

**SCIENCE & RESEARCH INTERNAL REPORT NO.164**

**The impact of weeds on threatened plants**

by

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# Abstract

Weeds pose a threat to a third of all New Zealand nationally threatened plants, and half of those threatened plants listed in the species priority ranking system used by the Department of Conservation.

Weeds have the potential to cause threatened plants to become extinct and usually put threatened plants in jeopardy through interactions with other risk factors. Data on how weeds jeopardise threatened plants were collected. This information was then used to define future research needs.

Threatened plants most at risk from weeds are found in damp habitats (wetlands, dune slacks, alpine seepages, lakes), coastal habitats, and seral plant habitats. Grasses are the group of weeds which most commonly jeopardise threatened plants, competing with adult plants and hindering regeneration. Research into the problems posed by weeds to threatened plants should have a focus on habitat and individual species management. Despite a focus on weeds, this study underlines the importance of managing all the factors that put threatened plants at risk of extinction.

# 1. Introduction

## 1.1 BACKGROUND

The Environmental Weeds Research Plan (Timmins 1997) recognised that research information is urgently needed regarding effects of weeds on threatened plants. The present project was set up to meet that need with the following aims:

- To identify examples of threatened vascular plants being affected by weeds.
- To demonstrate the particular ways weeds effect these threatened plants.
- To show the level of threat posed by weeds.
- To provide research directions for the Department of Conservation.

Despite its focus on weeds, this study underlines the importance of managing all the factors that put threatened plants at risk of extinction.

## 1.2 DEFINITIONS

Within the text scientific names have been used exclusively for threatened plants and where possible, common names for weeds. A glossary of weed names used in the text can be found in Appendix 1. Nomenclature follows that advocated by Cameron *et al.* (1995).

Many definitions of the term "weed" exist. Williams (1997) encompasses most by stating: "Weediness is a concept which emerges only where plants, the environment, and human interest meet".

In this project environmental weeds are defined as any foreign plant species that threatens local native species or ecosystem processes. Occasionally native plants behave as weeds as a result of changes to ecosystem functioning, or human introduction of native plants to new areas. Some of these examples have been included. When normal successional processes cause a native plant to compete with a threatened plant, the native plant species has not been included in this report.

Threatened plants are defined here as those: listed in the New Zealand Botanical Society Threatened and Local Plant List, by the New Zealand Threatened and Local Plant Committee, (Cameron *et al.* 1995); those listed in the Species Priority Ranking System for conservation management, (Molloy and Davis 1994); or those species which have been recognised as threatened by researchers and are likely to be included in the next revision of the New Zealand Botanical Society Threatened and Local Plant List.

There are two commonly used methods for listing threatened plants. First the New Zealand Threatened Plant Committee categorise plants according to IUCN criteria. The subset of this first list is used by Molloy and Davis (1994) to rank plants according to their priority for assessment for conservation action by the Department of Conservation.

### **1.2.1 Threat categories from New Zealand Botanical Society List**

The New Zealand Botanical Society Threatened Plant List uses the IUCN Red Data Book threat categories of: presumed critical, endangered, vulnerable, rare, taxonomically indeterminate, insufficiently known. In addition, the New Zealand Threatened Plant Committee recognises another category "local". These threat categories are summarised by Cameron *et al.* (1995) and are listed in Appendix 2.

The term "nationally threatened" is used to refer to the plants in the New Zealand Botanical Society IUCN list, excluding local plants.

### **1.2.2 Species Priority Ranking System**

The species listed in Molloy and Davis (1994) are threatened plant taxa that have been ranked for "urgency of assessment for conservation action", i.e., their priority for management. Only critical, endangered, or vulnerable IUCN plants were considered in the A, B, C, X, O, or M rankings. While a small proportion of taxonomically indeterminate or insufficiently known species were included in category I.

The criteria used in this ranking process considers: distinctiveness, status, threats, vulnerability and values. Species are grouped into three main priority categories.

