Context Case Studies

I. Case Studies

Case Study – Protection and Management of Egmont National Park

Egmont National Park is important nationally for its diverse range of vegetation, and the presence of many threatened plant and animal species e.g. the alpine plant *Melicytus drucei,* North Island brown kiwi, blue duck, New Zealand Falcon and long-tailed cuckoo. It provides a good case study of the benefits aerial 1080 operations have brought to the park's biodiversity values that could not have been provided by ground-based approaches alone.

Although ecologists have recognised possums as a significant pest and threat to the park for about 50 years, it was not until 1993 that control across the entire park was implemented. The decision to intervene was based on observations of declines in species (e.g. northern rata, Hall's totara and pahautea or mountain cedar) and ecosystems. There was also concern that, had the high level of possum browse continued, there would be a catastrophic collapse of some of the ecosystems in the park e.g. rata/kamahi forests, which had suffered significant damage elsewhere in New Zealand.

Due to the park's size (33,500 hectares) and because much of it is remote, densely vegetated and rugged, the Department of Conservation relied heavily on aerial application of 1080 to achieve control of possums. The main goal of the control programme has been to maintain the vegetative cover of the forest canopy and halt the loss of possum-preferred species such as northern rata, kamahi and Hall's totara.

Following the 1993/94 aerial 1080 operation, there was a 70-80% reduction in possum numbers. Extensive monitoring of natural and reticulated water supplies was undertaken, and no measurable contamination of water by 1080 was found. Similarly, no decline in native bird populations was recorded. In contrast, there was a significant improvement in the condition of forest trees that were being monitored. Possum browse on Hall's totara and pahautea was reduced to almost zero.

A second aerial 1080 operation was completed in 2002/03. Possum monitoring using the Residual Trap Catch Index produced excellent RTCI values of 0.8% above 650 m and 1.2% below 650 m. Monitoring undertaken following the operation indicated that there was no detrimental impact on forest bird populations and no 1080 was detected in water samples taken from within the park. Preliminary analysis of vegetation monitoring conducted in 2003/2004 indicates that the conservation goal is being achieved.

Spreading 1080 by air was, and continues to be, the only practical, efficient and effective method of achieving possum control on this scale. The size of the park, its dense vegetation and its rugged terrain make it extremely difficult for workers to cover the ground on foot. Weather conditions are very changeable and frequent spells of wet weather reduce the effectiveness of ground control programmes and increase their expense.

Current costs are approximately $15 per hectare for aerial control, whereas estimates from independent contractors for ground control work in Taranaki range from three to five times that cost. Based on current resources, if 1080 was no longer available then, at best, only a third of the park could be treated. The goal of maintaining the vegetative cover of the forest canopy and whole ecosystem processes across the park would be unachievable and the emphasis of possum control would have to be scaled back to only protecting the most

vulnerable species at localised sites. Canopy collapse over large areas of the Park would again become likely in the future. Figures 1 and 2 show the difference between the area within Egmont National Park that can be protected with 1080 versus what could be maintained without the use of 1080 respectively

