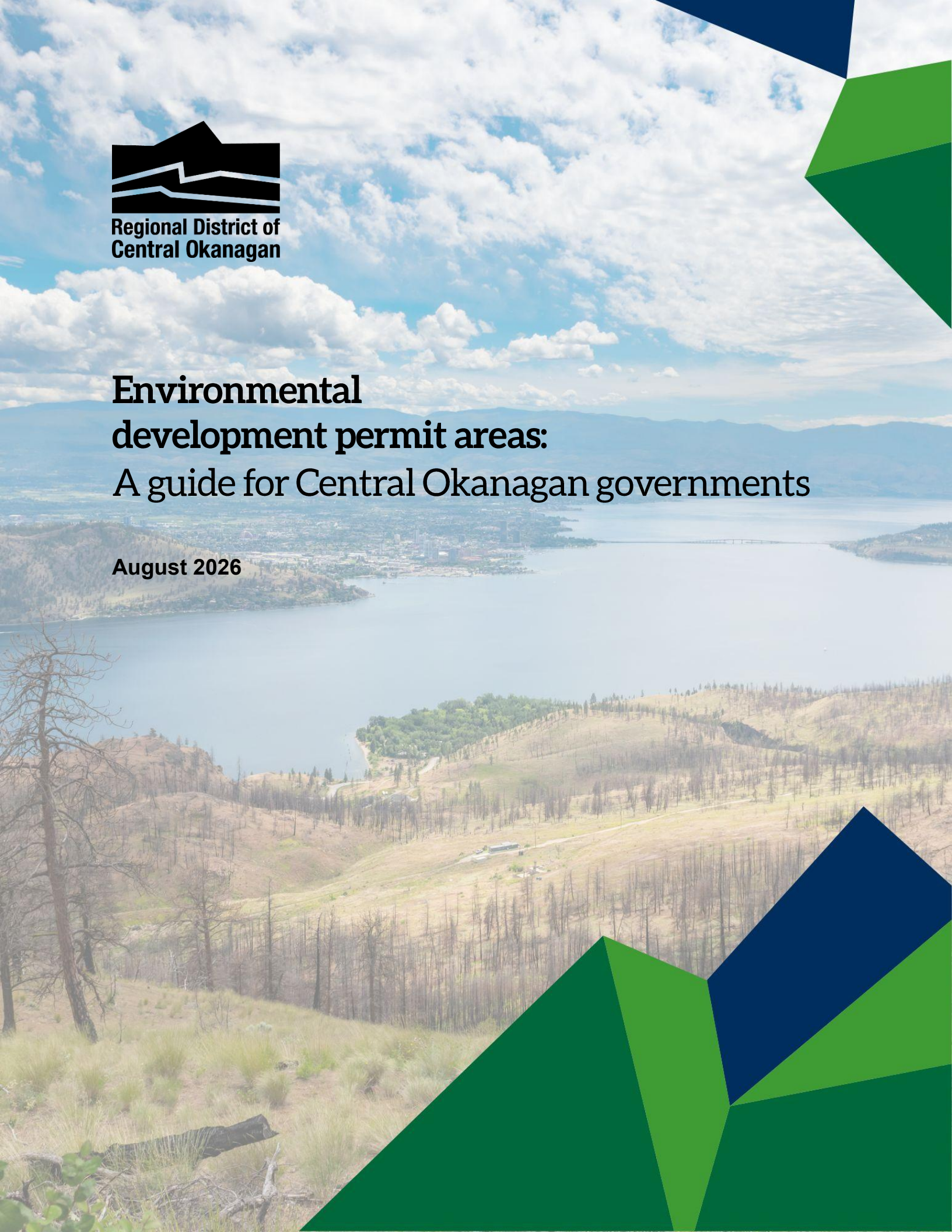

Regional District of Central Okanagan

Environmental development permit areas:

A guide for Central Okanagan governments

August 2026

Land acknowledgement

The RDCO acknowledges our presence on the traditional, ancestral and unceded tm̓xʷúlaʔxʷ (land) of the syilx / Okanagan people who have resided here since time immemorial. We recognize, honour and respect the syilx / Okanagan lands upon which we live, work and play.

Acknowledgements

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- Alison Kwan, Project Manager, RPBio
- Lauren Smith, Natural Areas Planner
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Environment and Climate Change Canada
Environnement et Changement climatique Canada

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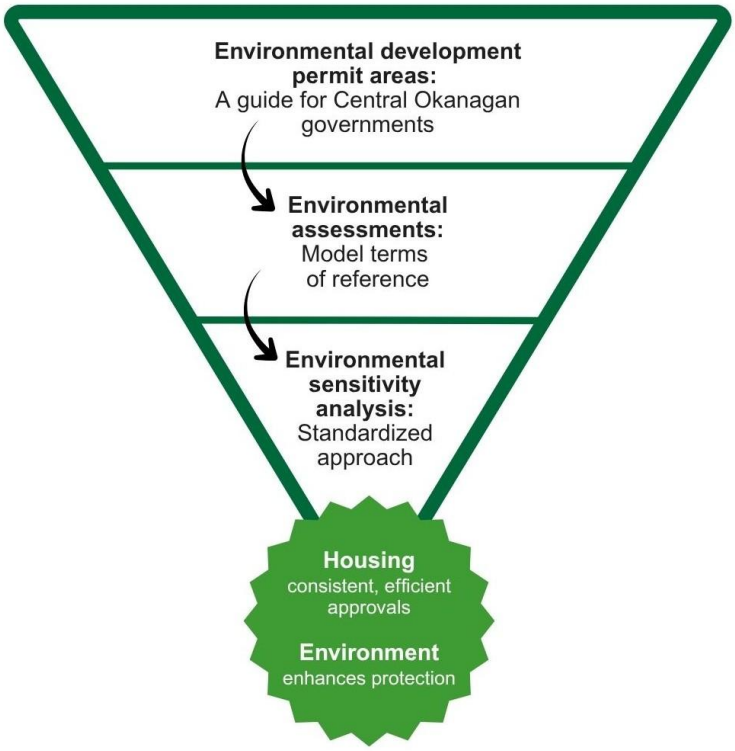
Executive summary

The Central Okanagan is one of British Columbia's most ecologically significant regions. As a low-elevation semi-arid landscape, it supports a remarkable diversity of ecosystems, from dry grasslands to high elevation old conifer forests and provides habitat for some of Canada's rarest plant and animal species. Within the region, there are documented occurrences of 40 provincially listed species at risk, underscoring the importance of protecting the ecosystems and habitat features that sustain biodiversity at the regional, provincial and federal scales. As growth continues across the region, governments in the Central Okanagan are under increasing pressure to manage development in ways that protect these sensitive landscapes while also responding to housing needs and the increasing frequency of natural hazard events (e.g. extreme heat, wildfires and floods). In this context, Environmental Development Permit Areas (EDPAs) are one of the key tools available to local governments to help direct growth away from sensitive areas, protect ecological function and support more resilient landscapes over time.

The purpose of this guide is to support Central Okanagan governments with a step-by-step approach for updating EDPAs. The intent of this regional guide is to provide a voluntary framework that results in a more coordinated and consistent approach for development applications within the region, alongside best practice environmental protection measures for the Central Okanagan's natural environment. As a voluntary regional guide, each member government's authority to establish and update their own EDPAs (or EDPA-like instruments) as appropriate within their context, is fully recognized.

This project was identified as a priority in the 2024 - 2028 Regional Growth Strategy (RGS) Priority Projects Plan, which was endorsed by the Regional Board in 2024. The need for a

consistent regional approach was established through a collaborative process with input from the regional partners. In tandem, the RDCO has developed a set of regional best practice guides entitled *Environmental assessments: Model terms of reference* and companion *Environmental sensitivity analysis: Standardized approach* to inform the preparation of professional environmental assessment reports. Together, these three guides comprise a regional environmental framework system of resource materials to support member governments within the Central Okanagan.



A central message of this guide is that regional coordination and alignment does not require municipalities to adopt identical mapping or ecological priorities. Rather, it involves standardization of EDPA language and aligning definitions and structural components so that key terms carry the same meaning across jurisdictions. Using common terms can improve clarity for applicants, consultants and reviewing staff, while allowing local governments to tailor EDPA mapping and policy to their local planning contexts and priorities.

Key themes and recommendations described in further detail throughout this guide are:

- Best practice EDPA design is around the **ecological features and functions that matter most**, rather than just what is easiest to map. Mapping efforts should focus on the ecosystems and habitat features that are most sensitive to disturbance, most important to long-term ecological function and most difficult to restore, once lost.
- In the Central Okanagan, this means grounding EDPA design in **watershed health, biodiversity and ecological resilience**.

- For terrestrial ecosystems, the Central Okanagan **Sensitive Ecosystem Inventory** (SEI 2021) provides the best available regional foundation for this work. This does not mean an EDPA should rely on SEI data alone, or that every municipality must map terrestrial sensitivity at the same level of detail. Rather, the SEI offers a scientifically defensible database that can be further refined with local field verification through site-specific assessment.

- Integrating the Okanagan Collaborative Conservation Program's regional **ecological corridors** into sensitive terrestrial mapping is recommended to ensure EDPAs capture not only individual sensitive features but also include the broader habitat linkages that support ecological connectivity over time.

- **Climate change** is already reshaping ecological conditions across the Central Okanagan such as increasing heat, drought and wildfires and is recommended as a core consideration in EDPA design. It is recommended that **drought** be incorporated as an ongoing concern that heightens ecosystem sensitivity and restoration risk over time.

- It is recommended that sensitive ecosystems impacted by wildfire maintain their ESA sensitivity rating and remain included in EDPA mapping as they undergo regeneration. While a recent burn area may not appear to be a sensitive ecosystem, it is important to plan with future ecosystem regeneration in mind to protect the ability to regenerate young forest, especially given that tree regrowth is particularly challenging in the hot and dry Central Okanagan climate.

- The spread of **invasive species** should likewise be treated as a climate change consideration, as hotter, drier conditions, repeated disturbance and post-fire redevelopment can create ideal conditions for invasive species to establish and spread.

Introduction and background

Purpose of this guide

The purpose of this guide is to support Central Okanagan governments with a step-by-step approach for updating Environmental Development Permit Areas (EDPAs). The intent of this regional guide is to provide a voluntary framework that results in a more coordinated and consistent approach for development applications within the region, alongside best practice environmental protection measures for the Central Okanagan's natural environment. As a voluntary regional guide, each member government's authority to establish and update their own EDPAs (or EDPA-like instruments), as appropriate within their context, is fully recognized.

Background and regional context

This project was identified as a priority in the 2024 - 2028 Regional Growth Strategy (RGS) Priority Projects Plan, which was endorsed by the Regional Board in 2024. The need for a consistent regional approach was established through a collaborative process with input from the regional partners. In tandem, the RDCO has developed a set of regional best practice guides entitled *Environmental assessments: Model terms of reference* and companion *Environmental sensitivity analysis: Standardized approach* to inform the preparation of professional environmental assessment reports. Together, these three guides comprise a regional environmental framework system of resource materials to support member governments within the Central Okanagan.

The Regional District of the Central Okanagan's current Regional Growth Strategy (RGS) was adopted in June 2014. Since then, the regional context for managing growth in environmentally sensitive areas has changed substantially. The RGS was initially developed on the basis of a regional population of 179,839 (2011 Census) and the region has since grown by approximately 40 percent[1]. Since then, population growth, changes in provincial housing legislation and increasing frequency and severity of natural hazard events such as wildfires and floods have influenced the pace and location of new growth in the Central Okanagan[2]. The RDCO has initiated the development of a new RGS to update regional policy related to housing and environmental protection (among other policy objectives). Updated regional policies in the new RGS will provide guidance to member municipality Official Community Plans, further enhancing an efficient and consistent approach across the Central Okanagan region to growth and environmental protection. The RDCO is also in the process of updating EDPA mapping and guidelines to support planned updates to Electoral Area Official Community Plans.

Users of this guide

This guide provides an overview of how to develop an EDPA that is consistent with regional ecosystem conservation objectives, standards and methodology. This guide identifies best practices and important considerations for deciding what to protect, provides sample Official

Community Plan (OCP) policy language and Development Permit (DP) exemptions and identifies the spatial data information required for developing EDPA maps. This guide was developed as a voluntary resource for member municipal planning departments within the Central Okanagan. Should other organizations find it a valuable resource, they are most welcome to use it as well.

The RDCO acknowledges the syilx / Okanagan Nation who continue to steward the region as their traditional, ancestral and unceded territory. While this guide presents a contemporary scientific perspective, the importance of syilx / Okanagan knowledge and ongoing collaboration in regional environmental stewardship is also respectfully acknowledged. Further, the project partners look to existing efforts underway, such as the Foreshore Integrated Management Planning (FIMP) program led by Living Lakes Canada for leadership in integrating Indigenous Knowledge into environmental data and mapping efforts within the Okanagan.

Scoping an EDPA update

Given that there is no legislated requirement in BC that EDPAs be updated on a fixed schedule, local and regional governments vary on updating frequency. Climate change and the pace of development is driving a faster rate of change in ecosystems, requiring more frequent updating cycles to meet environmental protection goals. Continual improvements in technology, Geographic Information Systems (GIS) and environmental mapping are allowing EDPAs to be defined at a finer scale and with increasing accuracy. For these reasons, it is recommended that EDPA revisions follow alongside regular OCP reviews where possible.

Project team and qualifications

The development of an EDPA requires input from several qualified professionals. First, Qualified Environmental Professionals (QEPs), such as a Registered Professional Biologist (RPBio), are essential for assessing and reporting on ecosystem health. They are qualified to conduct field work and assess the state of natural areas within a jurisdiction, which is a key step for capturing natural features that may not be mapped and for verifying that the spatial information is accurate to current day on-the-ground conditions. Second, GIS specialists, or those highly familiar with GIS software, are critical for the creation and detailed analysis of spatial data for EDPA mapping. Finally, the involvement of professional planners, such as Registered Professional Planners (RPPs), ensures that new or updated EDPA policies and mapping align with local government development jurisdiction and permitting processes and that guidelines are written so that they can be easily understood by all audiences.

Timeline and budget

The required timeline for developing new or updating existing EDPAs is variable and dependent on the size and density of the community. Timelines for these Development Permit (DP) review projects typically range from a minimum of 6 months to 1.5 years, with level of effort dependent on a variety of factors. For example, developing new EDPAs will likely require a minimum of one

year to complete, whereas spatial updates to existing EDPA mapping for smaller communities may only require 6 months.

Budgetary considerations for EDPA updates depend on the size of the jurisdiction and the amount of field verification conducted. Additionally, the cost of purchasing up to date spatial data, such as LiDAR or satellite imagery, is a key consideration when developing a budget. Budgets for EDPA updates for small to medium communities (populations between 1,000 and 100,000) typically range between $45,000 and $100,000 CAD (in 2026 dollars)[4]. The key considerations listed above for timeline development are also applicable for budget scoping.

