implied discount rates in recent transactions is summarised in Table 2. Forests are described by location and size class (Small <1000 ha; Medium 1000 to 10,000 ha; Large >10,000 ha).

There is variation in the implied discount rate of different transactions and also between the discount rates that different forest valuers have estimated for the same transaction. This is particularly so for the medium forest in Canterbury for which the two estimates of the implied discount rate to be applied to pre-tax cashflows are lower than the third valuer's estimate of the implied discount rate to be applied to post-tax cashflows. The valuers providing these estimates clearly had different assumptions about yields or prices. This illustrates the requirement for consistency stated in the Guidance Notes on Discount Rate in the NZIF Forest Valuation Standard: "*If a discount rate is derived using transaction evidence it should be derived using the same set of assumptions (taxation, borrowing, log prices, log price increases) as will be used in valuation of the target forest.*"

Market activity subsequent to the survey

FCF

On 12 September FCF reported a forest value (including crop and land) of $728 million. This was calculated using prices from the previous 2 quarters rather than the previous convention of using a 12 quarter average. FCF log prices for the last 2 quarters prior to June 2003 were 15% below average prices for the 12 quarters prior to June 2003. In addition, FCF increased the effective discount rate applied to post-tax cashflows from 8.0% to 9.75%.

The annual results were followed on 15 September by an announcement that FCF had signed a letter of intent to sell the forests to The Campbell Group for $685 million. FCF subsequently announced, on 8 October, that a variation to this letter of intent had been negotiated to enable consideration of a competing bid of $725 million by Kiwi Forests Group. Due diligence and negotiations are proceeding.

CNIFP

On 24 October it was reported that the 165,000 ha Central North Island Forest Partnership estate had been sold to GMO Renewable Resources acting for the Harvard Management Company. Details of the sale are confidential at this stage.

White-spotted tussock moth response – how good was it?

Gordon Hosking*

Learning from past experience does not seem to be one of the more obvious attributes of the human race. Despite this, and at the risk of attempting to push the proverbial uphill, Forest Research has recently completed a comparison of the white-spotted tussock moth response with currently accepted best practice (Hosking 2003), with the aim of improving performance in similar operations in the future. The comparison draws on extensive documentation of Operation Ever Green, the personal experience of those involved, and a recently published review of 'best practice' in incursion response (Myers & Hosking 2002, Hosking 2002).

The comparison is broken down into the major response phases of detection, evaluation, response decision, operation, monitoring and review, within each of which key activities were evaluated. The review attempts to provide a performance rating against best practice for each phase and the results are summarised below.

The **Detection** phase was rated only 3/10 against best practice. The white-spotted tussock moth was not found by any formal survey but by a member of the public. A resident of the heavily infested zone, having noted the distinctive caterpillars, claims to have called a Government agency in October 1995 without success, six months before the flag was raised. Capitalising on public involvement could contribute significantly to the early detection of new pests and diseases, but requires obvious and responsive pathways for diagnosis and information.

Performance in the **Evaluation** phase was good and rated 8/10. Ground assessment of the problem was excellent, as was consultation with affected parties and the involvement of specialist expertise. Two areas where improvement could have been made were: (i) the explicit involvement of the affected community from day one, and (ii) the use of spatial information management in delimiting survey data collection. However, it should be acknowledged that, in 1996, neither the routine use nor the accuracy of GPS units was anything like that of today.

The **Response Decision** phase also rated highly at 8/10, and included a rigorous evaluation of the problem by a well-balanced group representative of all affected parties, with the exception of the affected community. Although the response decision was well documented and unanimously agreed, it was not supported by a formal evaluation report. The production of such a report and the involvement of community representation would enhance this phase in future responses.

The **Operation** itself involved one major short-coming,

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the failure to give priority to the development of a comprehensive operational plan. Such a plan should have been the primary reference for all activities and, as a live document, constantly updated to reflect changes in strategy and new decisions. While the operation was not seriously compromised by this failure, due to the close integration of the operational, science and policy teams, it would have improved communication and provided greater documentation of the response. The operational phase was rated 7/10 with all other key activities undertaken to a high level. It would have been further enhanced by follow-up environmental impact monitoring and also by a comprehensive review at its conclusion.

Monitoring was carried out to a high standard across the whole programme and provided a high level of confidence to the true extent, stage, and density of the target insect population, and the efficacy and coverage of the spray programme. Both health monitoring and community support was effectively managed, with the overall monitoring phase rated 9/10, its only failure being the lack of follow-up environmental monitoring of the fate and impact of Btk.

The final phase, **Review,** was the most notable failure of the white-spotted tussock moth programme, and potentially had the greatest long term impact through a failure to document and learn from such an outstanding success. Not only was a review not undertaken, but little effort was made to protect records and data, and no formal account of the programme was produced. The review phase was rated 1/10 against best practice, and its failure has been reflected in the costly mistakes of a similar subsequent operation.

The key lessons which can be learnt from the white-spotted tussock moth operation are:

- the need to capitalise on the eyes of the community in the detection of new pests and diseases, by providing well defined and responsive pathways for public involvement;
- that an operational plan is an essential tool once response is underway and needs to be afforded the highest priority and expertise;
- the review, documentation and evaluation of a response, whether a success or failure, is critical to improving performance in the future.

The successful white-spotted tussock moth eradication made little contribution to the closely related painted apple moth programme just a few years later. New Zealand can ill afford to squander such intellectual capital and experience, given the magnitude of challenges involved in effective biosecurity.

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Response of red beech to fertiliser, Island Block coal mine, North Westland

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Restoration of mine sites to indigenous vegetation is now generally a standard condition of access arrangements for mining on public conservation land. However, the overburden materials associated with mine sites, especially when soil is not available, presents serious problems for the establishment of forest species particularly because of shortages of nitrogen and phosphorous. This note examines the fertiliser response of field grown red beech (*Nothofagus fusca*) established on sandstone and siltstone overburden from the Island Block open-cast coal mine, north Westland (42°10' S, 172°58' E, 760m a.s.l.).

After ripping to 1 m, the restoration trial was established during winter 1985 using 3-year old bare-rooted red beech. The fertiliser trial was established in November 1991 when fertiliser was applied to two of four 14 x 15 m plots at an application rate of 110 g diammonium phosphate (DAP; 18% N and 20% P) per plant and applied in one spade slot in the ground approximately 15 cm from the plant. Plant height was measured at the time of fertilisation and again in November 1993. A second fertiliser treatment was applied in October 1994 using 150 g DAP per plant. During October 1996, following the obvious red beech response to fertiliser, mine staff inadvertently fertilised all plants in the trial with approximately 100 g DAP per plant. Plants were not re-measured at this time. No subsequent fertiliser additions were made with final plant measurements in March 2001.

Fertilised red beech put on substantially more height growth than unfertilised plants, with no overlap of 95% confidence intervals in either 1993 or 2001 (Fig. 1).

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