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Report to the Landcare Committee
from Geoff Cameron, Manager, Natural Forestry

Forest Health Survey Results

1. Purpose

To advise the Committee about the results of the 1999/00 forest health survey.

2. Need for a Forest Health Survey

The Natural Forestry Department organised specific forest health surveys over the Council's natural forest estate during the last four years. The first three years were under contract with the old Ministry of Forestry. This year's survey was through Forest Health Advisory Services, a subsidiary of Forest Research Limited.

A service level for forest protection in the draft Environmental Asset Plan requires "monitoring forests for introduced insect pests and pathogens". The specific prescription is "annual formal survey by independent specialists".

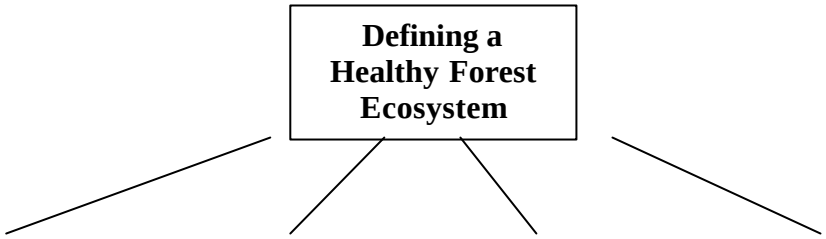
The literature on overseas experience reports that injurious biological agencies can rapidly deplete forest cover, and affect water supplies. North American forests have been affected by a number of mostly endemic insects and fungi. One report from a New Zealand official visit to eastern Russia, indicated that at the height of an Asian Gypsy Moth (AGM) infestation in the early 1990s, the Vladivostok water supply had to be shut down because of water contamination by caterpillar faeces and hairs. The AGM defoliated an entire catchment in a short period of time, hence the water problem. AGM is a serious threat to New Zealand flora, and early detection is paramount.

Locally, the white spotted tussock moth was detected early in Auckland in 1995. The area was sprayed in 1996 and tested with pheromone traps in 1997. The control programme cost over $12 million to eradicate the insect from an area of 7,000 hectares.

There are a number of pathways for pests to enter the Wellington Region. The international airport, Centre Port, Trentham Army base and international tourists using our parks, are the most obvious. There is border control, but responsible asset managers require other protection systems; this survey is one of them.

Figure 1 shows how this survey fits with ecosystem management and pest monitoring.

Figure 1 : Linking Ecosystem Protection, Ecosystem Management and Pest Monitoring



Forest Health Survey

- permanent plots
- forest stratified
- assess individual tree canopy
- looks for new insects, fungi
- looks for new pathogen / host relationship
- considers forest vitality esp. regeneration
- conducted annually

NVS Plots

- permanent plots
- measures height and diameter of marked trees
- measures number, species, height of all plants in each canopy layer
- some other recordings
- measured every five years

FCS Plots

- not fixed plots
- measures range of features
- able to record features of fauna and flora
- used to measure management results
- no fixed time frame

Pest Monitoring

- specific for each pest
- to measure pest population and results of control operation
- difficult to monitor some animal pests
- no fixed time frames

3. Developing the Survey Technique

The survey technique used in the first three years was a modification of that used for plantation forests. It had no statistical basis, was not strictly repeatable and so could not be used to observe trends. No other forest survey technique was available in New Zealand, so we discussed a range of options with forest health specialists.

With the Regional Council needs defined, an internationally recognised scientist, Dr Gordon Hosking, worked with Forest Research to design an indigenous forest health assessment system; used for the first time on the Wellington Regional Council estate.

The aim of the survey, is to detect any change in forest condition over time, with reasons. Accordingly the specific objectives of this survey were:

- to provide a baseline assessment of the health of all important forest types and tree species;

- to characterise a number of health and vitality attributes of these forests, against which the influence of present and future management strategies can be assessed;

- to identify any significant threats to the integrity of these forests, so that management action can be considered

4. Key Results from the Survey

The Survey report will be tabled, and made available in the Councillors Lounge before being placed in the Council Library.

The survey covered:

- the Akatarawa block
- the Eastern and Western Hutt Water Collection areas
- the Wainuiomata and Orongorongo Water Collection Areas.

These areas were stratified into 37 geographic areas and forest types, based on existing maps.

172 plots were set up, recorded in GPS and measured. In these 845 trees, of 31 different species, were assessed. Six plots were installed in subalpine tussock. Thirty collections of pest and disease damage were sent for Forest Research diagnosis; nothing significant was found.

