

Value of environmental-impact monitoring to forest management under the Resource Management Act : Mangatu Forest

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Before the introduction of the Resource Management Act concerns were being expressed about how to harvest Mangatu Forest, if at all, without causing severe environmental damage. With the passing of the Resource Management Act attention has been drawn nationwide to the impacts of forest operations on the environment. Although the process of gathering information and monitoring forest operations is a statutory requirement of Regional Councils, the fourth schedule of the RMA can require consent applicants to provide detailed assessments of effects of activities on the environment. The forest industry must therefore consider implementing programmes to collect relevant information that will both facilitate consent procedures and assist forest management with planning strategies that require little intervention from regulatory authorities.

This article outlines the value of a monitoring programme designed to record and report on environmental impacts of harvesting operations at Mangatu Forest; a programme initiated voluntarily by forest management. The responsibility of providing an independent assessment of the environmental impacts of harvesting operations was contracted to Manaaki Whenua – Landcare Research. Monitoring began on day-one of harvesting.

Background

Mangatu Forest was planted as a dual-purpose forest to provide increased slope stability and reduced erosion and to attain sustainable timber production from land not suitable for continued pastoral farming. The forest is well known, both locally and nationally, as a success story for erosion control. It is also seen as a significant

wood resource for the region. However, a perception widely held by the community is that this forest was planted to halt erosion and reduce flooding, which could be accentuated or reactivated by any logging.

The Government and the forest industry also had their concerns. Government-funded research programmes on forest hydrology and erosion process were initiated in the 1980s to assess environmental impacts of clearfelling stands of mature exotic forest on unstable terrain. In addition, several conventional ground-based harvesting techniques were compared by measuring their impacts on slope stability, soil compaction, and soil disturbance. Harvest planning for part of this forest was completed three years in advance of logging.

Political and public interest focused on Mangatu Forest as the date for starting large-scale harvesting neared. In 1990 a two-year stumpage sale agreement for 130,000 tonnes per annum was finalised. The proposed method of logging was by heavy-lift helicopter. Because of the level of concern forest management considered an independently conducted Environmental Impact Assessment (EIA) a necessary prerequisite. This was undertaken by the Forest and Wildland Ecosystems Division (now part of Manaaki Whenua – Landcare Research) of the former Forest Research Institute. As an additional safeguard against undue environmental damage all heli-logged cut-overs were monitored, and findings were reported monthly to management.

In 1991 commercial ground-based and hauler logging operations began at Mangatu, bringing renewed fears of environmental damage.

Monitoring at Mangatu

Cut-overs are inspected at predetermined intervals and a written report is given to management within seven days. There are

three readily identifiable impacts associated with logging practices at Mangatu: slope scarification, slash in watercourses, and soil mobilisation from man-made construction sites.

Field inspections of cut-overs focus on the cause(s) and severity of impact, and the primary objective of the reporting procedure is to recommend action to lessen both the on-site and off-site impacts of harvesting operations, including:

- * improving road and landing design, placement, and construction techniques;
- * control of surface water runoff by adequate water table design, culvert placement, and use of flumes;
- * protection of watercourses from machine disturbance, unnecessary removal of live vegetation from riparian zones, and undue input of sediment or slash into watercourses;
- * reduction of severity of soil disturbance on cut-overs during the harvesting operation;
- * post-construction maintenance of landings, roads, watertables, culverts, and flumes;
- * post-harvest removal of temporary water crossings and slash from watercourses;
- * monitoring of post-harvest soil mobilisation on cut-overs;
- * rehabilitation of batter and fill slopes;
- * mapping of post-harvest slope failures, collapsed man-made structures, and zones of active watercourse scouring.

From experience it appears that monthly monitoring and reporting may have been too frequent. Management found it difficult to organise for remedial works to be undertaken before the next inspection. Priorities for staff and equipment are by necessity geared to meeting market demands, with remedial work being of lesser priority.

It is recommended therefore that future monitoring programmes be implemented

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Harvesting operations (foreground) in steep erosion-prone hill country (background), monitored for environmental impacts, Oil Springs Creek, Mangatu Forest. Note the use of the aggraded streambed during periods of low summer flow for landing sites. (M. Marden)

at intervals appropriate to the sensitivity of the environment being monitored, taking into account the level of concern of the public and/or local authorities towards forest activities. As a general rule, the greater the sensitivity of the environment and the potential for on-site impacts of forest activities to affect downstream ecosystems, the greater the requirement for regular and frequent monitoring of activities. The frequency of monitoring may also be designed to reflect the intensity of forest activities, with more frequent monitoring to coincide with periods of increased activity, such as road and landing construction, or to reflect periods of greater or lesser risk, perhaps as a consequence of extremes in local climatic conditions.

