of non-woven geotextile fabric of various grades;
  - Several rolls of silt fencing with sufficient wooden stakes to allow for installation;
  - Tarps, poly sheeting; and
  - Clean drain rock.
- Other suitable erosion control measures may include: slope drains and interceptor ditches, berms, check dams, grass seeding, and mulch. Sediment control measures that may be employed include check dams, erosion control fabrics and logs, sumps and sediment traps, and rip-rap. Hay bales and straw must be certified weed free if they are to be used onsite.
- Stockpiled soils and fill material must be stored away (i.e., >30 m) from watercourses, ditches, and other aquatic habitats and must be covered with poly sheeting or tarps or surrounded with silt fencing to

prevent sediment from being conveyed off-site, particularly during rain events. Stockpiled material must not be allowed to slough beyond the disturbance limits.

- All access roads must be kept clean and free of fine materials throughout construction works. Sediment accumulation upon the road surfaces must be removed (i.e., swept or scraped) on a regular basis and disposed of appropriately.
- The release of silt, sediment, sediment-laden water, or any other deleterious substances into any ditch, watercourse, ravine, or other drainage feature must be prevented at all times.

5.8 Equipment Maintenance and Fueling

The contractor will ensure all onsite equipment and machinery is in good operating condition, and free of leaks, excess oil, and grease. The contractor shall perform and record the daily inspections of all equipment, vehicles, and storage containers used on site for leaks, staining, or other signs of discharge.

- Vehicles and equipment must be serviced, inspected, and pressure washed off-site, prior to construction works to remove surface oil, grease, weed seeds, and other undesirable or deleterious materials.
- Fueling or vehicle maintenance must be conducted on impermeable (i.e., paved) surfaces and must be at least 30 m from any surface drainage or tributary channel.
- The contractor will ensure that fuel, oil, hydraulic fluid, and other hazardous or deleterious materials are stored at least 30 m away from any watercourse or surface water drainage. This includes tanks, barrels, drums, generators, and other equipment.
- The contractor will ensure all hydraulic machinery working within or directly adjacent to any watercourse or surface water drainage utilizes environmentally sensitive hydraulic fluids that are non-toxic to aquatic life and that are readily or inherently biodegradable.

5.9 Emergency Spill/Response

Spills of deleterious substances can be prevented through awareness of the potential for negative impact on aquatic habitats and with responsible housekeeping practices onsite. Maintenance of a clean site and the proper use, storage and disposal of deleterious liquids and their containers are important to mitigate the potentially harmful effects of spills and/or leaks. The following BMPs are adapted from the Standards and Best Practices for Instream Works (MOE and DFO 2014). Materials Safety Data Sheets (MSDS/SDS) for all potentially hazardous materials will be kept onsite during construction activities.

- Preventative measures the contractor will undertake to prevent spills from occurring include safe containment, labelling, and storage of all deleterious substances present onsite, securing stored hazardous or toxic materials to prevent vandalism or theft, disposing of used containers properly, and using appropriate personal protective equipment when handling, transporting, or disposing of hazardous or toxic substances.
- Stand-alone fuel tanks, generators, and other potential spill sources will be surrounded by an impervious berm designed to holdback 110% of the volume of the container materials.

- All spill events will be recorded and reported to the site supervisor and EM. In the event of a spill, the site supervisor (Contractor) will be immediately notified by workers onsite. The supervisor will then be responsible for contacting a mechanic (if necessary) and the EM.
- Spills shall be contained, absorbed, and disposed of in accordance with the regulations outlined in the provincial Environmental Management Act and using the following general steps:
  - Assess, monitor and prevent the hazard or threat;
  - Stabilize, contain, remove and clean up the hazard or threat;
  - Evacuate persons;
  - Recover and rehabilitate wildlife;
  - Restore wildlife habitat;
  - Take other steps to address the long term impacts resulting from the spill; and
  - Report the spill event (within 48 hours). Reportable quantities are provided in the Spill Reporting Regulation of the *Environmental Management Act*.
- Copies of contact phone numbers for notification of all of the required authorities in the event of a spill/emergency response will be posted and clearly visible at the site.
- Spill containment kits will be kept in machines operating onsite or readily available during construction activities in case of the accidental release of a deleterious substance to the environment. Kits will generally include absorbent pads and/or socks, pillows, disposal bags, disposable gloves, and goggles.
- Any spills of a toxic substance shall be immediately reported to the Emergency Management BC's Emergency Coordination Centre 24-hour hotline at 1-800-663-3456. Reporting of spills should include the following information:
  - Name and phone number;
  - Location and time of the spill;
  - Type and quantity of the substance spilled;
  - Cause and effect of the spill;
  - Details of action taken or proposed;
  - Description of the spill location and the surrounding area.

5.10 Noxious Weed Control

As part of the maintenance of the site and prevention of ecological degradation, a noxious weed management plan is provided below. The intent of the weed management plan is to reduce the potential to spread noxious weeds within or beyond the construction site boundaries. Mitigation measures have been adapted from the Invasive Species Strategy for BC (ISCBC 2012) and the MFLNRO Invasive Plant Program Strategic Plan (2014). Other sources of information on the identification, management, and control of invasive species are available at

the Okanagan and Similkameen Invasive Species Society (http://www.oasiss.ca/) and the RDOS Invasive Species Program (http://www.rdos.bc.ca/departments/public-works/invasive-species-program/).

- The basic principles of the weed management plan include:
  - Suppression of weed growth;
  - Prevention or suppression of weed seed production;
  - Reduction of weed seed reserves in the soil; and
  - Prevention or reduction of weed spread.
- Identification of existing weed populations and prevention of spread is the most efficient form of weed management. The EM will identify and delineate the extents of existing weed species of local or regional concern. The EM will inform and educate the contractor about the weed species and locations onsite. If necessary, weed infested areas will be delineated with flagging tape or snow fencing to prevent access.
- The EM will direct the removal of existing weeds (by hand pulling or digging) and disposal off-site, in accordance with provincial regulations. Species of management concern observed onsite include knapweed, cheatgrass, and Russian thistle. These species will be removed where they overlap with construction or restoration works.
- Areas where weed populations have been identified will not be used for excavation and placement of fill. If excavation of weed infested areas is required, the soils will be disposed of off-site.
- Pesticides, herbicides, or other chemical control measures must not be used on the Property. Hay bales and straw must be certified weed free if they are to be used onsite.
- The contractor will ensure that all equipment and vehicles are washed and free of weed seeds prior to mobilization and de-mobilization. Vehicles and equipment will not be stored, parked, or staged within weed infested areas. Contractor clothing will also be inspected daily for signs of weed seeds. If found, weed seeds must be disposed of in a contained refuse bin for off-site disposal.

5.11 Site Cleanup and Restoration

As there are is no development currently proposed for the lot, this section contains only general recommendations for restoration. Current works being conducted pursuant to the ESDP must continue to follow the recommendations of the original EA and associated memos and addendum. This includes restoration measures provided in those reports which will be reviewed and confirmed by the Ecora EM, with progress updates and recommendations to be made in separate EM reports. General cleanup and restoration measures are provided below.

- Restoration measures will be implemented at all disturbed areas, including cut/fill slopes and other exposed soils. At a minimum, re-graded slopes must be stabilized and covered with a suitable hydroseed comprised of mulch, tackifier, and native grass seed. Restoration measures will be overseen by the EM and will include additional measures, as appropriate and based upon the final disturbance footprint and/or performance of the contractor.
- Grass seed mixes must be certified as Canada #1 Grade by Agriculture Canada to minimize the weed seed count. The seed mixture will include native species appropriate for the ecological conditions and will be reviewed and approved by the EM prior to application.

- Future development within the strata subdivision must follow form and character guidelines reviewed and approved by RDOS. These guidelines will include terms and conditions for the building designs, as well landscaping, which should include the use xeriscaping and native species appropriate for the local climate and conditions. Landscaping must also follow the BC FireSmart guidelines.
- Restoration measures must be completed consistent with the recommendations of the 2016 EA report and the Addendum 1 report. Ecora understands that the Proponent provided security bonding for this work, which will be overseen and approved by the EM.

