

Whirling Disease in Lake Louise, Yoho, Kootenay Field Unit

Direction for *Permitted Users* conducting water-related activities in LLYK

Interim Direction

This information and permit conditions are to be added to Restricted Activity Permits, Development Permits or other tools used to permit researchers, contractors, partners, stakeholders, etc. who are working in muddy or aquatic environments in the Lake Louise, Yoho, and Kootenay Field Unit.

Approved by:

A handwritten signature in black ink, consisting of several overlapping loops and lines, positioned above a horizontal line.

Date: updated 26 April 2017

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Direction for *Permitted Users* conducting water-related activities in LLYK

The following document is intended to provide consistent direction, in the form of permitting conditions, for anyone who is conducting work in or near water bodies, ephemeral or otherwise, or involved in the use or transportation of surface waters in Lake Louise, Yoho and Kootenay Field Unit.

Background

In August 2016, Whirling Disease (*Myxobolus cerebralis*) was detected in some waters in Banff National Park. This is the first documented case of this disease anywhere in Canada and Parks Canada is committed to reducing the spread of this disease, in part, by managing our work and the work performed by external proponents. While there are no human health concerns, effects on native fish populations can be very significant with 90% mortality being reported in other jurisdictions. The parasite attacks juvenile fish and causes spinal deformity (whirling swimming pattern) and discoloration (blackened tails). Some species of fish, or individual fish, can be infected but show no visible symptoms at all.

Whirling Disease is a parasitic freshwater disease that affects most salmonids. Species of particular concern in Alberta include: Westslope Cutthroat Trout (federally and provincially listed as a *threatened* species) Bull Trout (provincially listed as a *threatened* species), Rocky Mountain Whitefish, Rainbow Trout, Brook Trout, and Brown Trout. The disease is spread by a small parasite that goes through both spore and planktonic life stages, which infect both fish and aquatic tubifex worms.

HOW IS WHIRLING DISEASE SPREAD?

The disease is most often spread by (in descending order):

1. **Movement of fish** (fish stocking) or parts of fish (use of live or dead baitfish). All of these activities are illegal in Banff, Yoho and Kootenay National Park.
2. **Movement of mud** that is laden with the resistant spore stage or infected tubifex worms. Likely vectors include dirty waders, boats, and construction equipment.
3. **Movement of water** that is transporting the planktonic life stage called a TAM

The spore life-stage is incredibly small and hard to destroy. Spores that sink to the bottom of water bodies can remain viable in sediment for many years. The only effective means of killing the spores include hot water (90C) or 10 minutes soaking in effective detergents (quaternary ammonium-based cleaners, bleach); prolonged freezing (7 days at -20C) or complete desiccation (drying) for at least 24 hours (less if exposed to direct sunlight). Therefore, preventing the movement/transport of mud from infected water ways (where spores are most often found) is of critical importance.

The planktonic life-stage is called a triactinomyxon (TAM). These microscopic organisms float in the water column waiting to attach to a live fish and inject their lethal contents into the fish through its skin or gills. Although the TAM stage is more vulnerable to hot water, effective detergents, freezing or desiccation, it is a concern because it is often more mobile as it floats in the water column. For this reason, movement of water also needs to be prevented (e.g. water withdrawal permits for hydro-seeding, paving crews, etc.).

SIMPLIFIED PERMIT CONDITIONS:

If you have been issued a permit to conduct a) work in-stream, b) work in wet or muddy riparian areas, or soils that are seasonally wetted (ephemeral) or c) pumping or moving of surface water, you are required to follow these decontamination protocols:

1. **PREVENTION:** Do not allow equipment to enter a watercourse or wet riparian area, or to pump or transport water, unless the equipment has been properly decontaminated **before AND after** use in different waterbodies. The current extent of Whirling Disease in Alberta and BC is not known, so your equipment may already be contaminated or may become contaminated during use. Never move equipment between water bodies without applying the following decontamination protocols. Avoid wetting equipment unless absolutely necessary.
2. **PRE-CLEAN:** When you leave a work area remove **all** sediment and organic material. The most resistant life stage is the myxospore and these spores settle into the mud. By washing off all mud (in an area where the rinse water will not re-enter a watercourse, a storm water system, or sanitary sewer system) you can reduce the chances of spreading this disease. This is the most effective and first line of defence against most aquatic invasive species.
3. **HOT WASH or DISSINFECT:** At an appropriate facility, where wastewater will not re-enter a watercourse (either through storm water or sanitary water treatment), wash or disinfect your equipment as follows:
 - a. **HOT WASH** – use a low pressure hot water wash system (e.g. Hotsy) to apply very hot water (90°C) across all equipment surfaces for at least 10 minutes. Appropriate PPE is required to prevent injury when using water at these temperatures*. For smaller items or in remote locations - boiling at 90°C for 10 minutes will also destroy the spores.

