Equipment Disinfection Procedures to Prevent the Accidental Spread of Aquatic Invasive Species – Version 1.1 June 2009

Contact:

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Scope:

The procedures described here are intended to help reduce the risk of spread of the invasive freshwater algae Dydimo or 'rock snot' in B.C., and provide direction on how to prevent the spread of New Zealand mudsnail and zebra / quagga mussel.

Rationale:

The procedures outlined here are best management practises for fieldwork carried out by Ministry staff and its contractors. The introduction and spread of a whole range of non-native aquatic species is posing an increasing risk to fisheries and biodiversity of B.C.'s aquatic environment.

One major pathway for the spread for a range of these organisms is the accidental transport of these 'aquatic hitchhikers' on waders, boats, trailers, nets and other equipment moved between water bodies. Many of these organisms can grow from fragments hardly visible to the human eye, so proper disinfection procedures need to be followed to prevent the spread of aquatic invasive species between watersheds during fieldwork. These procedures describe methodologies which prevent the spread of Dydimo, a microscopic freshwater algae that can form large mats in rivers and streams. However, a range of the methods described here are also successful at preventing the transport of other freshwater species like New Zealand mud snail, Eurasian watermilfoil, and zebra / quagga mussels.

The approach described here is based on general watershed zones, since the distribution data for Dydimo in B.C. is too limited to target specific infested sites.

When to disinfect equipment:

- These procedures aim to prevent the spread of aquatic invaders from infested sites to un-infested sites, particularly if personnel are moving between watersheds which are not naturally connected.

- The current disinfection boundaries (see maps below) are based on ecological drainage units and delimit the minimum level of disinfection required. One exception is the additional disinfection area around the Somas River watershed and the Alberni Inlet area (Vancouver Island). Since this is the only know location of New Zealand mud snail, we request all gear to be cleaned when leaving this area. Whenever equipment is moved across a disinfection boundary, both general and field gear disinfection (Level 1 + 2) is to be conducted.

- Whenever possible a more prudent approach should be adopted, and at least the general procedures (Level 1) are to be used if you move between watersheds within 7 days.

- Additionally, field gear disinfection (Level 2) is to be conducted whenever field gear is returned to storage or a MoE office, and will be used within the next two weeks. As long as an immersion tank or other facilities are set aside for disinfection, this should require very little time.

- The Ministry strongly discourages the use of felt-soled waders, as they are a major pathway for the dispersal of aquatic hitchhikers, including Dydimo, and particularly difficult to disinfect. Newly developed rubber-soled alternatives are available on the market, and provide the same non-slip qualities, but are much easier to clean. Some regions have already moved to rubber-soled waders and are satisfied with their performance.

Procedures:

All removal of fragments or dirt should either take place when leaving the site or in a location where run-off is not going into a water body. DO NOT clean the gear with water from the site as you might just re-contaminate it, unless you use additional disinfection procedures afterwards.

Level 1: General disinfection procedures followed whenever possible as you move to a new site:

- When leaving a waterbody, remove any visible plants and animals from your gear and boat.
- Remove any mud and dirt since they might contain Dydimo or New Zealand mud snails
- Eliminate water from any conceivable item before you leave the visiting area

Level 2: Field gear disinfection procedures:
To disinfect your waders, nets, sieves, buckets, floats, gloves, etc., use **ONE** of the following procedures (see Table 1 for effectiveness). Make sure that all parts of the equipment get fully submerged for the whole time period required:

- Submerge all gear in hot water (45ºC - uncomfortable to touch) for at least 10 minutes, or until soaked through. Felt-soled waders or other absorbent materials need to soak for 40 minutes

OR

- Freeze all gear until solid (> 4hrs)

OR

- Soak in a 2% solution of household bleach for 1 minute

OR

- Soak in a 5% household bleach solution and soak for 15 minutes

Table 1: Effectiveness of different equipment disinfection procedures	Dydimo [1]	New Zealand mud snail[2]	Zebra / Quagga mussel[3]	Fish path ogen [4]	Amphibian pathogen[5]
Immersion in 45ºC water for 10mins (or 40mins for felt-soled waders or absorbent material)	Yes	Yes	Yes	?	?
Freeze until solid (4hrs or more)	Yes	Yes	Yes	?	?
Soak in a 2% solution of household bleach for 1min	Yes	?	Yes (larvae only)	?	?
Soak in a 5% household bleach solution and soak for 15mins	Yes	?	Yes (larvae only)	Yes	Yes

