



Okanagan Large Lakes Foreshore Protocol



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Ministry of Forests, Lands, Natural Resource Operations and Rural Development
Thompson Okanagan Region | Resource Management | Ecosystems Section

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RECOMMENDED CITATION

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Note: This is version 2 of the Okanagan Large Lakes Foreshore Protocol. The original released in 2009 has now been replaced by this 2018 version.

1.0 INTRODUCTION

Foreshore and riparian areas are important for biodiversity and provide valuable habitat for many species in the Thompson Okanagan Region of British Columbia (B.C.). During the planning and evaluation of developments affecting foreshore and riparian areas, consideration needs to be given to applicable legislation and to ensuring that developments do not impose direct or long term cumulative impacts to environmental values. The [Okanagan Shuswap Land and Resource Management Plan \(OSLRMP\)](#) provides strategic direction for the management of large lake shorelines and associated fish habitat, both above and below the high water mark (HWM). The OSLRMP directs agencies to manage proactively through identification of fisheries management zones, to guide lakeshore development so as to reduce or avoid impacts to sensitive fish habitats, and to minimize the potential for cumulative impacts resulting from individual projects (Province of B.C. 2001).

Following the strategic direction provided in the OSLRMP, the Okanagan Large Lakes Foreshore Protocol (the Protocol) provides direction to proponents and qualified professionals (QPs) on requirements for provincial natural resource applications based on the environmental sensitivity of a site and the risk of the foreshore development activity. Knowledge of this information in the early planning stages of development can be beneficial in choosing an appropriate site or activity. The 2018 Protocol is based upon current management priorities, best available science, and up-to-date mapping, and applies to all works below the HWM on the following “large lakes” identified in the OSLRMP: Mabel, Sugar, Okanagan, Kalamalka, Wood, Skaha and Osoyoos. It will be used as guidance for all other lakes in the Okanagan area of the Thompson Okanagan Region (e.g., Vaseux Lake). This Protocol may also be utilized by provincial, federal and local governments in planning and decision making processes.

The environmental values focused on in this Protocol include Shore Spawning Kokanee¹ (*Oncorhynchus nerka*), Freshwater Mussels², and Foreshore Plants³, all of which are a priority for management direction. The Ministry of Forests, Lands, Natural Resources Operations and Rural Development (FLNRORD) continues to update information related to shore spawning fish habitat and inventories for species at risk. This is a living document that will be updated as new information becomes available.

NEW Additional Guidance Documents for Freshwater Mussels and Foreshore Plants have been developed and must be used in conjunction with this Protocol (see Section 3.4). These Guidance Documents provide the necessary practices to follow to ensure protection and proper mitigation during development activities. The combined use of this Protocol and the Guidance Documents will help to maintain the integrity and function of important foreshore habitats for these species.

¹ Stream spawning kokanee habitat is not mapped as part of the 2018 Protocol but is still considered to be an important environmental value

² Specifically Rocky Mountain Ridged Mussel (*Gonidea angulata*), which is red-listed in B.C. and listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as endangered

³ Specifically foreshore plant species at risk (SAR) that are red-listed or blue-listed in B.C. and/or listed under the *Species at Risk Act*

2.0 FORESHORE LEGISLATION

Within B.C., most foreshore areas below the natural boundary of a lake are considered to be provincial crown land and under provincial jurisdiction. Development activities in these areas typically require authorization under the provincial *Water Sustainability Act* and tenure under the provincial *Land Act*, with environmental values taken into account in both processes. Residential, commercial and industrial development activities above the HWM of these large lakes are generally subject to the provincial Riparian Areas Regulation, which provides protection for riparian areas. Other legislation that may be applicable to foreshore developments includes the provincial *Wildlife Act* and the federal *Fisheries Act*, *Species at Risk Act* (SARA) and *Navigable Waters Protection Act*. Local governments may also provide protection for foreshore areas through bylaws or other tools and should be consulted before proceeding with a project.

