

Progressive Stewardship of Mountain Ecosystems: Next Practices for Sustainability

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Fisheries & Watersheds Focus Area

Prepared in partnership with Jennifer Greenwood

The Vision

The fisheries and watershed vision is for operations to be watershed stewards working to keep water clean, allow the species that rely on healthy watersheds to thrive, and maintain the integrity of the physical formations and processes that support watershed functioning.

Background Information

Watersheds comprise all the land that drains into a waterbody, including streams and rivers, lakes, and oceans. Healthy watersheds provide food, fibre, and habitat for native animals. They produce clean water for consumption as well as water for power, agriculture, and industry. They move sediments and cycle nutrients, purify and store water, and regulate flow to reduce downstream flooding. Furthermore, functioning watersheds moderate extreme weather, absorb pollutants, and store carbon, offering resilience to climate change.

Any work around water or other components of a functioning watershed can have impacts on water quality, fish and wildlife species, and habitat. When foreign substances are introduced into water, this can influence water flow, natural drainage, alter nearby wetlands, and impact flood protection. Foreign substances are also detrimental to species and habitat both in and beside the water.

Watersheds can be impacted by activities year-round. Ensuring that work in and around watercourses is planned and carried out in compliance with environmental legislation and with the advice of a Qualified Environmental Professional (QEP) is key to maintaining healthy and sustainable watersheds. While this section deals mainly with work and activities occurring in or near streams, watersheds include all the land that drains into them; therefore, activities occurring in areas of a tenure that are upland of a stream or lake can have significant impact on watershed health. These include sub-alpine and alpine habitats, which are particularly sensitive habitats. In addition to the guidelines provided in here, maintaining healthy watersheds will also be supported by the environmental guidelines for all other sections of this document.

Sustainability Standards

There are limited specific legal requirements governing the overall activities of helicat operations in relation to watersheds; however, there are specific requirements surrounding works and activities in and around watersheds that are addressed in the following section.

Water Sustainability Act

Mandatory Actions:

- Part 2 Licensing, Diversion, and Use of Water
 - If an operation would like to make changes in or near a stream or waterbody, it will require a license, use approval or change approval. These will likely involve specific terms and conditions established by Habitat Officers and can vary by region.
 - For example, sensitive streams may require identification (17 (1-4)), and mitigations required. Licenses for projects designed to produce power are specifically addressed in section 19(1-11).
 - Changes in or near a stream must be carried out in accordance with Part 3 of the Water Sustainability Act, "Protecting Water Resources".
- Section 30 Water licensing requirements:
 - 30 (1) A person who diverts water must make beneficial use of the water diverted.
 - (2) A licensee must submit to the comptroller, a water manager or an engineer, as applicable, a signed declaration that complies with subsection (3) at the time directed to do this by the comptroller, water manager or engineer.
 - See also 30 (3-9)
- Section 10 Use Approvals - This section explains the requirement to only use water as it was initially approved.
- Section 11 Changes in and about a stream - This section explains the limits to the changes that can be made within a stream.
- Section 17 Sensitive streams mitigation - This section outlines the extra requirements for applying for a change approval within an identified sensitive stream.
- Section 45 No new dams on protected rivers - This section outlines the prohibition from constructing dams on protected rivers.
- Section 46 Prohibition on introducing foreign matter into a stream:
 - 46 (1) Unless authorized under this or another enactment or excepted under subsection (2), a person must not:
 - (a) introduce debris, refuse, carcasses, human or animal waste, pesticides, fertilizers, contaminants or another matter or substance into a stream, a stream channel or an area adjacent to a stream, or

- (b) cause or allow debris, refuse, carcasses, human or animal waste, pesticides, fertilizers, contaminants or another matter or substance to be introduced into a stream, a stream channel or an area adjacent to a stream in such a quantity or in such a manner as to cause a significant adverse impact to:
 - the stream or stream channel
 - the existing uses of the water from the stream
 - the property of riparian owners on the stream
 - an aquifer that is hydraulically connected to the stream or the existing uses of the water from that aquifer
 - the aquatic ecosystem of the stream
- Section 19 Licenses for Power Purposes (1 – 11) - This section outlines the licenses required for installing hydro power projects.

Resources:

Water Sustainability Act

http://www.bclaws.ca/civix/document/id/complete/statreg/14015#division_d0e7281

Water Licenses and Approvals

<https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-licensing-rights/water-licences-approvals>

Timing windows for working around water

<https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-licensing-rights/working-around-water/regional-terms-conditions-timing-windows>

Federal Fisheries Act

The Federal Fisheries Act protects fish and fish habitat from harm. Fisheries and Oceans Canada provides information about how projects may adversely affect fish and their habitat as well as measures to mitigate these effects.

