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37 Jun -00	4		Monitoring of *Dactylanthus..*At Te Kopia, even with low possum numbers following last winter's 1080 operation any uncaged flowers were still destroyed.
48 Apr -03	4		kokako: Hunua Ranges Management Block: There were seven nesting attempts, of which five failed due to flooding and suspected harrier and possum predation.
45 Jun-02	4	Auckland	Moturemu Island: there are a number of seedlings that have germinated from the natural seedbank on the island. These are in a natural tree gap that has been kept open by trimming back native foliage (pohutukawa and houpara). [browsing increasing biodiversity]
41 Jun -01	7	Bay of Plenty	*Dactylanthus:* where most plants are caged, flowering was average with little sign of animal activity... where only a few plants are caged, flowering was monitored to see what effect the previous winter's 1080 operation would have on flowering success. With significant flower damage occurring as expected, a trapper was employed, and nine possums were removed from the area, four of which had bracts present in their stomachs. This possum cull enabled some of the later developing flowers to survive..On the Mamaku plateau a possum gut survey occurred in late March in several reserves where *Dactylanthus* was thought to be present. Although several possum stomachs were investigated for staining none contained *Dactylanthus* flowers.
48 Apr -03	5	Bay of Plenty	discovery of *Peraxilla tetrapetala* on *Quintinia serrata* at the northern Mamaku plateau in the Opuiaki Ecological Area (part of the Kaimai-Mamaku Forest Park), and in Te Kopia Scenic Reserve on the Paeroa Range near Reporoa. The Opuiaki find consisted of two large healthy plants which were flowering profusely in late January, and were discovered by staff working in the area in preparation for laying bait stations. The Te Kopia find consisted of seven large plants near the main ridge. The size of these plants enabled them to be found outside the flowering season in mid-March. The unusual aspect of both these discoveries is that occurred in areas with relatively high possum populations and little or no historic possum control. Despite this, all the plants seen were old and large and appeared relatively healthy with no possum browse noted.
48 Apr -03	5	Bay of Plenty	Okareka Mistletoe Restoration Project; a joint effort between DOC, Environment BOP, Forest & Bird and the Rotorua Botanical Society..Forest & Bird have been focusing on laying grided bait stations covering part of the reserve. The Rotorua Botanical Society is focused on undertaking weed control. DOC has been establishing Foliar Browse Monitoring for the mistletoe population. This has shown that while plants are generally in good condition in this part of the reserve, they are highly localised. It is hoped that when the possum population is brought under control, the mistletoe population will be able to spread further through suitable habitat in the reserve
49 Jun -03	6	Bay of Plenty	Dactylanthus: At Waione (in Whirinaki) extensive trapping and poisoning was undertaken in the vicinity of the Dactylanthus population during flowering. Possum damage was still noted, but probably happened before and after control occurred.
50 Sep -03	5	Bay of Plenty	*Ileostylus* on mangeao at Oropi, near Tauranga: the *Ileostylus* was found on two large old trees in a paddock: at least nine possum browsed mistletoe were found on one tree, while the other tree (and mistletoe) were nearly dead.
52 Mar -04	7	Bay of Plenty	Kaharoa Forest was treated using feracol in bait stations for rat control, but.. numbers were not reduced to the required level. Furthermore, the kokako breeding season was very poor for a number of reasons. Onaia Ecological Area (EA) rodent results were 6% r.t.i (West Block) and 13% r.t.i (East Block). Possum numbers were kept to the 5% threshold (per 100 trap nights).
