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LONG-TERM POSSUM CONTROL: GETTING THE FRAMEWORK RIGHT

(Short Answers in Conservation Science)

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LONG-TERM POSSUM CONTROL : GETTING THE FRAMEWORK RIGHT

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1. Background

This report is in response to advice sought from Kath Walker, CAS, Nelson and follows on from a meeting held with DoC staff at Nelson on 4 June 1992. Two formal questions were posed in the request for unprogrammed science services:

(a) *"What criteria (additional to those in Parkes' priority rating of areas) should DoC be considering in selecting mainland 'islands' for long-term possum control?"*

(b) "What is the most cost-effective technique to rapidly survey the forest types of Northwest Nelson and assess the present impact of possums?"

2. Introduction

The aim of possum control is to protect conservation values, not to kill possums *per se.* Because resources for control are limited, attempts to protect everything everywhere are unlikely to provide sustained protection. There are three essential ingredients for ensuring an effective long-term possum control strategy: selecting the most appropriate areas, establishing a baseline, and monitoring the effectiveness of control.

Of course, other factors such as selecting the most effective control techniques within the prescribed budget must also be considered. These technical details will fall into place once the framework for providing sustained protection has been established.

3. Selecting the most appropriate areas

3.1 Knowledge of the resource

Selecting the most appropriate areas for long-term possum control requires definition of the specific conservation values to be protected. This requires knowledge of the resource, including: patterns of ecosystem composition and individual species abundance, the extent and severity of possum-induced modification, and the history and density of possum populations.

The resource information need not be highly detailed (e.g, mapped at 1: 250 000 or 1:50 000), and much of it can be obtained from reviewing available information. If necessary, rapid field reconnaissance techniques can be used to fill information gaps. Information gathered at this stage can also be used to establish baseline condition for future monitoring (Section 3).

3.2 Importance of "common" ecosystems

Presently available techniques for ranking vegetation and wildlife conservation values provide a guide to selecting appropriate areas, both nationally and regionally. However, they tend to stress "special" values such as endemism, rareness, and distributional limits (see Warburton & Coleman 1992). The inherent value of "common" ecosystems and species, that are actually more representative of the region, tends to be under-estimated (see Ogden 1991).

Although it is easy to sympathise with highly vulnerable, threatened, or otherwise special species, it should be remembered that such species live in ecosystems. Conservation of threatened species (e.g., kaka, land snails) may be heavily dependent on maintaining the health of common forest types (e.g., rata-kamahi and beech forest). An holistic approach is therefore required: the aim should be to protect ecosystems.

3.3 Assessing ecosystem susceptibility

Ecosystems that are highly susceptible to possums, i.e., that contain abundant possum-preferred biota, should rank highly for possum control. The ranking will be particularly high if they also contain threatened or endangered species.

Where data on forest composition is available, e.g., from past surveys, the relative susceptibility of different forest types and areas can be inferred from the distribution and abundance of key possum-preferred canopy and understorey species. In addition, or where compositional data is lacking, rapid reconnaissance can be used to assess and map the abundance of species such as southern rata (Rose *et al.* 1990).

Forest composition, diversity, and susceptibility frequently reflect the distribution of different rock types. Geological information can therefore be helpful in assessing forest susceptibility (Stewart & Rose 1988; Rose *et al.* 1990)

3.4 Assessing possum-induced modification

Long-term possum control will be most effective in protecting conservation values in areas where possum populations have not yet caused substantial modification.

A combination of reviewing available information and the use of recently developed field techniques provides a cost-effective means for assessing possum impact. Remote-sensing, such as recent aerial photographs (up to about 1: 25 000) can be used to assess dieback where the canopy is dominated by susceptible species (Rose *et al.* 1992). However, this would prove difficult or impossible in the beech-dominated forests of many parts of Nelson-Marlborough. Rapid reconnaissance techniques, involving ground-based and aerial inspections, have been developed for similar forests in South Westland and would be appropriate in Nelson-Marlborough (Rose *et al.* 1988, 1990, 1992, 1993, in press). For example, mature and seral forest dieback and canopy cover of southern rata was assessed and mapped in about 10 hours for 156 000 ha of forest in South Westland. For your Conservancy, further cost-savings may be obtained by first identifying areas you definitely do not want assessed.

