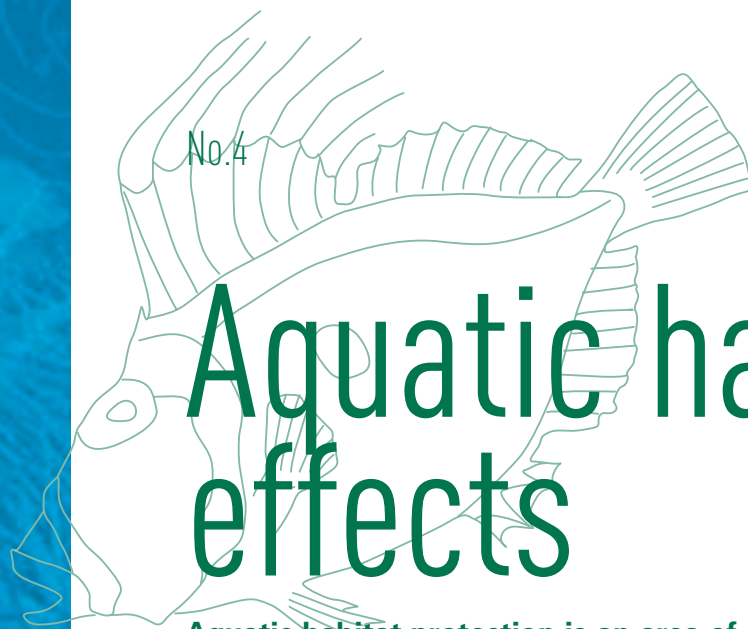


Stormwater Facts



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Aquatic habitat effects

Aquatic habitat protection is an area of concern in the Region, and is dependant on mitigating both stormwater quantity and quality effects (see Fact Sheets 2 and 3). New developments also allow the opportunity for degraded streams to be enhanced.

Altered hydrology (ie increased stormwater flows) and contamination of stormwater degrades aquatic habitat and can cause a loss of freshwater aquatic resources. Primarily this occurs through erosion and sedimentation of stream habitat and loss of streams through piping.

1) Physical Structure

Maintaining the integrity of the physical structure of a stream means mitigating increased stormwater flows by:

- retaining open streams,
- limiting the increase in peak rates of runoff,
- reducing the volume of stormwater discharged,
- attempting to limit the erosive duration of stormwater flows, and
- managing thermal impacts.

Technical publication 10, May 2003, *Stormwater Management Devices: Design Guidelines Manual (TP10)* highlights that increased urbanisation causes increased stream channel instability due to the increased volume and frequency of stormwater flows. Therefore, in order to protect and maintain stream channel stability, the ARC requires stormwater detention to minimise erosive forces.



Many of Auckland's streams are under pressure by development. Development can provide us with an opportunity to enhance streams and allow them to become an amenity for local communities rather than a degraded drain acting as a polluted water conduit



Culverts and pipes create barriers to fish migrating upstream

2) Barriers to fish passage

Culverts, weirs and other in-stream structures often form barriers to fish migration within streams. It is important that all new in-stream structures are constructed in order to allow fish passage. Technical Publication 131 (2000) 'ARC Fish Passage Guidelines' provides further information.

3) Water Quality

Contaminants affect aquatic life in a number of ways. Organisms living at the bottom of water can be smothered by sediment which can also deprive them of habitat by filling up riffle pool areas. In addition, sediment reduces light penetration, clogs gills and causes a number of other adverse side effects.

Contaminants other than sediment also have impacts on aquatic organisms. Chronic toxicity can stress local populations, while acute toxicity can cause mortality. Toxicity can impact at a particular level in the food chain which can disrupt the overall diversity and abundance of an aquatic ecosystem.



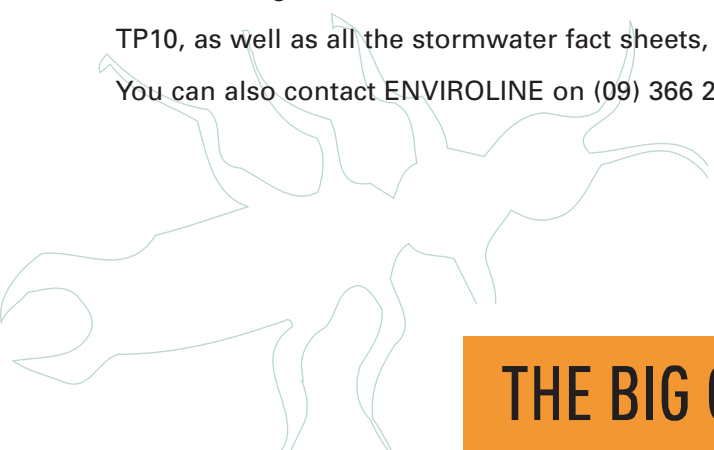
Sediment in streams can smother organisms and reduce light.

Further information

TP10 provides further information regarding the mitigation of water quality and water quantity effects, and the design of constructed stormwater management devices.

TP10, as well as all the stormwater fact sheets, are available on the ARC website: <http://www.arc.govt.nz>

You can also contact ENVIROLINE on (09) 366 2000 for more information regarding stormwater consents.



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