OR

- b. **DISSINFECT** – For equipment that cannot withstand these temperatures, (e.g. glued fabrics such as inflatable watercraft, aqua-dams, Gore-Tex, etc.) use regular water to remove any residual mud. However, extra diligence must be taken to disinfect this equipment in order to destroy the spore stage. All equipment must be soaked for at least 10 minutes, in an appropriate concentration of disinfectant* (see link to Table 1). Disposal of rinse water containing disinfectant with QAC's may **not** go into sanitary sewers in LLYK. Contact your local WWTP for disposal of disinfectant as these chemicals may cause permanent damage to waste management operations if not diluted, neutralized, or dissipated prior to disposal.
4. **DRY:** Allow all equipment to dry thoroughly (fully dry + 48 hours) before being used in each new waterbody. Drying is **ONLY** effective if every surface is completely dry. Again, this is why removal of ALL mud is so important, as it aids effective drying.

Note – follow all manufacturer's MSDS and instructions for use of Personal Protective Equipment.

FISH-HANDLING PERMIT CONDITIONS:

If you have been issued a permit to conduct fish-handling work, the following conditions apply:

1. **PARKS CANADA REVIEW:** If handling of fish is anticipated or could occur during in-stream work, a review by Parks Canada aquatics biologists or environmental assessment scientists is required. Please contact Shelley Humphries (shelley.humphries@pc.gc.ca) or Brianna Burley (brianna.burley@pc.gc.ca) for review.
2. **SIMPLIFIED DECONTAMINATION APPLIES:** The protocol outlined above applies to all wetted equipment, with special attention paid to material in direct contact with fish or invertebrates. Additional pre-cleaning of gear is required (thorough scrubbing with a nylon bristled brush with fresh, clean water) to removal any organic or sediment contamination.
3. **MOVEMENT OF BIOLOGICAL MATERIALS:** Special conditions and permitting applies if fish (frozen, or fresh), benthic organisms, sediment, or water is to be removed or moved between sites. Consult with Parks Canada aquatics biologists for details on transportation of materials. Note: a special CFIA permit is required for all movement of all unpreserved fish tissue of susceptible species that are collected from the Bow River.
4. **DISPOSAL OF CONTAMINATED TISSUE.** Unpreserved water, fish, sediment or benthic macroinvertebrates can transmit whirling disease. Samples may require special disposal depending on the location and species.
5. Consult regularly with the CFIA website pages dedicated to whirling disease.
<http://www.inspection.gc.ca/animals/aquatic-animals/diseases/reportable/whirling-disease/eng/1336685663723/1336685826959>

Table 1: Available Disinfectants and Manufacturer's Concentrations.

Note the list below is intended to aid you in application of these protocols, but should not be considered exhaustive or as an endorsement of these specific products or manufactures. Other products with Quaternary Ammonium Cations (QAC) as the active ingredient are also effective.

Brand Name	Manufacturer	QAC Active Ingredient(s)	QAC Concentration (as supplied)	FINAL Concentration (for disinfection)
Quat Plus	Dustbane	n,n-dialkyl –n, n-dimethyl ammonium chloride	4.8%	2000 ppm
Quat Plus M5	Dustbane	n,n-dialkyl –n, n-dimethyl ammonium chloride	7.7%	2000 ppm
Vanguard	Dustbane	Didecyl dimethyl ammonium chloride n-alkyl; dimethyl benzyl ammonium chloride	2.88% 1.92%	2000 ppm
Pinosan	Dustbane	Didecyl dimethyl ammonium chloride n-alkyl; dimethyl benzyl ammonium chloride	1.44% 0.96%	2000 ppm
Quat 128	Sanicare	Didecyl dimethyl ammonium chloride Dimethyl benzyl ammonium chloride	5.07% 3.38%	2000 ppm
SparQuat 256	Spartan Chemical	Dialkyl dimethyl ammonium chloride Alkyl dimethyl benzyl ammonium chloride	5-10% 5-10%	2000 ppm
Bleach	Clorox	Sodium hypochlorite	5%, 5.25%, 8.25%	500 ppm