Figure 1 | Area of Egmont National Park protected with 1080

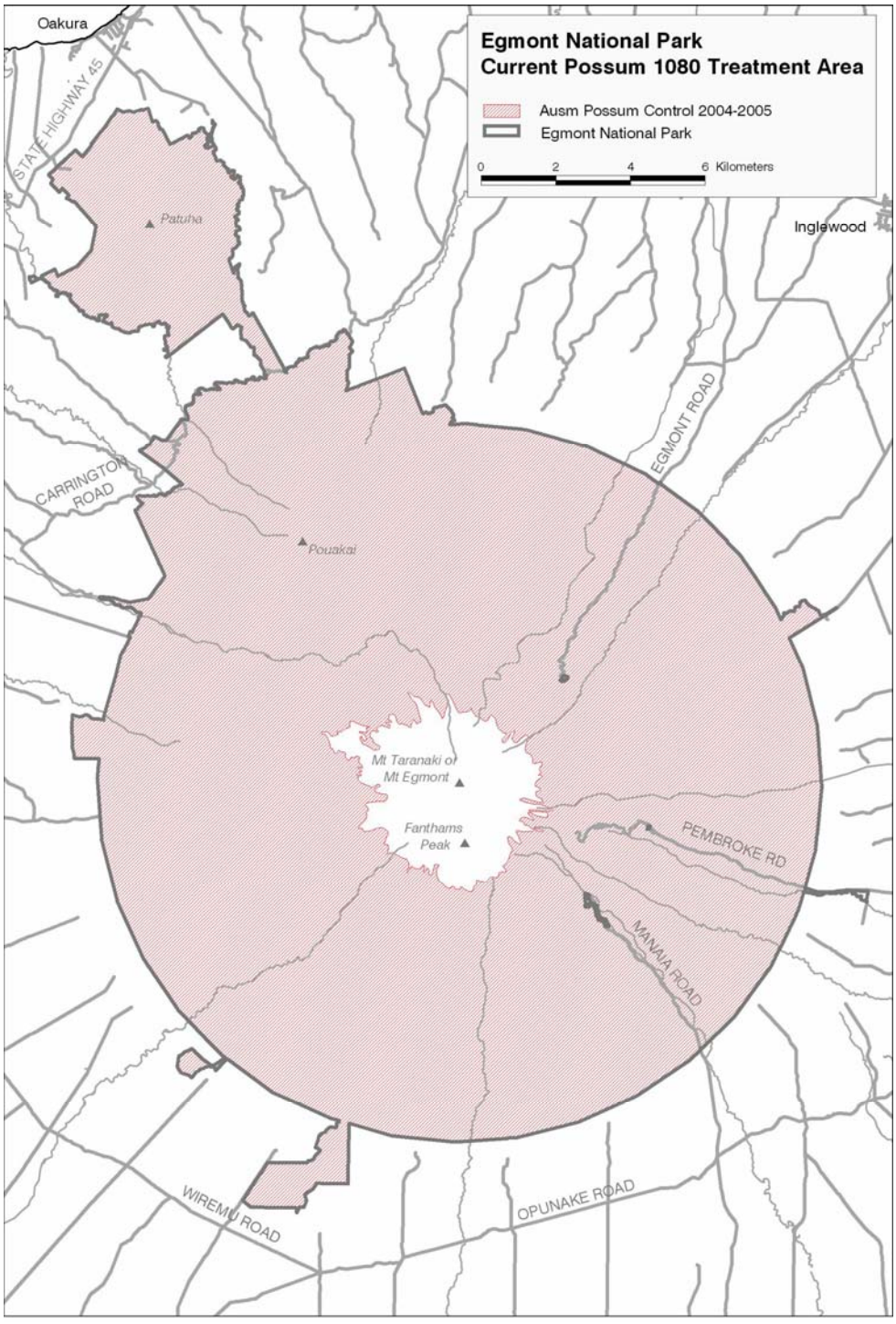
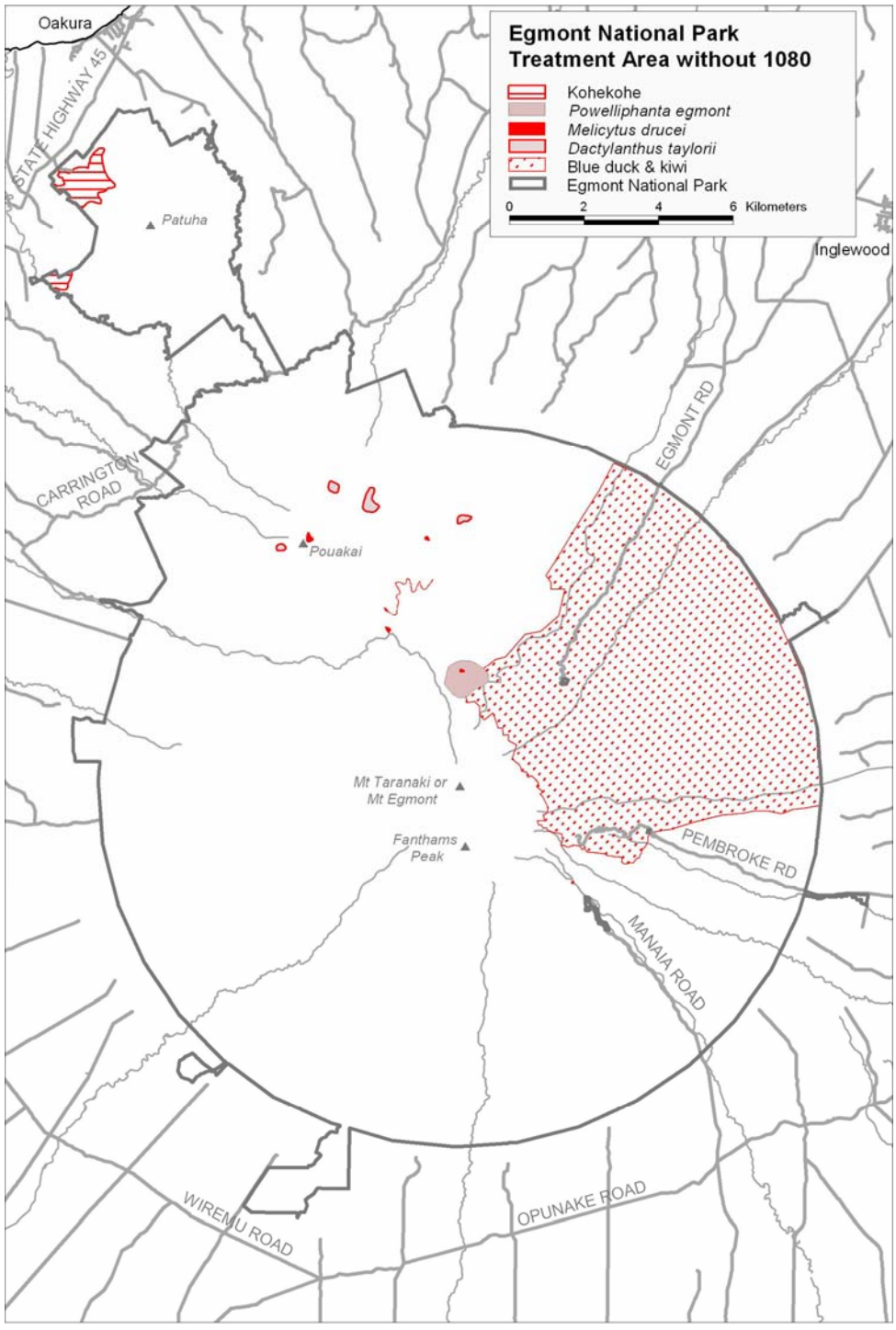