? Indicates that there is currently a lack of information on the effectiveness of this treatment for this species or pathogen

See for source information and more detail:
[1] http://www.biosecurity.govt.nz/didymo
[2]New Zealand mudsnail prevention guide:
http://seagrant.oregonstate.edu/sgpubs/onlinepubs/g06006.html
[3]Stop Aquatic Hitchhikers: http://www.protectyourwaters.net/hitchhikers/
[4]Standard operating procedures for research, evaluation, and development
[5]Hygene protocols for amphibian field staff and researchers, Ministry of Environment, B.C.

Figure 1: Disinfection boundaries for Vancouver Island. Note the additional zone around the Somass watershed to prevent the spread of New Zealand mud snail (green dot).

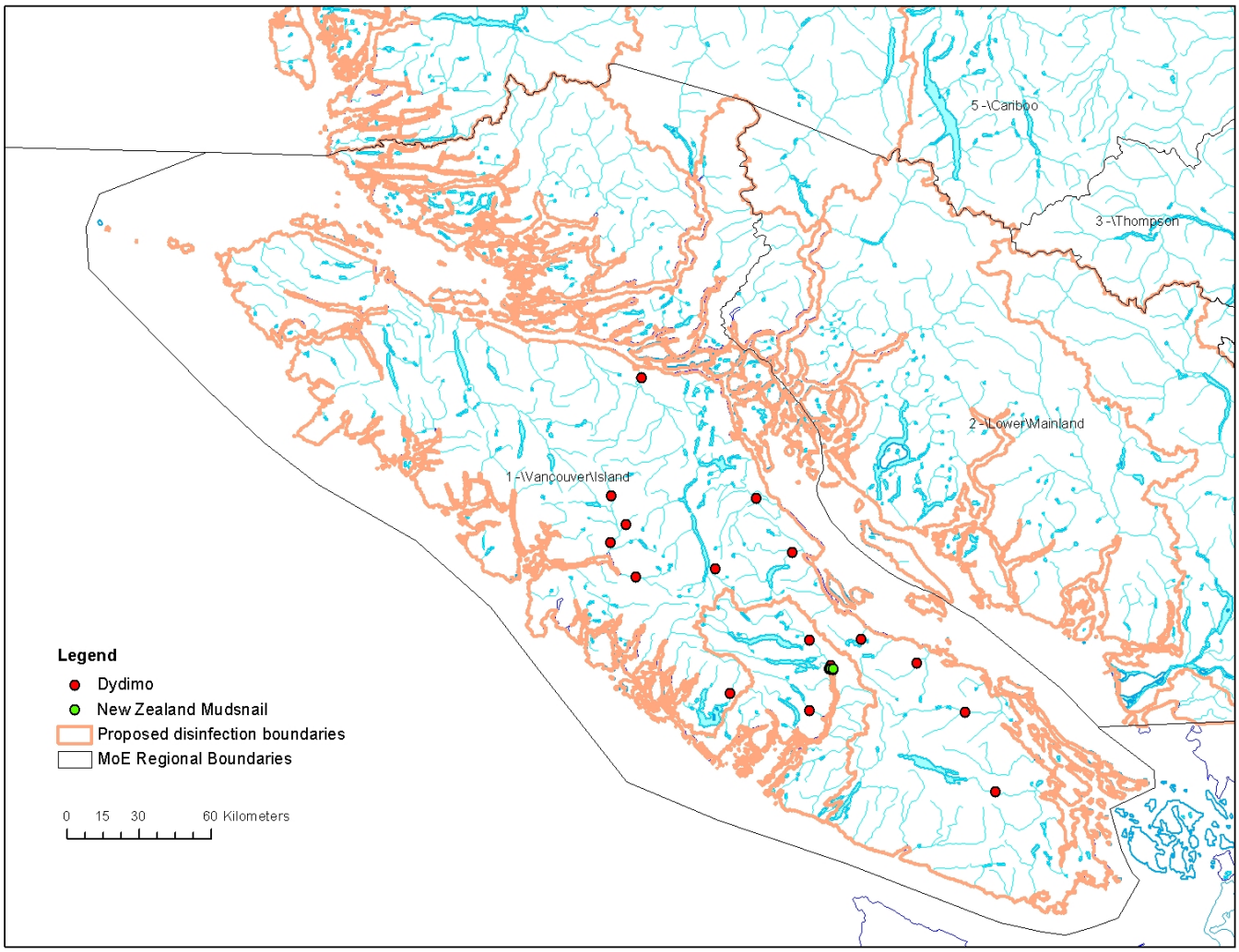

Figure 2: Disinfection boundaries for the Thompson, Lower Mainland, and Okanagan Regions.