3.0 THE PROTOCOL

The Protocol consists of the following steps:

1. Determine the foreshore sensitivity zone(s) associated with the site based on available mapping
2. Determine the activity risk associated with the proposed development
3. Determine the application/submission requirements and when a QP must be retained
4. Determine which species-specific Guidance Documents are required

3.1 STEP 1 – Determine the Foreshore Sensitivity Zone

The zonation of the foreshore includes sensitivity areas for (i) Shore Spawning Kokanee, (ii) Freshwater Mussels and (iii) Foreshore Plants. It is limited in scope to these species based on data availability and current management priorities. If other values are identified at a site they should be appropriately considered. There are four zone categories listed in order from highest to lowest sensitivity (Figure 1): Black Zone (i.e., critical habitat value), Red Zone (i.e., high habitat value), Yellow Zone (i.e., moderate habitat value) and No Colour Zone (i.e., low or unknown habitat value). The rationale used for mapping the zones can be found in Appendix A.



Figure 1 Foreshore Sensitivity Zones listed in Order from Highest to Lowest Sensitivity

The mapping for Shore Spawning Kokanee is based on five decades of detailed annual surveys of most areas of Okanagan Lake, Kalamalka Lake and Wood Lake. As such, the No Colour Zone for this species on these lakes indicates areas with low habitat value based on comprehensive surveys. In contrast, surveys for Freshwater Mussels and Foreshore Plants have only been completed in certain areas and have been relatively limited in scope; for these species groups, the No Colour Zone indicates an unknown value due to data deficiencies. A site assessment, including a field survey, may be required to confirm the foreshore sensitivity zone for Freshwater Mussels and Foreshore Plants.

The Guidance Documents for these groups must be consulted to determine the required assessment effort.

Note: Black Zones are specifically for managing extremely high sensitivity areas. For Shore Spawning Kokanee, the Black Zones identifies the most highly sensitive areas to manage for the protection of the stock. For Foreshore Plants, the Black Zones identifies Critical Habitat as defined under the SARA. Foreshore development activities within a Black Zone are likely not consistent with provincial priorities/direction and likely will not be approved. Contact the Thompson Okanagan Region Ecosystems Section Head before hiring a QP or submitting a provincial natural resource application.

Foreshore sensitivity mapping for Shore Spawning Kokanee, Freshwater Mussels and Foreshore Plants is available through [iMapBC](#). iMapBC is a provincial government web based program that allows the user to view numerous map datasets hosted in the BC Geographic Warehouse. The user can view the foreshore sensitivity mapping in an interactive mapping environment to determine the zone(s) applicable to the site. In addition, KML files for use in a geospatial software program such as Google Earth are available through the [Protocol website](#). It is important that the most current version of sensitivity mapping is used for your works as available mapping layers may change as new data becomes available.

Note: Data can be delayed in getting onto iMapBC. There may be circumstances where you will be notified of additional values through your provincial natural resource permitting process.

Local governments may have more detailed foreshore coding and zoning for applicable bylaws. If there is a discrepancy between appropriateness of activity, procedures or practices, the higher protection standard is to be applied.

3.2 STEP 2 – Determine the Activity Risk

The second step of the Protocol is to determine the risk associated with the proposed foreshore development activity. Risk has been assigned into three categories based on the likelihood and magnitude of an impact for differing types of development activities: High, Moderate or Low. Table 1 provides risk rankings for the majority of foreshore development activities occurring in the Okanagan Valley.

Table 1 Risk Rating by Activity Type

Risk	Activity Type
High	Marina – New
	Boat Launch – New
	Erosion Protection – New (Hard)
	Dredging – Foreshore
	Infill – Foreshore
	Beach Creation
	Waterline (Trenched) – New
	Aquatic Invasive Vegetation Removal – Rototilling, Harvesting
Moderate	Dock/Piled Structure – New
	Dock – Removable
	Stormwater Outfall – New
	Erosion Protection – New (Riprap)
	Debris Removal – Large / By Machine*
	Aquatic Invasive Vegetation Removal – By Hand
	Restoration Works*
	Recreation – Beach Maintenance
Low	Dock/Piled Structure – Repair/Upgrade*
	Rail Launch – Permanent, Removable
	Marina – Repair/Upgrade*
	Boat Launch – Repair/Upgrade*
	Waterline (Drilled) – New
	Waterline – Repair/Upgrade*
	Stormwater Outfall – Repair*
	Erosion Protection – New (Soft)
	Erosion Protection – Repair (all types)*
	Debris Removal – Small / By Hand*
	Vegetation Removal – By Hand*
Mooring Buoy	

*Assumes no significant terrestrial disturbance or change to site hydrology; if not valid, increase risk by one level

High Risk activities generally include substantial projects with large footprints and/or associated habitat disturbances that have a high likelihood of adverse effects to environmental values that cannot be mitigated. Moderate Risk activities generally include new works with some associated habitat disturbance and a moderate likelihood of adverse effects to environmental values that can often be addressed with mitigation measures. Low Risk activities generally include repairs to existing structures or other activities with small footprints and no significant substrate disturbance or changes to site hydrology when available [Best Management Practices](#) (BMPs) are applied. If your works are not listed in Table 1 you must contact the Thompson Okanagan Region Ecosystems Section Head to confirm the appropriate risk ranking.