Figure 2 | Area of Egmont National Park protected without 1080



Case Study – The North Island Kokako

The North Island Kokako (*Callaeas cinerea wilsoni*) is ranked as nationally endangered – the second highest category of threat for possible extinction (Hitchmough 2001). Past declines in North Island kokako populations were largely due to predation of eggs, chicks and adults by ship rats and possums during the nesting season (Innes *et al.* 1999).

Research over the past two decades has shown that effective, sustained management of ship rats and possums will reverse population declines (Innes *et al*. 1999; Basse *et al*. 2003). Establishing both the safety and efficacy of 1080 bait formulations for the conservation management of kokako was a key component of the research.

Initial non-toxic bait trials determined that kokako were unlikely to eat 1080 baits. Kokako were then monitored through both 1080 aerial and 1080 bait station operations. All results indicated the risks to kokako are extremely low from 1080 operations using the current bait formulations.

During an eight-year adaptive management trial, the control of pests significantly increased kokako chick production and, as a consequence, adult kokako populations increased at three sites (Innes *et al.* 1999). Aerial and bait station use of 1080 effectively controlled possums and rats during the majority of the operations (Innes *et al.* 1995, Innes *et al.* 1999). Kokako at Mapara and Rotoehu succeeded in fledging young in only 14% of nesting attempts without pest control. With pest control, however, this figure increased to 49%. Kokako at Mapara increased from 5 to 45 pairs with 8 years of pest management.

However, pest control must be highly effective in order to achieve such outcomes. Innes *et al.* (1999) show that possum abundance must be below 1% trap-catch and ship-rats below 5% tracking to achieve kokako nest success of 50% or greater. At the three study sites the desired level of possum and ship rat control was achieved 11 times from 13 attempts, five of the successful operations used aerial 1080 and one used 1080 in bait stations. These were interspersed with operations using anticoagulant toxins in bait-stations.