The following is a list of some key considerations when scoping out timelines and budgets for developing or updating an EDPA:

- **Updating vs. developing:** The level of effort and time to complete is contingent on whether existing policies and frameworks are already in place to support an EDPA. Anticipate longer timelines and higher budgets if new policy development and mapping is required.
- **Quality of spatial data:** Quality of spatial data refers to both the spatial and temporal resolution (i.e. the time interval between observations of the same location). Ideally, the goal is to maintain spatial datasets that are up-to-date, highly accurate and have complete coverage across the jurisdiction. Unfortunately, high-resolution datasets can be costly. Fortunately, costs have declined in recent years as technology has improved. Timelines and costs may be higher than anticipated if new spatial data needs to be acquired and/or developed.
- **Staff capacity:** Capacity of project staff (both external and internal) is an essential consideration when determining project timelines, especially if using consultants. Internal capacity for content review may extend project timelines.
- **Field work:** It is highly recommended that field work be included in EDPA updates to confirm, on-the-ground, the current state of ecosystems within a jurisdiction, especially if critical spatial datasets are outdated and/or of low resolution. Many small but important sensitive features are prone to generalization by spatial datasets, such as rocky knolls within forested areas. Field work is an important step to verify mapping accuracy at the local scale. Timelines may need to be extended depending on the scale and intensity of field work required. Most importantly, field work is best scheduled in the late spring/early summer months when vegetation has leafed out and wildlife are most active. For larger jurisdictions, a minimum of one-year should be scoped for EDPA updates when field work is proposed.
- **Consultation and engagement:** Local governments may determine if engagement is required for developing or updating EDPAs and if so, the appropriate scope of engagement. At a minimum, gathering stakeholder feedback on current processes is recommended. Public and key stakeholder engagement is also highly recommended,

especially for policy changes to an EDPA. This ensures local contexts and community priorities inform the project and mitigates for potential pushback in the final stages.

Role of an EDPA in managing growth, risk and resilience

Climate resilience, ecological connectivity and cumulative effects are three closely linked concepts that an EDPA can address when it is supported by current mapping and clear guidelines. Together, these concepts help municipalities move beyond a development project-by-project approach and better manage environmental systems over time, particularly in areas where growth occurs alongside sensitive ecosystems and natural hazards.

Climate resilience

Climate resilience refers to the ability of ecosystems and the services they provide to withstand stress, adapt to changing conditions and recover from climate-related disturbance over time[5]. Within the Okanagan, climate resilience has become increasingly important as climate change is expected to increase the frequency and severity of weather events such as heatwaves, drought, rainfall events, wildfire and smoke and also shift seasonal weather patterns[6,7]. These changes can compound pressures on the landscape by increasing water stress and heat impacts during summer, altering runoff timing and low-flow conditions in aquatic habitats and heighten erosion and flood risks during heavy rainfall events, which can impact stream health, slope stability and the quality and connectivity of terrestrial and riparian habitats.

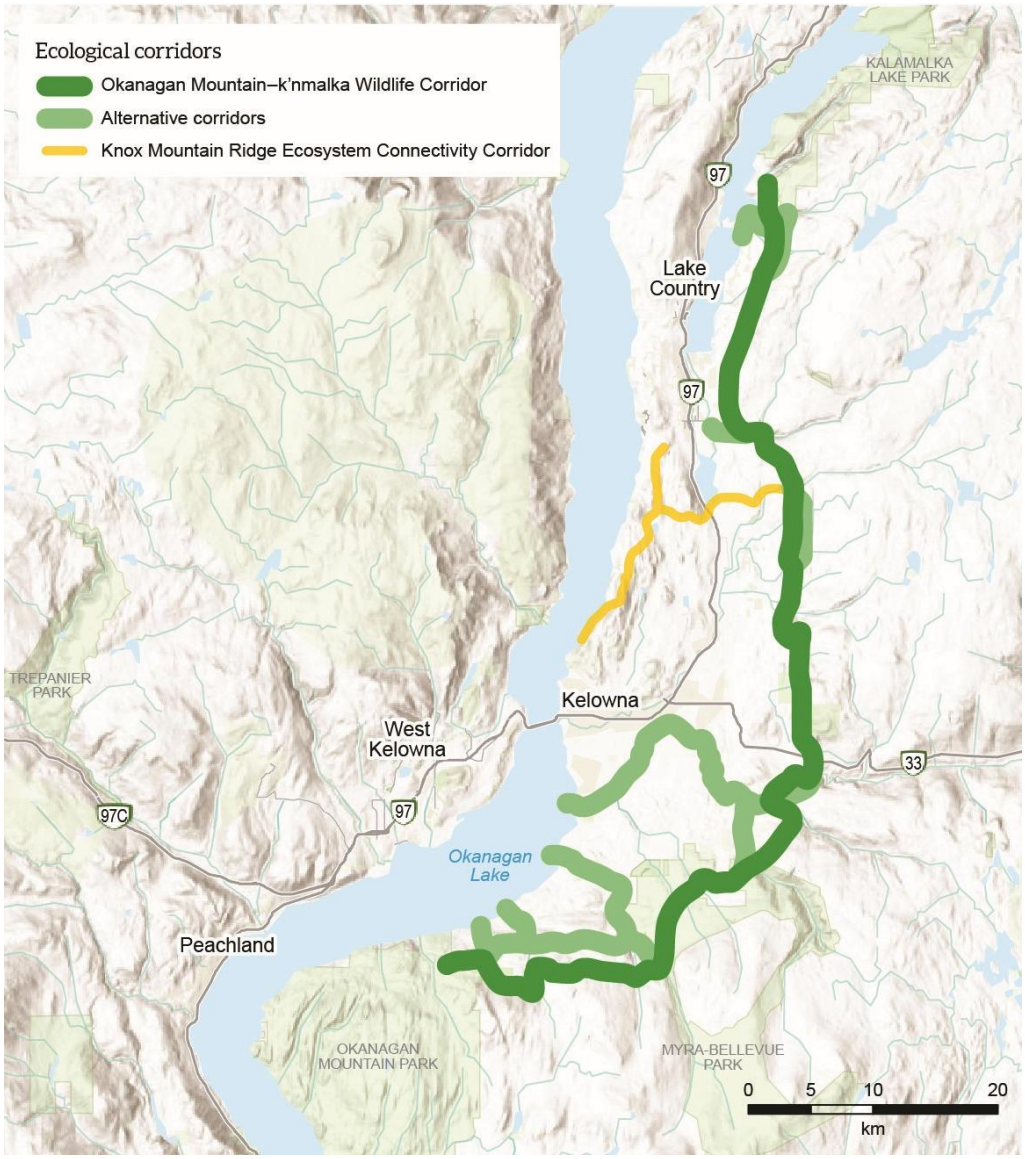
By protecting natural features and their ecological functions, EDPAs can buffer climate-related pressures and reduce long-term risk to communities and ecosystems. In practice, this means using EDPA mapping to focus development review on areas where maintaining ecological function is particularly important, such as riparian areas, wetlands, flood-influenced landscapes and areas with intact vegetation. Clear EDPA guidelines can set consistent best practice management guidelines for site planning and disturbance, including limiting unnecessary vegetation removal and soil disturbance, managing drainage and runoff to reduce erosion and downstream effects and retaining or re-establishing native, climate-adapted vegetation that provides shade and cooling, supports biodiversity and is more resilient to drought and heat stress.

Connectivity

Connectivity describes how well habitats are linked across a landscape to facilitate wildlife movement between areas for feeding, breeding, shelter (refuge) and seasonal use and to keep populations connected through genetic exchange. Connectivity also supports ecological processes, such as seed dispersal and pollination, which depend on organisms moving through a connected habitat network. This network becomes even more important as the climate changes, as species need to adjust their ranges and movement patterns in response to changing temperatures, water availability and the increased fragmentation of habitats from urban development that limit movement and access to suitable conditions[8,9]. EDPAs can be

leveraged to support connectivity by identifying and protecting corridors and “stepping-stone” habitat sites. These connectivity areas can also include riparian networks, which function as both biodiversity pathways and natural drainage systems. Connectivity is particularly relevant in a regional district context, as habitat connections do not stop at municipal boundaries and the loss or narrowing of a single corridor segment can potentially reduce the function of the broader network over time[10].

Connectivity preservation is important for considering in an EDPA from the site-specific level all the way up to a regional scale. The Okanagan Collaborative Conservation Program’s (OCCP) *Keeping Nature Connected* initiative shares information, regional projects and stewardship examples focused on maintaining and reconnecting ecological pathways like the Okanagan Mountain–k’nmalka Wildlife Corridor across the Thompson–Okanagan. This corridor, along with the Knox Mountain Ridge Ecosystem Connectivity Corridor is identified in the map below



Components of a connectivity network

Edge effect: refers to the changes in resources and environmental conditions that occur at the boundary of a habitat or ecosystem, often as a result of nearby disturbance. These changes can affect temperature, light, moisture, wind exposure and species use of the area, which in turn can reduce habitat quality and alter how ecological communities function.

Habitat hubs (large): form the foundation of an ecological connectivity network. These hubs are critical for supporting species that are less tolerant of edge effects, providing essential shelter and biodiversity value.

Stepping-stone habitat sites (small): provide strategically located, temporary refuge across the landscape, offering unique habitat features and facilitating species movement between larger patches. These sites typically provide habitat to species that are more tolerant of urban conditions.

Ecological corridors (linear): pathways that link habitat hubs and sites, which enable wildlife movement and maintain ecological processes. Protecting, expanding and enhancing these corridors strengthens landscape connectivity and reduces habitat fragmentation over time.

Cumulative effects

Cumulative effects occur when multiple small changes, each of which may seem modest on their own, compound and add up to significant impacts over time[11]. As one important example, biodiversity loss driven by habitat loss is also compounded by impacts from climate change. Examples include incremental riparian encroachment, gradual loss of native vegetation and increasing stormwater runoff and pollutant loading as watersheds urbanize. EDPAs address cumulative effects by applying consistent protection requirements across various development applications. This helps avoid outcomes where similar sites receive very different treatment, or where repeated small variances gradually erode environmental function in high-pressure areas.

Standardized language and definitions for regional use

Across the Central Okanagan, local governments use broadly similar approaches to protecting environmentally sensitive areas through Development Permit Areas. However, the way key terms are defined and applied within DPA guidelines varies between jurisdictions. These differences often relate to how concepts such as disturbance, redevelopment, riparian area, restoration and ecological connectivity are expressed in DPA guidelines.

For example, some local governments define disturbance primarily as vegetation removal, while others include grading, soil compaction, infrastructure installation and other site alteration associated with the development proposal. Similarly, riparian areas may be identified in various ways. This ranges from using fixed setback distances, through application of the Provincial *Riparian Areas Protection Regulation (RAPR)* methodology, or through mapped watercourses and riparian areas supported by QEP field verification. These differences can influence when a development application requires a development permit, what level of environmental assessment is required and how mitigation measures and best management practices are expected to be applied during the permitting process.

For development applicants, consultants and environmental professionals working across multiple municipalities within the RDCO, variation in terminology can create uncertainty and lead to inconsistent expectations for environmental reports and development permit submissions and ultimately mitigation and restoration outcomes. Aligning foundational definitions and terminology across jurisdictions can help streamline development review and support enhanced environmental protection outcomes through the establishment of clear expectations for applicants and their qualified professionals.

Standardizing language does not require municipalities to adopt identical mapping or ecological priorities. Rather, it involves aligning definitions and structural components so that key terms carry the same meaning across jurisdictions. In the Central Okanagan, this need has already been recognized through the development of the *Environmental assessments: Model terms of reference,* which was developed to help foster greater consistency in how environmental reports are prepared, reviewed and used by local governments across the region[12]. This document recommends standardized processes for the following:

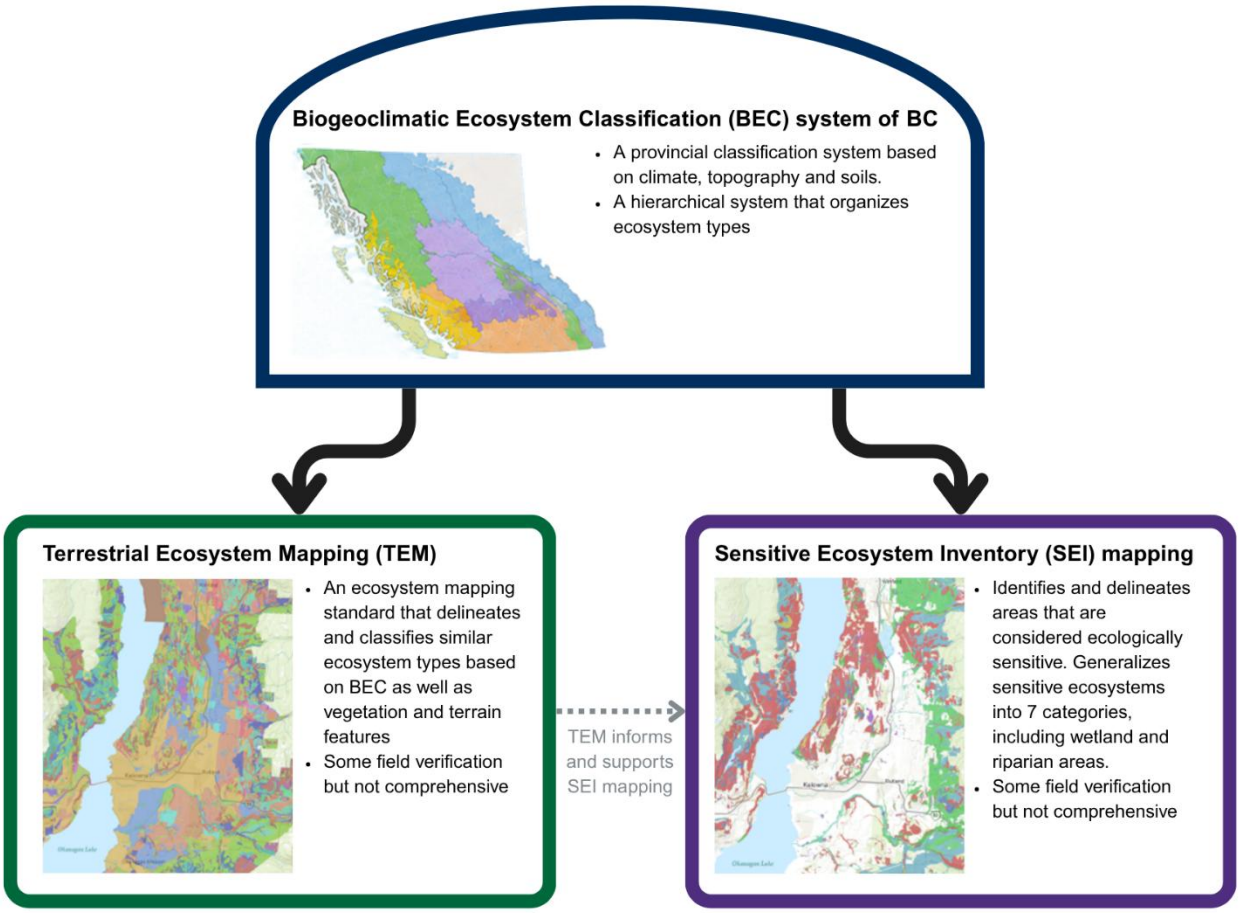
- **Disturbance footprint:** A standardized approach to defining and mapping the full extent of proposed disturbance associated with development, including both construction-related disturbance and disturbance associated with the development proposal (i.e. access from a home to a foreshore area). Mapping the disturbance footprint helps planners validate that it is suitably located within the developable area during development permit application review.
- **Environmentally Sensitive Areas (ESA) classification:** A consistent framework for identifying, classifying and mapping environmentally sensitive areas so that areas of higher ecological sensitivity can be clearly distinguished during development permit application review. In practice, this involves delineating ESAs on maps and showing

their relationship to proposed disturbance footprints and other site features. While larger municipalities may maintain detailed internal ecosystem layers on their digital maps, smaller jurisdictions may rely on regional datasets such as the Sensitive Ecosystem Inventory (SEI), provincial habitat mapping, or QEP field verification. Using consistent ESA classification terminology across various mapping resources helps ensure that similar ecological features are identified and evaluated in a consistent and comparable way across jurisdictions, even where map resolution varies.