53 Jun -04	5	Bay of Plenty	Dactylanthus: The northern site hadn't been checked for several years and cage maintenance was needed. Four and 14 cages were added at the northern and southern sites respectively. Flower monitoring showed less buds with more male and female flowers than in 2003, with low rates of possum and rat damage..Whirinaki Forest Park: Some good examples of flowering outside cages were found at the main site near Waione as a result of our regular intense possum control during flowering time
55 Dec -04	6	Bay of Plenty	In late September, staff spent three days in Whirinaki Forest Park monitoring existing mistletoe plants in the Rogers-Mangakahika-Moerangi

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			areas of the park..of 27 Peraxilla colensoi plants monitored regularly since 1999, 20 (74%) were dead, 2 (7%) were unhealthy (<50% foliage cover) and 3 (11%) were missing (experience strongly suggests these are dead or nearly dead). Only 2 (7%) of plants were still healthy (>50% foliage cover). This widely spread sample of P. colensoi shows a 15% average annual death rate over the 5 year monitoring period. This monitoring shows the ongoing decline of P. colensoi throughout the silver beech forest areas of the park where there is no possum control. The timing of monitoring differed this year, occurring in September rather than in January as in past years. Furthermore, significantly higher rates of possum browse on live mistletoe plants were found when comparing the January 2002 and September 2004 survey.. Many monitored plants had also died over this period, so could not be used for this analysis. This appears to confirm that the causal agent of the decline recorded over the past 5 years is most likely to be possums browsing mistletoe plants, mainly during the winter months
49 Jun -03	16	Canterbury	Periegops suteri: The primary cause of decline for this species is likely to be a reduction in suitable habitat. There are few remnants of mature forest remaining on Banks Peninsula and these are under considerable threat due to their small size and the impacts of weeds and pests. In some reserves.. the leaf litter layer in which it lives is regularly swept away by flooding. The spiders are also likely to be eaten by animal pests such as hedgehogs, cats, rats, mice and possums
53 Jun -04	14	Canterbury	Quail Island: The removal of predators including mustelids, cats, hedgehogs, possums, rats and mice from the island has provided an opportunity to restore a number of native invertebrate species
38 Sep -00	6	East Coast/ Hawke's Bay	It seems this species [*Tupeia Antarctica,* mistletoe] is a particularly sensitive measure of possum impact. Foliar browse methodology showed that 62% of 79 plants had no leaves at all 5 years after an October 1995 aerial possum control operation.
42 Oct -01	8	East Coast/ Hawke's Bay	This was the fifth season of monitoring pirirangi (red mistletoe, *Peraxilla tetrapetala*) hosted on *Quintinia* at the Otamatuna Core Area. Pirirangi numbers have continued to increase, since intensive management of pests commenced in 1996. The flowering period was slightly longer in length, than previous seasons. Flowering started later than the past two seasons and was more akin to the initial two seasons of monitoring. Surveys were not conducted for pirirangi hosted on tawai (red beech), as five out of six known plants did not flower.
44 Apr-02	9	East Coast/ Hawke's Bay	North Island weka: East Cape Peninsula: The first area is in the Motu Valley, between Gisborne and Opotiki where trapping for mustelids, cats and possums takes place. The second area is in the Whitikau Valley about 20 km north of Motu. This area is un-trapped and serves as a control to measure the success of the trapping regime.. Only one of the Whitikau juveniles is still alive. Of the four dead birds, three were predated by stoats and the other was either predated or scavenged by a cat. From the Motu area, three juveniles are still alive. Of the other two birds, one had wandered two kilometres beyond the trapped area and was predated by a stoat.
46 Sep -02	3	East Coast/ Hawke's Bay	Boundary Stream's biennial [Powelliphanta] snail survey: Unfortunately this year's survey has shown a 58% decrease in numbers, although only one of the empty shells found shown signs of predation
51 Dec -03	7	East Coast/ Hawke's Bay	Boundary Stream Mainland Island staff have discovered three plants of the mistletoe Tupeia antarctica, growing on a putaputaweta (Carpodetus serratus) host tree. This species was not previously known to exist in the reserve, although populations are found elsewhere in the Hawke's Bay. An extensive search is in progress to determine the population size. Intensive possum control has occurred in the reserve for 8 years, and mistletoes are benefiting; the yellow-flowered mistletoe (Alepis flavida) has increased from five to 50 known plants
52 Mar -04	11	East Coast/ Hawke's Bay	Dactylanthus taylori: Intensive trapping for rats and possums, and opportunistic stoat trapping, makes this locality a mainland island in all but name.
43 Dec-01	11	Nelson/ Marlborough	Monitoring of the transplanted *Carmichaelia juncea* on the Kahurangi coast showed devastation wreaked by introduced slugs. Wellgrown specimens, planted into salt turf and clifftops during winter are now stumps. Browse inside mesh cages showed slugs as the culprits. Previously similar damage was attributed to hares and possums.. Typical damage involves removing leaf and flower buds, chewing small shoots and stems

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43 Dec-01	11	Nelson/ Marlborough	*Pittosporum patulum: ..*Possum control and Marley™ pipe protectors have allowed a return to health over the last three years for most of the 50 trees in the study area.