Recommendations from this research are now being implemented by site managers elsewhere to protect kokako. This has led to a 50% growth in the national total number of kokako, from a low of an estimated 370 pairs in 1995 to 554 pairs in 2004. Prior to 1995, kokako were in decline and may have been critically endangered (the highest extinction threat category) by now without management. 1080 was the key tool in achieving this remarkable recovery and continues to be a major part of ongoing pest management to improve the status of kokako populations. Being able to use a variety of pest control tools with differing modes of action is essential to reduce the risk of target pests developing bait aversion or toxin resistance.

Case Study – Bovine Tb Vector Control in the Hauhungaroa Range

Shrouded in dense native bush, the Hauhungaroa Range is situated in the central North Island and covers some 83,000 hectares. Since the early 1970s, Tb infected possum populations in the range have been associated with Tb infection in cattle and deer herds in surrounding areas. In order to reduce herd infection rates, possum control has been undertaken from time to time in parts of the range adjacent to infected herds. However this only provided short term relief and infection continued to persist around the range.

Due to the large area and difficult access to many parts of the Hauhungaroas, undertaking possum control over the entire area in one operation was not seriously considered until 2004 when the Animal Health Board made a commitment to eradicate Tb from the area. After considering all possum control options and, given the sheer size of the operation and the nature of the terrain, the most practical, efficient and cost-effective way to undertake vector control was to use aerial application of 1080. In April 2005 the largest single possum control operation ever attempted commenced with the Hauhungaroas being aerially pre-fed twice with non-toxic bait – this was carried out to ensure a greater acceptance by possums of the bait. Toxic bait was then applied during the period May to August. Given the popularity of the Hauhungaroas with deer hunters, a deer repellent was applied to the toxic bait over approximately 25,000 hectares of conservation estate and private lands.

The aim of the operation was to eradicate Tb by reducing the number of Tb vectors to a level at which the disease could no longer be sustained. The performance target for this operation was set at a 2% RTC. This was successfully achieved with a mean RTC of 0.047% being achieved – this equates to 8 possums being caught over a total of 16,170 trap nights (539 trap lines, consisting of 10 traps per line being set for three nights).

By uniformly reducing the possum density to such a low level, Tb eradication may well be achieved, as there will be insufficient hosts for the disease to be maintained. Major conservation benefits are also expected. Through the use of deer repellent in some areas, the deer population was not adversely affected, to the benefit of the hunting community.

Since the operation, there have been positive signs for local farmers with the number of infected herds declining and many local residents commenting on the number of native birds being greater than in previous years.

There are several accessible sites where visitors can see the benefits for themselves, such as the viewing tower at Pureora Headquarters (Pikiariki Reserve), Kakaho Road, Waihora Lagoon, Waihaha Hut track and Piropiro Flats.

Case Study – The Southern New Zealand Dotterel

The Southern New Zealand Dotterel (*Charadrius obscurus obscurus*) is an endangered species listed as nationally critical (Hitchmough 2001). It was once widespread in the South Island but there are no recent records of it breeding there (Dowding 1994). It now breeds solely on the alpine tops of Stewart Island. A population of about 350 birds survived on Stewart Island until the early 1950s, but subsequently declined and reached a low of 62 in 1992. Predation of adults, particularly males, by feral cats (and possibly rats) is thought to be the main reason for this decline (Dowding and Murphy 1993).

The Dotterel Recovery Plan (Dowding 1993) set a target of restoring the population to 250 birds by 2011 through predator control at the bird's main breeding sites between mid-August and the end of the following February. Feral cat control was initiated in 1993. Unfortunately, the isolated nature of the breeding sites means that they are not easily accessible. Trapping cats at the breeding sites is not considered feasible because there is no proven kill trap for cats, and leg-hold and cage traps must be checked daily which would require a person to be present at each of the five main breeding sites for six months of the year. It was therefore decided to use the only poison registered for cats, 0.10% 1080 feral cat bait.

Bait stations were set out at 50m to 70m intervals above the scrub-line in a cordon around dotterel nesting areas. Bait stations were filled and checked fortnightly over the dotterel's breeding season. Between 15 and 20 cat assigned bait takes occured each year.

Southern New Zealand Dotterel numbers have increased to 253 birds as a result of the feral cat control programme. The bird remains highly endangered, and its long-term survival and growth appear to depend very largely on continuing cat control – with 1080 playing a critical role.