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Figures

SITE LOCATION

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ENVIRONMENTAL ASSESSMENT
1750 HIGHWAY 3
RDOS, BC

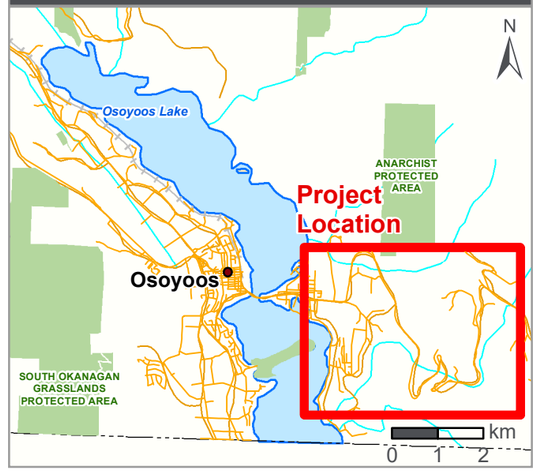
Legend

- Digital Road Atlas Roads
- 20m TRIM Contour Lines
- Fresh Water Atlas Streams
- RDOS Legal Parcels
- Property Boundary

References

Aerial Imagery: RDOS GIS. Imagery Date: January 15, 2016

LOCATION MAP



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Project No.: 180379
Client: Steinar Johnsen

Date: 2021/03/19
Drawn: MT Check: DT

NAD 1983 UTM Zone 11N

Figure 1.0

TERRESTRIAL ECOSYSTEM MAPPING & SENSITIVE ECOSYSTEM INVENTORY

ecora™

TEM Label Explanation:

% of Polygon → **4: CO: 3** ← 1st component
4: UR ← 2nd component
2: CF: 2 ← 3rd component

Site Series Code Structural Stage

Site Series Code Description:

BGxh1:
ES: Exposed Soil
SW: Big Sagebrush - Bluebunch Wheatgrass
SB: Selaginella - Bluebunch Wheatgrass
RZ: Road

SEI Label Explanation:

% of Polygon → **8 GR: st** ← 1st component
1 R1: sh ← 2nd component
1 WN: sw ← 3rd component

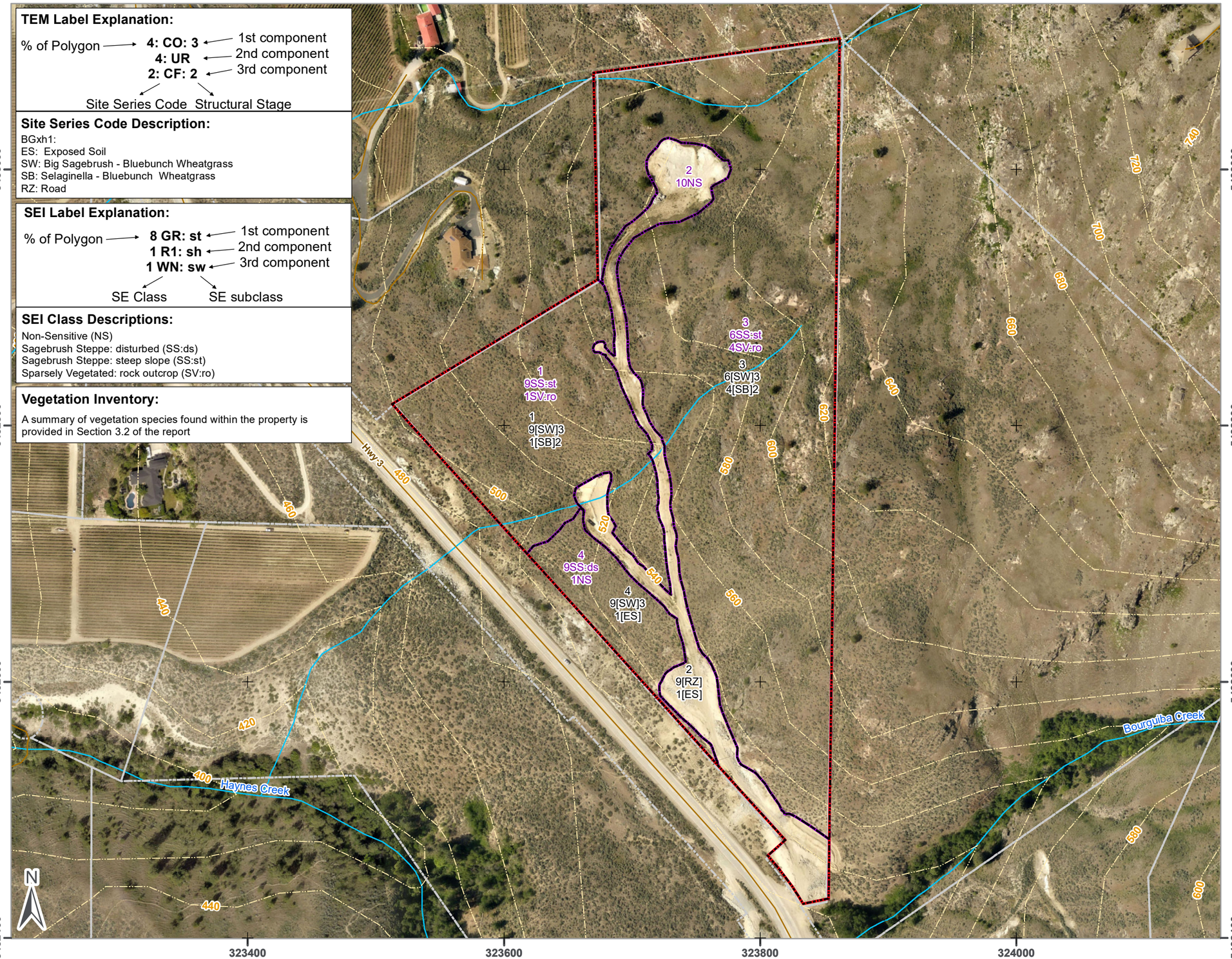
SE Class SE subclass

SEI Class Descriptions:

Non-Sensitive (NS)
Sagebrush Steppe: disturbed (SS:ds)
Sagebrush Steppe: steep slope (SS:st)
Sparsely Vegetated: rock outcrop (SV:ro)

Vegetation Inventory:

A summary of vegetation species found within the property is provided in Section 3.2 of the report



ENVIRONMENTAL ASSESSMENT
1750 HIGHWAY 3
RDOS, BC

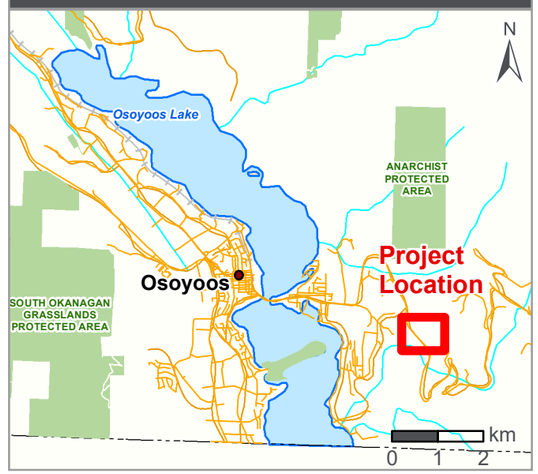
Legend

- Digital Road Atlas Roads
- 20m TRIM Contour Lines
- Fresh Water Atlas Streams
- RDOS Legal Parcels
- Property Boundary
- Ecosystem Polygons
- SEI Polygons

References

Aerial Imagery: RDOS GIS. Imagery Date: January 15, 2016

LOCATION MAP



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Project No.: 180379
Client: Steinar Johnsen