Mandatory Actions:

- Section 35 Serious Harm to Fish
 - (1) No person shall carry on any work, undertaking or activity that results in serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery.
 - Serious harm to fish is defined in the Act as “the death of fish or any permanent alteration to, or destruction of, fish habitat”.
- Section 20 (1-5) & 21 (1-2) Fishways - This section describes the ability of the government to request the owner of an obstruction to the free passage of fish to conduct studies to document its effects.

Resources:

Fisheries Act: Fisheries Protection Policy Statement

<http://www.dfo-mpo.gc.ca/pnw-ppe/pol/index-eng.html#ch82>

Fisheries Act: Fishways

<http://laws.justice.gc.ca/eng/acts/F-14/page-3.html#h-11>

Projects Near Water

<http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html>

Measures to avoid causing harm to fish and fish habitat including aquatic species at risk

<http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/measures-mesures-eng.html>

Pathways of Effects – This is a resource that describes different development proposals and the mechanisms that stress the aquatic environment

<http://www.dfo-mpo.gc.ca/pnw-ppe/pathways-sequences/index-eng.html>

Riparian Areas Regulation (RAR)

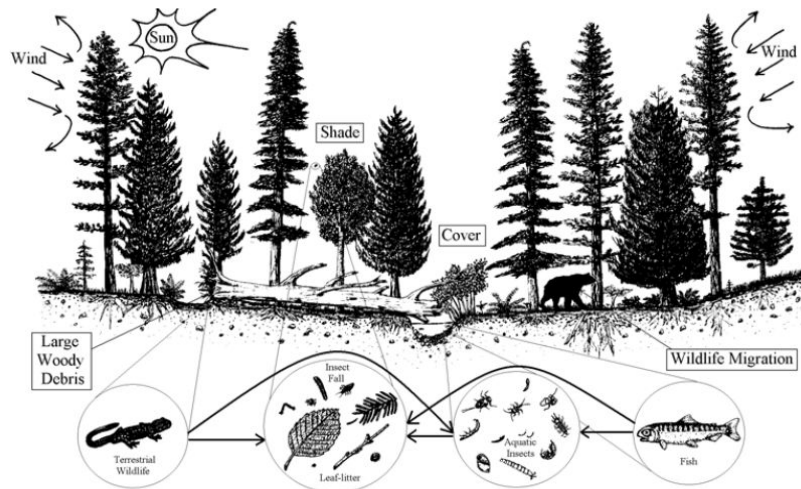
Riparian areas are the borders of streams, lakes, or wetlands, and provide a link between water and land. The water, streambed, and riparian vegetation are all considered habitat for aquatic animals (including fish), providing food, shelter, and substrate for reproduction.

The RAR requires local governments to enact bylaws that protect riparian areas during development. Any development activity that would alter the streambed, bank, or vegetation within 30 meters of the watercourse could be covered under the RAR.

Mandatory actions:

- Section 1(1) Determine if your project qualifies as a development under the RAR.
- Consult local government bylaws for setbacks and protection measures.
- Retain a Qualified Environmental Professional (QEP) to undertake an assessment and determine setbacks and protection measures, before site development.
- File a record of the assessment with the provincial government.
- Await approval from the local government.

Figure 1: The functions of a riparian zone in a typical stream (SW British Columbia).
From: *Standards and Practices for Instream Works*, MWLAP, Government of B.C., 2004, p.10



Resources:

Riparian Areas Protection Act:

http://www.bclaws.ca/civix/document/id/complete/statreg/376_2004

Riparian Areas Regulation Brochure

https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/fish-fish-habitat/riparian-areas-regulations/rar-brochure-2016_final_web.pdf

Comprehensive Information about Riparian Areas Regulation:

<https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/fish/riparian-areas-regulation>

Next Practice Guidelines

For helicat operators, the involvement of operations with watersheds may be less visible than some other environmental concerns. However, the sensitivity of watersheds and the possibility of moving water carrying any impacts downstream from the source makes watershed health an important consideration when skiing and working in and around watersheds.

There are four important concepts to consider when working and travelling in and around watersheds:

1. Protect riparian areas
2. Protect water quality and quantity (groundwater and surface water)
3. Minimize erosion, sedimentation, bank de-stabilization and soil compaction
4. Protect fish and wildlife populations, movements and habitat

General Watershed Protection

- Learn to identify riparian areas.
- Adhere to guidelines for waste and fuel management.
- Avoid sensitive sites, spawning habitats or SARA listed species and their habitats.
- Do not allow any foreign substance to enter the watercourse:
 - Avoid fuel spills
 - Avoid using pesticides and herbicides
 - Ensure building materials that do not leach deleterious substances
 - Develop a response plan in case of accidental contamination
- Monitor water quality before and after disturbance projects to ensure provincial and local water quality objectives are being met.
- Immediately re-stabilize shoreline or banks disturbed by these projects using appropriate species and substrates for restoration and reinforcement.
- Avoid the spread of pathogens and aquatic invasive species:
 - Do not move fish or other aquatic organisms between water bodies
 - Ensure footwear and equipment is clean and dry before entering tenure
 - Decontaminate footwear, clothing, and instruments that have been worn in or near other lakes, streams, and ponds, particularly those out of province or out of country:
 - Soak in bleach solution (approx. 1 part bleach:16 parts water)
 - Immerse for 15 minutes
 - Dry completely

