

WATERSHED VALUES

FISHERIES VALUES

The Lakelse Watershed possesses very high fisheries values and is one of the premier watersheds of the Skeena drainage system. It provides diverse habitat capable of sustaining sockeye, coho, pink, chum, chinook, and steelhead populations. Earlier reports on the Lakelse Watershed indicated that it supported about 35% of the total Skeena River commercial fishery catch for all species. Steelhead, coho, and cutthroat trout support major sport fisheries.

Resident species present in the system include rainbow trout, cutthroat trout, Dolly Varden, bull trout, mountain whitefish, and the following coarse fish: prickly sculpin, largescale suckers, redbelt shiners, northern pike minnow, peamouth chub, and threespine stickleback. The fish community contributes to the ecology, nutrient regime and structural diversity of the drainage and provides strong cultural, economic and symbolic linkages, as well as supporting aboriginal, recreational, and commercial fisheries.

Salmon are a large part of this area's culture and community. High fishery values are based on the outstanding spawning and rearing habitat that is present. Lakelse River is a world-renowned angler's paradise with easy wading, many pools, and stretches of swift water.

Lakelse Watershed Stewards Society has worked very hard over the last several years to promote and encourage habitat preservation, restoration, and projects related to the Lakelse Sockeye Salmon populations which are now considered by Fisheries and Oceans Canada as a species of concern. Human impacts, linear development, habitat degradation, loss of riparian areas, and other factors have contributed to a significant decline in this stock population.

Since 2005, LWSS has been a partnering stakeholder in the Lakelse Sockeye Salmon Recovery program. Other agencies on this team include: Terrace Salmonid Enhancement Society, Kitselas First Nation, Ministry of Environment, Fisheries and Oceans Canada, and Ministry of Forests.

Projects and Funding

Since 2005, LWSS has been involved in a number of resource-based projects with funding received from groups such as the Pacific Salmon Commission, DFO's Public Involvement Program, and the Pacific Salmon Foundation.

Projects have included:

- Ground water augmentation, habitat restoration, and enhancement on Scully Creek (groundwater).
- Culvert / bridge replacement on Salmon Creek.
- Informational brochures on Lakelse Sockeye Salmon.
- Information kiosks and notice boards at various community locations around Lakelse Lake.
- Fry Outplant Project – Williams Creek Egg Takes and Fry release.
- Interpretive walks and talks.

Work with various related agencies and groups continues as Lakelse Watershed Stewards Society endeavors to persevere in public education and awareness; on the ground projects which will restore or enhance fish habitat; and participate with others in studies which will preserve this highly valued aspect of Lakelse Watershed.



LWSS members guiding an interpretive walk along Williams Creek in 2019

CULTURAL VALUES

The cultures of the Kitselas and Kitsumkalum tribes differed little from those of the other Coast Tsimpshian people. Permanent villages of large rectangular longhouses were built from cedar planks at the mouth of the Lakelse River as well as at Kitselas Canyon and Kitsumkalum. Their length of occupancy dates back at least 3500 years. The Lakelse Lake area was extensively used by the Kitselas band and a summer village site was located near the outlet of the lake. Burial sites along the Lakelse River were associated with Killutsal and Klakelse villages near the mouth. (Extracts from the Greater Terrace Official Settlement Plan, 1984.)