Date: 2021/03/19
Drawn: MT Check: DT

NAD 1983 UTM Zone 11N

Figure 2.0

BIODIVERSITY CONSERVATION STRATEGY

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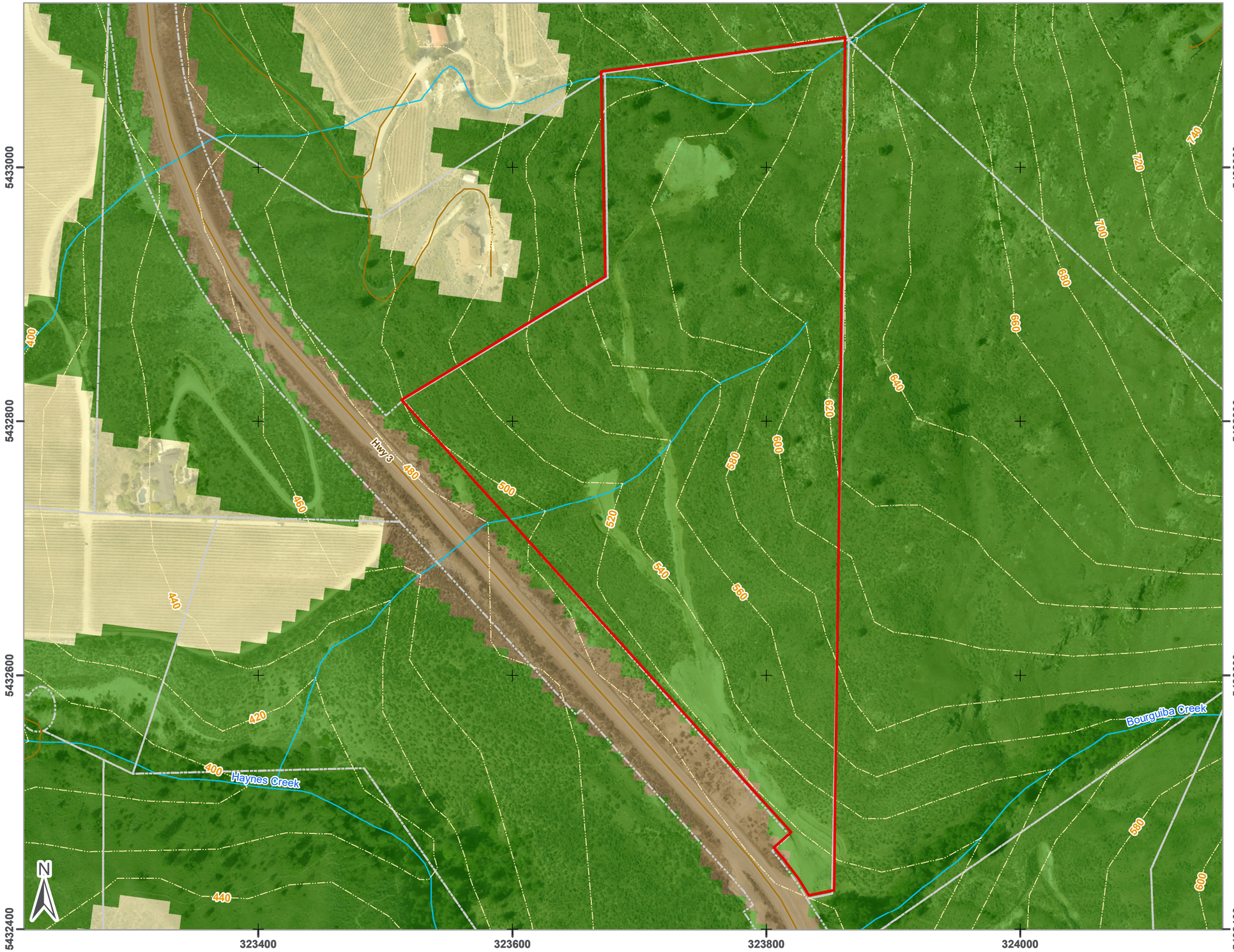


ENVIRONMENTAL ASSESSMENT
1750 HIGHWAY 3
RDOS, BC

Legend

- Digital Road Atlas Roads
- 20m TRIM Contour Lines
- Fresh Water Atlas Streams
- RDOS Legal Parcels
- Property Boundary

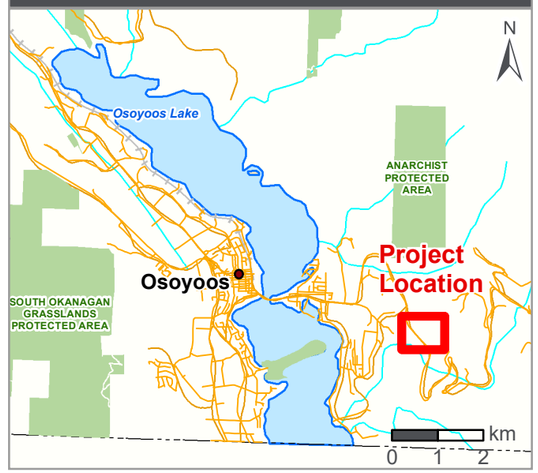
Conservation Rank

- 1 = Very high
- 2 = High
- 3 = Moderate
- 4 = Low

References

Aerial Imagery: RDOS GIS. Imagery Date: January 15, 2016

LOCATION MAP



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Project No.: 180379
Client: Steinar Johnsen

Date: 2021/03/19
Drawn: MT Check: DT

NAD 1983 UTM Zone 11N

Figure 3.0

SPECIES AT RISK OCCURRENCES AND WILDLIFE FEATURES

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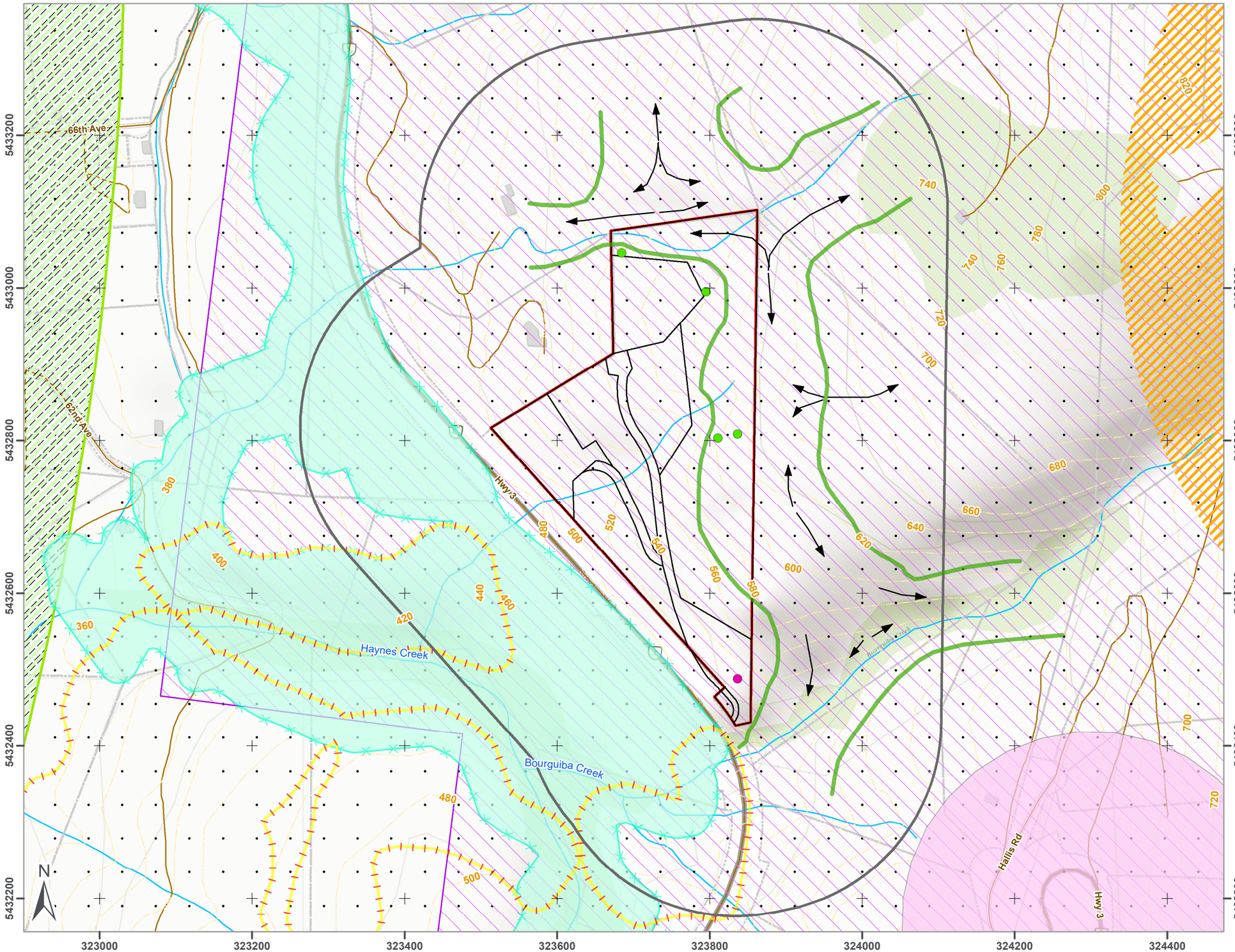


ENVIRONMENTAL ASSESSMENT
1750 HIGHWAY 3
RDOS, BC

Legend

- Digital Road Atlas Roads
- 20m TRIM Contour Lines
- Fresh Water Atlas Streams
- Legal Lot Lines
- RDOS Legal Parcels
- Property Boundary
- 250m Buffer of Property Boundary

Wildlife Features

- Bank Swallow Colony
- Wildlife Tree
- Approximate Wildlife Corridor

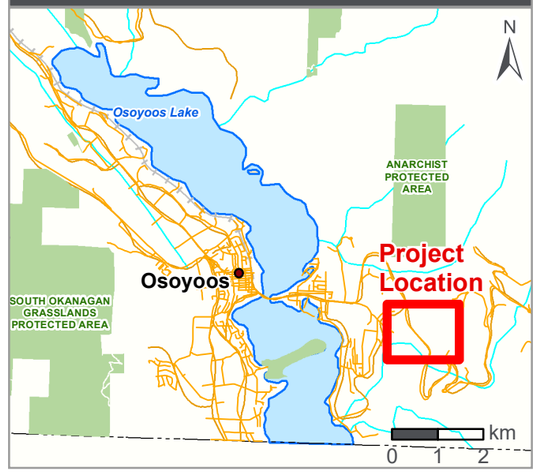
Species Occurrence

- Desert Nightsnake; Western Rattlesnake; Great Basin Gophersnake, Western Tiger Salamander (CWS) American Badger (CDC)
- Half-moon Hairstreak (CWS)
- Lewis's Woodpecker (CWS & CDC)
- Pallid Bat (CWS)
- Antelope-brush / Needle-and-thread Grass (CDC)
- Big Sagebrush / Bluebunch Wheatgrass (CDC)
- Whited's Fissurewort (CDC)

