

Wetland Ways



9

Interim Guidelines for
Wetland Protection and Conservation in British Columbia

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Chapter Nine

ROAD AND UTILITY CORRIDORS

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These interim guidelines will be updated using experience from pilot testing and feedback from user groups. If you would like to comment on these guidelines, please send your comments to wsp@gov.bc.ca

Cover photos: Judith Cullington



CHAPTER 9: ROAD AND UTILITY CORRIDORS

9.1. INTRODUCTION

This chapter provides guidelines for the protection and management of wetlands when linear development activities— such as road and rail corridors, trails, pipelines and electrical transmission lines —take place nearby. It is intended to be read in conjunction with [CHAPTER 2: GENERAL GUIDELINES](#).

Linear development activities can have many impacts on wetlands.

- ♦ **Direct loss and or fragmentation:** Linear developments, and access to these if improperly sited and installed, can cause infilling and drying out of wetlands, degrading or destroying the wetland habitat. They may also create barriers to wildlife movement that impacts breeding and feeding activities.
- ♦ **Sedimentation:** Soil disturbance from site preparation and road construction exposes soil and makes it susceptible to erosion. This is more severe where roads are on steeper slopes, soils are easily erodible, and where activities are carried out during wet periods. Ongoing erosion and sedimentation can occur from road surfaces, ditches, and road crossings. Sedimentation in wetlands can reduce biological productivity, stress wildlife (changing feeding and breeding behaviours), and may also affect downstream habitats.



Linear corridors can impact wetlands. PHOTO: SARMA LIEPENS



- ♦ **Water Quality:** Highway stormwater drainage can contain a wide variety of contaminants such as de-icers, metals, petroleum products, and nutrients. Pesticides and fertilizers may be used for vegetation establishment and management. Where these pollutants reach wetlands they can cause *eutrophication*¹ and impacts to plants and animals and their habitats.
- ♦ **Other impacts:** New roads and other linear developments create a distribution system for invasive, non-native species (by humans and vehicles) and provide opportunities for recreational impacts to spread (e.g., through boating and ATV use on wetlands).

9.2. LEGISLATION

See [CHAPTER 2](#) for legislation that applies to all land managers.

- ♦ [Environmental Assessment Act](#): Sets out procedures and requirements for major project reviews. Legislation is managed by the Environmental Assessment Office.
- ♦ [Pipeline Act](#): Provides process for pipeline companies for entry and occupation onto public and private land for the purposes of building and maintaining pipelines and other infrastructure including roads and compressor stations.
- ♦ [Water Act](#): Primary provincial statute regulating water resources in B.C. Establishes licensing requirements including fees and through regulation manages changes in and about a stream including stream and wetland crossings.
- ♦ [Fish Protection Act](#) and [Riparian Areas Regulation](#): Regulates setbacks from streams and other watercourses that are fish-bearing, or have surface connections to fish-bearing waters. The Riparian Areas Regulation applies to road and utility corridors if developed in association with residential, commercial or industrial development.
- ♦ [Transportation Act](#): Deals with the planning, design, holding, construction, use, operation, alteration, maintenance, repair, rehabilitation and closing of provincial highways and public works related to transportation.
- ♦ [Canada Fisheries Act](#): Protects fish and fish habitat. The Act regulates the release of deleterious substances into fish bearing waters and prohibits the harmful alteration, disruption and destruction of fish habitat.

All B.C. legislation can be found at <http://www.bclaws.ca/>.
Federal legislation can be found at <http://laws.justice.gc.ca/>.

¹ *Definitions* can be found in the [GLOSSARY](#).



9.3. OBJECTIVES

As outlined in [CHAPTER 2](#), there are three major objectives for the protection and management of wetlands:

- ◆ Protect and maintain water quantities;
- ◆ Protect and maintain water qualities; and,
- ◆ Protect and maintain habitats and species.

