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Report to the Rural Services and Wairarapa Committee
and Environment Committee
from Dave Cameron, Regional Soil Conservator

Soil Health Monitoring 2001/2002

1. Purpose

To inform the Committee of the results of ongoing soil quality monitoring, and a soil intactness pilot scheme, undertaken during 2001/2002.

2. Background

The Regional Policy Statement for the Wellington Region outlines a vision for the future. In relation to soil this vision is:

"The soils are able to maintain their desirable physical, chemical and biological characteristics."

In "*Measuring Up*", the State of the Environment Report for the Wellington Region 1999, we tried to measure how we were progressing towards attaining this vision. Our conclusion was that we did not have sufficient information available about the quality of soils around the Region to make this assessment.

To rectify this situation in the Long Term Financial Strategy, \$25,000 per year for three years was provided to establish a baseline soil quality monitoring programme. It was part of the national "500 Soils" programme run by Landcare Research. This amount was increased to \$40,000 per year when Ministry for the Environment removed financial assistance in 2001. The programme has run for the past two years and a total of 50 sites have been monitored.

A pilot study to begin the Soil Intactness monitoring programme was completed from savings made in the Soil Quality monitoring programme during 2000/01.

3. Soil Quality Monitoring Programme

The sampling programme began with the most widespread soil in each of the intensively used groups on both the Wairarapa and Otaki plains. Intensive uses included dairying, market gardening, cropping, grazing, orchards, and indigenous bush. The sampling programme has moved onto the less widespread soils such as the Bideford, Martinborough and Tauherenikau soils in the Wairarapa, and the Manawatu and Rahui soils on the Otaki plains.

In 2002/03, the dominant hill country and steepland soils will be sampled. This will complete the initial part of the soil quality monitoring programme.

After this initial three year programme, sites were to be revisited every five years to determine trends and to address any adverse impacts on soil quality from the present uses.

4. Soil Intactness Monitoring Programme

In June 2002, Dr Doug Hicks of Ecological Research Associates was contracted to design and trial a soil intactness monitoring programme. Soil intactness expresses whether soils are staying in place. A decrease in soil intactness may reduce the land's productive capability on-site. Off-site, it may create environmental pressures, notably if soil enters waterways.

Specifically the survey indicates what areas of soil are stable, disturbed but inactive, re-vegetating, or eroding. With careful selection of land use categories, additional information can be provided such as the proportion of farmland where soil conservation plantings have been installed, and the extent of erosion on unplanted land.

The pilot survey was carried out on 1:25,000 prints of orthophotos corresponding to NZMS 260 map, sheet T26, which extends from Masterton to Riversdale.

5. Main Findings

5.1 Soil Quality

- The majority of soil quality properties (86%) fell within acceptable ranges.
- The principle issue of concern was compaction (low macroporosity) that occurred on most soils under pasture as well as under cropping land uses.

- High phosphate levels were found on two market gardens and horticulture sites, probably the effect of high fertiliser application rates.
- There was a marked loss of aggregate stability on the market garden soil.
- Appropriate management could reverse the majority of instances of poor quality.

5.2 Soil Intactness

The soil intactness results covered by the pilot survey only relate to one NZMS sheet, approximately 46,000 hectares or 5% of the Wellington Region. Approximately 15,000 hectares showed signs of instability

The results of the pilot trial are summarised in the following Table:

Landuse	% of total area surveyed	% assessed as stable	Comments
Intensive uses (vineyards, orchards, grain crops, dairy pasture)	6%	91%	<ul style="list-style-type: none"> • 79% of land under intensive use has no other vegetation present, apart from cover associated with the principle use. • 21% has secondary vegetation, mainly shelter belts.
Lowland Pasture (improved & unimproved)	33%	60%	<ul style="list-style-type: none"> • Most of the unstable land is either riverbanks and floodplains or past gully or streambank erosion. • 50% of lowland pasture has no other vegetation present • 25% has scattered tree or scrub cover • 25% has extensive tree or scrub cover.
Hill Country Pasture (improved & unimproved)	40%	21%	<ul style="list-style-type: none"> • 42% of hill country pasture has no other vegetation present • Most of the unstable land is hillsides which show signs of past mass movement or gulling. The remainder is valley bottoms.

Exotic forest & scrub	14%	23%	<ul style="list-style-type: none"> • 39% of exotic forest is closed-canopy stands • another 36% has canopy gaps with scrub, mostly re-growth amongst young pine stands • 18% has canopy gaps occupied by grass • 6% has other trees in canopy gaps some of these are hardwoods planted up gullies or along streambanks for soil conservation, while a few are remnant bush on similar sites.
Indigenous forest & scrub	5%	11%	<ul style="list-style-type: none"> • 17% of indigenous cover is closed-canopy bush, a further 12% is closed-canopy scrub • bush and scrub occupy land recognised as being too erosion prone for grazing or forestry.
Other land uses (urban, riverbeds, water bodies)	2%		<ul style="list-style-type: none"> • 57% is urban land of which 2/3 is built on and 1/3 is grassed or treed open space. • ¾ of riverbeds are bare gravel or water filled channels, the remainder have some form of tree or scrub cover, usually willows. • None of the river beds were assessed as stable.

6. Where to From Here?

A further 25 sites are currently being assessed for soil quality sampling during November 2002. This will complete the first cut of sampling for the region. The database will contain information from 75 sites.

In the next two years further sampling is proposed in areas where specific soil quality problems have been identified. This will provide greater certainty about the causes of soil quality problems and enable specific remedial actions to be identified.

Soil intactness monitoring for the entire region is proposed for 2003/04. A further 19 NZMS 260 sheets are required to be point sampled. The methodology is such that consultants can complete this for \$20,000.

Both sampling programmes are compatible with work currently being undertaken by a number of other Regional Councils. The work emanates from the Land Monitoring Group which has been working on standardising methodologies across Councils in order to meet regional and national responsibilities.

As the monitoring programme develops and its findings are further analysed, the information will help the Council develop strategies that will maintain and enhance the productive capability of soils for future generations.

7. Communication

Copies of the results of soil quality monitoring have been sent to all of the property owners who allowed us on to their land to undertake this monitoring.

The results of monitoring form the basis of the Annual Report Card for Soil which will be included in the Annual Environment Report.

8. RPS Implementation

This report gives effect to Soil Policies 9 and 10 in the Regional Policy Statement and Method 6.2.8 of the Regional Soil Plan

9. Recommendation

That the report be received and its contents noted.

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