52 Mar -04	16	Nelson/ Marlborough	Powelliphanta "Anatoki Range": The number of snails appears to be similar to when it was last surveyed in 1991, and it appeared that none of the empty shells were predated by possums or rats. The main threat seems to be habitat degradation by hares and goats
55 Dec -04	12	Nelson/ Marlborough	Recent monitoring of plots shows Rhytida oconnori, a Nationally Endangered terrestrial snail, continues to decline and is in urgent need of protection from predators; the main culprit is likely to be rats. On the other hand, sustained possum control through aerial applications of 1080 is starting to have a very pronounced benefit for many Powelliphanta populations in Golden Bay
40 Mar-01	2	Northland	A large part of Whirinaki Forest Park has been surveyed over January in order to gain a better understanding of the distribution and threats to *Peraxilla* spp. [Mistletoe] Monitoring of existing plants showed many are in poor condition with loss of foliage that doesn't appear to be possum related.
44 Apr-02	3	Northland	The 2001/02 kokako breeding season was a slow one in Mataraua. Three nests were found in late November and early December; one of these produced two chicks, the other two nests failed, and the cause was unable to be ascertained due to safety standards involving tree climbing. Rodent monitoring, however, yielded satisfactory results and possum catches were low - harriers are thought to be responsible for many nest failures in this area.
45 Jun-02	3	Northland	The Puketi forest Dactylanthus site was visited in early April when the majority of the caged plots appeared to have new bud development with no evidence of disturbance. Old seed set was still observable. By early May, half the plants had flowers and buds at different stages of development. Some of the flowers had been partly eaten, and some buds had been totally eaten.
36 Apr-00	19	Otago	Stu Thorne in Wanaka has been back into the Dingle valley checking *Pittosporum patulum*. To his dismay 3 of the 4 young trees at one site, which had all been healthy last May, had been totally defoliated. Possums seem to be the most likely culprit, and a strategy for protecting the site is being considered.
46 Sep -02	9	Otago	Ongoing widespread possum control in the Catlins continues to assist the recovery of *Tupeia antarctica* mistletoe.
39 Dec-00	15	Southland	*Whio:* The productivity and survival study has just kicked off in the Clinton and Arthur Catchments (Milford Track).. We are placing video cameras on nests (3 so far) and will continue this throughout the summer. Two of the three videoed nests have been visited by stoats and one also by a possum. A stoat destroyed one of the nests and the female survived, while the other female managed to defend her nest from a stoat and a possum although the stoat stole one egg.
50 Sep -03	17	Southland	As part of a monitoring programme to determine the impacts of white-tail deer and possums on invertebrates on Rakiura (Stewart Island), a pitfall trap monitoring programme has been set up. Previous studies carried out in New Zealand indicate that deer can have an impact on ground dwelling invertebrates through altering available habitat and food types (litter-composition). Possums are direct predators of some invertebrates and significant foliage browsers of certain species.
43 Dec-01	7	Tongariro/ Taupo	Outcome monitoring of threatened plants is also occurring following the aerial 1080 possum control operation in Tongariro Forest. Two possum palatable threatened plants have been chosen as our sensitive and moderately sensitive indicator species: the root parasite dactylanthus and *Pittosporum turneri*..During the dactylanthus surveying, two plants of the mistletoe Tupeia antarctica were discovered. Both of these were severely browsed by possums. If time allows we may search more thoroughly and include this species as part of our outcome monitoring. *Pittosporum turneri* has been chosen to monitor as our moderately sensitive species. This species has juvenile and adult growth forms, both of which are browsed by possum, but the adult is far more palatable. Sixty trees have been included in the monitoring at the Kapoors Road frost-flat site. Thirty of these trees have been banded and thirty have been left unbanded. The possum density at which impacts become apparent on

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			this species is not known, though it is thought to be between 5-10% residual trap catch (RTC).
44 Apr-02	9	Tongariro/ Taupo	two kaka nests have been detected in Rangataua Forest, both in early incubation. Staff will monitor them as they run the stoat/possum/rat gauntlet over coming months.
52 Mar -04	9	Tongariro/ Taupo	'Whakapapa Survey Area' (first surveyed in 1998/99) was re-surveyed in January. The purpose of this area is to determine whether natural regeneration is occurring as a result of possum control. This area was resurveyed.. The outcome was highly successful; the abundance of red mistletoes has increased dramatically from 50 plants in 1999 to 97 in 2004. Of note is that most of the new plants are small and hence likely to be new recruits as a result of our ongoing possum control. Unfortunately the yellow mistletoe abundance here is still very low, with three plants now known in this area.
39 Dec-00	5	Tongariro/ Taupo	The white mistletoe (*Tupeia antarctica*) has again been found at Te Porere redoubt fairly close to a large population found on Mt Tongariro last year. The vegetation is similar, and it is likely that more plants are present throughout the adjoining Tongariro Forest. Unfortunately all of the plants were heavily browsed and the only shoots present were out-of-possum reach. The host species was putaputaweta. Though not categorised as a threatened species, a single shrub of the possum palatable and epiphytic shrub *Pittosporum kirkii* was found fallen to the ground amongst perching lilies at Karioi rahui. This is perhaps another indication that the intensive possum control at the rahui is showing benefits. There have only ever been three records of this species previously in the conservancy, the last in 1976.