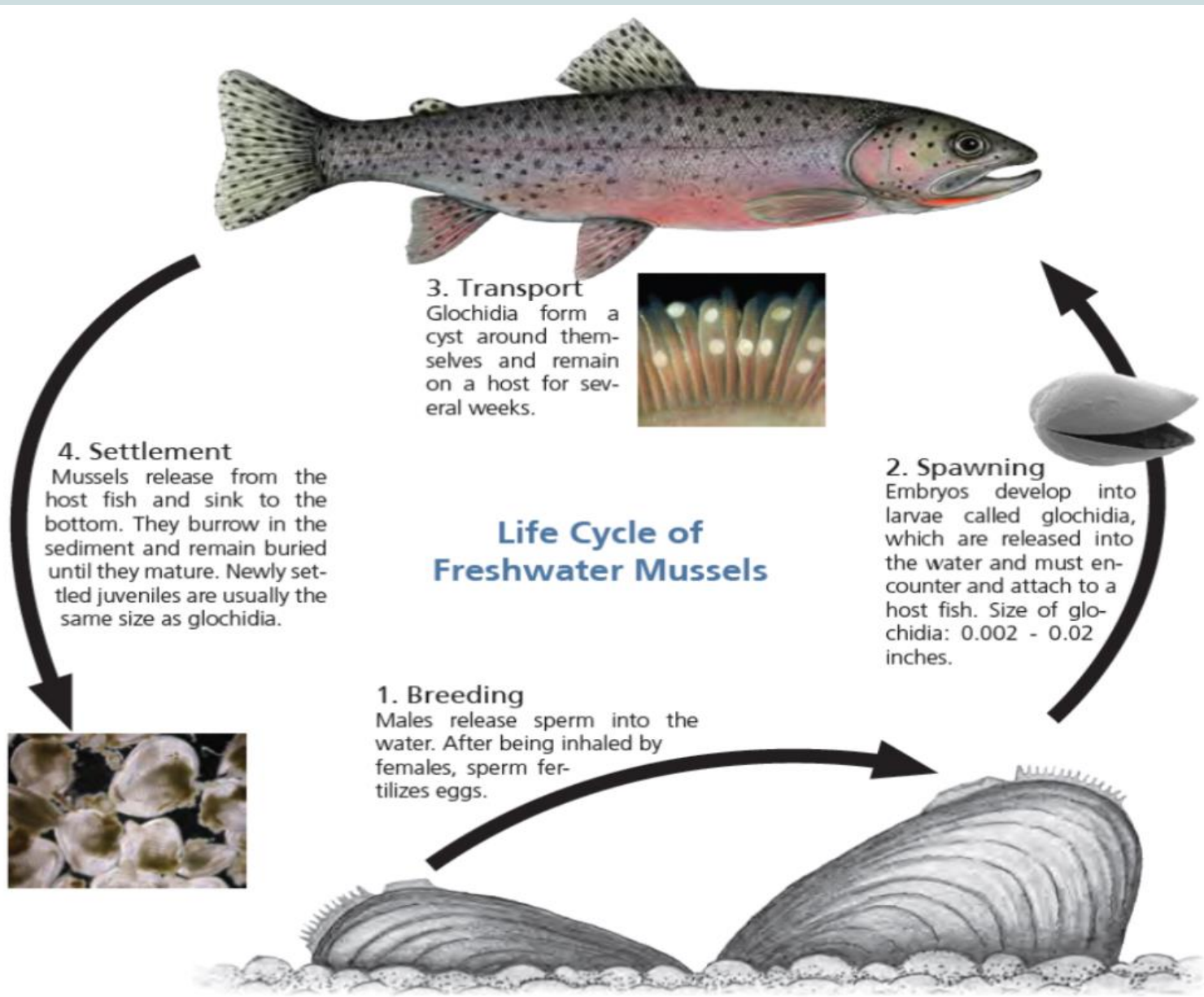
Western Pearlshell

The First Nation's name for Lakelse Lake is Lax Gyels after its freshwater mussels. The Western Pearlshell is found in the Lakelse River. Their average lifespan is 60 – 70 years and the maximum can exceed 100 years.



Western Pearlshell

Cutthroat trout are commonly the host fish required to transport their eggs as part of their reproductive cycle. The species found in the lake is thought to be the Western Floater, about which nothing is known about its biology or host fish. Mussels are one of the most endangered species on earth and because of their sensitive environmental needs they are sentinels of aquatic system health.



illustrations: Ethan Nedeau; glochidia image: U.S. Geological Survey; encysted glochidia and juveniles: Chris Barnhart

RECREATIONAL VALUES

Lakelse Lake has long been recognized as a unique recreational gem for local residents and tourists alike.