References

Aerial Imagery: RDOS GIS. Imagery Date: January 15, 2016
Canadian Wildlife Service - Critical Habitat Data (CWS)
Conservation Data Centre Element Occurences (CDC)

LOCATION MAP



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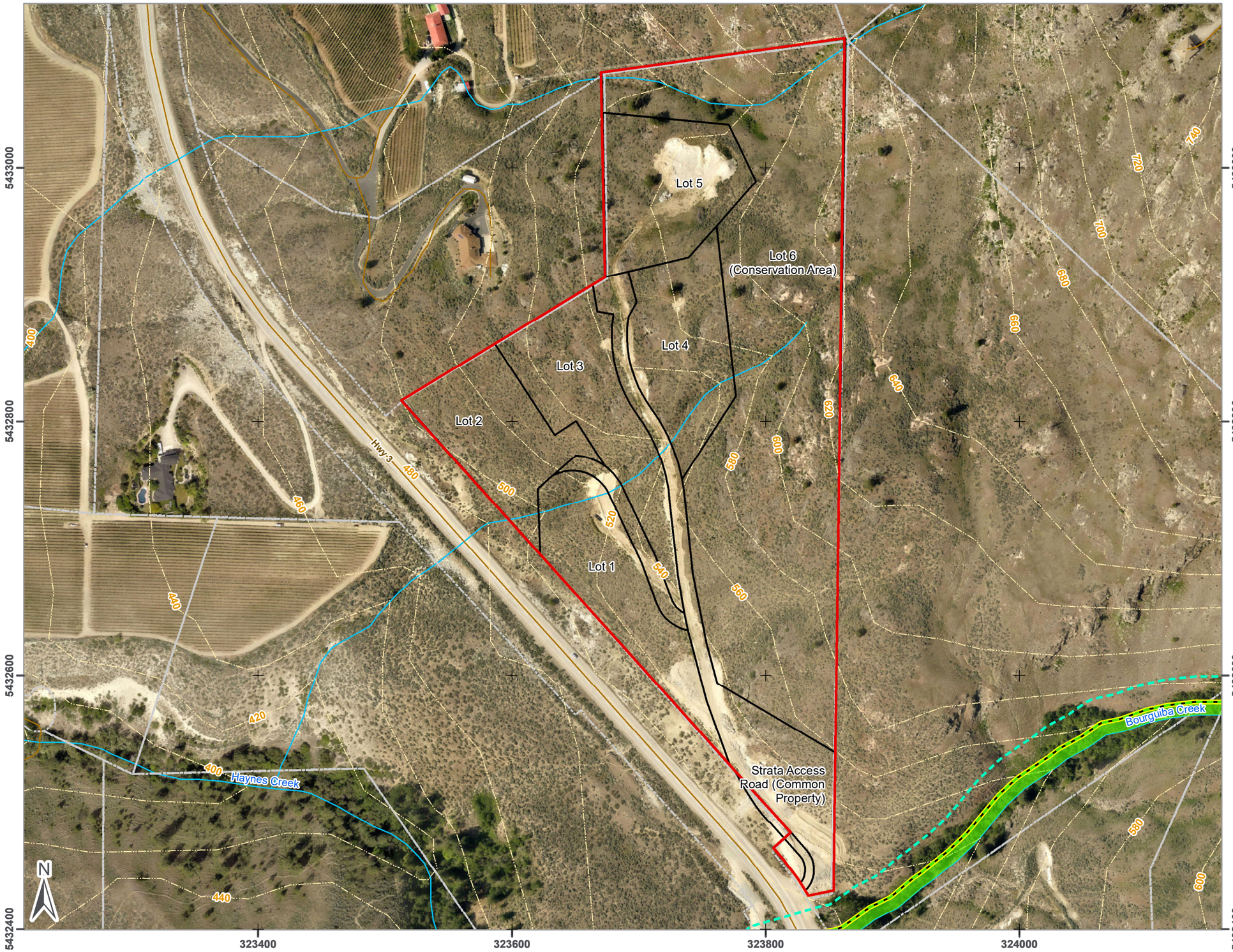
Project No.: 180379
Client: Steinar Johnsen
Date: 2021/03/19
Drawn: MT Check: DT

NAD 1983 UTM Zone 11N

Figure 4.0

RIPARIAN AREAS PROTECTION REGULATION ASSESSMENT



ENVIRONMENTAL ASSESSMENT
1750 HIGHWAY 3
RDOS, BC

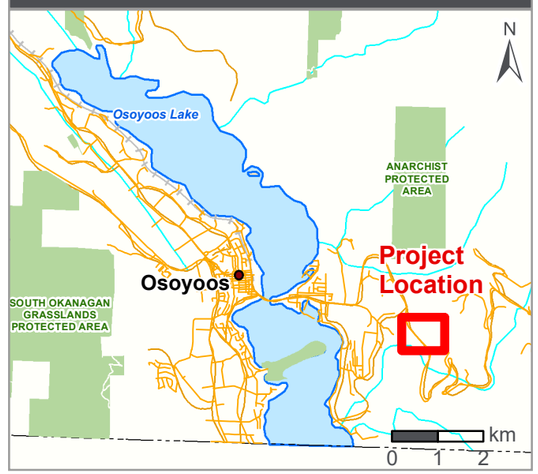
Legend

- Digital Road Atlas Roads
- 20m TRIM Contour Lines
- Fresh Water Atlas Streams
- Legal Lot Lines
- Riparian Assessment Area (RAA)
- ZOS - Large Woody Debris
- ZOS - Litterfall and Insect Drop
- ZOS - Shade
- RDOS Legal Parcels
- Property Boundary
- Streamside Protection and Enhancement Area (SPEA)

References

Aerial Imagery: RDOS GIS. Imagery Date: January 15, 2016

LOCATION MAP



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Project No.: 180379
Client: Steinar Johnsen

Date: 2021/03/19
Drawn: MT Check: DT

NAD 1983 UTM Zone 11N

Figure 5.0

ENVIRONMENTALLY SENSITIVE AREAS

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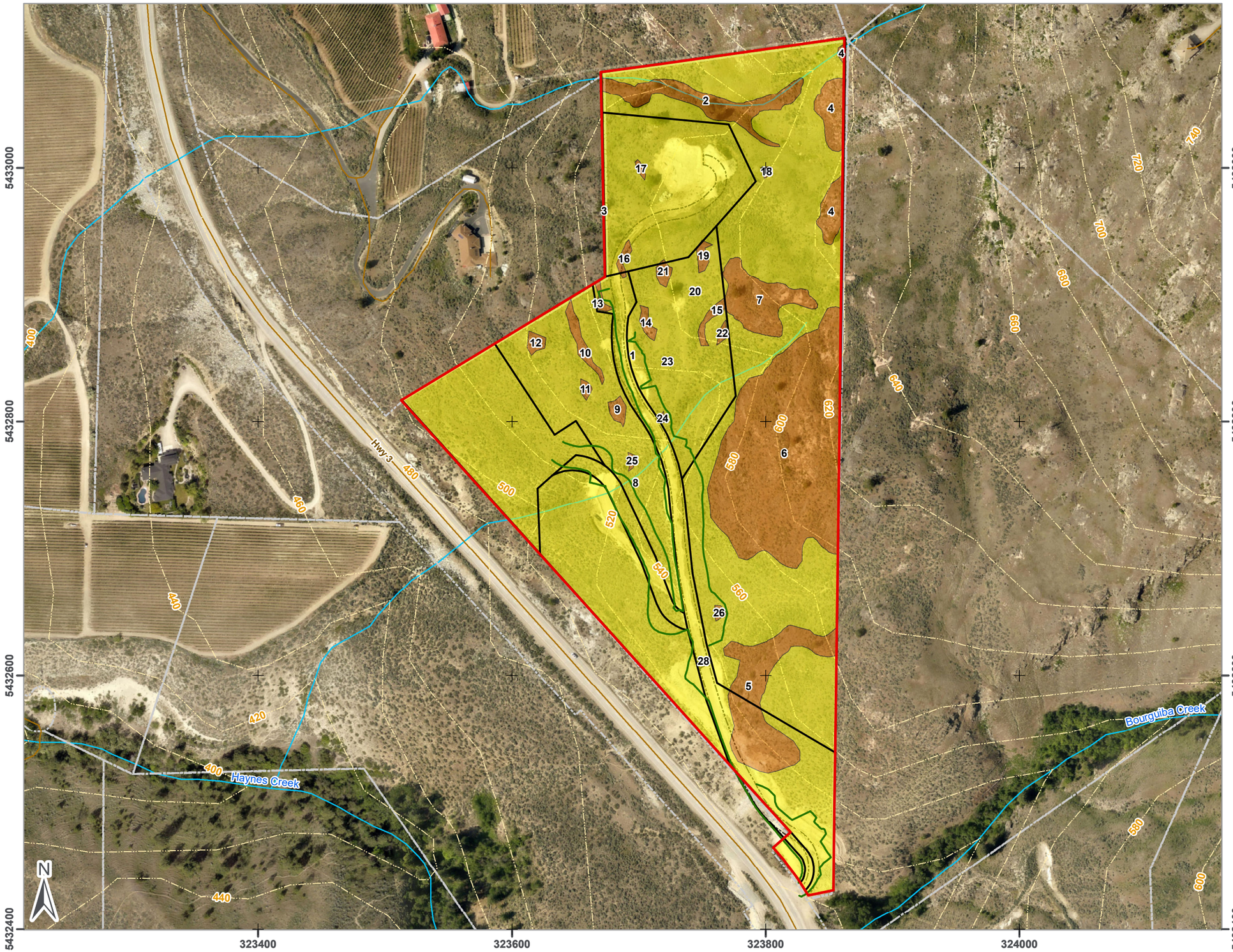