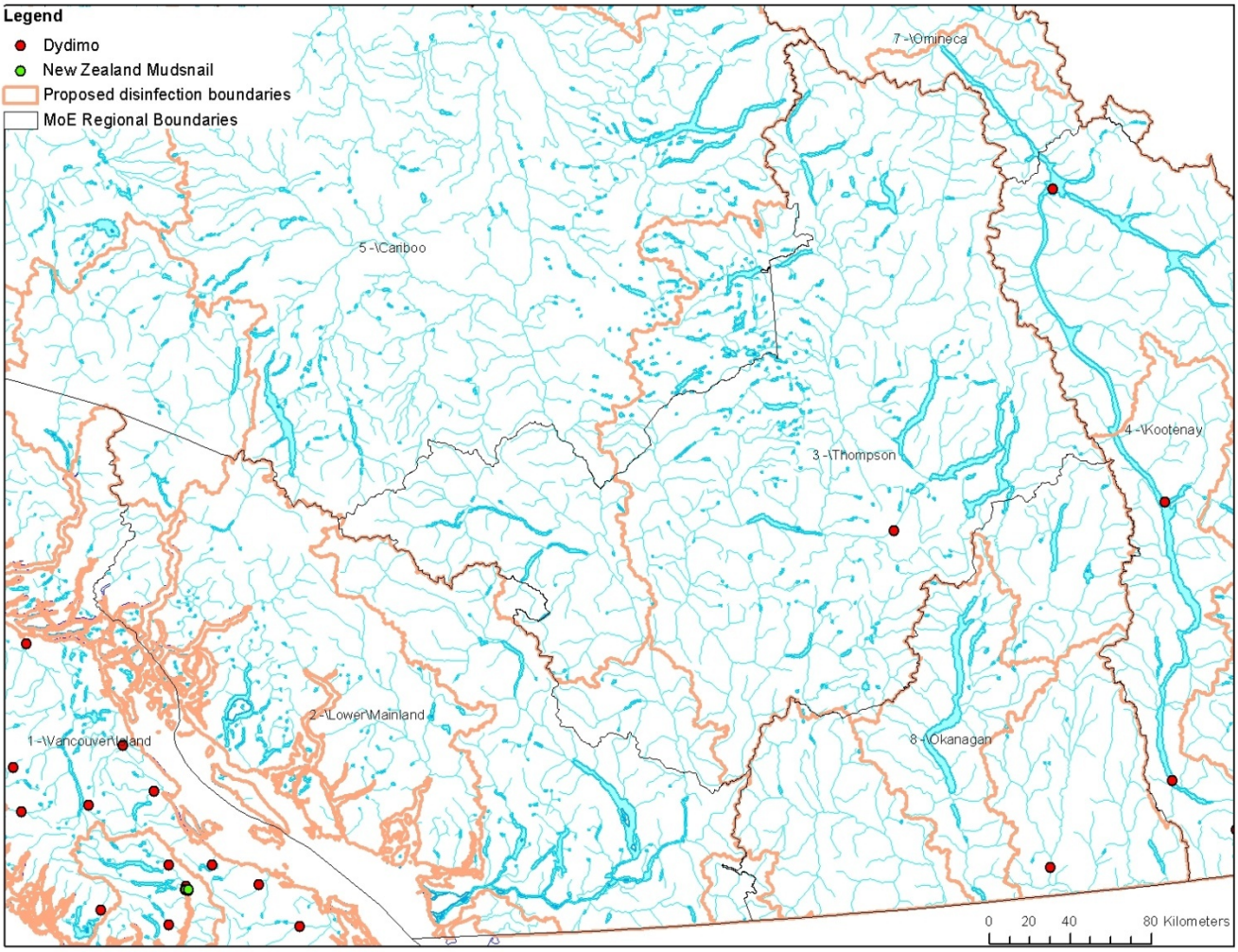

Figure 3: Disinfection boundaries for Kootenay Region.