This can be achieved by:

- ◆ Knowing what you have (inventory and mapping) (see [CHAPTER 2](#));
- ◆ Protecting wetlands with buffer zones and by maintaining water quality;
- ◆ Placing linear developments and associated facilities away from wetlands; and
- ◆ Ensuring that riparian features and functions are protected during and after development.

Following the guidelines in this document will help landowners and land managers demonstrate that they have applied due diligence. Monitoring the impacts of activities will assist in meeting the objectives. For more information, see [CHAPTER 12: MONITORING AND REPORTING](#).



Road and rail development within wetland habitat. PHOTO: SARMA LIEPENS



9.4. GUIDELINES

9.4.1. Planning and Design

IDENTIFY SENSITIVE AREAS

- Identify the location, size and type of wetlands within the proposed right of way (ROW) from topographic maps, aerial photos, and other available information. Include information on vegetation types, 100-year flood plain and presence of threatened or endangered species where available.
- Conduct additional inventories if information is not readily available.
- Groundtruth information when conducting reconnaissance surveys.
- Identify any areas within the wetland that would be particularly sensitive to disturbance, such as waterfowl nesting or feeding areas and habitats for species at risk.
- Identify wildlife travel corridors (e.g., for frog migration) and design structures to accommodate this.



Design structures such as this 'toad tunnel' to allow amphibians safe passage under a highways.
PHOTO: MARLENE CASKEY

AVOID DISTURBANCE TO WETLANDS

- Minimize habitat disruption and fragmentation by using any existing rights of way for access and development activities.
- Where practical, plan new right of way alignments and operations to avoid wetlands. Locate transmission poles or towers outside the wetland and adjacent riparian areas.
- Where practical, use horizontal directional drilling to locate pipelines under wetland areas. Locate drill set-up areas outside riparian areas.

DESIGN ACCESS ROADS AND TRAILS CAREFULLY

Access roads and trails are often required to provide site access for material and equipment during construction. Road and trail construction and use can be a major source of sediment delivery to wetlands. Roads in or close to wetlands can cause habitat loss through infilling or dewatering. Roads and crossings can also lead to habitat fragmentation. Once in place, roads can also facilitate the distribution of non-native species and provide opportunities for increased recreational impacts.

- Avoid constructing access roads through erosion-prone wetland soils unless there are no reasonable alternatives. Building roads in or near wetlands is difficult and expensive. Use existing roads wherever possible.

For more details on roads and trails see [CHAPTER 5: FORESTRY](#), [CHAPTER 6: MINING](#), and [CHAPTER 7: OIL AND GAS](#).



Encourage visitors to stay on roads
PHOTO: ROBERT COX

DESIGN CROSSINGS FOR MINIMAL IMPACT

- Ensure you have all necessary permits and authorizations prior to working in or about wetland areas. Crossings for operations are regulated under Section 9 of the [Water Act](#).
- Design, install and maintain wetland road crossings to provide for passage of surface and subsurface water, fish and other aquatic organisms. Clear span bridges are the preferred crossing option.
- Design upland road approaches to wetlands so that surface runoff carrying potential sediment is diverted before entering the wetland. Avoid steep downhill approaches to prevent erosion from high velocity runoff.

9.4.2. Construction

Proper planning for linear developments can limit long-term impacts such as habitat fragmentation and disturbance to wildlife. Short-term impacts from construction of access roads and trails, and right of way development can also cause significant impacts (e.g., sedimentation, changes to water quality, and habitat damage) if not managed.

MINIMIZE OR MITIGATE IMPACTS

Where structures must be located within wetland or riparian areas, proponents will need to develop a mitigation plan. While each plan will be site-specific, see [CHAPTER 11: WETLAND ENHANCEMENT AND RESTORATION](#) for an overview on principles for wetland mitigation.

- Ensure you have all the necessary legislative approvals and permits before commencing any work.
- Incorporate runoff treatment structures (detention ponds, grassed swales, etc.) into highway designs to serve as filters for suspended solids, metals and other contaminants to minimize contaminated runoff entering wetlands.
- Utilize sod-forming grasses adjacent to roadway shoulders and for vegetated swales to trap and retain sediment and contaminants.
- Use low ground impact and/or low impact road building techniques (e.g., wooden mats) where work in or near wetland soils is unavoidable.
- Locate worksites for material and equipment storage and fabrication outside riparian areas and manage surface water flows to prevent sediment and contaminants from entering wetlands. Site these areas on stable ground at least 100 m from wetlands.