Glading, trail building, construction and maintenance of roads (winter and summer), helipads, and facilities, including micro hydro

- Avoid building trails or glading next to waterways.
- Enact perpendicular designs (direction of trails) to minimize loss of riparian habitat.
- Develop a sediment and erosion control plan.
- Reduce width of hard-packed trails and or impervious surfaces to reduce the amount of runoff and surface flow.
- Avoid building trails, bridges, and other structures on features that are inherently unstable, such as braided streams and meander bends.
- Minimize clearing of riparian vegetation; if vegetation has been identified as critical habitat for species at risk, do NOT remove.
- Avoid removal of woody debris, rocks, sand, and other bank materials.
- Immediately re-stabilize shoreline or banks disturbed by these activities using appropriate species and substrates for restoration and reinforcement.
- Equipment should be situated in a dry area or operated from a bank.
- Follow protocols to ensure machinery is well-maintained and clean of toxic substances, invasive species, pathogens and noxious plant species.
- Wash, refuel, and service machinery away from all watercourses.

- Do not operate machinery in habitat where SARA-listed species occur.
- If more than one crossing of a waterbody is required by machinery, construct a temporary crossing structure.
- Remove all construction materials.
- Minimize the duration of in-water work.
- Conduct in-stream activities in isolation of flowing water.
- Do not intercept groundwater systems with ditches, drain tiles, etc.
- Establish vegetated swales (or similar structure) to prevent the transport of contaminants into sensitive habitats.
- Choose timing of works that minimizes impacts to adult and juvenile fish, reptiles, and amphibians, as well as their eggs, and their prey.
- Ensure that all in-water activities and structures do not impede fish passage, or result in stranding or death of fish.
- Ensure that in-water activities do not reduce channel width or flow.
- Do not use explosives near water; the shock waves rupture the organs of fish and damage their swim bladders.

Motorized use, winter and summer (including helicopters, snowmobiling, snow-biking, ATVs)

- Ensure equipment is well-maintained and avoid contaminant leaks (fuel, oil, grease).
- Use existing roads and trails.
- Avoid using trails that are muddy, show signs of erosion, or are near watercourses.
- Do not trample vegetation.
- Use designated landing sites for helicopters away from streams.
- Do not introduce foreign substances into streams.
- Use existing bridges and stream-crossing structures to cross streams, or cross:
 - at right angles
 - on substrate larger than cobble
 - on bedrock
- Yield to wildlife (e.g. amphibians such as Western toad) on trails and roads.

Non-motorized use, winter and summer (including skiing/snowboarding, snowshoeing, hiking, trail running, and mountain biking)

- Use existing trails - do not venture off trails or trample vegetation.
- Avoid using trails that are muddy, show signs of erosion, or are near watercourses.
- Use existing bridges and stream-crossing structures to cross streams, or cross:
 - at right angles
 - on substrate larger than cobble
 - on bedrock
- Avoid using cleaning products in streams; use only biodegradable products away from watercourses.
- Use designated meeting/congregation sites.

- Yield to wildlife (e.g. amphibians such as Western toad) on trails and roads

Conclusion

Watersheds are dynamic and complex systems and the guidelines here are intended to provide basic steps that can be taken to foster their health. However, the mandatory actions and guidelines suggested in other sections of this sustainability document are equally important for the maintenance of healthy watersheds. By using the tools and links provided here to remain connected with current practices and resources, and by following the guidelines provided, helicat operators are in a position to operate as watershed stewards.

Resources

Standards and Best Practices for InStream Works

This document includes detailed requirements and best practices for working in and around water.

<https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/standards-guidelines/best-management-practices/iswstdsbpsmarch2004.pdf>

Fish Stream Crossing Guidebook

Regulations and guidelines surrounding establishing crossings on fish streams

https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/resource-roads/fish-stream_crossing_web.pdf

Fish Habitat Rehabilitation Procedures, Watershed Restoration Technical Circular No. 9

Resource for fish and riparian habitat restoration

https://www.for.gov.bc.ca/hfd/library/FFIP/Lister_DB1997.pdf

British Columbia Natural Resource Standards and Guidance

Best Management Practices

<https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/natural-resource-standards-and-guidance/best-management-practices>

British Columbia Develop with Care 2014, Environmental Guidelines for Urban and Rural Land Development, Section 3.7

These guidelines have a regional focus to help operations determine local concerns.

<https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/natural-resource-standards-and-guidance/best-management-practices/develop-with-care>

The Partnership for Water Sustainability in British Columbia

Guidance and information about watershed planning, rainwater management, and water sustainability.

<http://waterbucket.ca/guidance-resources/>