- **Standard environmental assessment phases and reporting structure:** A consistent framework for environmental assessment and reporting that typically includes a baseline ecological inventory and sensitivity analysis, an impact assessment of the proposed development, mitigation planning for ecological impacts and monitoring recommendations to ensure optimal ecological health. A standardized reporting structure helps ensure that all required information is consistently provided and allows municipal staff to more efficiently review development applications.
- **Compensation and monitoring expectations:** Clear expectations for when compensation or restoration may be required, how mitigation measures should be documented and how mitigation bonding is calculated to ensure environmental protection measures are implemented and maintained over time. Monitoring should be conducted during the construction process and after construction is complete. Restoration success is typically confirmed through follow-up monitoring by a QEP, at which time the security can be released.

Improving consistency across RDCO member jurisdictions can involve both shared EDPA terminology and standardized EDPA guidelines. This may include using common definitions for concepts such as habitat hubs, habitat sites, ecological corridors, riparian areas, disturbance, exemptions and levels of professional reporting by QEPs, while also organizing EDPA guidelines in a consistent way, with clearly identified application criteria, objectives, submission requirements and mitigation expectations. Implementing these approaches can improve clarity for both applicants and reviewing staff and support more consistent interpretation during development permit application review, strengthen defensibility and make it easier to update EDPA mapping using comparable spatial criteria across the region. In this context, the *Environmental assessments: Model terms of reference* provides a useful regional technical resource and can be used alongside local development application procedures when establishing or updating EDPAs.

Overview of regional ecosystems



Ecological diversity in the Central Okanagan

The Central Okanagan Basin is a low elevation semi-arid environment that supports some of Canada's rarest plant and animal species[13], making this an area of critical ecological importance both provincially and federally[13]. The Central Okanagan contains a diverse array of plant communities from dry grasslands to high elevation old conifer forests. These plant communities support a wide variety of both resident and migratory wildlife species, making this region one of the most biodiverse areas in British Columbia.

The diversity of ecosystems within this area is largely due to a unique mix of complex topography that includes large aquatic systems and mountainous terrain. These features create relatively uniform climates that determine the types of plant communities that can thrive there[14]. To help standardize ecosystem classification and inform management decisions for these unique plant communities, a hierarchal ranking system called the Biogeoclimatic Ecosystem Classification (BEC) zones was first developed in 1949 by V.J. Krajina and his research team at

the University of British Columbia, where it was eventually adopted by the Government of British Columbia in 1976[15] and continues to be updated and used as the standard ecosystem classification system today. Centred around Lake Okanagan and nestled between mountain ranges and the Thompson Plateau, the Central Okanagan spans across the following five BEC zones:

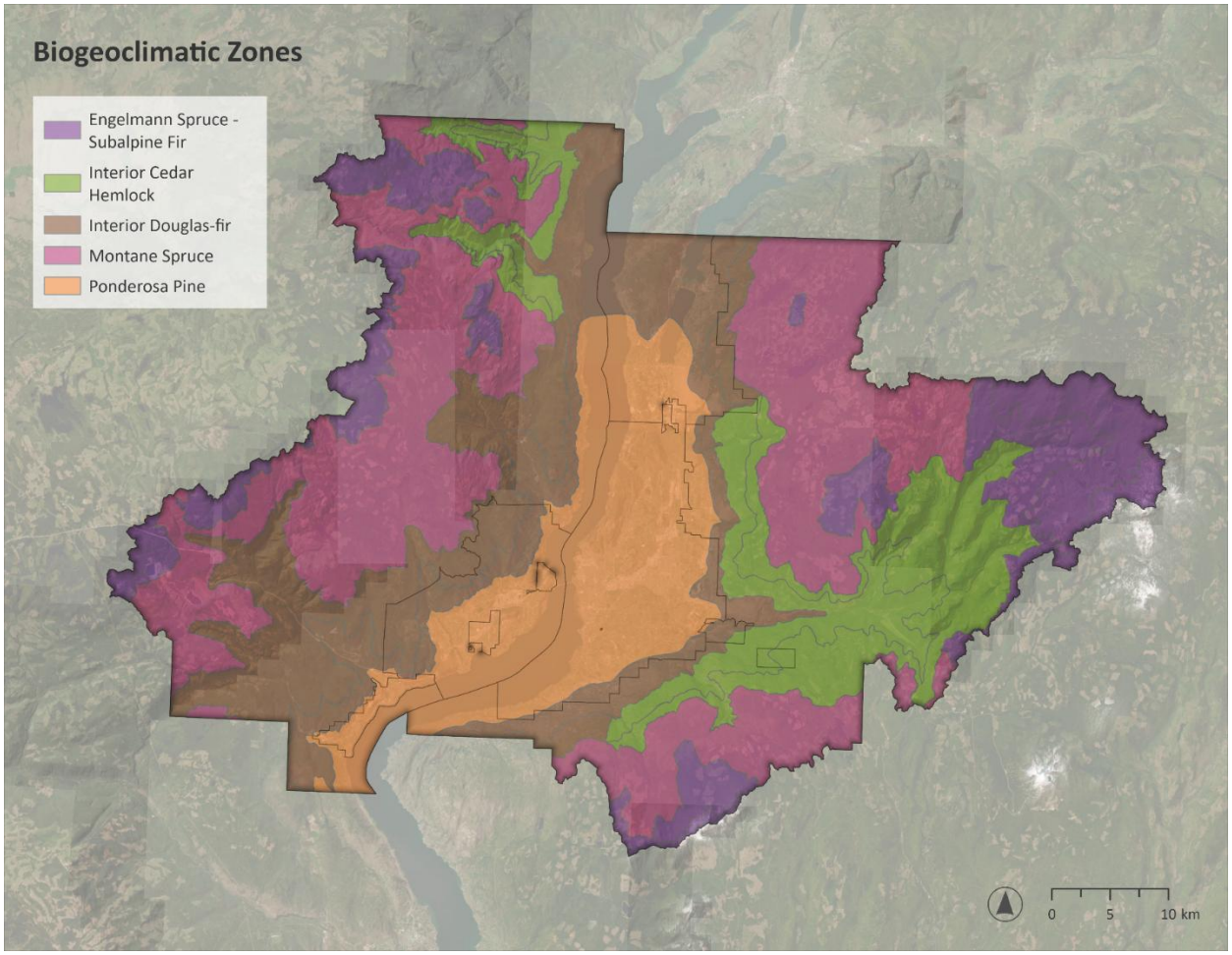


Figure 1. Biogeoclimatic zones of the Central Okanagan

Englemann Spruce-Subalpine Fir

Englemann spruce
(*Picea engelmannii*)

The Englemann Spruce-Subalpine Fir (ESSF) BEC zone covers approximately 15% of British Columbia, making it the third largest BEC zone in the province[16]. The ESSF is characterized by high elevation subalpine boreal climates with long, cold winters and cool, short summers. Precipitation is highly variable throughout this zone, with the ESSF zones in the Central Okanagan tending to be drier. As its namesake suggests, the most common tree species found in this zone are Englemann spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*). Lodgepole pine (*Pinus contorta*), Doulgas-fir (*Pseudotsuga menziesii*) and western redcedar (*Thuja plicata*) are also found in the ESSF, though typically in smaller amounts. Species such as ponderosa pine (*Pinus ponderosa*) and rocky mountain juniper (*Juniperus scopulorum*) are also commonly found in this zone within the Okanagan Basin at lower elevations. These ecosystems provide important watershed protection functions, supporting snowpack accumulation and gradual melt that sustains downstream water supplies, as well as critical habitat for wildlife adapted to high-elevation environments.

Interior Cedar-Hemlock

Western redcedar
(Thuja plicata)

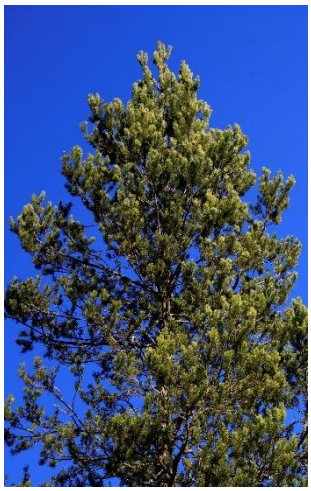
The Interior Cedar-Hemlock (ICH) is a temperate zone characterized by cool winters with warm and dry summers, covering around 5.5% of the province[17]. The ICH zones within the Central Okanagan tend to be cooler and wetter than other ICH zones within the Okanagan Basin. Forests in this zone are often highly productive due to warmer summer temperatures and moist soils, which also contribute to higher species diversity. Western hemlock (*Tsuga heterophylla*) and western redcedar are the most common species found here. Other species include Douglas-fir, pine species such as lodgepole, ponderosa and western white (*Pinus monticola*), as well as Pacific yew (*Taxus brevifolia*). ICH forests represent relatively rare and moisture-dependent ecosystems within the Central Okanagan. They provide important functions for watershed regulation, slope stability, carbon storage and biodiversity, including habitat for species associated with older, structurally complex forests.

Interior Douglas-fir

Douglas fir
(Pseudotsuga menziesii)

Interior Douglas-fir (IDF) is another less common BEC zone in BC, also covering approximately 5.5% of the province[18]. Located at lower-to-mid level elevations, this zone is characterized by temperate dry climates with longer growing seasons. Due to less moisture, growing conditions are less favourable, limiting the diversity of tree species in these areas. Aside from Douglas-fir, other common species within this zone include lodgepole and ponderosa pines, trembling aspen (*Populus tremuloides*), western redcedar and western larch (*Larix occidentalis*). Forests in this zone are well adapted to fire, with species such as Douglas-fir relying on wildfire disturbance to reduce the presence of less fire-resistant plant species and improve the chances for their own seeds to survive. For example, Douglas-fir trees will self-prune their lower branches, meaning they intentionally cut off water supply to kill branches and allow them to drop in order to increase the fuel available on the ground, preventing fires from jumping into their canopy[19]. The IDF zone provides important wildlife habitat, supports regional biodiversity and plays a key role in watershed function and slope stability.

Montane Spruce



Lodgepole pine
(Pinus contorta)

Montane Spruce (MS) is a BEC zone that occurs only in high elevation plateaus in the central and southern interior, covering only 2.9% of the province[20]. It is characterized by short, warm and dry summers and cold winters and is often located as a transition zone between the ESSF and IDF. The most common tree species found in this zone are lodgepole pine, Douglas-fir, subalpine fir and Engelmann spruce. Ecosystems in this zone play an important role in regional hydrology, supporting snowpack accumulation and gradual melt that sustains downstream watercourses and drinking water supplies. Montane Spruce forests also provide important habitat for wildlife and contribute to landscape connectivity between valley-bottom and subalpine ecosystems.

Ponderosa Pine

Ponderosa pine
(Pinus ponderosa)

The Ponderosa Pine (PP) BEC zone is one of the smallest, driest and hottest forest zones found in BC, covering only 0.4% of the province[21]. While ponderosa pine is the most common tree species, this zone is heavily dominated by shrub-steppe and grassland vegetation communities due to its long, hot and very dry summers. Lodgepole pines are also common within this zone throughout the Okanagan valley and Douglas-fir, trembling aspen and balsam poplars (*Populus balsamifera*) are common in riparian areas. These ecosystems are adapted to frequent, low-intensity fire and drought conditions and support a high diversity of wildlife, including several species at risk in open forest and grassland habitats.

Species at Risk

The ecosystems within the Okanagan Valley are of particular importance to some of Canada's most rare and sensitive species. Unfortunately, many of these species are under threat due to climate change and habitat loss and require special protections to ensure they are not lost forever. Species at risk in British Columbia are protected through two pieces of legislation:

- The Federal *Species at Risk Act* (SARA) which identifies special management and protection protocols for plants and animals whose populations have been deemed as endangered, threatened, or of special concern.
- The Provincial *Wildlife Act* which defines protections for animal, plant and ecological communities assigned a conservation status of endangered or threatened (red-listed), of special concern (blue-listed), or secure but requiring further monitoring (yellow-listed).

The Okanagan basin is home to over 50 threatened or endangered species[22]. Within the Central Okanagan, there are documented occurrences of 40 provincially listed species at risk, including 14 vertebrate animals, six invertebrate animals, nine vascular plants and 11 ecological communities. Of these 40 provincially listed species, 12 have been red-listed, 26 blue-listed and two species – the western bumble bee (*Bombus occidentalis*) and Michigan moonwort *(Botrychium michiganense*)

have been yellow-listed. Federally, 18 of these provincially listed species are also listed in the federal *SARA*. While there have not been any recent sightings or documented occurrences, the Central Okanagan also contains critical habitat for four additional federally listed species at risk, including the woodland caribou southern mountain population.

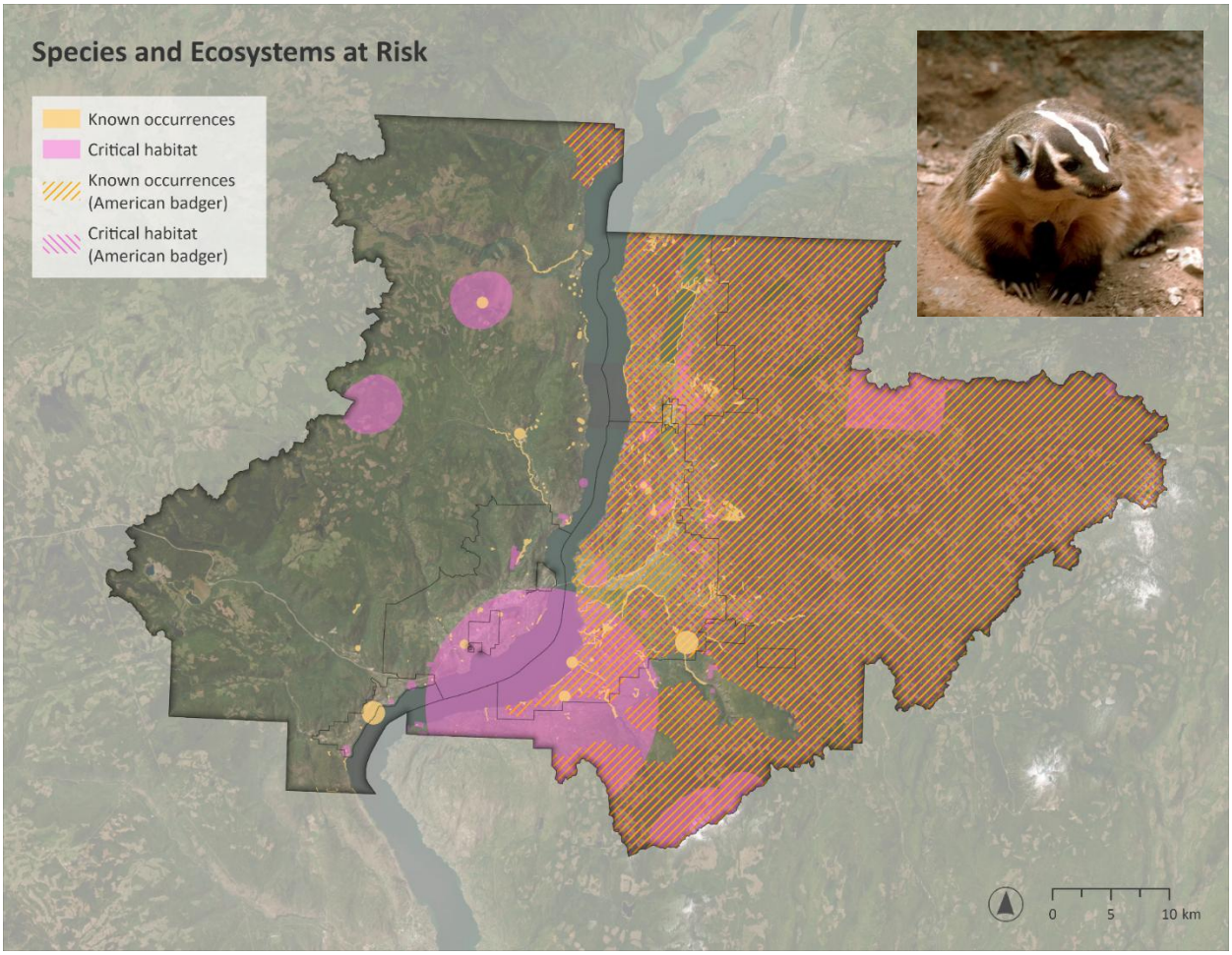


Figure 2. Distribution of species and ecosystems at risk throughout the Central Okanagan.