With the recent addition of the Lakelse Wetlands Park at the south end of the lake, B.C. Parks have become custodians of about 25% of the shoreline. Park visitors to the picnic site, swimming beach, campground, and Gruchy's beach are estimated to amount to around 200,000 annually. Lakelse Lake Provincial Park offers camping at Furlong Bay.



The beach at Furlong Bay Campground, Lakelse Lake Provincial Park

WILDLIFE VALUES

Lakelse Lake is a valued stop-over for many species of migrating wildfowl and is renowned in particular for the once endangered Trumpeter swans. About 100 bird species have been counted in the area. There are also diverse wildlife populations including Kermodei, black, and grizzly bear, coyote, moose, deer, wolf, lynx, cougar, otter, beaver, and many smaller mammals that utilize the Lakelse Watershed.



WATER QUALITY TESTING

Some LWSS volunteers have been trained in water sampling by the BC Lakes Stewardship Society. MoE, assisted by LWSS, have conducted an incredibly extensive analysis of Lakelse water since July 2002, repeating the 10 lake sites used by McKean in 1986 and adding 16 creek sites in 2003. These analyses cover nutrients, bacteria and 26 chemical elements. We now know everything from our arsenic to our uranium levels. These results can be found in the Lakelse Lake Management Plan (LLMP).

Iron Input to the Lake

Many tributary creeks of the lake are high in iron. As mentioned in the Elodea section, iron is known to be a chemical which enhances its growth and areas adjacent to these creeks have had dense Elodea beds.

	<u>Max.</u>	<u>Av.</u>
Prov. Park Creek	3490	2500
Eel Creek	3190	1770
Hotsprings South	1670	731
Hotsprings North	1530	770
Furlong Creek	1300	680
Mountain Creek	1120	670

(Micrograms/L; Guideline is 300)

	<u>Max.</u>	<u>Av.</u>
Eel Creek	34	25
Prov. Park Creek	28	23
Mountain Creek	18	12
Williams Creek	17	11
Whalen Creek	14	6

(Micrograms/L; BC Guideline is 10)

Phosphorous

The 1986 McKean report pointed out that a 30 meter septic setback to prevent a bacterial health hazard to adjacent ground and surface waters would not be adequate for soils of poor phosphorus adsorption. Poor soils have been identified at 1st Avenue, Beam Station, Lupine, Snowy Owl Bay, Catt Bay, Southwest and Northwest shores, and the Provincial Campground. The report suggests setbacks of 175 meters for such soils and that they should apply to development around inflow creeks!

LWSS supports the Regional District of Kitimat-Stikine in their present sewage studies and plan for Lakelse Lake and Jackpine.

With these bacteria results and a general B.C. wide policy, our local Health Authority issued an advisory against using any surface water without treatment.

Phosphorous

Phosphorus is a primary fertiliser for all plants:

- 15 ug/L can cause nuisance growth
- 30 ug/L can cause algae blooms
- 60 ug/L can kill plant life.



There are several creeks providing serious phosphorus contamination, with the worst being Williams since it accounts for 64% of the drainage area. During 2004 spring run-off Williams was estimated to be adding more than 20 kg/day of phosphorus to the lake. By comparison the Regional District study estimated that 6 kg/day would be added to the lake by Lakelse and Jackpine if septic systems discharged to the lake with absolutely no effective treatment by septic field soils.

The main water-mass of Lakelse has so far remained below 8 micrograms/L for 50 years, however in September 2004 deep-site readings reached 11 micrograms/L for most of the depth. Bottom sediment is rich in phosphorus with levels measured from the core samples at more than 1000 micrograms/gram. Phosphorus can be stirred up from bottom sediment by wave action. Nature's way of controlling this is by damping waves by reed beds. To make matters worse, if oxygen levels ever get to zero, phosphorus can be drawn from sediment into the water column, thereby adding greatly to lake fertilization.