- A-highest priority, score greater than 47 (36 vascular plants)
- B-second priority, score between 39 and 47 (68 vascular plants)
- C-third priority, score between 30 and 38 (21 vascular plants)

Other special purpose categories were used. These were not ranked against the criteria used for A, B or C species:

- X-species which have not been sighted for a number of years but which may still exist.
- I-Species about which little information exists, but based on existing evidence, are considered to be threatened.
- O-Species which are threatened in New Zealand, but which are known to be secure in other parts of their range outside New Zealand
- M-Species that are rare or localised, and of cultural importance to Maori.

These are considered, along with other factors (e.g. logistic, financial, political) for determining the priority for funding of all threatened biota, within the Department of Conservation.

## **1.3 INFORMATION SOURCES**

Data were collected from a wide variety of sources, so that they would be representative, of the weed-threatened plant interactions throughout the country. It was not intended that an exhaustive list was made so statistics in this report on weed threat are probably minimum values.

Information on threatened plants and their weeds was gathered by interviewing Department of Conservation staff and external botanists, and by searching library and in-house files.

## 2. The data

An Access 2 database was created to store the collected data in three linked tables. It is held electronically at The Department of Conservation Science Technology and Information Services division. Appendix 3 explains and defines the fields used within these tables. Appendix 4 gives an abridged version of the database, listing all the threatened plants and 9 of the 17 data fields. The level of threat to the threatened plant were as either: Important, Secondary, Past, Potential, Undetermined or Supporting. These are defined in Appendix 3.

Each 'threatened plant/weed' couplet is referred to as a record. In the field, individual species of threatened plant may be found at a number of sites. The weeds found at these sites may vary. Thus there may be different weed problems at different sites, for the same threatened plant, within a single conservancy. For some threatened plant species, information on their weeds is only available at a national level. The letter codes for Conservancy identification are elaborated at the end of the database (Appendix 4).

When a threatened plant is considered as being at risk from weeds, this means one or more populations, (i.e. at one or more sites), is at risk from that weed. Therefore all individuals may not be at risk.



### 3. Summary of data

#### 3.1. CHARACTERISTICS OF THREATENED PLANTS

Weeds are often present with threatened plants. Of the threatened plants 33% of IUCN species and 62% of species ranked as a high priority for management (A, B, C) grow with weeds, (Table 1 and 2). The more threatened a plant the higher the likely hood it will be at risk at least in part from weeds. This dictates that weed management be an important component in the management of threatened plants.

Very few examples of local plants being affected by weeds were collected. Either local plants are only occasionally threatened by weeds or weed threats to local plants were under-reported, with emphasis being given to species in the higher threat categories.

The "Critical" threatened plants which are affected by weeds are: *Lepidium banksii*, *Acaena rorida*, *Amphibromus fluitans*, *Australopyrum calcis* subsp. *calcis*, *Cortaderia turbaria*, *Sebaea ovata*, *Carmichaelia kirkii*, *Corybas carsei*, *Asplenium pauperequitum*.

TABLE 1. THE PERCENTAGE OF NATIONALLY THREATENED PLANT SPECIES BY (IUCN) THREAT CATEGORY WHICH ARE AT SOME LEVEL OF RISK FROM WEEDS. (Numbers of species affected by weeds are given in brackets.)

THREATENED PLANT IUCN THREAT CATEGORIES				
CRITICAL	EN-DANGERED	VULNERABLE	RARE	TOTAL (IUCN categories)
45% (9)	70% (26)	52% (32)	33% (26)	33% (103)

TABLE 2. THE PERCENTAGE OF THREATENED VASCULAR PLANT SPECIES IN THE A, B, AND C PRIORITY CATEGORIES WHICH ARE THREATENED BY WEEDS. NUMBERS OF SPECIES AFFECTED BY WEEDS ARE GIVEN IN BRACKETS.

THREATENED PLANTS PRIORITY RANKINGS			
A	B	C	TOTAL (A, B, C SPECIES)
72% (26)	59% (40)	52% (11)	62% (77)

### 3.2. COMPARISON OF THREATENED PLANTS AND ECOLOGICAL WEEDS

There are 125 weeds associated with threatened plants identified in this study. Of these weeds 55% are listed in the Weeds of Conservation Concern Database (Owen 1997). Because the remaining 45% are also weeds that jeopardise threatened plant species (and are therefore of conservation concern), it is anticipated they will be considered for inclusion in the list of Weeds On Conservation Land Database. Appendix 6 lists the 45% not yet included as conservation weeds.