ENVIRONMENTAL ASSESSMENT
1750 HIGHWAY 3
RDOS, BC

Legend

- Digital Road Atlas Roads
- 20m TRIM Contour Lines
- Fresh Water Atlas Streams
- Legal Lot Lines
- Limit of Grading
- Driveway
- RDOS Legal Parcels
- Property Boundary

ESA Ranking

- ESA 1 - High
- ESA 2 - Moderate
- ESA 3 - Low
- ESA 4 - Not Sensitive

References

Aerial Imagery: RDOS GIS. Imagery Date: January 15, 2016

LOCATION MAP

1:3,000

0 50 100 150 200 Meters

Project No.: 180379
Client: Steinar Johnsen

Date: 2021/03/19
Drawn: MT Check: DT

NAD 1983 UTM Zone 11N

Figure 6.0

IMPACT ASSESSMENT

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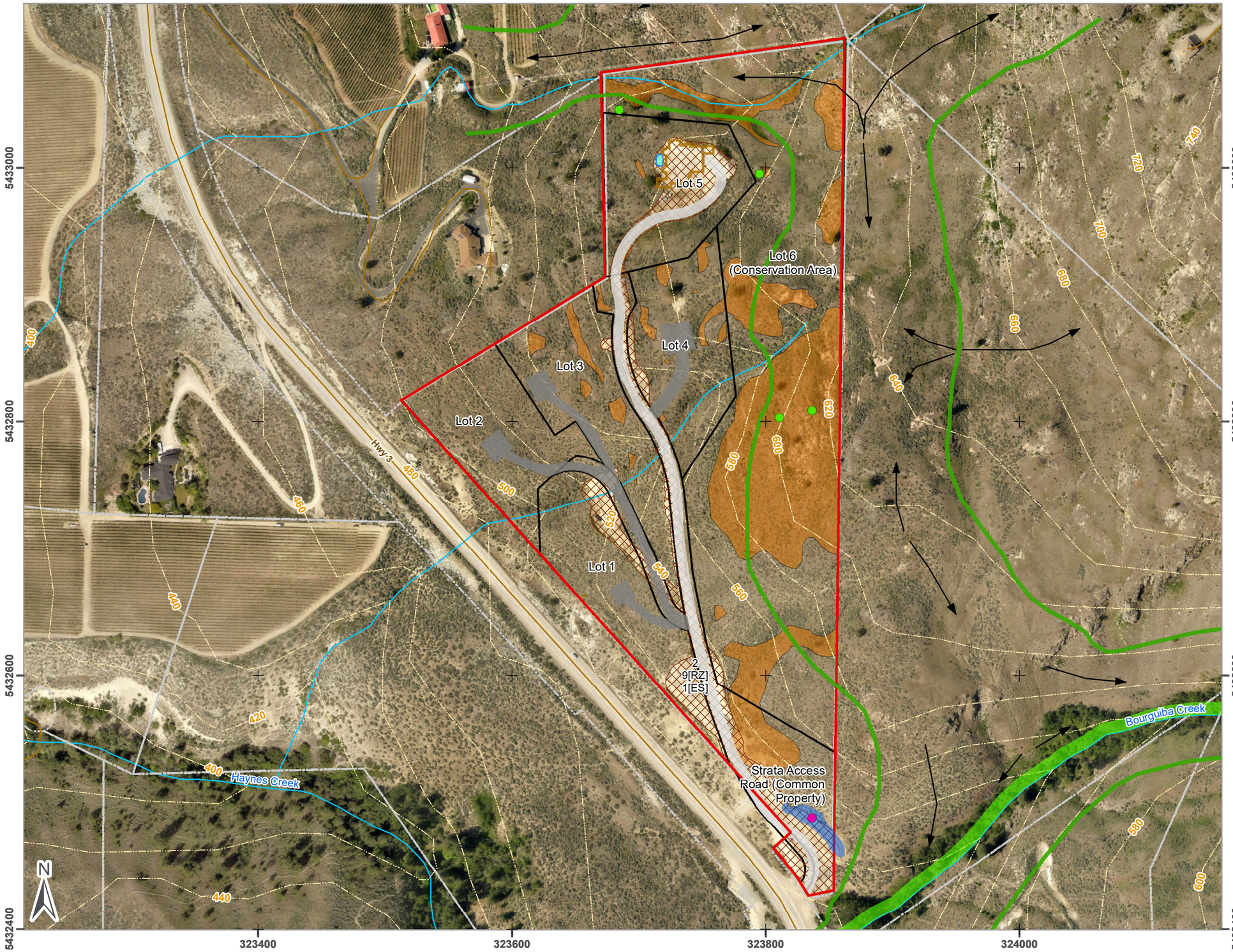


ENVIRONMENTAL ASSESSMENT
1750 HIGHWAY 3
RDOS, BC

Legend

- Digital Road Atlas Roads
- 20m TRIM Contour Lines
- Fresh Water Atlas Streams
- Legal Lot Lines
- RDOS Legal Parcels
- Property Boundary
- Swallow Restoration
- Streamside Protection and Enhancement Area (SPEA)
- Sensitive Area
- Existing Disturbance
- Driveway
- House (Lot 5)
- Pool
- Approximate Development (Lots 1-4)

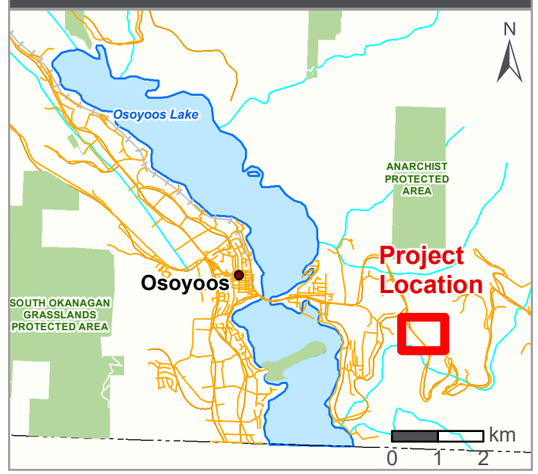
Wildlife Features

- Bank Swallow Colony
- Wildlife Tree
- Approximate Wildlife Corridor

References

Aerial Imagery: RDOS GIS. Imagery Date: January 15, 2016

LOCATION MAP



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Project No.: 180379
Client: Steinar Johnsen