FORESTRY

Proposed Logging in the Furlong and Granite (Hatchery) Creek Watersheds

Maps showing the proposed logging cutblocks by Coast Tsimshian Resources in the Lakelse Lake watershed were posted at the information kiosks in the various lake areas e.g. Beam Station area (Lakeside Rd.), Snowy Owl, Westside Rd., Waterlily Bay, Lakelse Lodge Rd., Southwest Lakeview area. These were posted in November 2007. Please take the time to have a look. LWS has concerns about logging in this watershed. These blocks are near Furlong Creek and Granite (Hatchery) Creeks, two of the streams currently part of the sediment study. If you have concerns please forward them to LWSS or Kitimat Stikine Regional District or DFO or MoE or MoF.

UPDATE: January 30th, 2008

LWSS President Richard Olson, Vice President John Rowlands, Fisheries Director Ian Maxwell, and Forestry Director Leslie Rowlands met with John Schultz, Brendon Wilson, Eric Sankey, Eugene Bryant and Jerry Lawson from Brinkman Forests and Coast Tsimshian Resources to discuss logging proposals for Furlong Creek and Hatchery (Granite) Creek Community Watersheds. Also discussed was the advertised Old Growth Management Area (OGMA) for Hatchery Creek, with a 60-day public comment period until March 31st, 2008.

LWSS put forward a visual presentation outlining a wide number of lake concerns around the impacts to the watershed from human development, then the discussion moved to Forestry. LWSS voiced again, as we have in the past, that Forest Stewardship Plans are not a good vehicle for public input with their generalizations and restricted time periods for public input. The public is not told when or where at the watershed level that logging will occur. LWSS has insisted that the attention to detail missed in the FSP'S must have a means for public input.

We are asking for:

1. PRECAUTIONARY APPROACH:

- increased riparian buffer protection for the smaller tributary streams.
- improved stream crossing measures
- improved risk assessment of windthrow and preventative measures in light of the Furlong Creek blowdown in October 2007

2. LONG TERM PLANNING

- the need for good data and good tools to assess non timber resources, and to monitor the impacts of forestry decisions.
- the results of the Williams Creek sediment study, 2007, and the current suspended sediment transport study underway on Furlong, Granite, and Scully Creeks must be incorporated into forestry decisions.
- the digital map base and website, showing all licensees and their existing and proposed cutblocks within the watershed, (Forest Practices Board recommendation OCT. 2007) currently being drafted by Ministry Of Forests in Terrace, be promoted.
- In the meantime Brinkman Forests and Coast Tsimshian Resources has agreed to share their maps and information with us.

Update July 2008:

This website is now available: www.for.gov.bc.ca/dkm

3. OGMA (Old Growth Management Area) AMENDMENT

So far LWSS supports the new proposed OGMA and will take the foresters up on their offer to accompany them on site this spring. The Foresters believe the new OGMA will give better biodiversity protection closer to Hatchery Creek. We have learned that it is legal to enter into this community watershed.

4. SUSTAINABLE FORESTRY

Lakelse Lake is in the monitoring stages with several studies, and an adaptive approach to Forestry is in the best interests of the watershed. We have an opportunity to work together with Foresters, to make better informed decisions, as new logging proposals are developed.

We encourage everyone to ask questions, and to submit your concerns and comments.



THE VALUE OF LAKELSE LAKE

A 1974 joint study by the Regional District of Kitimat-Stikine and the Department of Fisheries and Oceans estimated that the annual income from the existence of Lakelse Lake was an astounding \$101,641,000 (in year 2000 dollars).

We think that an update of this value would be useful in making decisions affecting the watershed. We are asking for the Regional District's help on this.



ISSUES AND CONCERNS

- **EROSION**

CAUSES OF EROSION

Shoreline erosion can arise from a variety of reasons including:

- Changing freezing conditions
- Ice expansion
- Changed wind and wave action
- Changed water levels
- Loss of natural anchoring vegetation and roots
- Adjacent shoreline armouring by rocks or concrete
- Disappearance of reed beds (nature's wave reducers).



- **WAVE ACTION**

Wave action is more damaging where reeds have been removed.