This remaining 45% may not have been previously considered because they appear insignificant in most plant communities, or are only a small component of the weed flora. Some characteristics of threatened plants make them vulnerable to this latter set of weeds. Threatened plants are often: small, making them easy to over-top; uncommon so the loss of individual plants is a significant loss to biodiversity; require specialised habitats making them vulnerable to competition as they have few habitat options.

### 3.3 HOW SERIOUS IS THE WEED THREAT?

- For 43% of the records in the Threatened Plants Affected By Weeds database, weeds were considered to be an Important Threat, i.e., one of the main risk factors to the survival of threatened plant populations (see Appendix 3).
- For 7% of records, weeds were considered to be a Secondary Threat, having an effect but not one of the main threats.
- For 22 % of records, weeds are a Potential Threat.
- For 9% of records, weeds have been a problem in the Past, but the weeds were either controlled, or the threatened plant population has been lost.
- For 18% of records, the weed threat was Undetermined; more information is needed to clarify the level of threat.
- For 46% of records of A and B and C threatened plant species (threatened plants which are in high priority categories for management) weeds are considered an important threat, i.e., one of the main risk factors affecting the plants survival.
- For 33% of IUCN threatened plant species weeds are considered an important threat.
- 49% of A, B, and C threatened plant species weeds are considered an important threat.

These figures show weeds are a major risk to threatened plants, and weed control is an essential component in ensuring their survival.

### 3.4. WEED GROWTH FORM

The following tables show each weed growth form as a percentage of total database records (Table 3), as a percentage of the records where the weed threat is Important (Table 4), or as a percentage of the total records where the weed threat is Important for A, B, and C species (Table 5).

The conclusion from these tables is that grasses are a major problem for threatened plants. Grasses are the most commonly occurring weed growth form in this database, occurring 35 % of the time (Table 3). Two thirds of these grass records are contributed to by the pampas grasses or grass. Grasses make up nearly half of all Important weed threat records or 19 % of total threat records (Table 4).

Grasses also contribute nearly half of the Important weed threat to threatened plants of a high priority for management (Table 5). It is therefore

TABLE 3. WEED RECORDS BY GROWTH FORM AS A PERCENTAGE OF ALL RECORDS IN THE THREATENED PLANTS AFFECTED BY WEEDS DATABASE.

GROWTH FORM OF WEED	GRASS	HERB	SHRUB	TREE	CLIMBER	SEDGE AND RUSH	AQUATIC	FERN	OTHER	TOTAL
N of total records	35	19	15	16	4	4	1	<1	6	100

TABLE 4. IMPORTANT THREAT RECORDS BY GROWTH FORM, GIVEN AS A PERCENTAGE OF ALL RECORDS IN THE THREATENED PLANTS AFFECTED BY WEEDS DATABASE. (Important records are those in which a weed constitutes the major risk to a threatened plant.)

GROWTH FORM OF WEED	GRASS	HERB	SHRUB	TREE	CLIMBER	SEDGE AND RUSH	AQUATIC	FERN	OTHER	TOTAL
N of total records	19	9	5	2	1	2	0	<1	3	41

TABLE 5. 'IMPORTANT' WEED THREAT RECORDS OF A AND B THREATENED PLANT SPECIES (HIGH PRIORITY FOR MANAGEMENT) IN THE THREATENED PLANTS AFFECTED BY WEEDS DATABASE, DIVIDED HERE BY GROWTH FORM, WHERE 'IMPORTANT' RECORDS ARE 49% OF TOTAL RECORDS FOR A AND B SPECIES.

WEED GROWTH FORM	GRASS	HERB	SHRUB	TREE	CLIMBER	SEDGE AND RUSH	AQUATIC	FERN	OTHER	TOTAL
N of important A & B records	42	23	14	5	3	5	0	<1	8	100

important to understand how to manage grasses to reduce the effect they have on threatened plants.