Prevent erosion and sedimentation. PHOTO: JUDITH CULLINGTON

- Prevent the establishment and spread of invasive species along rights of way. Clean equipment before moving into new areas where there is potential for transport of invasive species.

TIME ACTIVITIES APPROPRIATELY

- Once started, carry out and complete construction without delay. Leaving construction works uncompleted increases risk of erosion and sediment transport.
- Schedule activities to avoid critical breeding and rearing seasons and when activities will have the least impacts on wetland habitat (e.g., winter or dry periods). Regional least risk windows for fish and wildlife are available at the [Ministry of Environment website](#).
- Suspend or limit operations when soils become saturated. Check weather forecasts to make sure operations are not at a critical stage when wet weather arrives.

PREVENT EROSION

- Where clearing is required, limit or delay grubbing until grading and construction is ready to proceed; the root masses and associated organic matter provide substantial erosion control.
- Install and maintain erosion control measures if exposed soils could deliver sediment to wetlands through drainage systems or overland flow. Apply straw, mulch or fibre mats on exposed soils until the area can be vegetated to prevent erosion. Ensure that drainage systems are functional during construction
- Direct water from ditches onto vegetated areas at frequent intervals, to allow water to infiltrate and sediment to settle out prior to reaching wetlands. Never drain road side ditches directly into wetlands or streams.

B.C. Ministry of
Environment regional
websites:
http://www.env.gov.bc.ca/esd/esd_reg_ops.html



- Install perimeter fencing adjacent to wetlands during construction including access if included in the right of way, to prevent access to sensitive wetland or riparian areas and limit wildlife access to the work area.

AVOID INFILL OR SEDIMENTATION

-  Never sidecast road construction material into riparian areas.
- Place sidecast or fill material above the ordinary high water mark of any wetland. Use fill from upland sources to minimize impacts on wetland habitat.

MAINTAIN NATURAL FLOWS

- Maintain the natural hydrograph.
- Ensure that drainage structures maintain an adequate flow of water into and out of the wetland to sustain water levels and drainage patterns.
- Ensure that ditches do not create outlets that will result in drainage of the wetland.

RE-VEGETATE DISTURBED SITES

- Use native grasses or other plant species to reseed bare, erodible riparian areas; never introduce invasive, non-native plants.
- Establish a winter vegetative cover planting for erodible areas that were disturbed in the fall, but will not be planted until spring and where natural vegetation is not sufficient to stabilize the soil.

9.4.3. Operation and Maintenance

Road Management

MANAGE ACCESS

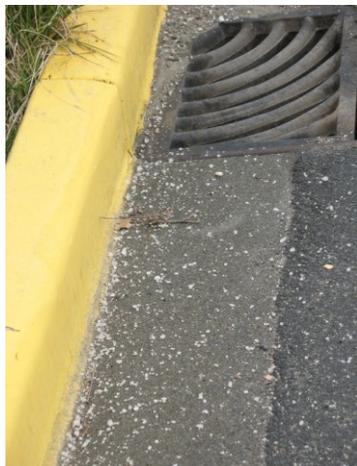
- Operate vehicles only on established roads and trails.
- Manage entry to operational areas during and after development activities where unauthorized use is impacting wetland species and habitat (e.g., mud bogging). Minimize traffic on roads during wet conditions. Consider using geomat or rock to reduce road damage.

MANAGE EROSION AND SEDIMENT

- If access roads are required for ongoing maintenance, carry out regular inspections to ensure that all erosion management structures such as culverts, water bars and ditches are functioning properly.