- **ICE EXPANSION**

Ice expansion can cause erosion and shoreline damage.

- **DISAPPEARANCE OF REED BEDS**

Leaving the reeds and the natural vegetation will reduce wave action and erosion.

- **LOSS OF VEGETATION**

Loss of naturally anchoring vegetation and roots leads to erosion and shoreline changes.

- **ARMORING THE SHORELINE**

Armoring the adjacent shoreline with rocks, concrete, or galvanized walls.

- **CHANGES IN WATER LEVELS**

Fluctuations in water levels can influence erosion.



- **ELODEA CANADENSIS**

Elodea is an invasive, perennial aquatic plant or submergent macrophyte, native to most of North America.

Young plants initially start with a seedling stem with roots growing in mud at the bottom of the water; further adventitious roots are produced at intervals along the stem, which may hang free in the water or anchor into the bottom. It grows indefinitely at the stem tips and single specimens may reach lengths of 3 m or more.

The leaves are bright green, translucent, oblong, 6-17 mm long and 1-4 mm broad, that develop in whorls of three (rarely two or four) round the stem. It lives entirely underwater with the exception of the small white or pale purple flowers which float at the surface and are attached to the plant by delicate stalks. It requires summer water temperatures of 10-25 °C and moderate to bright lighting.

Elodea was first identified in Lakelse Lake in 1999 and was actually the impetus of the Lakelse Watershed Stewards Society who was concerned about the apparent infiltration of this weed. It grows rapidly in favorable conditions and can choke shallow ponds, lakes, and the margins of some slow-flowing rivers. It spreads rapidly by fragmentation, which can be generated by motor boats and other similar activities. It was first noticed in significant amounts near the Furlong Bay Campground and by 2004 was found in all parts of the lake. It seems to be a cyclic plant with natural rhythms of population blooms and decline. As a concern in 2004 and 2005, it seems to be in decline at the moment. Plans have been made to map out and survey the current elodea situation.

Other Information About Elodea

In a study of Wabamun Lake in Alberta, consultants postulated that new colonies of Elodea were initiated in areas where sediment is abundant in iron, where it thrives in nuisance proportions, lasting from 1 year to 9 years depending on iron reserves and replenishment. (The Biology of Canadian Weeds, 1988)



- **FORESTRY CONCERNS**

The Lakelse watershed with its aquatic and terrestrial components has a unique mixture of habitats, from the Lakelse River, as part of the Skeena system, to numerous creeks that drain into the lake. The southern wetlands and remaining old growth forests all require careful balancing of resource values related to human development. Everything we do within the watershed has cumulative impacts.

The practice of forestry includes road building, harvesting, and replanting. The Lakelse Lake Watershed has experienced over 40 years of industrial logging. As these complex forests have been cut, options for the biodiversity of plants, fish and wildlife are now reduced. Reforestation has often been met with problems of soil erosion on steep sites, with thin and nutrient poor soils, and the loss of topsoil, leaving bare ground and sand, making forest regeneration in some areas difficult or unlikely.

Road building, and the practice of clearcutting up to the smaller tributary streams, with little or no riparian buffer, and the loss of protective habitat connectivity for wildlife, are all real threats in the watershed. Creeks and their tributaries require water clear of sediment, with trees and shrubs as overhang to cool the water to keep salmon and trout happy.

Check out this website: www.for.gov.bc.ca/dkm

The above website is available to the public. It was put together by The Ministry of Forest and Range (MOFR) and local Licensees for the Kalum Forest District. This makes it easier for the public to contact the licensees and view their tenures and logging proposals.

Effects of Forest Harvesting on Hydrology include:

- increased average run-off and total yield,
- clearcutting increases storm run-off and advances timing,
- small and moderate early autumn storms are most affected,
- logging roads increase storm run-off and advance timing of floods,
- water quality deterioration has been widely documented,
- results are consistent for the whole of the Pacific Northwest,
- rain on snow effects seem to be accentuated by forest harvesting.