48 Apr -03	7	Tongariro/ Taupo	discovered many *Tupeia antarctica* on Raetihi hill during a foray to investigate likely plants to monitor for.. monitoring for possum control
49 Jun -03	9	Tongariro/ Taupo	kiwi: We named the chick Possum, a fitting name as another nest due to be robbed on the same day was predated by a suspected possum!.. eight have returned to the forest, one of these was predated by a stoat..Eight chicks successfully hatched in the wild: four were predated by stoats..new chicks were..released back into their parental territory in Tongariro forest. Three were predated by stoats
52 Mar -04	9	Tongariro/ Taupo	100 Acre bush: Possum control is continuing this year to protect dactylanthus at this site from browse. Additional dactylanthus clumps have been located here in order to better measure the efficacy of this control. A good population of Tupeia antarctica was discovered during a recent survey and monitoring visit, with approximately 60+ plants growing on a dense grove of lemonwood. All of these plants were fairly large and healthy, and have responded from over a decade of intensive possum control.
55 Dec -04	9	Tongariro/ Taupo	Pittosporum turneri: populations are healthy, which it not surprising since possum numbers are still below 2% residual trap catch. Many plants at all populations are now heavily flowering.
44 Apr-02	6	Waikato	North Island robins, Pureora: The fledgling success of pairs in Waipapa, an area controlled for possums and rats, was 82%. Predictably, things were not so good in the unmanaged Waimanoa with only 33% of pairs successful.
48 Apr -03	4	Waikato	staff are pleased with the success of recent possum control operations on Mount Pirongia, especially the spin-off benefit for the rare plant *Dactylanthus taylorii*. A team of DOC staff and three volunteers spent the last week in January on Pirongia's summit monitoring dactylanthus plants that had previously been caged for protection. Most of the 150 caged plants were in good health and flowering profusely, with no sign of possum or rat browse.
49 Jun -03	5	Waikato	Hebe speciosa: steadily increasing since monitoring began in 1999, when 41 individuals were found. In the latest survey, 388 plants were counted. All plants were in extremely good condition, with only one individual showing some sign of browse. Possum control and fencing out stock by the landowner are thought to be the main factors that have contributed to this increase
47 Dec -02	11	Wanganui	*Tupeia* :This previously known plant has been caged and is doing well. This new find (three plants so far) may be because of the high level of possum control at the site. In the 8 or 9 years since the aerial 1080 drop at Paengaroa, followed by ground control, the *Tupeia* has flourished to

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			such an extent that some mistletoes are now 3 m across, and some host maire trees are looking decidedly sick
50 Sep -03	10	Wanganui	Paengaroa is one of six mainland islands maintained by DOC and is significant because of its rare collection of divaricating plants. Divaricating plants have a scraggly appearance because of their profuse and tangled branches, which some scientists believe may have originally evolved as a defence against browsing moa.
51 Dec -03	9	Wanganui	Lepidium flexicaule:. Grazing may be an issue, but then again there aren't any plants in a fenced off section of the herbfield, where weeds seem to be doing pretty well [grazing assisting biodiversity]
36 Apr-00	3	Wellington	We now know at least 1 leafy mistletoe remains on Great Barrier Island!..It's more a surprise to us that this mistletoe hasn't been recorded here before, than that it has been discovered. Great Barrier should be a mistletoe haven– with no possums and plenty of habitat.
36 Apr-00	3	Wellington	In December white mistletoe..was found..at Ketetahi in Tongariro National Park during the establishment of forest health monitoring plots..Further.. hundreds were found in January on another monitoring line in the same forest, some plants even occurred within the 20 x 20 m forest plots. Most of the plants were heavily browsed. This species will now be used as an indicator of forest health for an upcoming possum control operation.
36 Apr-00	4	Wellington	The majority of Tongariro/Taupo Conservancy mistletoe surveying and monitoring has concentrated on *Peraxilla colensoi* at Rangataua Conservation Area, an area with 5 years of good possum control, and in a part of Kaimanawa Forest Park where possums are not controlled. Many large healthy plants were found flowering prolifically at Rangataua. In Kaimanawa Forest Park approximately 40 new hosts were found, of which about half could be banded. The health of the mistletoe here was more variable with some plants heavily browsed while others appeared untouched and were flowering well.