Note: Developments that result in a High Risk likely pose a significant environmental concern. Complete mitigation is unlikely.

3.3 STEP 3 – Application/Submission Requirements and When to Engage a QP

The third step of the Protocol is to determine the provincial natural resource application and submission requirements of your works as well as the need to engage a QP (Figure 2). Unless the site is located in a Black Zone for either Shore Spawning Kokanee or Foreshore Plants, the process direction is based on activity risk. You must follow the requirements laid out for all values identified at your site. This process will assist you in determining your requirements to mitigate or avoid risks.

Note: Application requirements for **Private Moorage and Docks** do not follow this flow chart and are addressed under separate guidance. Docks are the most common foreshore development activity type on Okanagan large lakes. Consequently, a significant effort has been put in to develop specific guidance to reduce impacts through design and mitigation practices. If you propose to construct a dock you must follow the Dock Design Criteria for Okanagan Large Lakes.

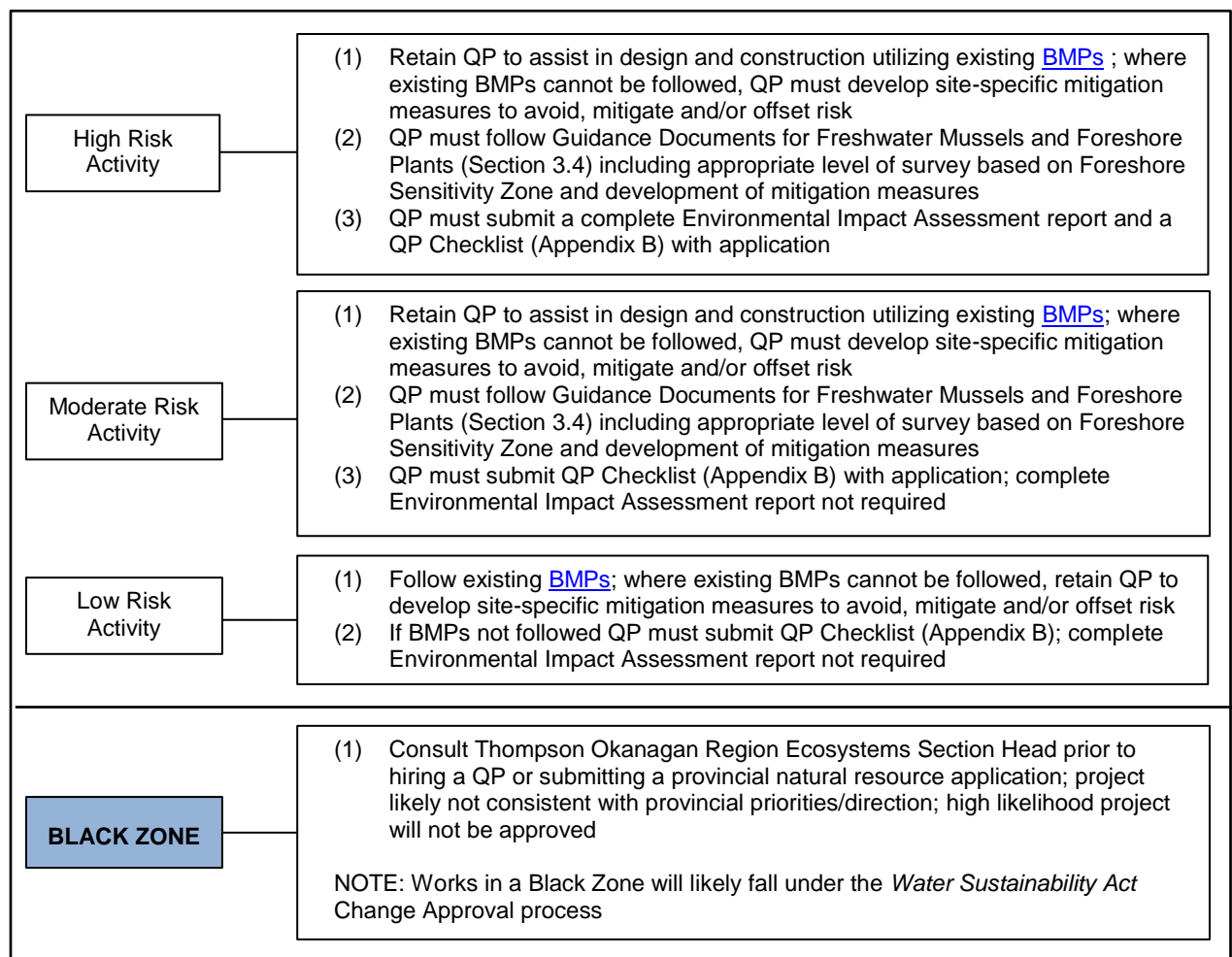


Figure 2 Application/Submission Requirements and Need for a QP

The application and submission requirements discussed here are limited in scope to habitat requirements for file review by provincial FLNRORD Ecosystems staff. Additional requirements may be requested by other FLNRORD staff. The scope and scale of work required by a QP is also indicated and further defined in the applicable Guidance Documents (see Section 3.4) if required. In

general, activities in lower sensitivity areas (e.g., No Colour Zone for Shore Spawning Kokanee) require less QP involvement than activities in higher sensitive areas (e.g., Red Zone for Shore Spawning Kokanee).

A QP is a person acting within their field of expertise that belongs to a professional association. See [College of Applied Biology](#) for more information. Generally, a QP is required when a development activity proposal is:

- designated as a Moderate or High Risk
- inconsistent with guidance or guidance is not available
- potentially impacting species at risk
- not included in the risk rating
- lacking site specific information, or
- when requested by a government agency

3.4 STEP 4 – Determine Required Species Guidance Documents