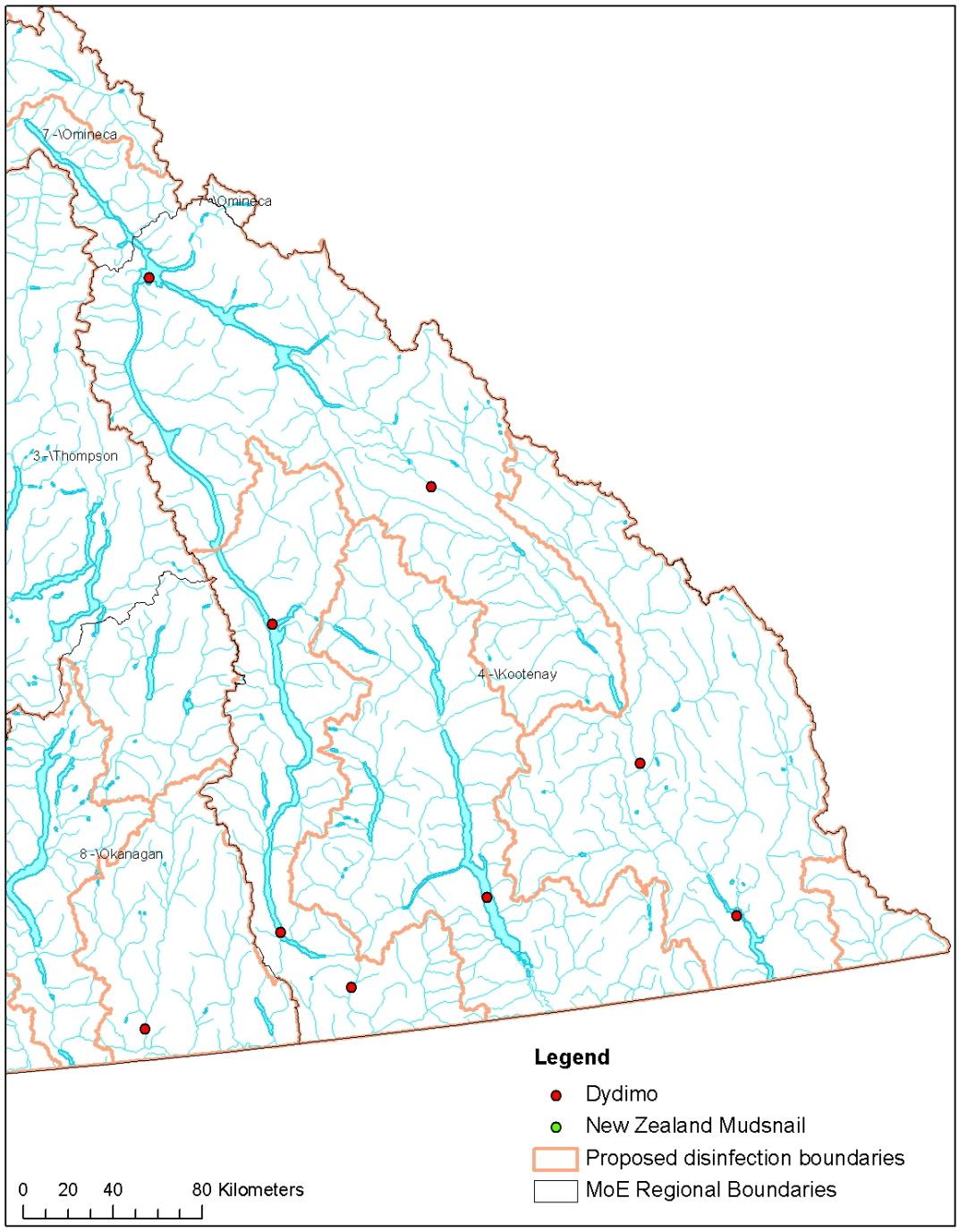

Figure 4: Disinfection boundaries for the Cariboo Region.