36 Apr-00	4	Wellington	Flowering [of mistletoe] was comparatively light this year in contrast to last year, despite insignificant possum browse being observed.
55 Dec -04	11	Wellington	Kokako: Monitoring of the birds released at Pukaha/Mount Bruce has commenced. The first territories have been mapped out and possum and ship rat numbers are at low densities, so we wait for the first nest reports
40 Mar -01	9	West Coast	Pittosporum patulum: Wanaka Area staff re-monitored three sites in the Dingleburn in January. All sites have been impacted by possums. About 25% of plants at the largest site show browsing ranging from minor to heavy.
51 Dec -03	14	West Coast	Powelliphanta annectens is one of the largest giant land snail species. The Heaphy subpopulation is restricted to the area around the Heaphy River mouth, but is abundant and increasing further due to annual ground control for possums. During late winter and early spring, Buller Area Office staff became aware of exceptionally high numbers of P. annectens snails being eaten by thrush at three localised sites on the Heaphy Track. On 15 August, 477 shells were collected from the sites. The majority of the snails had been killed within the previous 3–4 weeks. Over the next 2 months the sites were checked every 2–3 weeks and the empty shells collected. By 13 October, over 1,700 snails had been killed. No decline in the rate of predation was found
51 Dec -03	15	West Coast	Parts of South Westland remain a stronghold for the scarlet mistletoe (Peraxilla colensoi). A recent field trip to the Hope Valley, where possums are still in an early colonising phase, established some permanent plots for monitoring recruitment and mortality of scarlet mistletoe. Data collected estimated that there are on average approximately 36 scarlet mistletoe per hectare below 700 metres altitude in this valley. This figure is very similar to the Thomas Valley (Haast catchment) pre-possum colonisation in the early 1990s (also 36 per hectare in silver beech-podocarp forest, data collected by Hamish Owen, Canterbury University), and to two possum-free islands in Lake Waikareiti, Te Urewera National Park in January 2003 (about 31 per hectare, Aniwaniwa Area Office). The results of this and work at other sites confirms that scarlet mistletoe has suffered dramatic declines in abundance throughout much of its range, and that browsing by possums is the major cause of these declines

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54 Sep -04	11	West Coast	The Conservancy monitoring team has been measuring scarlet mistletoe condition at sites with colonising and pre-peak possum populations in south Westland. Results show declines in mistletoe populations which appear to be following the possum invasion front (in areas without current possum control). Some areas to the south of Jackson's Bay are only now being colonised by possums, and they seem to have very good populations of scarlet mistletoe (estimated to be around 36 per hectare at last count). Because there has been some doubt that possum impacts are directly causing this mistletoe decline, we decided to collect possum gut samples from these newly colonised areas. This would help confirm the link between rising possum populations and the decline of mistletoes in the south Westland area. Twenty-six possum stomachs were collected from possums trapped during surveillance monitoring between October and December 2003 from the Hope, Spoon and Gorge River catchments. The layer separation method (Sweetapple & Nugent 1998) was used to determine the individual food types eaten. Analysis was carried out by Peter Sweetapple (Landcare Research, Lincoln). The results were what we suspected (Table 1): mistletoe was the most dominant food item eaten (32.09%), and 16 of the 24 possums had evidence of mistletoe foliage in their stomachs. These results reflect the abundance of mistletoe within the Hope, Gorge and Spoon catchments and confirm its high preference as a food item by colonising possums. Muehlenbeckia australis (21.11%) and fuchsia (14.65%) were the next most commonly eaten food items, similar to previous studies on the diets of pre-peak possum populations. Pokaka (Elaeocarpus hookerianus) fruit and fuchsia flowers also made up a high proportion of the diet at 10.42% and 6.297% respectively. A relatively small number of food types dominated the diet, with the foliage of common staple foods such as kamahi absent from possum stomachs (this may reflect time of year with many other foods available). These recent diet results give further evidence of the key threat that possums pose to beech mistletoe and add support to the conclusion that possums are a major factor behind the rapid declines recently observed within south Westland forests. Our challenge now is to keep possum densities at low levels within these last areas where mistletoe is still common. The plan is to carry out an intensive possum control programme over the Hope Catchment to try and keep possums below 5% RTCI. The Gorge and Spoon are to have less intensive possum control
54 Sep -04	13	West Coast	Powelliphanta: numbers have decreased. An analysis of empty and damaged shells showed that mortality resulted from predation by song thrush, rat and possum. Populations at the other two sites were also considered to be low and damaged shells were again found.