The fourth and final step of the Protocol is to consult the species-specific Guidance Documents developed for Freshwater Mussels and Foreshore Plants, as required in Figure 2. These region-specific documents provide guidance to QPs on how to conduct species surveys and mitigate adverse effects on these species groups as a result of foreshore development activities. These guidance documents are available under separate cover and can be accessed from the links below:

- [Guidance for Freshwater Mussels in the Okanagan](#)
- [Guidance for Foreshore Plants in the Okanagan](#)

4.0 SUMMARY

This Protocol provides direction to proponents on requirements for provincial natural resource applications based on the risk of the foreshore development activity and environmental sensitivity of a site. This direction is based on three environmental values that have been mapped to various extents for the large lakes in the Okanagan area: Shore Spawning Kokanee, Freshwater Mussels and Foreshore Plants. Addressing the application requirements may require the proponent to retain a QP to conduct additional surveys and develop mitigation measures following the guidance provided in this Protocol and in the species-specific Guidance Documents. These guidance documents are to be used in conjunction with this Protocol and are an integral part of maintaining the integrity and function of the Okanagan's large lake foreshore habitats.

5.0 REFERENCES

Province of British Columbia. 2001. Okanagan Shuswap Land and Resource Management Plan (OSLRMP). Province of British Columbia. <https://www.for.gov.bc.ca/tasb/slrp/plan70.html>

APPENDIX A RATIONALE USED TO DEFINE FORESHORE SENSITIVITY ZONES

Zonation	Shore Spawning Kokanee
Black	Recent (2001 to 2014) FLNRORD data where aggregations of ≥1000 spawning fish were observed; includes a 25 m buffer to account for data capture error, migration corridors, and indirect/edge effects of development on species biology
Red	Recent (2001 to 2014) FLNRORD data where aggregations of >50 spawning fish were observed and historical (pre-2001) data where aggregations of ≥1000 spawning fish were observed; includes a 25 m buffer to account for data capture error, migration corridors, and indirect/edge effects of development on species biology
Yellow	Recent (2001 to 2014) FLNRORD data where aggregations of ≤50 spawning fish were observed and historical (pre-2001) data where aggregations of <1000 spawning fish were observed; includes a 25 m buffer to account for data capture error, migration corridors, and indirect/edge effects of development on species biology
No Colour	No recent or historic shore spawning is known to occur