(Olav Slaymaker, Professor of Geology & Director for the Study of Global Issues at UBC)

- **SEDIMENT STUDIES**

Increased sediment in the lake is of concern to the Lakelse Watershed Stewards Society. As a result, a number of initiatives and studies were pursued by the volunteers.

Sediment Core Sampling

Sediment core samples were taken from the lake in 2002 from the deep-site and a basin further south.

The graph shows large increases in sediment accumulation rates since development around the lake took place in the 1950's.

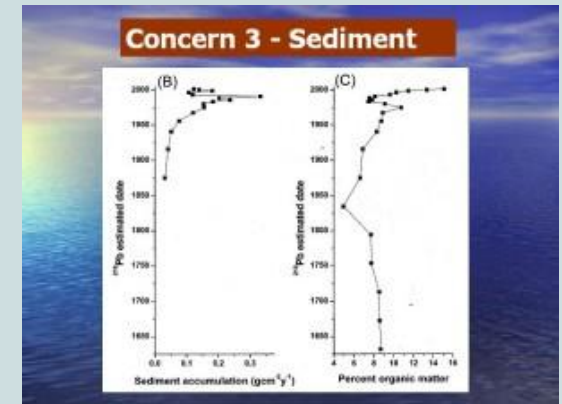
There has also been a large increase in the percentage of organic matter since the early 1990's. This suggests that inwash into the lake has changed recently.

Analysis of sediments show elevated iron and phosphorus levels in the top slices of the cores.

The full report is included in the Lakelse Lake Management Plan and Addendum.

Lakelse Lake Sediment Study

A major new study to assess sediments entering the lake from the major tributaries has just been started. This was initiated by Ministry of Environment and is partnered with Department of Fisheries and Oceans and Lakelse Watershed Stewards Society. Automated sampling will take place round the clock on Williams, Furlong, Hatchery, and Scully Creeks until at least the spring and probably through to 2009.



- **SHORELINE CHANGES**

Impacts of shoreline vegetation loss on lakes:

- Reduced flood protection
- Loss of erosion protection
- Increased sediment, phosphorus, and nutrients
- Less protection against septic leachate
- Loss of fish, insect, and wildlife habitat

Erosion as a result of removal of lake reeds and shoreline vegetation.



Shoreline Erosion Prevention Information

“The use of artificial materials – including rip-rap or logs – in the lake to protect against shoreline erosion requires approval from the Ministry of Environment, under Section 9 of the Water Act: Approvals and Notifications for “Changes In and About a Stream”, and any works within 30 meters of the water may require a DFO authorization (unless they meet the criteria for projects that do not require DFO review: See DFO’s Projects Near Water website). Refer to Table 2 for DFO and MoE authorization, approval, and notification forms. If other breakwater devices (such as logs) are to be used that could affect navigation or safety, then approval under the Navigable Waters Protection Act or the Navigation Protection Act (anticipated in April 2014) may be needed (Regional District of Kitimat-Stikine).”

In order to assess and manage the dynamics of your lakeshore erosion problem, it is advisable to work with a qualified professional or team of professionals depending on the scale and/or scope of the problem (MoE). As well, contacting and applying for necessary provincial and federal approvals in advance is necessary.

1. Applicable Provincial Legislation – Front Counter BC

- Water Act
- BC Land Act and Land Title Act

2. Applicable Federal Legislation Applications – Fisheries and Oceans Canada

- Fisheries Act Approval – Request for Review required

“For most property that slopes toward water, leaving the natural shoreline undisturbed is often the best and least expensive protection against erosion. A filter strip of thriving vegetation on and near the shore binds the soil and minimizes erosive soil loss from surface runoff, waves and from use by people. Existing vegetation can also be enhanced by planting appropriate native woody or aquatic plants (MoE).” Examples of natural vegetation include cattails, sedges, and rushes. Applying additional armouring (rock or rip-rap) may cause future implications for neighbouring properties, impact fish habitat, and create amphibian barriers. The figure below illustrates the potential future issues with establishing additional armouring.