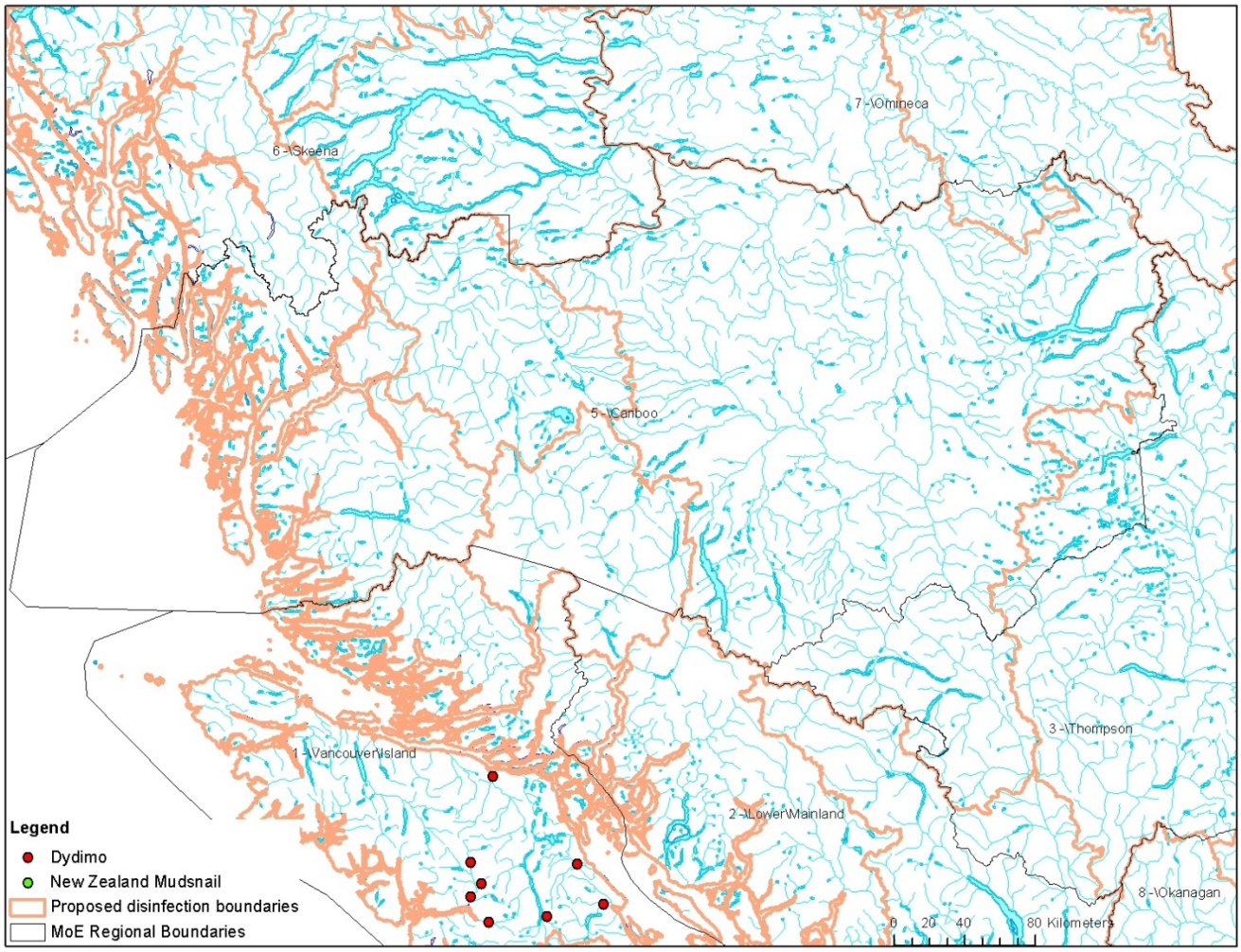

Figure 5: Disinfection boundaries for the Skeena Region.