Operate vehicles only on established roads and trails
PHOTO: ROBERT COX



Use alternatives to road salt where runoff could impact wetland water quality. PHOTO: ROBERT COX

- Maintain road running surfaces, ditches and cross drains to minimize erosion and sediment delivery. Correct any problems immediately.

MAINTAIN ROADS AND DRAINAGE

- Inspect wetland crossings frequently during operations to determine if erosion is being controlled and aquatic organism passage remains unobstructed. Banks should be stable and soil movement into the wetland should be minimal.
- Consider the use of alternatives to road salts or dust control chemicals where runoff could impact wetland water quality.
- Carry out regular inspections and maintenance of highway stormwater detention structures to ensure they are functioning properly to contain and treat runoff contaminants such as metals, de-icers, nutrients, petroleum products.

PREVENT SPILLS

- Follow appropriate fuel management regulations and guidelines, as laid out in the B.C. [Fuel Handling, Management and Storage Guide](#).
- Locate fuel pumps and accompanying machinery in a manner that does not cause the wetland bank to erode or introduce sediment into the watercourse.
- Provide fuel spill and leakage containment around the pump.
- Store fuel or other toxic fluids at least 100 m from wetlands. Provide containment so spills or other leakage will not be transported to wetlands.
- Develop an emergency plan for pipeline or major transportation spills of hazardous products. Ensure that the plan contains specific measures to prevent and minimize spill impacts on wetlands.

9.4.4. Vegetation Management

Vegetation management activities are often necessary to provide continued access for maintenance activities and for safety along rights of way. These activities should be carried out in a manner that does not unnecessarily impair wetland features and functions.

- Use mechanical vegetation control techniques adjacent to wetlands where vegetation management is required for operational and safety requirements. Minimize disturbance to soils and root systems to maintain bank stability and protect against erosion.



MINIMIZE OR AVOID USE OF PESTICIDES

- Use pesticides around wetlands only where operational or safety constraints limit the use of mechanical controls.
- STOP** Never store or mix pesticides in riparian areas or where potential spills may be transported to wetlands or streams. Don't contaminate water supply sources when mixing pesticides. Carry a pesticide spill cleanup kit when transporting, storing or using chemicals.
- Apply pesticides and fertilizers well back from riparian areas and water bodies. Leave a buffer or no-spray zone strip of at least 15 m between your treatment and riparian and other sensitive areas. The width of the zone may need to be increased depending on the sensitivity of the wetland (e.g., rarity, species present, sensitivity).
- Only spray when weather conditions (e.g., wind and rain) are not likely to cause drift or runoff into riparian areas.

9.4.5. Wetland Restoration

Wetlands that have been impacted during linear development activities should be restored as closely as possible to pre-impact features and functions. Wetlands can reduce maintenance costs in hydro right-of-ways by limiting the growth of trees and shrubs that threaten conductors. This section does not address replacement of wetlands that have been completely disrupted or lost. See [CHAPTER 11](#) for details on wetland creation.

PUT UNUSED ROADS TO BED

- When all activities are completed and the access roads are no longer required, reshape the roadbed if required, open all drainage systems and stabilize erosion-prone areas.
- Remove temporary fills and structures in wetlands to the extent practical when use is complete.

RE-ESTABLISH WETLAND FEATURES AND FUNCTIONS

- Implement the mitigation plan to re-establish fully functional wetlands that have been impacted by linear development activities. This may involve restoration or enhancement depending on the nature of the impacts.
- Monitor the wetland and carry out any necessary works to ensure that wetland features and functions are stable and self-supporting.
- Re-vegetate exposed soils adjacent to wetlands with native species. Native species will re-establish the site complexity that existed prior to disturbance. Seed mixes should be certified weed free.



Restore wetlands to pre-impact features and functions. Coot.
PHOTO: ROBERT COX



9.5. REFERENCES AND FURTHER READING

Government Offices

B.C. Ministry of Environment regional offices.

<http://www.env.gov.bc.ca/main/regions.html>

Fisheries and Oceans Canada offices. [http://www.pac.dfo-](http://www.pac.dfo-mpo.gc.ca/pages/default_e.htm)

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