Through cooperation with local authorities and research organisations, forest management have succeeded in reducing the short-term on-site environmental impacts of harvesting to an acceptable level. Improvements were gradual as operational skills were honed and as respect for the environment increased, with greater awareness of the consequences of environmental damage among forest management and ground crews alike. Regulatory authorities too have benefited from open and frank discussions and have come to appreciate some of the problems asso-

ciated with reconciling environmental and commercial forestry interests in difficult terrain (Marden and Saunders, 1992). Consultation has at times been difficult as issues change, techniques change, and theories change, giving rise to uncertainty, inconsistency, and occasionally mistrust.

Nonetheless, since harvesting began at Mangatu three factors have clearly been responsible for the forest harvesting operation being conducted to the satisfaction of all concerned and in compliance with the spirit of the Resource Management Act:

- * the early identification of environmental values and specific hazards;
- * the monitoring of harvesting impacts throughout the term of the harvesting operations;
- * the maintaining of open lines of communication with the public and, in particular, with those local authorities that have a vested and/or regulatory role in forest activities.

Benefits of monitoring

Many forests throughout New Zealand do not have a database of site-specific research findings to use in environmental management issues. For these forests environmental monitoring programmes are an effective means of collecting a con-

tinuum of information from which impact trends will emerge and from which the effectiveness of adopted recommendations can be gauged.

Monitoring of impacts throughout the term of a harvesting operation allows for the early identification of environmental values and specific hazards. In the longer term, information gathered during monitoring programmes will create an invaluable database to be used by successive forest managers and/or owners.

The acceptance and credibility of information contained in monitoring reports is enhanced when such monitoring is undertaken by experienced personnel who are independent of the forest industry, local authorities, and pressure groups, and whose opinion is free of conflict. The neutrality of the auditor assumes greater importance should an abatement notice be served and differences of opinion have to be settled by litigation.

Experienced auditors trained in science adopt a systematic and consistent approach to monitoring. Consistency over time can lead to the establishment of self-imposed 'benchmark standards' to which forest managers and operators can work and against which management can compare their performance with standards set by regulatory authorities.

Problems with monitoring

Sometimes industry-funded information may not be released to local authorities, or industry may choose to be selective when disclosing the contents of an independent auditor's assessment of environmental impacts of forest activities. Issues of importance identified by the auditor may therefore be closeted until forced into the open through other channels or as a consequence of events.

Occasionally, advice to forest management by the monitoring auditor may conflict with that given by the local regulatory authority. Conflict can, however, prompt discussion between concerned parties to arrive at an acceptable working solution. Sometimes the presence of a third party may help diffuse potential conflicts between forest management and local regulatory authorities.

Forest management can be reluctant to enlist the services of an auditor/consultant to monitor environmental impacts of forest activities because:

- * auditors may have a bias towards conservation and environmental issues that will influence the outcome of monitoring inspections and reports;
- * auditors/consultants with environmental monitoring expertise may not be sufficiently experienced in plantation forestry objectives;
- * success of monitoring programmes may largely depend on the calibre of the individual undertaking the work;
- * potential for auditor/consultants to meddle in operational processes.

Improvements

Results from industry-funded environmental monitoring programmes should be made more freely available to interested parties and in particular to regulatory authorities. Only by maintaining open lines of communication and fostering discussion can solutions to environmental issues be found and conflicts between parties avoided.

Management needs a greater commitment to:

- * promoting more awareness of the consequences of environmental damage among forest management and ground crews, so that both jointly work towards finding workable solutions;
- * undertaking environmental monitoring programmes, particularly in forests where environmental issues have not previously been researched and no database of background information exists;
- * ensuring that recommendations speci-



The impacts of heli-logged cut-overs within an environmentally sensitive catchment at Mangatu Forest were monitored and findings reported to Management. (M. Marden)

fied in impact-monitoring reports are carried out promptly and efficiently and that sufficient finance, machinery, and personnel are available to undertake remedial work at short notice;

- * designing monitoring requirements around management objectives.

"If the forest industry wants the certainty of permitted activities, realistic consent conditions, and to be viewed as 'natural conservationists' then it is in their best interests to ... monitor their own compliance with consent condi-

tions ... monitor background environmental standards and fund research. The outcome they are seeking is environmentally friendly forest management which requires little regulation. That must be beneficial for everyone!" (pers. comm. Gisborne District Council).

References

Marden, M., and H. Saunders. 1992: Harvest at Mangatu: terrain on a tightrope. *New Zealand Forest Industries* 23(8): 60-61.