Environmental Consequences	Level of Risk
Deterioration in biodiversity	Moderate
Loss of habitat	Moderate
Erosion from overland flow	Moderate

Work is being carried out across a number of Council units to determine how staff can best apply the principles in "Wet and Wild".

The erosion risk is being mitigated by

- Building Standards and the Earthworks Bylaw
- Liquid Waste Management Plan which has an objective to decrease the quantity of sediment and silt reaching waterways to a level acceptable to GWRC
- GWRC research.

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Risks attributable to the absence of stormwater services	Level of Risk
Flooding	Low
Sediment erosion	Low

6.7 The Future and Risk Mitigation

6.7.1 Water Quality

Wellington Harbour stormwater contamination project

The most significant medium to long-term impact of urban stormwater discharges on the Wellington Harbour environment is the accumulation of stormwater-related contaminants in the sediments. This is because the contaminants can, over time, build up to concentrations that are toxic to sediment-dwelling organisms.

Council has commissioned Coastal Marine Ecology Consultants and Diffuse Sources Limited to carry out the initial biological and chemical surveys for a marine sediment monitoring programme in Wellington Harbour. The basis of the sediment chemistry programme will detect long-term trends in the concentrations of chemicals generated by human activities in the bed sediments of Wellington Harbour.

Stormwater Treatment

Currently there are investigations being carried out in conjunction with GWRC to determine appropriate water quality standards related to stormwater across the region. This will assist in determining what level of treatment may be required on stormwater discharges.

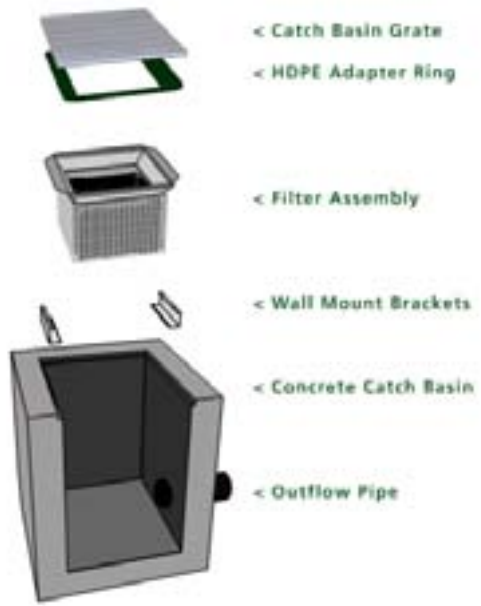

Figure 13 Filter bag set up. Installing such devices would help reduce sediments and chemical contaminants entering the harbour.

There are currently some ongoing developments where voluntary treatment options are being considered.

Runoff from Roads

Council's Transportation, Traffic and Roading Quarterly Report stated that over the months from March to June 2005 an average of 45kg/km^2 of material (silts, sand, gravels, glass, organic material, litter etc) was cleared from Wellington's road surfaces (excluding the CBD).

Uncontrolled these sediments and associated contaminants are ending up in streams and ultimately the harbour. Council's Environmental Strategy may propose installing removable filter bags (Figure 13), such as Enviropods, in sumps to remove fine sediments and other debris from road runoff after cost benefit analysis of road sweeping effectiveness and filter bags effectiveness. Any such project would include monitoring of the filter bags effectiveness. In future Council may look at opportunities where runoff from busy roads can be intercepted, especially ones that are likely to generate significant contaminants, and diverted to sand filters or swales to filter any contaminants from the runoff before it enters the receiving waters.

Council will also integrate the findings of the Ministry of Transport's future work regarding how Council policy takes into account the environmental costs of transport.

The Code of Practice for Land Development review

Council's Code of Practice for Land Development is soon to be reviewed. Emphasis will be put on controlling sediment laden run off from worksites and reducing impervious surfaces; whether replacing current surfaces or including impervious materials (such as pebbles, bark or ground cover planting) into designs of infill and subdivisional developments.

Consideration of alternative options such as establishing wetlands, swales and private and communal open spaces that absorb and filter stormwater run off will also be encouraged. On-site stormwater management devices that retain runoff and filter out contaminants and or sediments would be integral to the sustainable stormwater management emphasis in the updated Code of Practice.

6.7.2 Catchment Management Plans

The focus of Catchment Management Plans has shifted from being purely a flood protection exercise to a more holistic plan. As a consequence plans are now prepared to determine possible flood alleviation projects but also to protect water quality and public health.

For future Catchment Management Plans it was decided that an auditable approach was required to decide the next highest priority for investigation. The aspects used in setting the priorities are:

- Flooding
- Environmental risk
- Existing Resource Consent
- Potential Growth.

6.7.3 Environmental Change

Climate Change studies predict an increase in the frequency and intensity of rainstorms and droughts. More intense rain may result in more frequent flooding unless water can be attenuated. However with the rate of flood protection works being carried out, the situation in 50 years time, even with more intense rain, may, overall, be better than it is at present.

The matter of sea level rise is however more troubling. The Intergovernmental Panel on Climate Change (IPCC) indicate a sea-level rise of 0.3 to 0.5 m over this century. This would result in the lower lying areas of the CBD, Newtown, Kilbirnie and Miramar being at greater risk. Future works including stopbanks and pumping systems may be ultimately required. These areas are already too intensely built-up for development controls to be effectively introduced. However when more information is available the alternatives will be considered. The Code of Practice for Land Development has been amended to cater for an expected sea level rise of 0.4m over the next 50 years. Future rainfall intensities are still too vague for inclusion. All available information is being closely monitored and will be included in the design standards as appropriate.

6.7.4 Asset Planning

AMP's are continuously improving by carrying out various investigations and undertaking grassroots consultation to explore level of service options. AMP's also detail the likely future demands for service and how demands can be met or managed.

6.8 Future growth

Glenside Stream Care Group volunteers working on Porirua Stream

Demand

The Northern Growth Management Plan

The Northern Growth Management Plan has addressed the stormwater issues in those areas and has included water treatment issues.

Protection and enhancement of the green (open space and natural areas) and blue (streams and stormwater systems) systems will be central to how the area develops. The Plan suggests;

- Stormwater retention ponds provide a good public amenity whilst providing water quality control for Porirua Stream
- Improve water quality by limiting the impact of urban development on catchments.
- Work with developers, GWRC and PCC on flood and sustainable stormwater management to minimise impacts of flooding on stream and water quality and to protect the water catchment of Porirua Stream.
- Restrict or manage development in some areas so that streams and wetlands are recognised and protected, using if necessary new District Plan policies and appropriate zoning changes.