The following weed species occurred most often in the threatened plant/weed records:

marram grass	<i>Ammophila arenaria</i>
browntop	<i>Agrostis capillaris</i>
Yorkshire fog	<i>Holcus lanatus</i>
broom	<i>Cytisus scoparius</i>
gorse	<i>Ulex europaeus</i>

Genera occurring most often in the threatened plant/weed records:

<i>Agrostis</i>	<i>Ammophila</i>	<i>Cortaderia</i>
<i>Cytisus</i>	<i>Dactylis</i>	<i>Festuca</i>
<i>Hakea</i>	<i>Holcus</i>	<i>Hieracium</i>
<i>Juncus</i>	<i>Lupinus</i>	<i>Pinus</i>
<i>Salix</i>	<i>Trifolium</i>	<i>Ulex</i>

### 3.5 THREATENED PLANTS AND WEED HEIGHTS

Table 6 details the heights of weeds and the heights of threatened plants in the database. Height classes are those given in Appendix 3. Table 7 details the heights of weeds which affect each height class of threatened plants.

Threatened plants at risk from weeds are usually short; 54% are less than half a metre tall. As expected, the weeds associated with threatened plants tend to be the same height or taller, 45% are between 0.5m and 1.0 m tall. The conclusion from these tables is that because most threatened plants are short, there are few weeds that are not a potential threat on the basis of height.

TABLE 6. THE PERCENTAGE OF THREATENED PLANT SPECIES AND THE PERCENTAGE OF WEEDS AT EACH HEIGHT CATEGORY LIFTED FROM THE DATABASE.

HEIGHT CATEGORIES	PERCENTAGE OF THREATENED PLANTS	PERCENTAGE OF WEED SPECIES
Low a (0 - 0.1 m)	24	4
Low b (0.1+ - 0.5 m)	30	15
Low c. (0.5+ - 1 m)	11	30
Med. (1+ m - 2 m)	11	24
Tall (2+ m)	16	21
Climber	6	4
Aquatic	1	2

TABLE 7. THREATENED PLANTS BY HEIGHT CATEGORY SHOWING THE PERCENTAGE OF ASSOCIATED WEED RECORDS BY HEIGHT CATEGORY.

THREATENED PLANT HEIGHT CATEGORIES	WEED SPECIES % OF THREAT RECORDS FOR EACH THREATENED PLANT HEIGHT CLASS						
	LOW a	LOW b	LOW c	MED.	TALL	AQUATIC/CLIMBER	TOTAL
LOW a	6	20	41	20	12	1	100
LOW b	3	24	51	23	16	3	100
LOW c	2	21	27	31	19	0	100
MED.	0	7	10	35	38	12	100
TALL	3	7	14	24	58	14	100
CLIMBER/AQUATIC	8	8	28	10	28	18	100

### 3.6. HABITAT

Table 8 details the habitats where threatened plants at risk from weeds are found. Some plants are found in more than one habitat, so have been scored in more than one habitat category.

The conclusions from this table are that weeds are most often a concern for threatened plants in wet habitats, coastal habitats, or disturbed habitats. These are all areas where there is frequent human activity.

Wet habitats include: freshwater dune lakes; ephemeral wetlands; upland seepages; places where the substrate is damp. Coastal habitats include the foreshore, and dune systems. Places where natural disturbance occurs are important in creating habitat for seral threatened plants; they include river systems, areas of erosion, and coastal areas. However, maintaining systems that provide these habitats is difficult.

TABLE 8. THE PERCENTAGE OF THREATENED PLANT SPECIES JEOPARDISED BY WEEDS BY HABITAT. SOME PLANTS ARE IN MORE THAN ONE HABITAT CATEGORY.

HABITAT	%	HABITAT	%
Wetland damp aquatic	31	Alpine	4
Coastal	28	Mineral rich substrates	15
Tussock and grassland	18	Montane	9
Scrub	18	Disturbed	24
Forest	12		

### 3.7. REGENERATION

Regeneration is the process plants use to maintain populations and to pass on unique genetic material thereby maintaining biodiversity. There are 91 records in the database where weeds interfere with regeneration. In 35 of the records, the weed is a grass. Other weed species which prevent regeneration include: stoncrop, hawkweeds, wandering Jew and ivy. The 34 threatened plant species affected include such Critical and Endangered species as:

*Carex inopinata*, *Carmichaelia kirkii*, *Carmichaelia williamsii*, *Chordospartium muritai*, *Hebe cupressoides*, *Helichrysum dimorphum*, *Lepidium banksii*, *Leptinella nana*, *Muehlenbeckia astonii*, *Olearia hectorii* agg., *Olearia polita*, *Scutellaria novae-zelanadiae*.