Sensitive Ecosystem Inventory

To better manage and protect important natural areas, mapping and identification of sensitive ecosystems within the Okanagan basin has been undertaken since the early 2000s. Informed by broad-based BEC zones and based on the TEM standard, the identification of sensitive ecosystems in the Central Okanagan has resulted in the Sensitive Ecosystem Inventory (SEI).

The SEI is an initiative of the RDCO. It was first developed in 2001 through a partnership between the RDCO and the Province of British Columbia. The inventory mapped both privately

and publicly owned lands along the eastern and western flanks of Okanagan Lake in recognition of its high biodiversity and concentration of ecosystems at risk. Since then, the SEI has been widely referenced in OCPs, development permit area designations and environmental assessment practices across the Central Okanagan. The SEI was most recently updated in 2021, with public release in 2024. The SEI is an important tool for managing change. It helps RDCO track the percentage of development occurring in sensitive vs. non-sensitive areas and the percentage of natural area gained or lost over time.

According to the SEI, there are seven categories of sensitive ecosystem types across the Central Okanagan's five BEC zones:

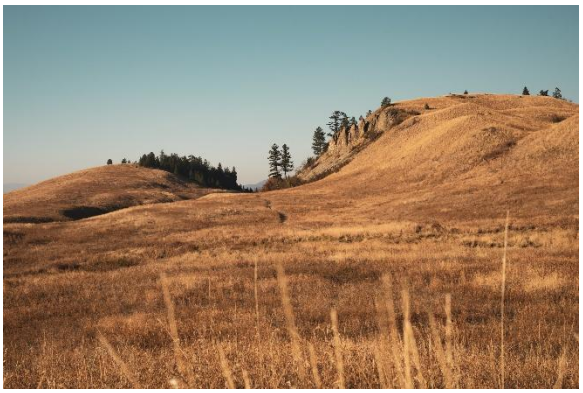
Riparian and wetland

Designated as distinctive categories in the SEI, riparian and wetland areas are well known as key components of functional ecosystems and hotspots for biodiversity throughout BC. These areas are of particular importance in arid environments, such as Central Okanagan, as they provide critical access to water, food and shelter for species throughout the hot and dry summer months[23]. The Okanagan Valley and the Central Okanagan contain some of Canada's few alkaline lakes, which are high salinity wetlands that support rare and specialized plant species tolerant of these harsh conditions. These important ecosystems are particularly sensitive to human impacts and is recommended for protection to avoid degradation and loss of function.

Coniferous woodland

Coniferous woodlands are one of the more common ecosystems found throughout the Central Okanagan and the Okanagan Valley. Comprised primarily of pine and fir trees, these forests support a wide variety of understory plants that have both high ecological and cultural value, such as saskatoons (*Amelanchier alnifolia*) and arrow leaf balsam root (*Balsamorhiza sagittate*). The diversity of plant communities found in these forests creates habitat for wildlife with specialized needs. These forests are typically found on steep south-facing slopes with rocky outcrops, lower moisture content and shallow soils, which results in slower growing forests. While common, coniferous woodlands and the plant and animal communities they support remain sensitive to human disturbance, thus their protection is of high importance.

Grassland



Grassland ecosystems are mainly comprised of bunchgrasses, shrubs and wildflower plant communities. These areas support a very high degree of biodiversity of both plants and animals and provide key foraging areas and habitat for many wildlife species. The grassland ecosystems within the Okanagan Valley are especially important as they are some of the only dry grassland ecosystems in Canada, thus many of the plant and animal species that rely on these areas are of extreme rarity[22].

Old forest

Old forest ecosystems are those that contain a high presence of large, old trees that often play a critical role in providing habitat wildlife. These forests typically contain an understory of grass and herbaceous plant communities adapted to frequent low intensity fires that reduce the presence of young trees that may outcompete the large, slower growing trees for resources. Old forests may be comprised of primarily coniferous or deciduous trees, or a mix of both. These ecosystems are considered to be very sensitive and very rare[22], making them of high conservation importance within the Central Okanagan.

Sparsely vegetated

Sparsely vegetated and rocky ecosystems are one of the most overlooked important ecosystems throughout the Okanagan Valley. While they may appear barren, these areas support highly specialized and often rare plant and animal communities that have adapted to thrive in these harsh microclimates. Multiple provincially and federally listed species at risk found within the Central Okanagan depend on these ecosystems. Additionally, rocky outcrops and cliff areas provide important nesting, breeding and overwinter habitat for a wide variety of wildlife species, including migratory birds and snakes.

Broadleaf woodland

Broadleaf woodlands are forested areas primarily comprised of leafy deciduous trees, often located in lower elevations or riparian areas where soil moisture is higher. These forests often contain a wide variety of shrubs and grasses, creating a diverse range of habitat types for wildlife. These ecosystems are very rare within the Central Okanagan[22] and include two provincially red-listed ecological communities, highlighting the importance of their protection.

Current and emerging pressures threatening ecosystems

It is well known that areas that support high rates of biodiversity and sensitive species are often the same areas considered most desirable for people to live[24,25], which often results in negative consequences for ecosystems. In the Central Okanagan region, rapid urbanization and new development is putting pressure on ecosystems through habitat fragmentation, functional changes and sometimes total loss. Further, the impacts of land use changes are exacerbated by the impacts of climate change and human settlement, including hotter temperatures, increased periods of drought, higher intensity and more frequent wildfires and the introduction of invasive species. Given the high percentage of rare and unique ecosystems and the sensitive and threatened species they support, a regional approach to protect these important ecosystems is needed.

Designing an EDPA

Separation of natural area DPAs

When designing an EDPA, member jurisdictions may choose to develop a singular natural environment areas DPA, or split guidelines based on the type of feature (e.g. aquatic DPA and terrestrial DPA). For ease of administration, developing two distinct GIS layers and management guidelines for aquatic and sensitive terrestrial DPAs is recommended. Separating aquatic and terrestrial DPAs improves clarity for the applicant, allows for guidelines to be updated independently to reflect periodic provincial or federal legislative updates and allows jurisdictions to have specific best management practices and mitigation measures tailored to their unique ecological conditions and features. This separation also provides an opportunity to ensure that riparian OCP guidelines are current with provincial watercourse protection requirements under the *Riparian Areas Protection Regulation (RAPR)*, including consistent definitions, applicable features and minimum required setbacks and of which has recently undergone legislated amendments in 2026 (coming into effect January 1, 2027).

New RAPR regulations are coming into effect January 1, 2027, which will need to be incorporated into DPA guidelines for local and regional governments.

Riparian protection requirements

Through RAPR, the Province of British Columbia maintains requirements for minimum riparian area protection standards. The standard process is for local governments to direct applicants to the provincial RAPR assessment review process. Alternatively, local and regional governments may request permission from the Ministry of Water, Land and Resource Stewardship to take on the role of reviewing RAPR reports through a "meet or exceed" approach[26]. Each approach has its own strengths and unique challenges; however, it is generally recommended that local governments use the "meet or exceed" approach when warranted by special ecosystem needs. One regional example is the designation of leavestrips for the protection of Kokanee salmon spawning habitat, as delineated in the Province of BC's Okanagan Large Lakes Foreshore Protocol.

The local government "meet or exceed" approach improves the development permit process for applicants. This approach allows local governments to review development applications and riparian protections internally, avoiding potential delays that may occur with the provincial review process. Wait times for riparian assessment reviews through the provincial *Riparian Areas*

Regulation Notification system can often be lengthy, adding up to an additional six months to the application process, though the province has been working on reducing review times.

As part of the "meet or exceed" approach, local governments are required to develop policies that clearly articulate how riparian area protections meet or exceed the minimum RAPR requirements – which are then embedded in the guidelines for aquatic DPAs. This approach requires periodic updates to aquatic DPA guidelines should the provincial regulations change. This also ensures that EDPAs remain up to date on environmental best management practices and provides an opportunity to update mapping to reflect current day conditions.

Local government staff capacity to review riparian area environmental assessments may be a limiting factor for adopting the "meet or exceed" approach. Local governments should have a QEP or RPBio on staff to review riparian area assessment reports and subsequent delineated setbacks to confirm if they are compliant with RAPR. In lieu of having a QEP on staff, a detailed terms of reference document developed by QEPs, such as the *Environmental assessments: Model terms of reference*, can provide clear guidance on the requirements of environmental assessment reports, the type of professionals who can produce these reports and ensure that any riparian area assessments and setbacks are determined by qualified professionals following RAPR guidelines.

Exemptions

Exemptions are intended to keep an EDPA focused on the activities most likely to affect environmentally sensitive areas. Well-drafted exemptions can improve efficiency for applicants and staff by removing low-risk or environmentally beneficial activities from the permitting process, while still ensuring that site alteration with the potential to affect riparian areas, sensitive terrestrial ecosystems, or wildlife habitat remains subject to review.

In practice, exemptions should be specific, clearly defined and tied to the level of new disturbance being created. It is also helpful for exemption language to clarify when confirmation from staff or a QEP may still be required, particularly where the presence or extent of a sensitive feature is uncertain. Example language and guidance for exemptions have been provided in Appendix A: Example language for EDPA exemptions.

A common example is work that remains within an existing building footprint. Many local government DPAs exempt repairs, renovations or rebuilding where the structure is not expanding into adjacent sensitive areas and no additional site disturbance is required. This exemption is generally appropriate because it distinguishes routine maintenance or replacement from new development. For aquatic ecosystems, this approach should also consider the forthcoming 2027 RAPR updates, which are intended to create more flexibility for specific low-risk activities in riparian areas, such as repairs to existing structures, minor access features such as stairs or trails, fence installation and erosion control measures. Similarly, restoration-oriented works are often good candidates for exemption or a simplified review pathway. Activities such as invasive species removal, riparian planting, bioengineering or ecological

restoration should not necessarily face the same permitting review as new construction, where no buildings or new structures are proposed and the intent is to improve site-level environmental conditions. In wildfire-affected areas, however, exemptions should be considered and used cautiously, particularly in riparian areas or other recovering landscapes where ecological function and site stability may remain vulnerable (see Accounting for climate change section).

Agricultural exemptions are also common, usually where activities qualify as normal farm practices under the *Farm Practices Protection (Right to Farm) Act*. These can be appropriate where they are clearly limited to established agricultural activities already protected under provincial legislation.

Exemptions also need to be applied carefully in landscapes affected by natural disturbance. In the Central Okanagan, a recently burned site should not automatically become exempt from EDPA review simply because sensitive vegetation has been removed by fire. Natural disturbance may temporarily change the visible condition of a site, without eliminating its ecological sensitivity or long-term recovery potential. Exemption language should therefore avoid treating burned or recovering sites as vacant or cleared land (see Accounting for climate change section).

While fire is an important aspect of the health of the Central Okanagan's ecosystems, wildfire impacts on human infrastructure, including homes, are becoming more prevalent as the region continues to experience hotter, drier summers due to climate change. To aid post-wildfire recovery efforts, primary residences lost to wildfire are now considered 'low risk' developments under the incoming 2027 RAPR updates and eligible for a rapid assessment process. Should member jurisdictions choose to adopt a "meet or exceed" approach to riparian areas protections, low-risk developments, such as the reconstruction of primary residences following wildfire, could be considered for an expedited approval pathway akin to that envisioned with recent RAPR legislative updates. It should be noted, however, that the exact criteria to meet the definition of low risk under RAPR must be reflected in the writing of the DP guidelines to warrant the use of the "expedited" approval pathway.

Best management practices for environmental protection

Best management practices help bridge broad environmental objectives and the practical realities of day-to-day development permit application review. In an EDPA, best management practices translate policy intent into clear direction for mapping, application triggers, submission requirements, permit conditions and post-construction obligations. This clear direction is especially important in the Central Okanagan, where environmental sensitivity is dynamic. Drought, wildfire, invasive species and changing hydrologic conditions are continually reshaping ecosystem structure, watershed function and recovery patterns over time. As a result, an EDPA

and its guidelines should be designed not only to protect existing environmental values, but to respond to changing site conditions in order to support long-term ecological resilience. In practice, this means designing permit guidelines that are comprehensive of all desired requirements, clear enough to be applied consistently, flexible and adaptive to address site-specific circumstances and current to reflect how climate-related disturbance is affecting riparian areas, grasslands, open forests and other sensitive ecosystems across the region. General language and guidance for some draft OCP guidelines have been provided in Appendix B: Example language for EDPA guidelines.

Enhancing the development permit review process

Provincial regulatory frameworks continue to evolve in ways that influence how development near aquatic ecosystems is assessed. In February 2026, the Province approved several regulatory updates under the *Water Sustainability Regulation (WSR)* and the *Riparian Areas Protection Regulation (RAPR).* While the WSR amendments are already in effect, the RAPR amendments are expected to come into force January 1, 2027. Incorporating new provincial direction provides an opportunity to review and enhance EDPAs more broadly.

One key area of change involves improved clarity around definitions and regulatory scope within RAPR. Under the current regulation, a 'stream' is defined broadly to include watercourses or bodies of water that may not always contain water, including ephemeral channels, wetlands, springs and artificial features such as ditches and stormwater detention ponds connected by surface flow. As a result, small seasonal channels or drainage features can still trigger RAPR requirements. The amendments are intended to clarify how these definitions are applied in practice, helping reduce uncertainty and inconsistencies of when riparian assessments are required.

Another important objective of the amendments is to better enable riparian restoration and enhancement activities. The updates are intended to reduce barriers for activities such as invasive species removal, bank stabilization using bioengineering techniques, riparian planting and stream restoration projects such as daylighting. Beginning in 2027, these activities may be eligible for simplified approvals or exemptions, rather than requiring a full riparian assessment.