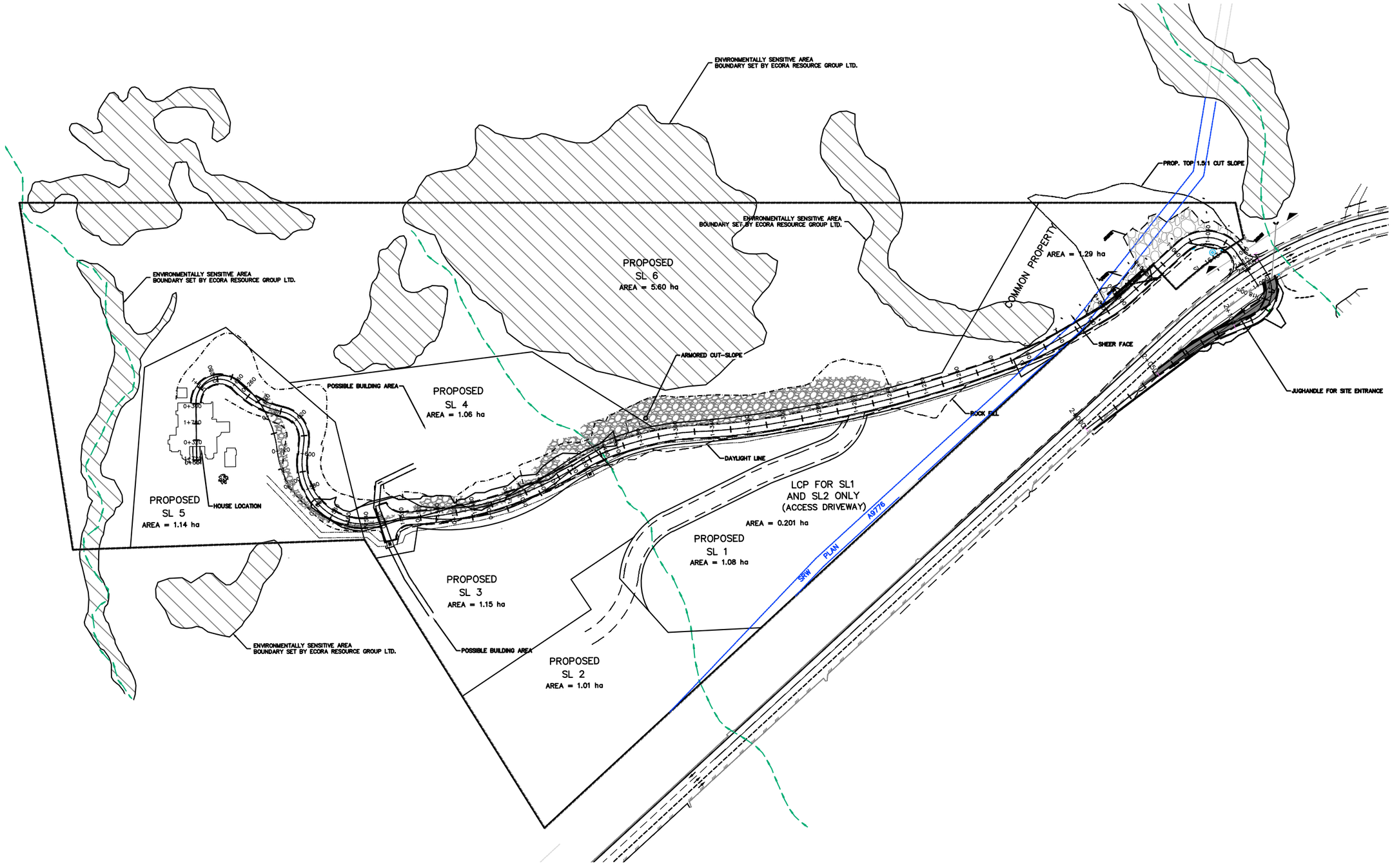
Date: 2021/03/19
Drawn: MT Check: DT

NAD 1983 UTM Zone 11N

Figure 7.0

Appendix A

Site Layout



LEGEND

	PROP	EX
WATER		
SANITARY SEWER		
STORM SEWER		
EOA		
CURB		
MANHOLE	●	O
CATCH BASIN	▨	▨
WATER VALVE	⋈	⋈
CURB STOP	•	•
HYDRANT	●	⊕
IC	•	•
POWER POLE	⊕P.P.	⊕P.P.
LAMP STANDARD	☐L.S.	☐L.S.
DRYWELL	☼	☼

NO.	DATE	DRN	REVISION	CH'KD
1	NOV. 29, 2019	DH	PRELIMINARY	KJM

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#201–234 MAIN ST PENTICTON, B.C. V2A 5B2
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Web: www.ecora.ca