*No data were collected between 1980 and 2001

**Zoning for Shore Spawning Kokanee only and does not include staging for stream spawning kokanee at stream mouths

Zonation	Freshwater Mussels
Black	N/A
Red	Known occurrences of live Rocky Mountain Ridged Mussel identified through various data sources and confirmed by FLNRORD as of 2017; includes a 100 m buffer to account for lack of survey data
Yellow	Known occurrences of Rocky Mountain Ridged Mussel shells identified through various data sources and confirmed by FLNRORD as of 2017; includes a 50 m buffer to account for lack of survey data
No Colour	Habitat has not been assessed for Rocky Mountain Ridged Mussel presence as of 2017

Zonation	Foreshore Plants
Black	Critical Habitat polygons identified for one or more foreshore plant species at risk (SAR) in a federal recovery strategy by Canadian Wildlife Service as of 2017
Red	Known occurrences of red-listed or blue-listed foreshore plant SAR identified either by BC Conservation Data Centre (CDC) or in recent surveys led by FLNRORD as of 2017; includes a 50 m buffer to take into account indirect/edge effects of development on species biology
Yellow	High potential habitat for red-listed or blue-listed foreshore plant SAR identified in recent surveys led by FLNRORD on Vaseux and Osoyoos Lake only as of 2017; includes a 50 m buffer to account for indirect/edge effects of development on species biology
No Colour	Habitat has not been assessed for foreshore plant SAR presence as of 2017

APPENDIX B QUALIFIED PROFESSIONAL CHECKLIST FOR FORESHORE DEVELOPMENTS

The Qualified Professional (QP) Checklist is **required** for all foreshore developments with a **Moderate** or **High Risk** activity ranking (see Section 3.2). In addition a QP Checklist is required for Low Risk activities where [Best Management Practices](#) (BMPs) are not being followed. This checklist must be completed by the QP leading the environmental component of the foreshore development, who is defined here as an applied scientist or technologist, acting alone or together with another QP. He or she must be registered and in good standing in B.C. with an appropriate professional organization constituted under an Act, acting under that association’s code of ethics and subject to disciplinary action by that association. The individual is considered a QP only for that portion of the assessment that is within their area of expertise. In this case, it is expected that the QP(s) is/are experienced in inventory, impact assessment and mitigation associated with foreshore habitats, Shore Spawning Kokanee, Freshwater Mussels and Foreshore Plants, including species and ecosystems at risk (SEAR). Where required, the QP Checklist must be submitted as an attachment to all applicable provincial natural resource applications; incomplete applications will be rejected. If there is a change in the development design after the initial application, the proponent must ensure that the QP re-assess the proposal and complete a new QP Checklist.

Activity		Foreshore Sensitivity Zone		
Type	Risk Ranking	Shore Spawning Kokanee	Freshwater Mussels	Foreshore Plants

General Foreshore Values

Complete the following table for all foreshore developments with a Moderate or High Risk (see Section 3.2).

Question	Yes, No or N/A	Explanation
Are you a QP as identified above?		
Have you discussed this project with an Ecosystems Biologist or other provincial staff member? If so, provide the staff member’s name.		
Have you reviewed <u>all</u> environmental data sources including BC Conservation Data Centre ¹ (CDC), wildlife species inventory ² (WSI), Fisheries Information Summary System ³ (FISS) and EcoCat ⁴ for available fisheries, aquatic habitat mapping, and SEAR data?		
Have you conducted a field assessment of the site to document environmental values associated with the site? If yes, list these values. A field assessment is expected in most cases.		