Accounting for climate change

Wildfire and post-fire recovery considerations

Wildfire is a natural and ecologically important process in the Central Okanagan. However, the scale, frequency and intensity of recent wildfire events reinforce the need for EDPAs to account for changing post-fire conditions during development permit application review. Provincial studies indicate that wildfire events are expected to increase as the climate warms, with consequences for ecosystem recovery, watershed function, soil conservation and habitat values[27]. In this context, post-wildfire planning should prioritize human safety and critical

infrastructure while also sustaining or restoring ecological functions such as water quality, soil stability and wildlife habitat.

A key implication for EDPA design is that fire-affected lands should not automatically be treated as lower-value or lower-sensitivity simply because vegetation structure has changed. Depending on burn severity, wildfires can sometimes temporarily increase landscape fragility and vulnerability to disturbance. For development permit application review, it is important to consider not only whether a site has burned, but how it is recovering and what risks to ecosystem health remain. Recently burned areas may still contain important wildlife habitat, ecological connectivity value and recovery potential that warrants protection. Burn recovery areas may also be more vulnerable to erosion, runoff, sediment delivery and further disturbance during reconstruction or new development.

The *Environmental Assessments: Model terms of reference* directs QEPs to investigate previous wildfire occurrence where there is evidence of fire on site, or where understory conditions indicate an early successional stage. This can include an assessment of tree regeneration (e.g. the presence of pioneer species such as alder), understory vegetation, invasive species presence, erosion evidence, soil hydrophobicity, snags and coarse woody debris and wildlife observations. These features are useful indicators for distinguishing between a site that is recovering naturally, a site that remains highly unstable and a site that may require active restoration or longer-term monitoring.

Post-fire rebuilding in riparian areas is another important consideration. The provincial *Riparian Recovery – 2023 Wildfire Rebuilding Direction* provides helpful guidance to inform EDPA design. It was developed by the Ministry of Water, Land and Resource Stewardship to support rebuilding of homes lost in 2023 wildfires, including McDougall Creek located in the Central Okanagan, where riparian areas were affected. The direction limits any redevelopment of pre-fire structures in the Streamside Protection and Enhancement Area (SPEA) to the existing building footprint without expansion. Further, it requires non-essential development within the setback to be relocated and requires a restoration prescription prepared by a QEP along with post-restoration monitoring. As per the revisions to RAPR which come into effect on January 1, 2027, jurisdictions may include the reconstruction of primary residences damaged or destroyed by wildfire under an expedited assessment review pathway in their aquatic DPA, so long as construction remains within the pre-fire footprint and is compliant with all other applicable laws and regulations. Riparian restoration plans within burn areas are still required, regardless of the condition of the riparian area prior to or after any fire impacts.

Several wildfire-related terms and concepts are also worth building into EDPA guidelines. These can include:

- burn severity
- post-fire recovery
- existing footprint
- non-essential development
- disturbance footprint
- biological legacies
- restoration prescription
- monitoring plan
- performance security

The intent is not to duplicate existing wildfire hazard development permit systems, but to improve coordination where environmental and wildfire hazard considerations overlap. This can provide municipal staff with clearer tools and directives for reviewing development projects in recently burned or recovering landscapes, while also supporting decisions that can help safeguard development and ecosystems from future wildfire risks.

Together these two DPA systems (environmental and wildfire hazard) may support a more streamlined review process by aligning information requirements, permit conditions and, where appropriate, covenant tools, so that ecological recovery, site stability and wildfire-resilient rebuilding measures can be considered together rather than through separate review streams.

Drought

Drought acts as a chronic and cumulative stressor on ecosystems within the Central Okanagan. Prolonged heat and reduced water availability can affect vegetation health, riparian function, habitat quality, slope stability and determine the success of restoration or compensation plantings over time. As hotter and drier conditions become more common with climate change, drought is increasingly influencing how ecosystems function, recover and respond to additional disturbance.

This has important implications for EDPA design and administration. Drought-stressed areas may be more vulnerable to incremental impacts from grading, vegetation removal and soil disturbance associated with development, particularly in riparian areas, exposed slopes and within ecosystems already under pressure from edge effects or prior disturbance. Permit guidelines should, therefore, support a more cautious approach to site alteration in these contexts. Where planting, restoration or compensation is required, guidelines should not assume that standard planting prescriptions will remain effective under current or future climate conditions. Instead, they should support drought-tolerant native species selection, realistic establishment measures and maintenance requirements that reflect hotter, drier growing seasons. Drought should thus be treated as an ongoing environmental condition that affects both ecosystem sensitivity and restoration risk over time.

Invasive species

Invasive species should be treated as a climate change consideration when designing an EDPA, not simply as a site maintenance issue. In the Central Okanagan, hotter, drier conditions, repeated disturbance and post-fire recovery can all create opportunities for invasive plants to establish, spread and outcompete native vegetation. Invasive species can reduce habitat quality, simplify vegetation structure, weaken ecological connectivity and undermine the success of restoration and compensation plantings over time. The *Environmental assessments: Model terms of reference* recognizes invasive species in the development permitting process directly by requiring site inventories to assess invasive species cover as a factor influencing current ecosystem condition. Invasive species presence is also included within post-wildfire ecological monitoring.

Invasive species monitoring should be incorporated into both development permit submission requirements and post-development obligations within EDPAs. At the assessment stage, applicants, through their QEPs, should be required to identify invasive species present on site, describe how infestations affect ecosystem condition and restoration potential and explain how site disturbance will be managed to avoid creating new pathways for spread. This is particularly important in recovering of partially disturbed landscapes, where invasive species can quickly colonize exposed soils, simplified vegetation communities and edge environments. EDPA guidelines should clarify that restoration success is not measured solely by plant survival, but also by whether invasive species are being effectively controlled and native vegetation is establishing as intended. Where performance security is used, the guideline should also identify the conditions that must be met before security can be released. The *Environmental assessments: Model terms of reference* recommends that monitoring and performance securities account for invasive species management during and after construction, including throughout the three-to-five-year plant establishment period. The terms of reference also establishes a maximum threshold for invasive weed cover in restoration areas and recommends that securities be withheld until deficiencies are addressed by the applicant.

Selection criteria

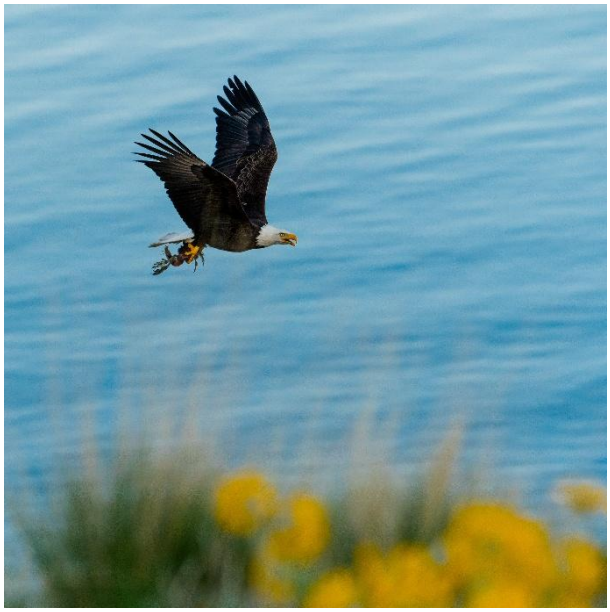
Selection criteria can support decisions on which environmental features should be included within an EDPA and, in turn, which areas will require closer review during development. In the Central Okanagan, these criteria should reflect the ecosystems and habitat features that are most sensitive to disturbance, most important to long-term ecological function and most difficult to restore once lost. An EDPA should not be drawn only around what is easiest to map. It should be designed to include ecological features and functions that matter most to watershed health, biodiversity and ecological resilience in this region.

For terrestrial ecosystems, the Central Okanagan SEI is the best available information source for the region. This does not mean an EDPA must rely on SEI data alone, or that every municipality must map terrestrial sensitivity at the same level of detail. Rather, the SEI offers a

scientifically defensible foundation of data that can then be further refined with local information, field verification and site-specific assessment.

Selection criteria should be targeted to focus on the environmental features that are most relevant in the Central Okanagan landscape. This includes riparian areas, wetlands, watercourses and other aquatic systems in addition to sensitive terrestrial ecosystems such as grasslands, old forests, broadleaf woodlands, rocky or sparsely vegetated habitats and other areas identified through regional SEI mapping or supporting local studies (see Current and emerging pressures threatening ecosystems section). Areas that perform broader ecological functions such as habitat hubs, movement corridors and other places that help maintain connectivity across the landscape should also be considered for inclusion in an EDPA. In practice, this means selection criteria should capture not only individual sensitive features, but also the landscape relationships that allow those features to remain functional over time.

Broad ecosystem mapping such as the SEI, however, may not capture all wildlife habitat features important to development review. Some habitat features, such as nests, may warrant protection because of their ecological importance or sensitivity to disturbance, or may also require protection under federal or provincial legislation. In these cases, local governments may wish to use known habitat information as a supplemental screening layer for permit review, while recognizing that static mapping sources may not include all features on the ground, which may need to be confirmed through professional assessment in the field.



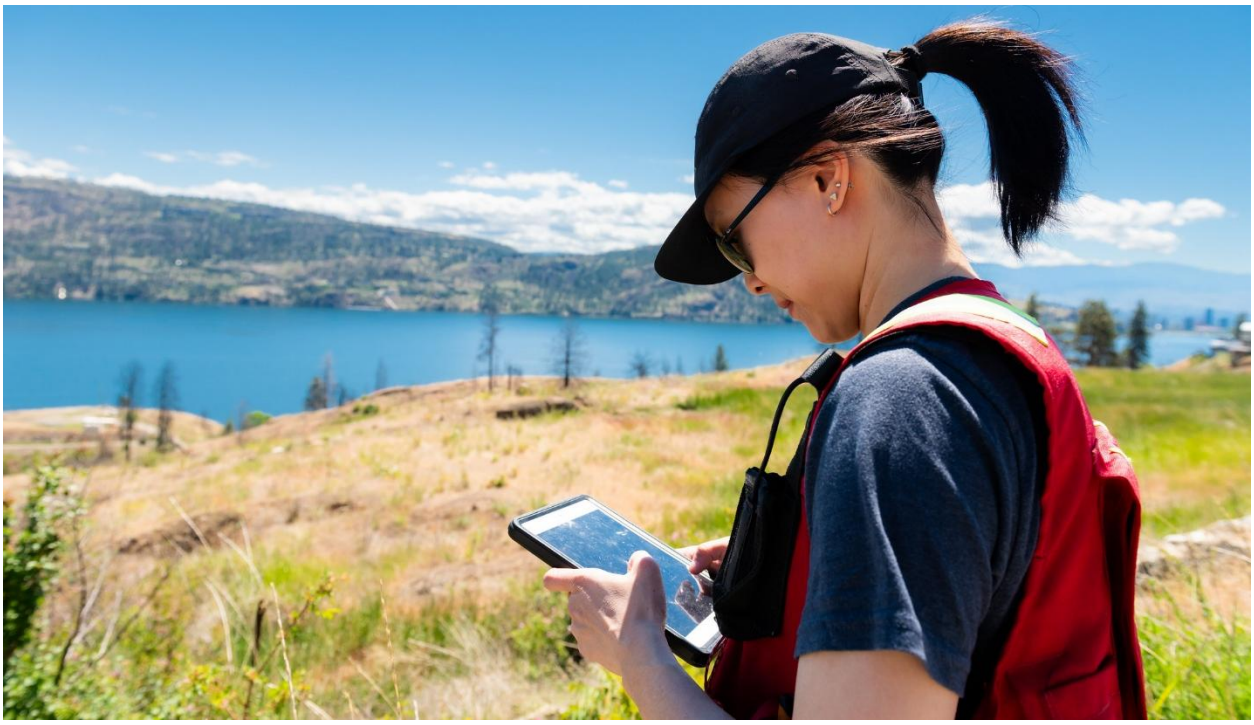
This is particularly relevant where an EDPA is intended to help protect habitat that supports species at risk or other disturbance-sensitive wildlife. In many cases, the most practical approach is not to rely solely on available government occurrence records or mapped species locations, but to ensure that the broader ecosystems and habitat features that support those species are captured in the selection criteria and then supplemented, where needed, through on-site professional assessment. Known nesting features are one example. A comprehensive nest-mapping approach may not always be practical or necessary and some nests, such as bald eagle (*Haliaeetus leucocephalus*) nests and great blue heron (*Ardea herodias*) colonies, are already protected under federal and provincial legislation. The purpose of including nesting information in an EDPA is therefore not to duplicate government protections, but to improve development screening and make potential constraints visible earlier in the municipal review process. For this reason, municipalities may choose different approaches to addressing nesting habitat within an EDPA, depending on local context and available information. Some may incorporate known nesting features into broader terrestrial

ecosystem mapping and rely on site assessment by qualified professionals to identify unmapped nests during development review. Others may use a dedicated nesting-tree DPA or a separate screening layer within a GIS system where nesting activity is frequent and disturbance pressures are high. To ensure the protection of highly sensitive wildlife features such as these, member jurisdictions may want to ensure this information remains internal or apply appropriate buffers to sensitive features until more precise locations can be determined on final EDPA mapping.

Common gaps, limitations and data constraints

One of the most common roadblocks when updating or developing EDPAs is access to high quality spatial data. Delineating sensitive natural areas that should be protected is a fundamental step in creating effective EDPAs. This process requires access to spatial datasets that ideally cover a municipality in its entirety and reflect current day conditions. Datasets should identify important features such as watercourses, environmentally sensitive areas and key wildlife habitat features in EDPA mapping. However, internal GIS capacities and municipal budgets often prevent frequent updates, resulting in outdated datasets that no longer represent current ecological conditions.

In an ideal scenario, field verifications would be conducted by a QEP for all natural areas to gather a complete understanding of the state of sensitive ecosystems within a jurisdiction. However, fieldwork is time intensive and costly, and municipal budget and time constraints often limit the amount of fieldwork for a project. Strategic selection of fieldwork sites using spatial data analysis is a common approach to prioritize efforts.



Required spatial data

Data sources and data quality assessment

LiDAR and imagery

High quality and recent Light Detection and Ranging (LiDAR) and imagery data are two of the most important datasets for mapping EDPAs. Recent advancements in LiDAR technology provide local governments with high-resolution elevation and surface structure measurements, which can be used to derive a wide range of environmental datasets important for EDPA mapping. Digital elevation models derived from LiDAR are also used to develop flow accumulation models for watercourse mapping, top of bank delineation, terrain and slope analysis and to determine forest stand and structure dynamics. These data products are best used in conjunction with recent high-resolution orthoimagery to confirm the absence or presence of features.

In locations where recent orthoimagery is not available, recent high resolution satellite imagery may be utilized. Satellite imagery is comparable to typical orthoimagery, as it provides a visual of ground conditions. Various satellite imagery sources are available, such as the Pleiades Neo satellite imagery or WorldView satellite imagery. It should be noted, however, that compared to orthoimagery, satellite imagery has lower spatial resolution (typically >30cm resolution), potential cloud cover blockages and inconsistent image capture dates.

LiDAR in combination with imagery can also be used for wetland delineation. LiDAR relies on the bouncing back – known as 'returns' – of light emitted from a measurement device as it travels over a surface. Water surfaces do not allow for returns as water absorbs, scatters and refracts light, resulting in a flat surface on the elevation model. This LiDAR use, in conjunction with multiband satellite imagery, can also be used to identify wetland boundaries, as the Near Infrared (NIR) band helps to identify wetted vegetation areas not obvious to the human eye.