3.5 Assessing possum history and density

High priority should be placed on areas with a short history of occupation by possums. Information on possum liberation and spread can be obtained by reviewing available information (e.g., Pracy 1974) and from patterns of possum-induced modification (Section 3.3).

3.6 Importance of geographical barriers

If possible areas selected for possum control should have some degree of geographical isolation to minimise immigration of possums.

4. Assessing baseline condition and monitoring

Monitoring is an essential part of a possum control programme, e.g., to determine whether the programme is being successful, to determine the need to modify control or management practices, and to make a case for continued, increased, or redistributed control effort in the future.

It is insufficient to just monitor possum numbers because the effectiveness of possum control is not simply measured from the numbers of possums killed. Control is only effective if it provides sustained protection of threatened conservation values. This cannot be determined unless the impacts of possums on specific conservation values are monitored.

Establishing a baseline is an essential prerequisite for monitoring. Much of the information will already have been gathered in the process of selecting areas (Section 2).

Monitoring need not be expensive. If the objectives are clearly thought out, monitoring can be restricted to key attributes that are sensitive indicators of possum impact. For example, a cost-effective programme could include a two-tiered approach (Rose et al 1993):

* broad-scale aerial monitoring of vulnerable dominant trees to provide an estimate of 'overall ecosystem integrity' (e.g., rata, Hall's totara).

* finer-scale monitoring of rapid-response, highly vulnerable indicator species in key locations (e.g., fuchsia, mistletoe, land snails, kaka).

5. Recommendations

* A multi-disciplinary team should be contracted to select the most appropriate areas for possum control in Nelson-Marlborough, using a wider brief than indicated by presently used ranking techniques (as indicated in Section 3). Selection should involve a review of available information and the gathering of new information, where required.

* Techniques recently developed for central and South Westland should be used for rapid assessment of possum impact in Nelson-Marlborough.

* All control operations should be closely monitored. Monitoring should involve assessment of possum impact, not simply possum density. A two-tiered approach, as used in South Westland is appropriate.

6. References

Ogden, J. 1991: Common plants are not a soft option. *New Zealand Journal of Ecology 15:* 109-111.

Pracy, L.T. 1974: Introduction and liberation of the opossum (*Trichosurus vulpecula*) into New Zealand. New Zealand Forest Service Information Series No. 45. New Zealand Forest Service, Wellington. 28 p.

Rose, A.B.; Pekelharing C.J.; Platt, K.H. 1988: Canopy mortality in Westland rata/kamahi forests. In: Batcheler, C. L.; Cowan, P. E (Eds.): Review of the status of the possum (*Trichosurus vulpecula*) in New Zealand. Pp. 27-34. Forestry Research Centre, Forest Research Institute, Christchurch and Ecology Division, Department of Scientific and Industrial Research, Lower Hutt.

Rose, A.B.; Pekelharing C.J.; Platt, K.H.; O'Donnell, C.F.J.; Hall, G.M.J. 1990: Impact of brush -tailed possums on forest ecosystems, South Westland. Forest Research Institute Contract Report 90/52. 35 p.

Rose, A.B.; Pekelharing, C.J. Platt, K.H. 1992: Magnitude of canopy dieback and implications for conservation of southern rata-kamahi (*Metrosideros umbellata-Weinmannia racemosa*) forests, central Westland, New Zealand. *New Zealand Journal of Ecology 16:* 23-32.

Rose, A.B.; Pekelharing, C.J. 1993: The impact of controlled and uncontrolled possum populations on susceptible plant species, South Westland. Landcare Research Contract Report (in press).

Rose, A.B.; Pekelharing, C.J.; Platt, K.H.; Woolmore, C.B. (in press): Impact of invading brushtail possum populations on mixed beech-broadleaved forests, South Westland. *New Zealand Journal of Ecology*.

Stewart, G.H.; Rose, A.B. 1988: Factors predisposing rata-kamahi (*Metrosideros umbellata -Weinmannia racemosa*) forests to canopy dieback, Westland, New Zealand. *GeoJournal* 17: 217-223.

Warburton, B.; Coleman, J.D. 1992: Possum management in New Zealand. A draft plan for the Department of Conservation. Forest Research Institute Contract Report FWE92/35.