For the different areas the results were:

(1) **Akatarawa (52 Plots)**

- the dominance of kamahi as a transitional species was noted in these forests;
- no plots were characterised as unhealthy or threatened;
- regeneration in the three stages of seedling, advanced growth and sapling was good to very good. In some areas the regeneration of canopy species was sparse and may reflect a long-term charge in forest structure, but the future of the forest cover was not considered at risk;
- overall the area is considered in good health. Some areas of animal damage were noted, particularly on the forest margins.

(2) **Hutt (58 Plots)**

- forests are largely beech-podocarp, with a strong element of kamahi;
- in some areas, past burns have created stands similar to those in the Akatarawas;
- most plots were healthy, with only one (high altitude beech forest) considered unhealthy because of twig and branch die back;
- regeneration was good to very good, although in a number of areas, advance growth was reduced by deer and possum browsing. This also affected the species composition of the regeneration by reducing the occurrence of palatable species;
- the forest cover was not at risk;
- animal damage is an important issue in this management area. The survey suggests deer numbers are unacceptably high and have the potential to cause long-term damage to forest structure, though not necessarily forest integrity;
- possum damage is slight and generally confirmed to kamahi. Hall's totara, usually a good indicator for possum activity, does not appear to be suffering in this management area;

- localised areas of leatherwood dieback were noted in the subalpine zone;
- the forests are in generally good health, with the key concern being the impact of deer on regeneration.

(3) **Wainuiomata/Orongorongo (56 Plots)**

- no plots classified as unhealthy or threatened;
- regeneration was considered very good. Canopy species were well represented. Some palatable species were present in the exclosure but rare or absent from much of the forest;
- animal impact was evident throughout the area, but did not appear to be having a significant effect on the health and vitality of the forest. Goats were active on the forest margins;
- the forests are generally in excellent condition. Regeneration is rarely less than adequate, and in most areas abundant beneath a healthy canopy.
- Animal damage is present but not having a significant impact on the health of these forests.

In summary, the surveyors found:

- The key forest tree species to be in good health throughout the three management areas relative to forest type, site and tree maturity.

- Overall forest health to be good to very good throughout the three management areas relative to forest type and site.

- Regeneration to be adequate to excellent throughout the forest areas assessed, although not always reflecting the canopy species.

- Animal impact, particularly on regeneration, while not considered a threat to these forests at present, requires localised monitoring.

- Current management is likely to assure the future health and vitality of these forests.

One of the primary objectives of the assessment strategy is to compare and identify changes in forest health and vitality over time. The data from this assessment is considered a very good baseline against which data from proposed future assessments can be compared to determine the effectiveness of present management strategies.

5. Comments on the Report

The Report is the first statistically based attempt at classifying forest **health**, defined in a relatively narrow way. Baseline information is now available.

The Survey and the Report did not take additional Regional Council stratification into account this time. For example the survey stratification did not take account of the various "land management areas" or Key Native Ecosystems defined in the Environmental Asset Management Plan. To do so would have required a significant number of extra plots. Nevertheless, the Survey is still built into the Environmental Management Functions and Standards, and the results will be used to set the health standards for Key Native Ecosystems.

The Report is not a detailed dissertation on animal control. It makes the point that animal control is an important issue in the Hutt Catchment. This is due to the animals' ability to adversely affect the forest structure in a critical area. High deer numbers in the past have reduced the forest biomass to such an extent that it now needs relatively few deer to keep the biomass at low levels. (Personal comment from Dr Ian Payton, Landcare Research Scientist.)

In the Wainuiomata Catchment, the forests are lower altitude, more vigorous and have greater botanical diversity. Hence the comment that animals "did not appear to be having a significant impact on the health and vitality of the forest". However, Landcare staff have focussed on another comment in the Report "some palatable species....but rare or absent from much of the forest" as indicative of not meeting KNE standards and therefore requiring active animal pest control. As seen in Figure 1, pest monitoring is different from the forest health survey, but both contribute in their own ways to healthy forest ecosystems.

6. Future Surveys

The Long-term Financial Strategy allows a repeat of this survey each year, in keeping with the Level of Service prescribed in the Environmental Asset Plan. Next year, the Pakuratahi forest will be surveyed, to alternate with the Akatarawa. Both water collection areas will be resurveyed, given the public health imperative of those areas.

The plot locations will be entered into the Council's GIS, and attribute databases attached so that future trends can easily be analysed.

7. Communication

This is a technical issue and fits with a number of issues relating to stewardship of the Council's environmental assets. It can be used when developing information on this Council's Stewardship role. Discussions are underway with the survey designer and with Forest Research about an article on the New Zealand Journal of Forestry.

8. Recommendation

That the report be received and its contents noted.

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