Regeneration can be prevented by the weed plants growing faster than the threatened plant, or by out-competing native species for favourable substrate for germination and establishment. For example:

- *Chordospartium muritai* site where weeds took the suitable habitat for seedlings (Williams et al. 1996).
- *Pittosporum obcordatum* seedlings can not compete with exotic grasses (or grazing) (Ogle pers. comm.).
- In the Hikurangi swamp wandering Jew forms a dense cover making it difficult for *P. obcordatum* seeds to grow after germinating. When the wandering Jew is grazed the seedlings have more chance of survival.
- Selaginella is spreading and causes similar problems to wandering Jew (McCluggage pers. comm.).
- The daisy family, containing *Olearia hectorii*, generally need high light for germination. When *O. hectorii* grows in agricultural landscapes the bare ground needed for germination is covered by exotic grasses, causing both germination and recruitment to fail with 38% of the adult population having little prospect for continuation (Rogers 1996).

### 3.8. WEEDS THAT SUPPORT THREATENED PLANTS

The ideal situation for threatened plants is growing in pristine habitat. While this is no longer possible, some threatened plants are able to coexist with exotic plants that are usually regarded as weeds. For example:

- *Tupeia antarctica*, a mistletoe, can use a variety of exotic weed species as hosts including; ivy, castor oil plant, tree lupins, and broom spp. (de Lange et al. 1997) The mistletoe *Ileostylus* has 87 exotic hosts many of which are environmental weeds (Barkla pers. comm.).
- *Urtica linearifolia* can be observed growing under willows (Wellington Threatened Plant Database 1997).
- Willows *Salix* spp. and alders *Alnus* spp. provide cover for the jersey fern *Anogramma leptophylla* (Sawyer pers. comm.).

Threatened species may be protected from wider habitat changes by growing with specific weeds. The use threatened species make of weeds needs consideration when control programmes are designed.

This report has focused on the impact of weeds on threatened plants. Weeds also impact threatened animals both positively and negatively.

For example, in a Northland study, 50% of North Island brown kiwi (*Apteryx australis*) were found to use weeds for cover and protection from dogs. The weeds kiwi use include mistflower, Mexican devil weed, and pampas grass (Robertson pers. comm.). These weeds put many threatened plants in Northland at risk. More research is required to ascertain the inter-relationships and to plan appropriate management.

## 4. What weeds do

### 4.1 WEEDS AND OTHER THREATS TO THREATENED PLANTS

Human activity can be seen as the threat to threatened plants, through the alteration or destruction of large amounts of habitat and the introduction of animal and plant pests. Present weed threats are traceable to human activity. They are often a result of the introduction of weed plants and other factors that allow weeds to be a problem.

The factors that help to create weed problems can be classified as: hydrological, habitat modification, change in the processes of succession, change in disturbance, grazing, trampling, competition from other plants, disease, hybridisation, reproductive constraints, catastrophic events (e.g. drought, flood), and collectors.

Lack of legal land protection can cause threatened plants to be put at risk from the threats listed above, because unprotected land may be managed in ways that allow weed problems, or do not support threatened plant species.

Threatened plants are, however, seldom at risk from one factor alone. A suite of factors as listed above may interact to make a plant threatened, two examples follow.

#### 4.1.1 *Amphibromus fluitans*

*Amphibromus fluitans* is a native grass found in ephemeral wetlands. It is threatened by: weeds, changes in hydrology, grazing, and loss of natural habitat. In Wellington Conservancy it grows at two sites very close to each other. The hydrology of the whole catchment has been radically altered so that the ponds are now drier than normal (Rebergen pers. comm.).