SEAL

DESIGN:	TJR
DRAWN:	DCD
CHECKED:	KJM
DATE:	JAN. 19, 2016
SCALE:	1:1000

PROPOSED 5 LOT STRATA SUBDIVISION

REM. LOT 15, HIGHWAY 3, OSOYOOS, BC
STEINAR JOHNSEN
SITE PLAN

Drawing No. PE-18-379-P-01

Rev.No 1

Appendix B

Conservation Data Centre Query Results

Scientific Name	English Name	Classification Level	Name Category	Species Code	Class (English)	Global Status	Prov Status	Prov Status Review Date	Prov Status Change Date	BC List	Prov Wildlife Act	COSEWIC	COSEWIC Date	COSEWIC Comments	SARA Schedule	SARA Status	SARA Date	General Status Canada	Migratory Bird Convention Act	Origin	Presence	Breeding Bird	Endemic	CDC Maps
Aeronautes saxatalis	White-throated Swift	Species	Vertebrate Animal	B-WTSW	birds	G5	S3S4B	Mar-15	Apr-15	Blue								4 - Secure (2005)	Y	Native	Regularly occurring	Y	N	W
Ammodramus savannarum	Grasshopper Sparrow	Species	Vertebrate Animal	B-GRSP	birds	G5	S1B	Apr-18	May-18	Red								4 - Secure (2005)	Y	Native	Regularly occurring	Y	N	Y
Antrozous pallidus	Pallid Bat	Species	Vertebrate Animal	M-ANPA	mammals	G4	S2	Feb-15	Mar-13	Red		Threatened	Nov-10		1	Threatened	Jun-03	1 - At Risk (2005)		Native	Regularly occurring		N	Y
Apodemia mormo	Mormon Metalmark	Species	Invertebrate Animal	LE-APOMOR	insects	G5	S1S2	Feb-20	Feb-20	Red		Endangered	May-14		1	Endangered	Jan-05	6 - Not Assessed (2000)		Native	Regularly occurring		N	Y
Ardea herodias herodias	Great Blue Heron, *herodias* subspecies	Subspecies	Vertebrate Animal	B-GBHE-HE	birds	G5T5	S3?	Mar-17	May-17	Blue								4 - Secure (2005)		Native	Regularly occurring	Y	N	Y
Asio flammeus	Short-eared Owl	Species	Vertebrate Animal	B-SEOW	birds	G5	S3B,S2N	Mar-15	Jun-96	Blue		Special Concern	Mar-08		1	Special Concern	Jul-12	3 - Sensitive (2005)		Native	Regularly occurring	Y	N	Y
Athene cunicularia	Burrowing Owl	Species	Vertebrate Animal	B-BUOW	birds	G4	S1B	Mar-15	Jun-98	Red	Endangered	Endangered	Apr-17		1	Endangered	Jun-03	1 - At Risk (2005)		Native	Regularly occurring	Y	N	Y
Bartramia longicauda	Upland Sandpiper	Species	Vertebrate Animal	B-UPSA	birds	G5	S2B	Mar-15	Apr-15	Red								4 - Secure (2005)	Y	Native	Regularly occurring	Y	N	Y
Botaurus lentiginosus	American Bittern	Species	Vertebrate Animal	B-AMBI	birds	G5	S3B, SNRN	Mar-15	Jun-98	Blue								4 - Secure (2005)	Y	Native	Regularly occurring	Y	N	Y
Buteo lagopus	Rough-legged Hawk	Species	Vertebrate Animal	B-RLHA	birds	G5	S3N	Mar-15	Apr-15	Blue		Not at Risk	May-95					4 - Secure (2005)		Native	Regularly occurring	N	N	N
Buteo swainsoni	Swainson's Hawk	Species	Vertebrate Animal	B-SWHA	birds	G5	S2B	Mar-15	Jun-98	Red								4 - Secure (2005)		Native	Regularly occurring	Y	N	Y
Butorides virescens	Green Heron	Species	Vertebrate Animal	B-GRHE	birds	G5	S3S4B	Mar-15	Jun-98	Blue								4 - Secure (2005)	Y	Native	Regularly occurring	Y	N	Y
Calcarius pictus	Smith's Longspur	Species	Vertebrate Animal	B-SMLO	birds	G4G5	S3S5B	Mar-15	Apr-15	Blue								4 - Secure (2005)	Y	Native	Regularly occurring	Y	N	W
Callophrys affinis	Immaculate Green Hairstreak	Species	Invertebrate Animal	LE-CALAFF	insects	G5	S2S3	Jan-20	Jan-20	Blue								6 - Not Assessed (2000)		Native	Regularly occurring		N	Y
Catherpes mexicanus	Canyon Wren	Species	Vertebrate Animal	B-CAWR	birds	G5	S3?	Mar-15	Apr-15	Blue		Not at Risk	May-92					3 - Sensitive (2005)	Y	Native	Regularly occurring	Y	N	Y
Centrocercus urophasianus	Greater Sage-Grouse	Species	Vertebrate Animal	B-GSGR	birds	G3G4	SX	Mar-15	Jun-96	Red		Extirpated	Mar-08	*Phaios* subspecies	1	Extirpated	Jun-03	1 - At Risk (2005)		Native	Regularly occurring	Y	N	Y
Chondestes grammacus	Lark Sparrow	Species	Vertebrate Animal	B-LASP	birds	G5	S3S4B	Mar-15	Apr-15	Blue								4 - Secure (2005)	Y	Native	Regularly occurring	Y	N	Y
Chrysemys picta pop. 2	Painted Turtle - Intermountain - Rocky Mountain Population	Population	Vertebrate Animal	R-CHPI-02	turtles	G5T2T3	S3?	Mar-18	Mar-18	Blue		Special Concern	Nov-16		1	Special Concern	Dec-07			Native	Regularly occurring		N	Y
Cicindela decemnotata	Badlands Tiger Beetle	Species	Invertebrate Animal	CO-CICDEC	insects	G4G5	S1S3	Mar-17	Mar-17	Red								4 - Secure (2005)		Native	Regularly occurring		N	Y
Cicindela pugetana	Sagebrush Tiger Beetle	Species	Invertebrate Animal	CO-CICPUG	insects	G4	S3S4	Mar-17	Mar-17	Blue								3 - Sensitive (2005)		Native	Regularly occurring		N	Y
Coccyzus americanus	Yellow-billed Cuckoo	Species	Vertebrate Animal	B-YBCU	birds	G5	SXB	Mar-15	Jan-09	Red								4 - Secure (2005)	Y	Native	Regularly occurring	Y	N	Y
Coluber constrictor	North American Racer	Species	Vertebrate Animal	R-COCO	reptiles	G5	S2S3	Mar-18	Mar-18	Blue		Threatened	Nov-15	Status applied to *Coluber constrictor mormon* .	1	Special Concern	Aug-06	3 - Sensitive (2005)		Native	Regularly occurring		N	Y
Corynorhinus townsendii	Townsend's Big-eared Bat	Species	Vertebrate Animal	M-COTO	mammals	G4	S3S4	Feb-15	Apr-15	Blue								2 - May be at risk (2005)		Native	Regularly occurring		N	Y
Crotalus oreganus	Western Rattlesnake	Species	Vertebrate Animal	R-CROR	reptiles	G5	S2S3	Mar-18	Mar-18	Blue		Threatened	May-15		1	Threatened	Jul-05	3 - Sensitive (2005)		Native	Regularly occurring		N	Y
Cypseloides niger	Black Swift	Species	Vertebrate Animal	B-BLSW	birds	G4	S2S3B	Mar-15	Apr-15	Blue		Endangered	May-15		1	Endangered	May-19	4 - Secure (2005)	Y	Native	Regularly occurring	Y	N	N
Danaus plexippus	Monarch	Species	Invertebrate Animal	LE-DANPLE	insects	G4	S1?B	Feb-20	Feb-20	Red		Endangered	Nov-16		1	Special Concern	Jun-03	6 - Not Assessed (2000)		Native	Regularly occurring		N	Y
Dolichonyx oryzivorus	Bobolink	Species	Vertebrate Animal	B-BOBO	birds	G5	S3B	Mar-15	Jun-98	Blue		Threatened	Apr-10		1	Threatened	Nov-17	4 - Secure (2005)	Y	Native	Regularly occurring	Y	N	Y
Dryobates albolarvatus	White-headed Woodpecker	Species	Vertebrate Animal	B-WHWO	birds	G4	S1	Mar-15	Oct-00	Red		Endangered	Nov-10		1	Endangered	Jun-03	1 - At Risk (2005)	Y	Native	Regularly occurring	Y	N	Y
Empidonax wrightii	Gray Flycatcher	Species	Vertebrate Animal	B-GRFL	birds	G5	S3B	Mar-15	Sep-01	Blue		Not at Risk	May-92					3 - Sensitive (2005)	Y	Native	Regularly occurring	Y	N	Y
Eremophila alpestris merrilli	Horned Lark, *merrilli* subspecies	Subspecies	Vertebrate Animal	B-HOLA-ME	birds	G5T4	S3?	Mar-17	May-17	Blue										Native	Regularly occurring	Y	N	W
Euderma maculatum	Spotted Bat	Species	Vertebrate Animal	M-EUMA	mammals	G4	S3S4	Feb-15	Feb-03	Blue		Special Concern	Nov-14		1	Special Concern	Jul-05	3 - Sensitive (2005)		Native	Regularly occurring		N	Y
Euphagus carolinus	Rusty Blackbird	Species	Vertebrate Animal	B-RUBL	birds	G4	S3S4B	Mar-15	Nov-05	Blue		Special Concern	Apr-17		1	Special Concern	Mar-09	3 - Sensitive (2005)		Native	Regularly occurring	Y	N	N
Falco mexicanus	Prairie Falcon	Species	Vertebrate Animal	B-PRFA	birds	G5	S1	Apr-18	Apr-18	Red		Not at Risk	May-96					3 - Sensitive (2005)		Native	Regularly occurring	Y	N	Y
Falco peregrinus anatum	Peregrine Falcon, *anatum* subspecies	Subspecies	Vertebrate Animal	B-PEFA-AN	birds	G4T4	S2?	Jan-11	Jan-11	Red		Not at Risk	Dec-17		1	Special Concern	Jun-12			Native	Regularly occurring	Y	N	Y
Falco rusticolus	Gyrfalcon	Species	Vertebrate Animal	B-GYRF	birds	G5	S3S4B, SNRN	Mar-15	Nov-05	Blue		Not at Risk	May-87					4 - Secure (2005)		Native	Regularly occurring	Y	N	Y
Hesperia nevada	Nevada Skipper	Species	Invertebrate Animal	LE-HESNEV	insects	G5	S3S4	Feb-20	Nov-06	Blue								6 - Not Assessed (2000)		Native	Regularly occurring		N	Y
Hirundo rustica	Barn Swallow	Species	Vertebrate Animal	B-BASW	birds	G5	S3S4B	Mar-15	Nov-05	Blue		Threatened	May-11		1	Threatened	Nov-17	4 - Secure (2005)	Y	Native	Regularly occurring	Y	N	N
Hydroprogne caspia	Caspian Tern	Species	Vertebrate Animal	B-CATE	birds	G5	S3B	Mar-15	Jun-96	Blue		Not at Risk	May-99					3 - Sensitive (2005)	Y	Native	Regularly occurring	Y	N	W
Hypsiglena chlorophaea	Desert Nightsnake	Species	Vertebrate Animal	R-HYCH	reptiles	G5	S2	Mar-18	Mar-18	Red		Endangered	May-11		1	Endangered	Jun-03	1 - At Risk (2005)		Native	Regularly occurring		N	Y