<p>Have you conducted inventories to confirm presence/absence of fish, wildlife, SEAR or their habitats onsite? If yes, list which species. Inventories must follow provincial standards and must be conducted during the appropriate time of year.</p>		
<p>Have SEAR been newly identified at the site? If yes, list these SEAR. Have results been submitted to the BC CDC using appropriate forms⁵?</p>		
<p>Have you assessed potential changes to local shoreline and stream mouth accretion/erosion dynamics as a result of the project? This is a requirement for marina, infill and erosion protection works projects.</p>		
<p>Are works scheduled during the least risk timing window for fish and wildlife species⁶? List this window.</p>		
<p>Does the project follow the standard <i>Habitat Officers' Terms and Conditions</i> and existing BMPs⁷ during construction of the project? Developments must following the terms and conditions in order to be compliant with the <i>Water Sustainability Regulation</i>.</p>		
<p>Are site-specific mitigation measures (e.g., avoid, redesign, relocate, minimize) required? If yes, list these measures.</p>		
<p>Are there residual effects to environmental values as a result of the project (i.e., adverse effects that cannot be mitigated)?</p>		
<p>If residual effects have been identified, have offsetting measures been agreed to, to compensate for adverse effects to environmental values?</p>		
<p>Has a QP been retained to provide environmental monitoring?</p>		
<p>Is ongoing maintenance and/or monitoring required? If so, describe the plan for ongoing maintenance and/or monitoring.</p>		

Freshwater Mussels

Follow the species-specific guidance provided in [Guidance for Freshwater Mussels in the Okanagan](#) as required in Figure 2. Complete the following table if your activity is in a No Colour, Yellow or Red Zone for Freshwater Mussels. The sections identified below refer to those in the Guidance Document; refer to this document for additional information.

Question	Yes, No or N/A	Explanation
Do you meet the minimum surveyor qualifications (Section 2.0)?		
Have you conducted a Freshwater Mussel Survey of the site as per the methods identified in Section 4.0?		
Have mussels been newly identified at the site as a result of the Freshwater Mussel Survey? Have results of all mussel species occurrences been submitted the CDC ⁵ ?		
If mussels have been previously or newly identified as the site, what mitigation measures been proposed to reduce the potential for adverse effects as a result of the project (refer to Guidance Document)?		
Are there residual effects to mussels as a result of the project (i.e., adverse effects that cannot be mitigated)?		
If residual effects have been identified, have offsetting measures been proposed to compensate for adverse effects to mussels?		

Foreshore Plants

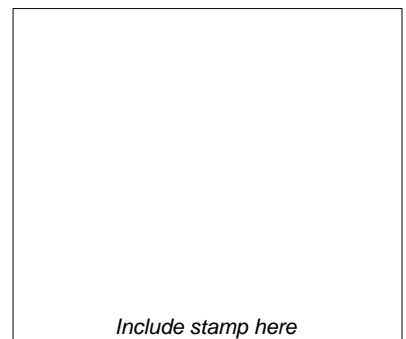
Follow the species-specific guidance provided in [Guidance for Foreshore Plants in the Okanagan](#) as required in Figure 2. Complete the following table if your activity is in a No Colour, Yellow or Red Zone for Foreshore Plants. The sections identified below refer to those in the Guidance Document; refer to this document for additional information.

Question	Yes, No or N/A	Explanation
Do you meet the minimum surveyor qualifications (Section 3.0)?		
Have you conducted a Preliminary Habitat Assessment of the site as per the methods identified in Section 4.1?		

Is high potential plant species at risk (SAR) habitat present (Section 4.1, Table 3)?		
Is a Detailed Plant SAR Survey required based on the habitat present? If yes, have you conducted a Detailed Plant SAR Survey of the site as per the methods identified in Section 4.2?		
Have plant SAR been newly identified at the site as a result of the Detailed Plant SAR Survey? Have results been submitted to the CDC ⁵ ?		
If plant SAR have been previously or newly identified as the site, what mitigation measures have been proposed to reduce the potential for adverse effects to plant SAR as a result of the project?		
Are there residual effects to plant SAR as a result of the project (i.e., adverse effects that cannot be mitigated)?		
If residual effects have been identified, have offsetting measures been proposed to compensate for adverse effects to plant SAR?		

I confirm that all information provided in this checklist is to the best of my professional knowledge true and completed

Signature _____
Name of Qualified Professional _____
Professional Association Number _____
Date _____



¹ <https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/conservation-data-centre>
² <http://www.env.gov.bc.ca/wildlife/wsi/index.htm>
³ <http://www.env.gov.bc.ca/fish/fiss/>
⁴ <https://www2.gov.bc.ca/gov/content/environment/research-monitoring-reporting/libraries-publication-catalogues/ecocat>
⁵ <https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/conservation-data-centre/submit-data>
⁶ <https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-licensing-rights/working-around-water/regional-terms-conditions-timing-windows/okanagan-region-timing-windows>
⁷ <https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/natural-resource-standards-and-guidance/best-management-practices>