The surrounding land has had most of the natural cover of cabbage trees (*Cordyline australis*), kahikatea (*Dacrycarpus dactyloides*), native sedges and rushes replaced by exotic plants. Lowered water level, cattle pugging, and shorter periods of inundation have allowed weeds to invade. *A. fluitans* is now growing among *Ludwigia*, willow weeds, *myosotis*, dock, bachelors button, and mercer grass.

The long-term effects of these weeds are only guessed at, although mercer grass appears to be the most threatening weed. Large parts of the area are grazed, and until recently this included the A. sites. Notes from the Research (1997) New Zealand Threatened Plant Database suggest that plants of *A. fluitans* being browsed could be infertile. This is of importance to plants with small populations occurring in ephemeral habitats. The pugging that cattle cause destroys A. plants, yet the removal of cattle may reduce grazing on the mercer grass as well. Mercer grass has the potential to smother *A. fluitans* if control through inundation or grazing is removed. Monitoring has been started to show the effect of grazing removal.



#### 4.1.2 *Melicytus flexuosus*

*Melicytus flexuosus* is a divaricating shrub occurring on alluvial terraces and flood plains of forest margins. At some sites regeneration is dependent on periodic disturbance and a continued supply of seed. So regeneration may be limited by factors such as flood control, removal of seed sources, competing pasture species, and animal grazing (Molloy and Druce 1994).

In Nelson, regeneration of *Melicytus flexuosus* has been completely stopped by exotic grass swards except where there are sufficient shrubs to shade out the grass. Problems are compounded by browsing (Courtney pers. comm.). The biggest population of 25 plants was found dead by ring-barking, thought to be caused by possum or hares; an event that coincided with snowfall. In Wanganui Conservancy, with the removal of ivy from a reserve, there has been a dramatic increase in the number of seedlings, although it is possible that this is attributable to existing seedlings becoming more visible with the ivy clearance (Ogle pers. comm.).

#### 4.2 FEATURES OF THREATENED PLANTS MAKING THEM VULNERABLE TO WEEDS

Threatened plants have intrinsic features that make them vulnerable to weeds. Threatened plants are often cryptic, i.e. hard to find, or naturally sparse, thus it is often hard to determine their real status. Some are small and readily out-competed by taller plants. Others are now restricted to severely modified habitats, found in small, widely scattered populations, or have specialist habitat requirements.

Plant species requiring disturbed ground (a common entry point for weeds) are particularly at risk. Seral plants, e.g. many of the threatened orchids, are reliant upon natural disturbance processes to provide habitat. Where exotic scrub re-replaces native scrub (in successions that occur after disturbance) potential habitat may be lost due to the changes caused by weeds. For these species, management of land to ensure continued disturbance without weed encroachment is essential given the small amount of available habitat and its fragmented nature.

An example of threatened plants requiring disturbed ground is found in Auckland. A strip of land formerly in kanuka/manuka scrub was bulldozed in preparation for a housing estate. The housing did not happen and the land was subsequently reserved. The threatened orchids *Thelymitra aemula* and *Caladenia atradenia* multiplied on the bare soil created by the disturbance. Five years later tall scrub covered the site and the orchids had virtually disappeared. Fire was suggested as an economic method of maintaining the disturbance needed by these orchids, but it would have also encouraged gorse and *Hakea* sp., growing nearby (Hatch 1995).

In this example, if fire were used the weeds would cover bare ground much faster than manuka or kanuka, so the bare sites become more quickly unavailable to the orchids. These orchids are always replaced by normal succession, but the small population numbers on fragmented sites make the potential risk from weeds an issue.

### 4.3. THE WAYS WEEDS THREATEN

Competition with weeds, or the effects of weeds altering the environment may jeopardise threatened plants. Some weeds have become a problem because the environment has been altered by other factors.

#### 4.3.1 Competition

Threatened plants face competition for: space, light, nutrients; moisture, and genes. This pressure may push threatened plants species into a reduced habitat range, causing their elimination or decreasing their vigour. Because knowledge of threatened plant biology, let alone interaction with weeds, is effect weed species have is not always clear.