Riparian datasets

The provincial RAPR requires protections for all natural and channelized watercourses and riparian areas that support fish and fish habitat. With this regulation comes specific setback requirements depending on the classification and sensitivity of watercourses and riparian areas. Up to date and high-quality aquatic datasets are critical components of EDPA mapping of riparian areas. As mentioned above, LiDAR can be used to derive watercourses through a flow accumulation model, however, it is important to have access to watercourse mapping that has undergone field verification. Regional datasets such as the Sensitive Habitat Inventory Mapping (SHIM), Foreshore Inventory Mapping (FIM) and SEI contain information on the location of stream centerlines, lake shorelines and wetland boundaries. Another data source containing important riparian area information is the provincial Freshwater Atlas, a dataset that delineates stream networks and lake and wetland boundaries. These datasets are essential for drawing

buffers around watercourses as riparian management areas consistent with provincial requirements. These datasets are often subject to infrequent updating or coarse resolutions, which can be problematic for municipal scale DPA mapping, for which up-to-date information is preferable. LiDAR derived flow models with field verification can be used to supplement these existing datasets and enhance accuracy.

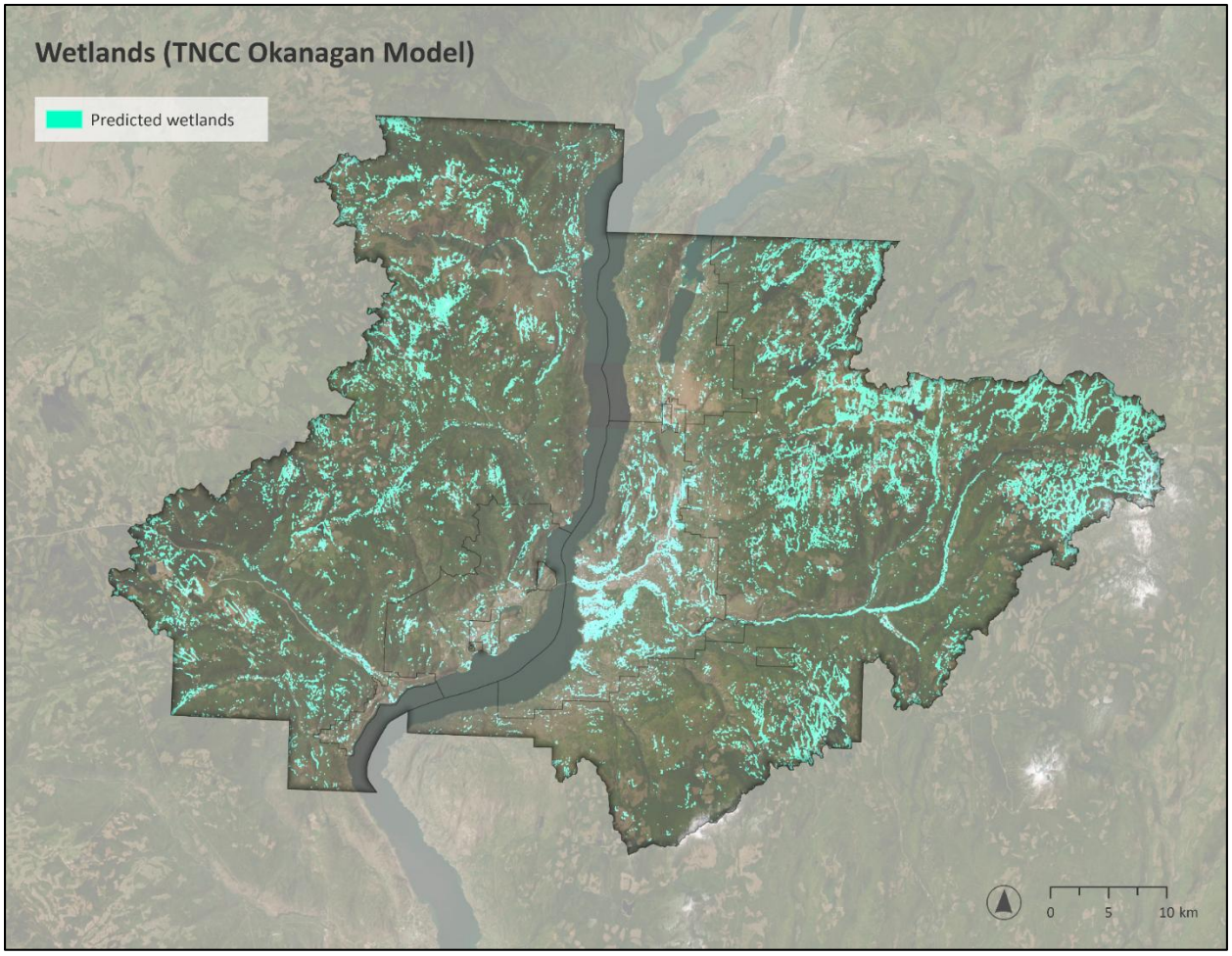


Figure 3. Screenshot Example: Location of wetlands identified by the TNCC Wetland Predictive Model with >90% confidence accuracy.

Wetland delineation can be a difficult task for the Okanagan region, especially for local government planners who do not have technical expertise in this area. This is problematic as wetlands are some of the most sensitive and most at risk ecosystems within the Okanagan and Canada as a whole. As an arid climate, wetlands in the region are not always obvious on multiband imagery and wetlands containing high aquatic and semi-aquatic vegetation coverage do not produce obvious flat surfaces on digital elevation models. A further challenge is the ongoing drought conditions, which can result in less watercourses showing up on orthodata

making watercourse identification more difficult. Local governments may want to consider using data from high accuracy predictive wetland modelling for mapping wetlands within their jurisdictions. The Thompson-Nicola Conservation Collaborative (TNCC) has developed the Okanagan Region Model, a LiDAR-derived predictive wetland mapping tool with a 3m resolution and an accompanying shapefile of predicted wetlands with >90% probability. Datasets such as these help to reduce the time and cost of ensuring that some of the regions most sensitive ecosystems are reflected in EDPA mapping.

Terrestrial datasets

The basis for many sensitive terrestrial EDPA mapping processes is the SEI dataset. This dataset is mapped at a regional scale following standards set by the province and is critical for identifying unique and sensitive ecosystems that require protection from development. It provides standardized definitions for sensitive ecosystems throughout the region to help align EDPA development and mapping with regional conservation goals. As a starting point, member jurisdictions can use the 2021 RDCO SEI dataset for sensitive terrestrial EDPA mapping and expand or refine areas based on their local contexts.

The provincial Terrestrial Ecosystem Mapping (TEM) dataset is a secondary resource for identifying natural areas to include in EDPA mapping. Specifically, member jurisdictions may find it helpful to review the attribute information for TEM polygons designated as ‘non-sensitive’ to ensure that smaller patches (0.5 ha or greater) of important natural areas have not been missed.

TEM data provides further information on the ecosystems present within a municipality, such as classification, stand structure, site series (a type of site that supports a predictable plant community), etc. This data is additionally useful for adding smaller patches of natural areas that may be categorized as ‘non-sensitive’ due to the regional scale of the SEI. The TEM information can help identify the types of ecosystems within these SEI-designated non-sensitive areas that are to be protected under municipal EDPA guidelines or can provide important stepping-stone habitat for ecological connectivity considerations.

Other important datasets to consider when mapping terrestrial EDPAs are the provincial and federal Species at Risk (SAR) known occurrences and critical habitat. These data layers can be used to fill in the gaps left by the regional scale of the SEI to ensure that areas important to endangered and threatened wildlife and ecological communities are protected.

Table 1. Suggested datasets and sources for EDPA mapping.

Dataset	Data type	Data source
2018 LiDAR	LiDAR point cloud	RDCO
2018 orthoimagery	3 band raster, 10 cm resolution	RDCO
2024 orthoimagery	4 band raster, 10 cm resolution	RDCO
2024 Digital Elevation Model (DEM)	DEM, 1 m resolution	RDCO
Pleiades Neo satellite imagery 2021 to present (or comparable satellite data)	6 band raster, 30 cm resolution	European Space Agency
2021 Sensitive Ecosystems Inventory	Vector	RDCO
2021 Terrestrial Ecosystem Mapping	Vector	Province
2019 Thompson-Nicola Wetland Model	Vector	Thompson-Nicola Conservation Collaborative, Geodesic Solutions
Species at risk, occurrences and known habitat, such as in the 2025 BC Species & Ecosystems Explorer (BCSEE)	Vector	Province
Ecological Corridors	Vector	RDCO

Additional data sources

The datasets mentioned in the above sections represent the minimum required information needed to develop robust and effective EDPA mapping. There are several additional spatial data products that can improve EDPA mapping, such as land cover classifications (LCC) derived from LiDAR and high-resolution aerial imagery. LCCs can often be expensive and time consuming to generate, as they require technical expertise to produce in-house or need to be purchased. Up to date and high resolution LCCs can help improve the accuracy of EDPA boundaries compared to solely relying on regional-scale datasets such as the SEI. Depending on the resolution of input LiDAR and/or imagery, EDPA mapping can more closely follow the extents of natural features on the ground.

Key wildlife features for species and/or habitats of interest can help improve the protections of regionally and culturally important species that may not be represented on species at risk datasets. This may include datasets for features such as important wildlife trees, sensitive raptor nests and important fish spawning habitat.

Mapping methodology

Riparian area mapping

Existing datasets

Existing riparian datasets serve as the basis for developing an aquatic (or riparian) area DPA map. Begin with datasets, such as the RDCO's SHIM layer, to identify networks of natural streams, channelized watercourses, ditches and wetland boundaries. The BC Freshwater Atlas may also be referenced to identify watercourses that may have been missed by the SHIM mapping; however, it is important to remember that the Freshwater Atlas was developed on a coarser scale than the SHIM and is updated less frequently.

Flow accumulation model

To ensure aquatic DPA mapping is comprehensive and compliant with the incoming updates to the RAPR, a flow accumulation model should be run to capture potentially unmapped watercourses, as well as previously mapped watercourses that may no longer exist within the jurisdiction. A flow accumulation model simulates how precipitation or runoff travels downhill, identifying drainage pathways, small channels and areas where water is likely to collect. The primary input dataset required for this analysis is a LiDAR derived Digital Elevation Model (DEM). Flow can be modelled at a variety of sensitivities, known as 'accumulation thresholds'. The accumulation threshold represents the amount of area that must fill a pixel (i.e. a cell) to be defined as a stream raster. For example, if the accumulation is 25 ha, then 25 ha of upstream flow or more must fill a pixel for the flow to be defined. The selected threshold should account for the size of the area being studied and the complexity of the terrain. Outputs from the different model thresholds should be compared to the most recent aerial imagery to help select the accumulation threshold that is most representative of the jurisdiction's area and scale.

It is important to remember that outputs from all GIS models are representations of *potential* features on earth. All unmapped watercourses identified by the flow accumulation model are solely based on topography and require QEP review, especially if field verifications are not within the scope of the EDPA mapping. If there is no QEP on staff, it is imperative that an external QEP contractor and field verification be included in the scope of work. Watercourses identified by the stream model should only be included in EDPA final mapping if:

- A visible channel and/or depression can be seen in the hillshade; and
- A defined channel and/or visible vegetation changes (i.e. gaps in vegetation) can be seen in the ortho-imagery and historical air photos on Google Earth to further validate that the channel exists; or
- The new feature has been assessed and confirmed present in the field by a QEP.

Flow models derived from LiDAR DEMs often create jagged stream centerlines due to the resolution of LiDAR surfaces in the order of centimeters. It is standard practise for the geometry of the linework to be adjusted based on aerial imagery to create a smoother, more representative stream centerline on GIS mapping.

Wetlands

Wetland delineation, especially in arid environments, can be a tricky task even for trained professionals. Many important wetland types were missed by old mapping technology. Wetland boundaries can change over time, particularly those in proximity to new developments. Some wetland boundaries have been lost entirely. It is strongly recommended that a QEP supplement static mapping review with field work to confirm wetland presence and perimeter. However, given that it is often not possible for field verification to be comprehensive in an EDPA update, wetland buffers should be sufficient to capture some uncertainty and allow for professional review as part of any future development permit application.

As previously mentioned, LiDAR pulses are typically absorbed by water which results in flat areas where returns do not exist. For this reason, an analysis of LiDAR-derived DEMs and multiband imagery should be completed and compared to an existing wetland polygons data layer, such as the SHIM mapping. Imagery that contains the near-infrared (NIR) band can help with wetland identification because it produces a ‘false colour’ image – healthy vegetation strongly reflects near-infrared light, while water and saturated soils absorb it. When the NIR band is displayed in the red band of an image, the greenest vegetation will appear as bright red. As they contain high water content, vegetation in wetlands, riparian vegetation and moist soils stand out from surrounding upland areas. This contrast helps analysts identify wetland boundaries, vegetation patterns and areas of persistent moisture that may not be visible in conventional aerial photography. The LiDAR DEM can be used in combination with the false colour imagery to delineate wetland boundaries by identifying the edges of flat surfaces where water may accumulate.

Buffering – top of bank vs. stream centreline

Once watercourses and wetland boundaries for a jurisdiction are delineated, a buffer will need to be applied for the Aquatic EDPA mapping. Buffers, also known as setbacks, are established distances from watercourses and wetlands where development is restricted. It is up to the municipality to decide buffer widths and where buffers are applied from. It is recommended that a minimum of a 30-metre buffer be applied from the stream boundary – i.e. top of bank (TOB) or top of ravine bank (TORB) (where applicable) – and from the natural boundaries of wetlands and waterbodies to remain in compliance with RAPR. The RAPR defines a 30-metre Riparian Assessment Area (RAA) around all applicable watercourses.

Watercourse and riparian area protections are implemented through QP delineation of a Streamside Protection and Enhancement Area (SPEA), based on professional assessment using the *RAPR Detailed Assessment Method*. Under the regulation, the maximum SPEA that

can be applied based on the characteristics of the watercourse or riparian area is 30 metres. However, an additional buffer area of up to 15 metres may also be required to protect the integrity of the ecologically significant areas surrounding the feature, such as the establishment of tree protection zones, windfirm boundaries (a forest or habitat edge that is stable and resistant to trees being blown over, especially after tree removal) for forested areas and geotechnical setbacks from steep slopes. These additional protections are referred to as "measures to protect the integrity of the SPEA" under RAPR and are determined by a QEP on a site-by-site basis. As DPA mapping is meant to serve as a flagging mechanism, applying a 30 to 45-metre buffer from the TOB or TORB ensures that the entire potential setback area under RAPR is accounted for. This additionally ensures that there are no surprises for development permit applicants when final riparian setbacks are delineated by a QEP should a watercourse on their property require a larger setback with measures. These buffers may be adjusted so long as the RAPR minimum requirements are met or exceeded.

As defined by RAPR, TOB/TORB are defined as areas where slope gradients of 30% or greater break for a perpendicular distance of at least 15 metres. The SHIM dataset contains some TOB and TORB mapping, however, additional delineation may be needed based on review of a DEM. If a TOB or TORB is not applicable or available for a given watercourse, a buffer may be created from its centerline.