Icteria virens	Yellow-breasted Chat	Species	Vertebrate Animal	B-YBCH	birds	G5	S2B	Mar-18	Apr-18	Red		Endangered	Nov-11		1	Endangered	Jun-03	4 - Secure (2005)	Y	Native	Regularly occurring	Y	N	Y
Larus californicus	California Gull	Species	Vertebrate Animal	B-CAGU	birds	G5	S2S3B	Mar-15	Apr-15	Blue								4 - Secure (2005)	Y	Native	Regularly occurring	Y	N	W
Lepus townsendii	White-tailed Jackrabbit	Species	Vertebrate Animal	M-LETO	mammals	G5	SX	Feb-15	Apr-15	Red								4 - Secure (2005)		Native	Regularly occurring		N	Y
Limenitis archippus	Viceroy	Species	Invertebrate Animal	LE-LIMARC	insects	G5	SX	Jan-20	Dec-99	Red								6 - Not Assessed (2000)		Native	Regularly occurring		N	Y
Limnodromus griseus	Short-billed Dowitcher	Species	Vertebrate Animal	B-SBDO	birds	G5	S2S3B	Mar-15	Jan-12	Blue								4 - Secure (2005)	Y	Native	Regularly occurring	Y	N	Y
Lycaena nivalis	Lilac-bordered Copper	Species	Invertebrate Animal	LE-LYCNIV	insects	G5	S3	Feb-20	Dec-99	Blue								6 - Not Assessed (2000)		Native	Regularly occurring		N	Y
Megascops kennicottii macfarlanei	Western Screech-Owl, *macfarlanei* subspecies	Subspecies	Vertebrate Animal	B-WSOW-MA	birds	G4G5T4	S3	Mar-17	May-17	Blue		Threatened	May-12		1	Threatened	Jan-05			Native	Regularly occurring	Y	N	Y
Melanerpes lewis	Lewis's Woodpecker	Species	Vertebrate Animal	B-LEWO	birds	G4	S2S3B	Mar-15	Apr-15	Blue		Threatened	Apr-10		1	Threatened	Jul-12	3 - Sensitive (2005)	Y	Native	Regularly occurring	Y	N	Y
Melanitta perspicillata	Surf Scoter	Species	Vertebrate Animal	B-SUSC	birds	G5	S3B,S4N	Mar-15	Mar-00	Blue								4 - Secure (2005)	Y	Native	Regularly occurring	Y	N	Y
Myotis ciliolabrum	Western Small-footed Myotis	Species	Vertebrate Animal	M-MYCI	mammals	G5	S2S3	Feb-15	Nov-95	Blue								3 - Sensitive (2005)		Native	Regularly occurring		N	Y
Myotis thysanodes	Fringed Myotis	Species	Vertebrate Animal	M-MYTH	mammals	G4	S3	Feb-15	Mar-13	Blue		Data Deficient	May-04		3		Mar-05	2 - May be at risk (2005)		Native	Regularly occurring		N	Y
Numenius americanus	Long-billed Curlew	Species	Vertebrate Animal	B-LBCU	birds	G5	S3B	Jan-18	Jun-96	Blue		Special Concern	May-11		1	Special Concern	Jan-05	3 - Sensitive (2005)	Y	Native	Regularly occurring	Y	N	Y
Nycticorax nycticorax	Black-crowned Night-heron	Species	Vertebrate Animal	B-BCNH	birds	G5	S1	Mar-15	Jan-13	Red								4 - Secure (2005)	Y	Native	Regularly occurring	Y	N	Y
Oeneis jutta chermocki	Jutta Arctic, *chermocki* subspecies	Subspecies	Invertebrate Animal	LE-OENJUT-CH	insects	G5T4Q	S3	Mar-13	Nov-06	Blue										Native	Regularly occurring		N	Y
Oreamnos americanus	Mountain Goat	Species	Vertebrate Animal	M-ORAM	mammals	G5	S3	Feb-15	Apr-15	Blue								4 - Secure (2005)		Native	Regularly occurring		N	N
Oreoscoptes montanus	Sage Thrasher	Species	Vertebrate Animal	B-SATH	birds	G4	S1B	Mar-15	Jun-98	Red		Endangered	Nov-10		1	Endangered	Jun-03	1 - At Risk (2005)	Y	Native	Regularly occurring	Y	N	Y
Ovis canadensis	Bighorn Sheep	Species	Vertebrate Animal	M-OVCA	mammals	G4	S3?	Feb-15	Apr-15	Blue								4 - Secure (2005)		Native	Regularly occurring		N	Y
Perognathus parvus	Columbia Plateau Pocket Mouse	Species	Vertebrate Animal	M-PEPA	mammals	G5	S3	Feb-15	Apr-15	Blue								2 - May be at risk (2005)		Native	Regularly occurring		N	Y
Phalaropus lobatus	Red-necked Phalarope	Species	Vertebrate Animal	B-RNPL	birds	G4G5	S3S4B	Mar-15	Jun-96	Blue		Special Concern	Nov-14					4 - Secure (2005)	Y	Native	Regularly occurring	Y	N	W
Phrynosoma douglasii	Pygmy Short-horned Lizard	Species	Vertebrate Animal	R-PHDO	reptiles	G5	SX	Mar-18	Sep-00	Red		Extirpated	Dec-18		1	Extinct	Jun-03	.2 - Extinct (2005)		Native	Regularly occurring		N	Y
Pituophis catenifer deserticola	Gopher Snake, *deserticola* subspecies	Subspecies	Vertebrate Animal	R-PICA-DE	reptiles	G5T5	S3	Mar-18	Mar-18	Blue		Threatened	Apr-13		1	Threatened	Jan-05			Native	Regularly occurring		N	Y
Plestiodon skiltonianus	Western Skink	Species	Vertebrate Animal	R-PLSK	reptiles	G5	S3S4	Mar-18	Mar-18	Blue		Special Concern	Nov-14		1	Special Concern	Jan-05	3 - Sensitive (2005)		Native	Regularly occurring		N	Y
Pluvialis dominica	American Golden-Plover	Species	Vertebrate Animal	B-AGPL	birds	G5	S3S4B	Mar-15	Jun-98	Blue								3 - Sensitive (2005)	Y	Native	Regularly occurring	Y	N	W
Polites sabuleti	Sandhill Skipper	Species	Invertebrate Animal	LE-POLSAB	insects	G5	S2	Feb-20	Jan-07	Red								6 - Not Assessed (2000)		Native	Regularly occurring		N	Y
Polites sonora	Sonora Skipper	Species	Invertebrate Animal	LE-POLSON	insects	G4	S3	Feb-20	Feb-20	Blue		Not at Risk	Nov-16		1	Special Concern	Dec-07	6 - Not Assessed (2000)		Native	Regularly occurring		N	Y
Psiloscops flammeolus	Flammulated Owl	Species	Vertebrate Animal	B-FLOW	birds	G4	S3B	Mar-15	Apr-15	Blue		Special Concern	Apr-10		1	Special Concern	Jun-03	3 - Sensitive (2005)		Native	Regularly occurring	Y	N	Y
Pyrgus communis	Checkered Skipper	Species	Invertebrate Animal	LE-PYRCOM	insects	G5	S3	Feb-20	Oct-01	Blue								6 - Not Assessed (2000)		Native	Regularly occurring		N	Y
Reithrodontomys megalotis	Western Harvest Mouse	Species	Vertebrate Animal	M-REME	mammals	G5	S3	Feb-15	Apr-15	Blue		Endangered	Nov-19	*Megalotis* subspecies.	1	Special Concern	Mar-09	2 - May be at risk (2005)		Native	Regularly occurring		N	Y
Satyrium behrii	Behr's Hairstreak	Species	Invertebrate Animal	LE-SATBEH	insects	G5	S1	Feb-20	Jan-07	Red		Endangered	May-12		1	Endangered	Jun-03	6 - Not Assessed (2000)		Native	Regularly occurring		N	Y
Satyrium californica	California Hairstreak	Species	Invertebrate Animal	LE-SATCAL	insects	G5	S3	Feb-20	Dec-99	Blue								6 - Not Assessed (2000)		Native	Regularly occurring		N	Y
Satyrium semiluna	Half-moon Hairstreak	Species	Invertebrate Animal	LE-SATSEM	insects	G4	S1	Feb-20	Dec-99	Red		Endangered	Apr-06		1	Endangered	Dec-07	6 - Not Assessed (2000)		Native	Regularly occurring		N	Y
Sorex merriami	Merriam's Shrew	Species	Vertebrate Animal	M-SOME	mammals	G4	S1	Feb-15	Mar-99	Red								2 - May be at risk (2005)		Native	Regularly occurring		N	Y
Sorex preblei	Preble's Shrew	Species	Vertebrate Animal	M-SOPR	mammals	G4	S1S2	Feb-15	Sep-01	Red								2 - May be at risk (2005)		Native	Regularly occurring		N	Y
Spea intermontana	Great Basin Spadefoot	Species	Vertebrate Animal	A-SPIN	amphibians	G5	S3	Mar-18	Jun-96	Blue		Threatened	Nov-19		1	Threatened	Jun-03	1 - At Risk (2005)		Native	Regularly occurring		N	Y
Speyeria mormonia erinna	Mormon Fritillary, *erinna* subspecies	Subspecies	Invertebrate Animal	LE-SPEMOR-ER	insects	G5T4	S1S2	Mar-13	Jan-07	Red										Native	Regularly occurring		N	Y
Spizella breweri breweri	Brewer's Sparrow, *breweri* subspecies	Subspecies	Vertebrate Animal	B-BRSP-BR	birds	G5T5	S2S3B	Apr-18	Apr-18	Blue										Native	Regularly occurring	Y	N	Y
Sylvilagus nuttallii	Nuttall's Cottontail	Species	Vertebrate Animal	M-SYNU	mammals	G5	S3	Feb-15	Nov-95	Blue		Special Concern	Nov-16	*Nuttallii* Subspecies	1	Special Concern	Dec-07	4 - Secure (2005)		Native	Regularly occurring		N	Y
Taxidea taxus	American Badger	Species	Vertebrate Animal	M-TATA	mammals	G5	S2	Feb-15	Apr-15	Red		Endangered	Nov-12		1	Endangered	Jun-18	3 - Sensitive (2005)		Native	Regularly occurring		N	Y
Tympanuchus phasianellus columbianus	Sharp-tailed Grouse, *columbianus* subspecies	Subspecies	Vertebrate Animal	B-STGR-CO	birds	G5T3	S2S3	Nov-05	Oct-00	Blue										Native	Regularly occurring	Y	N	Y
Tyto alba	Barn Owl	Species	Vertebrate Animal	B-BNOW	birds	G5	S2?	Mar-15	Apr-15	Red		Threatened	Nov-10		1	Threatened	Jun-18	3 - Sensitive (2005)		Native	Regularly occurring	Y	N	Y

Search Criteria

Animals
AND BC Conservation Status:Red (Extirpated, Endangered, or Threatened) OR Blue (Special Concern)
AND Distribution: Native
AND Habitat Types:
Forest,Grassland/Shrub,Riparian,Rock/Sparsely Vegetated Rock
AND BGC Zone:
Sort Order:Scientific Name Ascending