##### **Space**

Three examples of competing weeds:

*Botrychium* aff. *lunaria*, a small calcicole fern, is found at two sites in Nelson Marlborough Conservancy. It grows in hollows where snow lies after winter. Hawkweed has become an integral part of this turf, and appears to compete with *B. aff. lunaria* for space. However the exact role of weeds in the threatened plant's decline is unclear. Weeded and unweeded sites are being monitored to determine if *B. aff. lunaria* is being reduced (Courtney pers. comm.).

*Leptinella nana*, a diminutive moss like daisy, faces competition for space. It is easily by pasture grasses. To regenerate seeds require bare ground. It survives in Wellington where sheep have worn tracks which provide bare ground and slightly damp hollows or where bare ground is created through hand weeding (Wellington Threatened Plant database).

For *Olearia hectorii* to germinate, seeds need to fall on open ground. It was found growing in areas of frequent disturbance on valley toe-slopes, fans and disturbed riparian areas (Rogers 1996). Today populations which are relict on agricultural land are surrounded by naturalised grasses. These grasses cover any bare ground and out-compete new seedlings, thus preventing the regeneration of *Olearia hectorii*.

##### **Nutrients**

Threatened plant species' ability to compete may be changed when weeds are present which alter or compete for nutrients.

##### **Light/shade and over-topping**

Threatened plants are often small, with 25% of those threatened by weeds less than 0.1 metre tall (Table 6). Weeds easily smother and shade them out. This is of particular relevance where weeds may act on different parts of a plant's life cycle.

*Chordospartium muritai* has a single natural population of 30 plants growing on a coastal cliff. It is vulnerable to catastrophic events. For example, a land slide could wipe out the entire species. The seedlings grow very slowly (12 cm in their first two years), so are easily out-competed by weeds. Seedlings are only found in areas where it is too shady for grasses or on stony outcrops where competition from grass is less (Williams *et al.* 1996).

Partridge (1994) and Greenwood (1994) describe willows out-competing native vegetation, including some threatened plant species. The willows over-top the canopy, and replace it, resulting in changes to light levels.

### **Moisture**

Weeds can alter the availability of moisture at a microsite. Hawkweed, a weed associated with *Carmichaelia curta*, is thought to increase desiccation (Head, N. pers. comm.).

### **Hybridisation/introgression**

Loss of biodiversity at a genetic level occurs when populations become small and bottlenecks result. Weeds which can cross pollinate with threatened species can cause the loss of biodiversity through the loss of genes.

Hybridisation occurs when two different species cross. Introgression happens when the hybrids back-cross with the more abundant species. The result is a population which more closely resembles the abundant parent, with the possible loss of genes from the other parent. This is of concern when the less abundant parent is a threatened species.

*Acaena rorida*, endemic to tarns in the NW Ruahine ranges, is being reduced in cover by Yorkshire fog and hawkweed making cross pollination within the *A. rorida* population less likely (Ogle pers. comm.). Further, the introduction of *Acaena novae-zelandiae* at an airstrip built for deer hunting and its subsequent spread into tussockland, has allowed hybridisation of the two *Acaena* species with the possible loss of *A. rorida* genes, i.e. introgression (de Lange pers. comm.).

"[land] development has lead to a decline in the numbers of *Muehlenbeckia astonii* the disturbances thus created have been beneficial to other species in the genus, leading to an abnormal amount of pollen from these species within sites occupied by *M. astonii*. Therefore, a significant threat to the species is introgression with the more abundant *Muehlenbeckia* species, such as *M. australis*, *M. axillaris*, and *M. complexia*." de Lange *et al.* (1993).

### **4.3.2 Environmental changes caused by weeds**

Environmental changes which alter a threatened plant species' ability to compete can be caused by weeds. Weeds change the environment by altering: nutrients, seed banks, predators/grazers/disease, fire, pollinators, seed dispersers, and water.

#### **Soil chemistry and addition or removal of nutrients**

Weeds can change the soil character and chemistry, for example, by removing nutrients or changing the nutrient balance. The introduced legumes, broom, clover and gorse are nitrogen fixers and thus add to the soil nitrogen available to threatened plants and weeds growing with them.