Terrestrial ecosystem mapping

SEI / TEM integration

SEI and TEM data should serve as the foundational datasets for developing sensitive terrestrial EDPA mapping. The EDPA is intended to function as a screening and flagging mechanism that triggers a site-specific assessment by a QEP to confirm and delineate environmentally sensitive areas and assign ESA ratings in accordance with the Environmental Assessment Terms of Reference. Accordingly, all SEI and TEM polygons that meet the criteria for protection under the EDPA should be included in the mapping, regardless of their relative calculated conservation value.

The first step in identifying sensitive terrestrial ecosystems is to include all polygons designated as 'sensitive' by the 2021 RDCO SEI. This will ensure regional consistency for baseline sensitive ecosystems that should be protected from the impacts of development. As mentioned in the section above, due to the regional scale of the SEI, member jurisdictions should also review the TEM attribute information for any polygon designated as 'non-sensitive' to ensure that smaller patches (0.5 ha or greater) of important natural areas are not missed. TEM site series map codes for all BEC codes within the jurisdiction should be categorized into a general ecosystem type for inclusion in the EDPA mapping. Any 'non-sensitive' SEI polygons that contain a primary decile – i.e. the highest percent coverage of a vegetation community – that is considered an important ecosystem for protection by the EDPA guidelines should be included. A review of the secondary decile for TEM polygons that are considered non-natural (i.e.

anthropogenic, agricultural fields, etc.) should also be conducted to further identify gaps from the regional scale of the SEI.

Member jurisdictions may need to decide on the minimum percent coverage required to qualify for inclusion in their EDPA for non-sensitive, non-natural polygons. For example, the City of Kelowna's recent Natural Environment Development Permit Area (NEDPA) mapping update flagged polygons with a primary anthropogenic TEM decile (i.e. cultivated fields, urban, rural, etc.) of ≤70% and a secondary TEM decile with natural environmental features (i.e. herb wetland, black cottonwood, etc.) of ≥30% were flagged to be included in their sensitive terrestrial EDPA, following a detailed review by a QEP.

Other terrestrial data sources may be used to improve the baseline EDPA mapping in addition to SEI and TEM, especially for areas without coverage. It is important to ensure that they are understood and integrated correctly. For example, the Vegetation Resources Inventory (VRI) is a provincial dataset that identifies different vegetation communities present on the landscape and is developed through a multi-phase approach using photo interpretation and field verifications. This dataset is particularly useful for identifying areas with mature and old forests that have not been captured by the SEI. The VRI does not, however, have a standardized re-inventory cycle and is primarily updated through data projections of vegetation composition changes from the initial data collection date, as well as update requests from forest tenure licensees. This dataset is best used at a 1:3,000 scale, which may require manual refinements for use on a local scale. Member jurisdictions should incorporate the verification of datasets such as the VRI into the EDPA process to ensure that mapping updates remain reflective of current day conditions.

Canopy and structural refinements

Canopy classification is developed through the integrated use of LiDAR data and high-resolution imagery, as both datasets are required to capture the structural and spectral characteristics necessary for accurate canopy mapping. LiDAR provides detailed information on canopy height and vertical structure, while multispectral imagery contributes reflectance and textural information that helps distinguish tree canopy from low-lying vegetation and other land-cover types. An object-based classification workflow is used to segment imagery into meaningful canopy objects based on spatial context, structure and reflectance properties, resulting in a representation that more closely reflects on-the-ground features. Hierarchical classification rulesets are applied to extract precise tree canopy polygons, followed by targeted manual review and photointerpretation to correct errors, particularly in areas where mismatches exist between LiDAR and imagery acquisition dates. Where feasible, canopy will be classified into deciduous and coniferous categories to align with SEI classification standards. Once a classified canopy map is produced, forest structure polygons can be derived using LiDAR-based height metrics, stand density and species composition. These areas will be segmented according to dominant height classes and canopy characteristics to delineate structural classes such as

sapling, young forest and mature forest, supporting more detailed and ecologically meaningful forest analysis.

Ecological connectivity considerations

Ecological connectivity is a fundamental component of effective landscape level conservation efforts and is critically important to include in EDPA mapping. The Okanagan Nation Alliance, in partnership with the Okanagan Collaborative Conservation Program (OCCP), RDCO and the University of British Columbia, have identified the Okanagan Mountain–k'nmalka Wildlife Connectivity Corridor as a key regional habitat connectivity corridor for wildlife population health. A GIS-based connectivity analysis was used to identify initial corridors based on the needs of identified important wildlife species and further refined following engagement with key stakeholders and syilx / Okanagan knowledge keepers. It is recommended that the final corridor data layer be integrated into sensitive terrestrial mapping with supporting guidelines for the Terrestrial DPA.

Wildlife habitat considerations

Key wildlife habitat features are important considerations when developing EDPA mapping. Features may include the nests of sensitive raptor species that have provincial and federal protection requirements, significant trees, or important known habitat areas such as hibernacula for native snake species. To ensure that these features are protected, it is recommended that a buffer be applied to their locations. This ensures that any sensitivity buffers are incorporated into the EDPA mapping, such as required vegetation no-disturbance buffers around sensitive raptor nests and that the exact location of the sensitive wildlife feature is not reflected in the mapping as a protective measure. Existing datasets for the integration of wildlife habitat and key features include the BC Centre for Conservation Data (BC CDC), or the Community Mapping Network's Wildlife Tree Stewardship Atlas.

Burn area and forest succession considerations

The Okanagan region is well adapted to wildfire disturbance on the landscape, however, as climate change continues to result in hotter, drier summers[2], the frequency and intensity of wildfires within the Central Okanagan is expected to increase. This creates complex challenges for member jurisdictions, including how burn areas are incorporated into EDPA mapping as they undergo regeneration. While a recent burn area may not appear to be a sensitive ecosystem, it is important to plan with future ecosystem regeneration in mind to protect the ability to regenerate young forest, especially given that tree regrowth is particularly challenging in the hot and dry Central Okanagan climate. It is recommended that historical land cover data, such as TEM in conjunction with historical air photos, be reviewed for burn impact areas to identify previous forest types. This allows for a proactive approach in identifying and incorporating areas where forests stands may return in the years following a wildfire. Areas with historical TEM or SEI data that meet the criteria for sensitive terrestrial ecosystems should be considered for inclusion in the EDPA mapping.

Conclusion

The Central Okanagan is one of British Columbia's most ecologically significant regions, supporting diverse and sensitive ecosystems within a rapidly growing landscape. As development pressures continue to increase, local governments require clear and consistent tools to manage growth while protecting ecological function and mitigating the impacts of climate change. Environmental Development Permit Areas (EDPAs) remain a key mechanism to guide development away from sensitive areas, protect biodiversity and support long-term landscape resilience and ecosystem function.

EDPAs should be designed around the unique ecological form and function of the Central Okanagan. Selection criteria should prioritize ecosystem and habitat features that are most sensitive to disturbance, most important to watershed health and biodiversity and most difficult to restore once lost. They also should be designed in compliance with provincial and federal environmental regulations, such as the Riparian Areas Protection Regulation (RAPR). In the Central Okanagan, this includes riparian areas, wetlands, grasslands, old forests and other sensitive terrestrial ecosystems. Regional datasets such as the Sensitive Ecosystem Inventory (SEI), supported by field verification and local knowledge, provide a defensible foundation for mapping. Incorporating ecological connectivity, including habitat corridors and stepping-stone habitats, is also critical to maintaining ecosystem function over time.

The guide highlights the importance of integrating climate change considerations into EDPA design and implementation. Climate resilience, ecological connectivity and cumulative effects are identified as key concepts that EDPAs can address when supported by current mapping and clear guidelines. Drought, wildfire and invasive species are treated as ongoing pressures

influencing ecosystem sensitivity, recovery and restoration success, reinforcing the need for EDPAs to function as adaptive planning tools.

Clear development permit guidelines and best management practices are essential to translating policy intent into consistent application. This includes defining disturbance footprints, establishing submission requirements and setting expectations for mitigation, restoration and monitoring.

Overall, this guide demonstrates the value of a coordinated regional approach to environmental protection, enabling EDPAs to more effectively protect sensitive ecosystems, support resilient communities and guide sustainable growth across the Central Okanagan. This guide offers a voluntary framework for supporting RDCO member jurisdictions as they embark on updating EDPA guidelines in a coordinated and efficient manner. Regional consistency does not require identical mapping or priorities, but rather alignment in terminology, structure and core components. Standardizing definitions and processes improves clarity for both applicants and local government staff, supports more consistent development decisions and strengthens environmental protection outcomes across jurisdictions. Most importantly, it raises the standard of environmental protection throughout the Central Okanagan to a landscape-scale approach and ensures that nature will be protected across communities for many generations to come.

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Additional resources

- Grasslands Conservation Council of British Columbia. Publications. https://bcgrasslands.org/gcc-publications/
- Okanagan Collaborative Conservation Program. *Okanagan Mountain–k'nmalka Wildlife Corridor – Wildlife Corridor Action Plan*. https://okcp.ca/index.php/projects/current-projects/548-ecosystem-connectivity-in-the-okanagan?highlight=WyJjb3JyaWRvciJd
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Glossary

Biodiversity	Biodiversity is a term used to describe the variety and variability of life on Earth. Biodiversity encompasses all living species and their relationships to each other. This includes the differences in genes, species and ecosystems.
Biological legacies	Living organisms, organic materials and environmental patterns that survive a disturbance (e.g., wildfire) and are incorporated into the recovering ecosystem. They act as "lifeboats" or "ecological anchors," linking the pre-fire forest to the new, regenerating ecosystem and are essential for maintaining biodiversity and structural complexity. Examples can include mature trees, snags and coarse woody debris that contribute to unique and complex habitats and assist in a more rapid ecological recovery.
Buffer (spatial analyses)	An area of specified distance or time around one or more features. For example, to protect an endangered species, construction activity is not allowed within a certain buffer radius of its habitat.
Burn severity	Describes how the fire intensity affects the functioning of the ecosystem in the area that has been burnt. Can also be described as the degree to which an area has been altered or disrupted by the fire.
Climate change	Changes in long-term trends in the average climate, such as changes in average temperatures. According to the United Nations Framework Convention on Climate Change (UNFCCC), climate change is a change in climate that is attributable directly or indirectly to human activity that alters atmospheric composition.
Climate resilience	The ability of people to prepare for, recover from or adapt to the effects of climate change.
Critical habitat	Under the federal Species at Risk Act (SARA), critical habitat (CH) is the habitat that is necessary for the survival or recovery of listed extirpated, endangered or threatened species and that is identified as CH in a recovery strategy or action plan.

Cumulative effects	Combined effects from past, present and future activities and natural processes that affect the landscape.
Development Permit Area (DPA)	Areas of land that require special treatment or protections during the development process. Development Permit Areas are identified through a municipal or electoral area Official Community Plan.
Disturbance (ecology)	An event or force occurring on the landscape that impacts ecosystems and the organisms that inhabit them. Disturbances may be of natural or non-natural origin and may result or positive or negative consequences for natural areas.
Disturbance footprint (anthropogenic)	An area that is subject to enduring disturbance as a result of human occupation or activity and includes, without limitation, (a) footprints of buildings and other structures, (b) areas where soil or vegetation has been added, removed or altered and, (c) without limiting paragraphs (a) and (b), the following areas: (i) areas modified for agricultural use, including, without limitation, for crops, pasture, range, hayfields and normal farm practices; (ii) areas that are or have been used for resource extraction and have not been restored to their natural conditions; (iii) areas occupied by invasive plant species to an extent that precludes the unassisted reestablishment of native plant species.
Ecological community	Groups of plants, animals and other organisms that interact together and occupy a particular space.
Ecological connectivity	The unimpeded movements of wildlife and flow of natural processes that sustain life on Earth.
Ecological corridor	A land area that joins two or more larger areas of similar habitat. These may also be referred interchangeably as wildlife movement corridors or ecosystem connectivity corridors.

Edge effects	Refers to the changes in resources and environmental conditions that occur at the boundary of a habitat or ecosystem, often as a result of nearby disturbance. These changes can affect temperature, light, moisture, wind exposure and species use of the area, which in turn can reduce habitat quality and alter how ecological communities function.
Environmental Development Permit Areas (EDPAs)	Natural areas that have been identified by a municipality as special, sensitive or requiring special protections from the impacts of development. These may include features such as wetlands and watercourses, special ecological communities, steep slopes, etc.
Environmentally Sensitive Area (ESA)	Environmentally Sensitive Areas in the context of DPAs are areas that have special environmental attributes worthy of retention or special care that need to be protected from development. These areas are critical to the maintenance of productive and diverse plant and wildlife populations. An area identified as having features of ecological or environmental significance which are vulnerable to disturbance or degradation by human activities or developments.
Existing footprint	In relation to a building or other structure, means the area covered by (a) the structure, or (b) a projection from the structure, whether or not the projection is in contact with the ground.
Fragmentation	The process of splitting ecosystem patches into smaller fragments isolated from one another by barriers that prevent or restrict movement of some or all species between patches.
Habitat	The resources and conditions required by a species to live in an area. Some species can survive in a variety of conditions and use widely differing areas of habitat successfully, while others have very narrow requirements for very specific ecosystems or vegetation conditions. For others, habitat requirements vary with their stage of life. For example, frogs typically require wetlands or riparian areas for breeding and growth of young, but adults may use forest, grassland or other types of ecosystems for feeding and cover from weather or predators.
Habitat hubs	These are large areas that provide protected habitat and are somewhat isolated from the influence of urban development and activity. These refuge areas are important habitat areas for wildlife that are sensitive to urbanization.

Invasive species	A species that is not native to the area, or is outside of its natural range and is negatively impacting the environment by outcompeting native species for resources.
Mitigation (re. climate change)	An intervention to reduce the extent of global warming through reducing the sources or enhance the sinks of greenhouse gases.
Native species	A species which is present without direct or indirect human intervention and can be present within its natural dispersal abilities.
Natural area	Any physical area that contains sufficient native species, ecological communities and/or habitat features to support native biodiversity.
Natural boundary	The visible high water mark of a stream where the presence and action of the water is so common that there is a distinct mark in the soils or difference in the form of the banks, presence of vegetation, or changes in soil composition.
Natural disturbance	Temporally discrete events that alter ecological communities and populations and change resource availability or the physical environment. These include wildfires, windstorms, snow avalanches, landslides, flooding, insect outbreaks and diseases.
Performance security ('bonding')	Security of any kind, including money, given to ensure performance of an obligation arising under an enactment, a licence, a permit, a contract or another similar obligation and includes the terms under which the security may be realized.
Post fire recovery	The suite of actions undertaken to assess, recuperate, restore, reclaim and/or salvage landscape values that have been disturbed by a wildfire.
Qualified Environmental Professional (QEP)	A member of a professional body that has demonstrated expertise and knowledge in sensitive environments, ecosystems and/or riparian management. A QEP is only considered as such for the portion of assessment that is within their area of expertise.

