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Committee **Environment**
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Findings from the Soils work for the State of the Environment report

1. Purpose

To inform the Committee of the main points emerging from the technical report on Soils, written as part of the development of the State of the Environment Report.

2. Background

Over the last year, officers have been working on technical reports for the State of the Environment Report (SER) which will be published by the end of 2005. Technical reports have been written for each of the chapters in the Regional Policy Statement (RPS).

3. Soils

The objectives in the soils chapter of the RPS seek to maintain soil quality in the region and to limit land degradation from human influences. The chapter recognises the importance of soils to the functioning of all ecosystems. Without them most of the World's plants would not have evolved.

3.1 Soil Quality

Greater Wellington has been monitoring soil quality for five years. The monitoring programme follows a Landcare Research approach, which looks at soils in areas thought to be under stress from agriculture practices.

In agricultural soils, the most common concern is soil compaction (41 per cent of the sites surveyed). Soil compaction is a problem because it reduces air spaces (macroporosity) in soil and inhibits water and nutrients getting into the lower soil layers. As a consequence, overland flow can increase and there is less recharge of shallow groundwater. Soil compaction resulting in lower macroporosity is normally the result of continuous tracking by heavy machinery or heavy hooved stock (mostly dairy cattle) standing in one place for long periods of time.

Twenty four per cent of the sample sites within the region had high fertility. The fertility levels at these sites were well in excess of the amounts needed for maximum agronomic benefit. By putting too much fertiliser on the soil, farmers can eventually harm the water quality of shallow groundwater aquifers, while rain washes excess nutrients into streams where they exacerbate weed growth. Fertility is measured by levels of Olsen-P (plant available phosphate).

More recently, we have sampled five soil groups for levels of heavy metal contamination. The aim of this investigation was to establish the background levels of soil contamination in and around areas where people live and work.

We found that background concentrations of heavy metals in all five groups were very low compared with other regions, and all sites met health guidelines. High levels of cadmium were found in dairy pasture, with slightly lower concentrations in drystock soils – probably from phosphate fertilisers – but these were still within human health guidelines

3.2 Soil conservation

Soil conservation is about managing land use to prevent erosion and soil loss. Erosion can be the result of natural causes like heavy rain, winds and flooding, or human causes like over-grazing and poorly managed earthworks.

Greater Wellington has undertaken an intactness study of the region's land cover to assess its stability under natural and human influences. The region can be divided into areas based on land stability. Within the Wellington region we have stable land, unstable land, eroding land, and land covered by urban, rivers and lakes. The study found the following:

- About 45 per cent of the region has stable land, which is land not likely to erode at any time. Most of this land is in the valleys, notably the Wairarapa Valley, and the larger river valleys of the Tararua ranges.
- Thirty one per cent of the region is 'erosion-prone' land. This land is susceptible to erosion at different times depending on the trigger – a large storm or poor land management practices. A lot of this land is used for drystock agriculture and plantation forestry.
- About 18 per cent of land in the region is actually eroding, and most of this is the upland areas of the Tararua ranges. Over half of this eroding land is naturally recovering.
- Only 1.3 per cent of the region is actually bare and requires some form of soil conservation work. Of this percentage, 0.9 per cent was caused by poor land management and the remaining 0.4 per cent was exposed by natural forces.
- The region's most vulnerable land is the unstable land, where most of our drystock farming and plantation forestry takes place. To make this land more stable, woody vegetation rather than just grass is needed, as the woody vegetation is better at holding soil in place.

- Only 40 per cent of drystock pasture in the region has woody vegetation cover, and about 80 per cent of plantation forestry. The land not covered by woody vegetation is either grass or disturbed land that is susceptible to erosion.
- There are some remaining areas of drystock pasture and to a lesser extent plantation forestry needing conservation plantings of woody vegetation.

4. Communication

A communications plan has been developed for the State of the Environment Report, which will be published in December of this year.

5. Recommendations

That the Committee:

1. ***Receive the report; and***
2. ***Note the contents.***

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