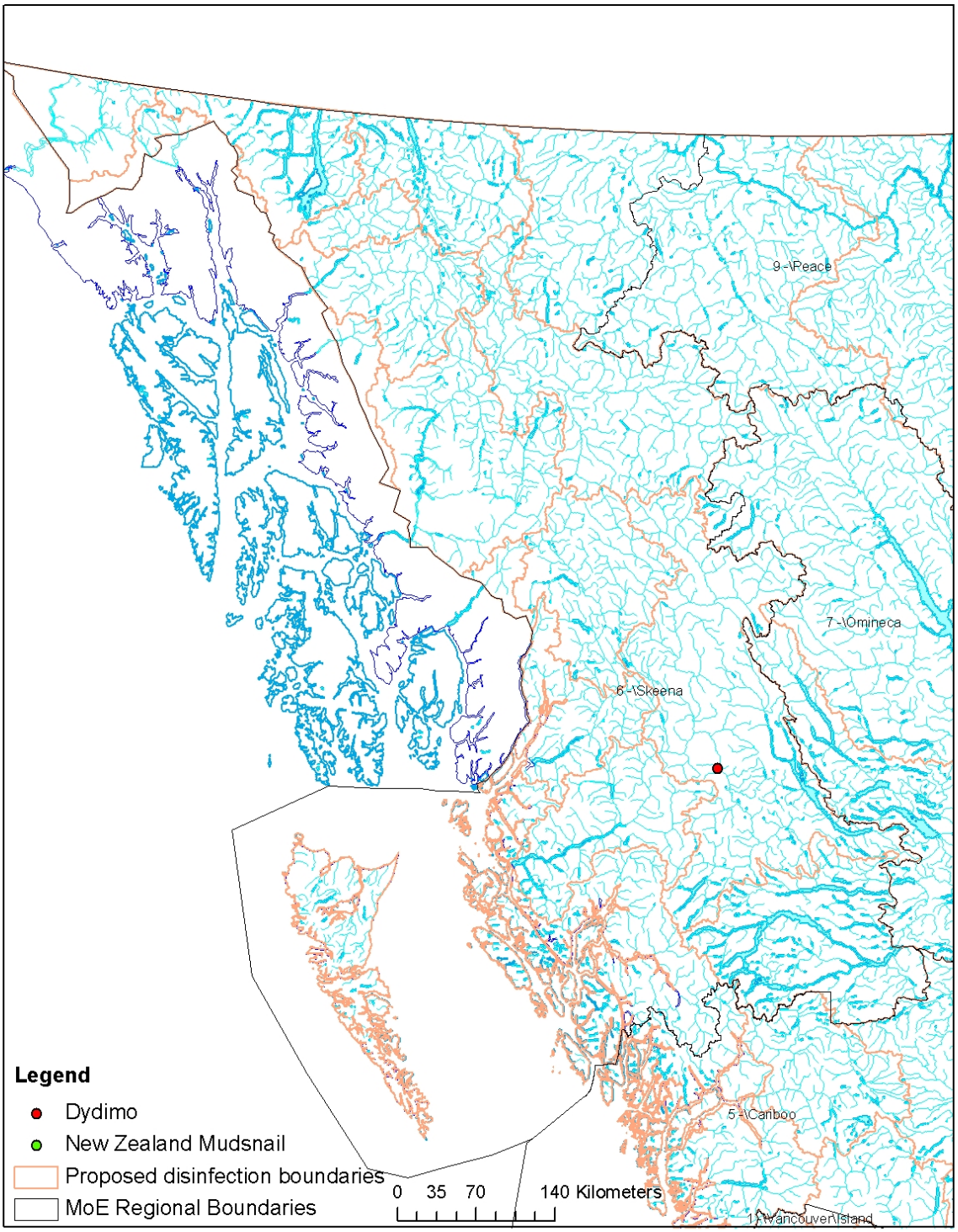

Figure 6: Disinfection boundaries for the Omineca and Peace Region.