Rare feature	Refers to species or ecological communities that are not commonly found, but not necessarily at risk of extinction.
Ravine	A narrow valley with an average grade on either side greater than 3:1 measured between the high water mark of the waterbody contained in the valley and the top of valley bank.
Restoration	The process of assisting the recovery and management of ecological integrity. Ecological integrity includes a critical range of variability in biodiversity, ecological processes and structures, regional and historical context and sustainable cultural practices.
Restoration prescriptions	Restoration prescriptions should take the form of maps showing the treatment locations, accompanied by the rationale for treatment, descriptions of treatments and treatment schedules and costs. Restoration prescriptions will also include future maintenance and monitoring requirements and will take into account safety and other logistical concerns.
Riparian area	The area adjacent to a stream that may be subject to temporary, frequent or seasonal inundation and supports plant species that are typical of an area of inundated or saturated soil conditions and that are distinct from plant species on freely drained adjacent upland sites because of the presence of water.
Riparian Assessment Area (RAA)	The riparian assessment area for a stream consists of a 30 m strip on each side of the stream, measured from the stream boundary. However, if a stream is in a ravine, the riparian assessment area for the stream consists of the following areas, as applicable: ► if the ravine is less than 60 m wide, a strip on each side of the stream that is measured from the stream boundary to a point that is 30 m beyond the top of the ravine bank; ► if the ravine is 60 m or more wide, a strip on each side of the stream that is measured from the stream boundary to a point that is 10 m beyond the top of the ravine bank.

Sensitive Ecosystem Inventory (SEI)	SEI identifies and maps rare and fragile terrestrial ecosystems in a given area for the purpose of encouraging land-use decisions that will ensure the continued integrity of these ecosystems.
Sensitive feature	These are features that are particularly susceptible to human activities or natural events, potentially leading to harm or decline. Particularly sensitive to human activities or natural events but not endangered or threatened (as used by COSEWIC - A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats).
Streamside Protection and Enhancement Area (SPEA)	The portion of the riparian assessment area for a stream that (a) includes the land, adjacent to the stream boundary, that (i) links aquatic to terrestrial ecosystems and (ii) is capable of supporting streamside vegetation and (b) in the case of a simple assessment, extends far enough upland from the stream that development outside the streamside protection and enhancement area will not result in any harmful alteration, disruption or destruction of natural features, functions and conditions in the area referred to in paragraph (a) that support the life processes of protected fish.
Species and ecosystems at risk	Species or ecosystems that have been identified as extirpated, endangered, threatened, or of special concern under the Federal Species at Risk (SARA) legislation or assessed as “Red” or “Blue” by the British Columbia Conservation Data Center (BCCDC).
Stepping-stone habitat sites	These areas are smaller in size and generally do not provide protected refuge areas for wildlife which are sensitive to urbanization. They act as important stepping-stone areas, often within urban landscapes that are likely to be used by species that can fly and terrestrial species that are more tolerant of disturbed habitats. Some examples include small forest patches, ravines, wetlands, shoreline pockets, and even urban green spaces that collectively allow species to move through an otherwise fragmented valley landscape.

Stream	a) a watercourse or body of water, whether or not usually containing water, and b) any of the following that is connected by surface flow to a watercourse or body of water referred to in paragraph (a): i. a ditch, whether or not usually containing water ii. a spring, whether or not usually containing water iii. a wetland
Stream boundary	In relation to a stream, means whichever of the following is farther from the centre of the stream: ► the visible high water mark of a stream where the presence and action of the water are so common and usual and so long continued in all ordinary years, as to mark on the soil of the bed of the stream a character distinct from that of its banks, in vegetation, as well as in the nature of the soil itself; ► the boundary of the active floodplain, if any, of the stream.
Temporal resolution	The frequency or rate at which images are captured over the same geographic location.
Terrestrial Ecosystem Mapping (TEM)	A standardized mapping approach and an associated dataset providing site-specific classifications and descriptions of ecosystem units in BC.
Top of Bank (TOB)	The point closest to the boundary of the active floodplain of a stream where a break in the slope of the land occurs such that the grade beyond the break is flatter than 3:1 at any point for a minimum distance of 15 metres.
Wetland	Land that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support and that under normal conditions does support, plant species that are typical of inundated or saturated soil conditions, including swamps, marshes, bogs, fens, estuaries and similar areas that are not part of the active floodplain of a stream.

Appendix A: Example language for EDPA exemptions

The example wording provided is intended to offer high-level guidance on the types of provisions local governments may wish to include when drafting EDPA guidelines and exemptions. These examples are intended to serve as a starting point and should be adapted to reflect local policy contexts, administrative capacity and applicable legal considerations.

Exemption example 1: Work within existing-footprint and/or low-disturbance renovations

A development permit may not be required where the proposed work is limited to repair, renovation or rebuilding within an existing lawful building footprint, provided that the activity does not extend into the Environmentally Sensitive Area (ESA) and does not require additional vegetation removal, grading or site disturbance.

A development permit may not be required for minor repairs to an existing structure, including interior renovations or replacement of exterior building components (e.g., roof, siding), where the work does not create new disturbance or affect the Environmentally Sensitive Area (ESA).

Note: *New RAPR amendments (January 1, 2027) will introduce greater flexibility for certain low-risk activities within riparian areas, such as repairs to existing structures, installation of minor water access features (e.g. trails, trams or stairs), fencing, erosion control works or rebuilding following natural disasters.*

Exemption example 2: Small restoration works

A development permit may not be required for removal of invasive species or noxious weeds, provided the work does not result in material disturbance to soils, riparian features or other sensitive habitat areas. The local government may still require review by staff or a Qualified Environmental Professional (QEP) where the potential for environmental impact is uncertain.

A development permit may not be required for streamside enhancement, riparian planting, or ecological restoration works that are clearly restorative in purpose and have obtained any required provincial or federal approvals.

A development permit may not be required for planting native vegetation or removing invasive vegetation and debris using small hand tools, provided the work does not create erosion, slope instability or other site disturbance. Where restoration works involve soil disturbance, heavy machinery or greater environmental risk, the local government may require a restoration plan prepared by a Qualified Environmental Professional (QEP).

Note: *Native replanting near top of bank (TOB) may be suitable for exemption or a simplified review pathway when said work is clearly restorative, uses low-impact methods and does not present erosion or slope stability concerns. Review by staff or a QEP may be warranted if proposed work involves soil disturbance, larger treatment areas (e.g., >100 m²) and/or the use of machinery. Additionally, it is recommended that exemptions are in alignment with the upcoming RAPR amendments (January 1, 2027) which will introduce greater flexibility for riparian enhancement and restoration activities such as invasive species removal, bioengineered erosion stabilization, riparian planting and habitat restoration and create a more streamlined approach for low-risk works in riparian areas.*

Exemption example 3: Agricultural activities

A development permit is not required for agricultural activities on lands in the Agricultural Land Reserve (ALR), provided the activity relates solely to normal farm practices under the Farm Practices Protection (Right to Farm) Act (i.e. farm uses) and does not introduce non-farm development into Environmentally Sensitive Areas (ESA).

Where necessary to confirm that the exemption applies, the local government may require evidence of existing farm use, such as;

- ongoing maintenance of restored or rehabilitated areas in accordance with QEP recommendations;
- farm income records;
- BC Assessment farm classification; or
- a government-issued Farm Number.

For lands not recently farmed (as determined by the local government), or for proposed new farm operations, the local government may require a farm plan prepared by a Registered Professional Agrologist. The farm plan may identify the proposed crops, the area to be farmed, the suitability of the land for agriculture, the extent of site preparation required, access requirements and confirmation that non-farm uses will not occur within Environmentally Sensitive Areas (ESA).

Exemption example 4: Hazard tree removals

The removal of a hazard tree, as defined by and adjudicated in accordance with the local government's tree bylaw (if applicable), as amended or replaced from time to time.

If the only activity being proposed onsite relates to the removal of hazardous and beetle kill tree(s). For the local government to determine whether the proposed activity qualifies for this exemption, applicants may be required to provide a report prepared by a certified forestry professional, registered in British Columbia holding either a) Wildlife/Danger Tree Assessor qualifications or b) Tree Assessment Qualifications (TRAQ).

Authorization from the local government in the form of a Tree Removal Permit for the removal of hazardous trees is required. Efforts should be made to mitigate potential hazards and utilize the trees for wildlife habitat values.

Note: *RAPR amendments (January 1, 2027) consider removal of trees that are evaluated as a hazard to a person or property as a low-risk development if all of the following conditions are met: (a) evaluations are conducted by persons who hold a Wildlife Danger Tree Assessor Certificate or a Tree Risk Assessment Qualification; (b) trees are felled by persons who hold certification as an arborist.*

Appendix B: Example language for EDPA guidelines

The example wording provided is intended to offer high-level guidance on the types of provisions local governments may wish to include when drafting EDPA guidelines and exemptions. These examples are intended to serve as a starting point and should be adapted to reflect local policy contexts, administrative capacity and applicable legal considerations.

Guideline example 1: Restoration plans, monitoring periods and bonding

Where restoration, enhancement or revegetation is required as part of EDPA approval, the local government may require submission of a restoration plan prepared or endorsed by a Qualified Environmental Professional (QEP). The plan should identify the location and nature of environmental degradation, such as encroachment, invasive species infestation, vegetation clearing, erosion, or other site disturbance and describe the actions proposed to restore the area to a healthy native plant community.

The restoration plan may also be required to include:

- maintenance and monitoring requirements for a defined period.
- target vegetation establishment or survival thresholds.
- invasive species management measures.
- replacement planting requirements where establishment is inadequate.
- a cost estimate for the proposed works for the purpose of determining any required financial security.

Where a QEP determines that site disturbance cannot be fully mitigated on site, the local government may also require off-site environmental improvements or compensation measures with the objective of achieving no net loss of important habitat functions. The Development Permit may further require:

- ongoing maintenance of restored or rehabilitated areas in accordance with QEP recommendations.
- monitoring of permit conditions and restoration performance by a QEP.
- registration of a Section 219 covenant, or similar legal instrument, to protect restored or rehabilitated areas from future disturbance.
- financial security, prior to building or site disturbance, based on the estimated cost of restoration, rehabilitation, habitat repair or remediation of environmental damage caused by construction or non-compliance.

Guideline example 2: Terrestrial ecosystems

Locate development and infrastructure as far away as possible from ESA 1 and 2.

Developments and infrastructure must be sited as far from highly Environmentally Sensitive Areas (ESAs) as possible and ensure no net loss of ecosystem area and/or function. If development must be located within an ESA, it should be located on the least sensitive portions of the site or on existing disturbed areas where possible. Efforts must be made to minimize development footprint and disturbance area to reduce impacts to the ESA. For all developments within an ESA, an Environmental Report must be prepared by a Qualified Environmental Professional (QEP) with expertise in the applicable sensitive ecosystem(s) present on site. Where disturbance and impacts are unavoidable, compensation areas must be identified to achieve no net loss. For high sensitivity ESAs, a larger compensation ratio may be required, at the discretion of the approval authority.

The Environmental Assessment Report must include:

- The ecological sensitivity rating of the ESA as identified by the *Environmental assessments: Model terms of reference.* If the ecological sensitivity rating methodology used differs, strong rational and detailed methodology from the QEP is required, with approval at the discretion of the approval authority.
- Assessment of the site's sensitive ecosystems and the wildlife values of the site prior to disturbance.
- Environmental assessment of drainage, sediment, and erosion control, and a plan developed using Professional Practice Guidelines for Erosion and Sediment Control (ESC).
- Identification of mechanisms of protection for environmentally valuable tree stands during and post construction, including the establishment of protection zones from the drip line for the protection of root systems.
- Buffers large enough to protect the ecological integrity of the ESA, with fencing along buffers where appropriate.
- Wildfire risk mitigation as guided by BC FireSmart principles (including consideration of the natural cycle of low intensity fire).
- Active bird nests and/or recommendations for timing windows for bird nest surveys.

Guideline example 3: Terrestrial ecosystems

Establish a transition area between ESAs and development.

Provide a transition area between the ESA and structures, infrastructure and impervious surfaces to prevent encroachment into environmentally sensitive areas and to accommodate workers, equipment and materials during construction. The width and recommendations for implementing this transition area must be provided by a QEP.

Guideline example 4: Terrestrial ecosystems

Design to minimize impacts to ESAs

Protect trees in environmentally sensitive areas as much as possible:

- Provide an arborist report to ensure trees in ESAs are protected. The arborist report must identify trees that will be removed or retained, protection measures, and a replanting plan.
- Construction tree protection barriers for all trees in the ESA. Tree protection barriers must follow standards outline in the local government Tree Protection Bylaw.
- Retain and protect dead-standing wildlife trees that do not pose a risk to people or property. Only trees that are identified as high-risk by a certified Tree Risk Assessor can be removed or modified in the ESA.

Preserve vegetation in retained ESAs:

- Protect all native understory vegetation in retained ESAs.

Protect habitat for species and ecosystems at risk:

- Protect and enhance identified critical habitat and species occurrences for federally and provincially listed species at risk found on site.

Guideline example 5: Aquatic Ecosystems

Design to minimize impacts to ESAs

Minimize the crossing of watercourses and their riparian areas:

- Minimize road, utility and other crossings of watercourses and riparian ecosystems. Where crossings are necessary, design them to be narrow and perpendicular to riparian areas.

Improve or maintain fish habitat and access:

- Design all culverts and bridges over fish-bearing and seasonally fish-bearing watercourses to be fish passable.
- Use clear-span bridges or open-bottomed stream crossings where feasible.
- Incorporate fish baffles or other best management practices to support fish passage in enclosed crossings.

Direct rainwater and surface runoff toward green stormwater management infrastructure:

- Incorporate green infrastructure, such as bioswales, rain gardens or stormwater ponds, where appropriate.

Guideline example 6: Terrestrial ecosystems / aquatic ecosystems

Minimize impacts to ESAs during construction

Schedule development activities to minimize risks to ESAs and restrict construction during sensitive timing windows.

- Bird nests are protected in accordance with the BC Wildlife Act and the Migratory Birds Convention Act and associated Migratory Bird Regulation. The nests of an eagle, peregrine falcon, gyrfalcon, osprey, heron or burrowing owl are protected year-round. Nests of other species are protected when they are occupied by a bird or its egg (i.e. during the nesting season). If tree or vegetation removal occurs within the nesting season, a bird nesting survey must be completed prior to any activity which may disturb nesting birds.

- Any work within a fish-bearing watercourse must be completed during the regional in-stream window, as determined by the Province.

- Construction activities adjacent to aquatic habitat should be timed to take place during favourable weather and low-water conditions to avoid sedimentation.

Avoid the introduction of invasive plant species to ESAs and eradicate any existing invasive plant species:

- All invasive plant species identified on-site must be eradicated. Care must be take not ensure they are not spread into ESAs.

- Avoid the introduction of new invasive plants on-site by using clean equipment and ensuring any soil deposits are free of invasive plant fragments and seeds.

Install protection fencing around the ESA:

- Install temporary protection fencing around the ESA for the entirety of construction to avoid impacts and disturbance in the ESA during construction.

- Install permanent fencing and signage following construction to avoid future impacts to the ESA. Design permanent fencing to allow for wildlife movement.

Prevent the release of sediment-laden water and pollutants into ESAs:

- Incorporate erosion and sediment control best management practices to prevent sediment from entering nearby watercourses and ESAs. An Erosion and Sediment Control (ESC) plan may be required at the discretion of the approving authority.

- Incorporate stormwater infrastructure to minimize the long-term pollution impacts from surface runoff to ESAs.

Protect freshwater fish and their habitat:

- All work in and around a stream must meet the requirements of the Water Sustainability Act and the Riparian Areas Protection Regulation. All in-stream work and work within riparian areas must have the appropriate permits by the relevant regulatory authority.