#### **Changes in the seed bank**

Some weed seeds persist in the soil, allowing the weeds to re-establish after having been controlled. Whether weeds have more effective reproductive strategies than threatened plants is not clear, though some threatened plants are threatened because their requirements for reproduction are specialised.

The reproductive advantage of weeds appears to be greatest where disturbance events are frequent.

#### **Stabilising of substrate**

Weeds may change ecological processes that create or deposit substrates; this is a feature of many coastal weeds. For example, pampas grass invasion of dune slacks stops the cyclical action of the wind depositing and removing sand, thereby stabilising the substrate. The dune slack habitat occupied by *Eleocharis neozelandica* is effectively removed (Courtney pers. comm.).

#### **Habitat for predators/grazers/disease**

Weeds can carry disease to threatened plants, and can act as a source of predators. For example the weeds broom and harbour fungal smuts and scale, with the potential to infect the divaricating shrub *Muehlenbeckia astonii* de Lange *et al.* (1992).

*Coprosma* "violacea" is found in lowland swampy forest and scrub. The amount of suitable habitat has been reduced by wetland drainage for agriculture. Pasture grasses invade sites and inhibit germination of *C.* "violacea" seed. The grasses also provide habitat for slugs and snails significant predators of *C.* "violacea" seedlings (de Lange pers. comm.). Surviving populations tend to be mature and lack seedlings (Wellington threatened plant database).

#### **Fire**

Gorse and *Hakea* spp. are weeds that burn more readily than native cover as they carry a lot of flammable material. In Northland, *Hakea* species are invading sites species. After fire the early colonisers are often weeds. *Pterostylis puberula*, an orchid, often grows under manuka scrub. Following fire disturbance, gorse can replace manuka creating a habitat less suitable to the or-chid (Wellington Threatened Plant Database 1997).

#### **Loss of pollinators and dispersers**

Williams and Karl (1997) showed that exotic bird species preferentially eat fruits of exotic plants and thus disperse the seeds. This may lead to the replacement of native vegetation with weeds, leading to a change in insect and bird fauna. This could affect the presence or behaviour of pollinators of threatened plants.

### **4.3.3. Environmental changes allowing weed problems**

The factors that may change and allow weed problems to occur are: creation of disturbance, land use, grazing, and the introduction of weeds.

#### **Changes in processes that create disturbance and habitat for seral plants**

With increasing human development of land, the area available to some threatened plants has been reduced and fragmented. Previously, as one site was no longer suitable for a seral plant, another site would be created through natural processes. Today these processes have been inhibited (e.g. with flood control) so fewer fresh sites are created.

Sometimes the new site is too far from a seed source (e.g. in a fragmented landscape). Often the newly created site is colonised by weeds making it unavailable to the threatened plant species.

### **Changes in land use**

At Whangamarino swamp changes in drainage and increased nutrient run off have facilitated an expansion of sedges and the loss of open ground. These changes threaten the survival of a population of the orchid *Corybas carsei* (de Lange and Clarkson 1994). The sedge is a native yet maybe considered as acting as a weed due to disruption of normal successional process.

The fern *Ophioglossum petiolatum* is found in ephemeral wetlands. At one site its main threat is changes to the hydrological regime brought about through the planting of pine plantations. These changes allow the growth of weeds (de Lange pers. comm.).

### **Changes in grazing**

The balance between threatened plants and weeds and the effects of grazing on their interaction is poorly understood. In some areas grazing has occurred for a long time and the threatened plants and weeds may be in some sort of equilibrium. Even so, the small numbers of these threatened plants makes the management of weeds important.

An understanding of what happens after management is also essential to avoid the loss or reduction of threatened plant populations. Grazing can reduce weed competition for some threatened plants (e.g. *Amphibromus* see above).

A similar problem with grasses exists for *Australopyrum calcis* subsp. *calcis*, a native grass endemic to Marlborough. *A. calcis* subsp. *calcis* is found at two adjacent sites growing at the edge of low forest (Molloy 1994). The semi-shade may reduce the competitiveness of adjacent exotic grasses. This site has been fenced to prevent stock wearing away the threatened grass from resting sites. The dilemma is that stock may be needed to keep the exotic grass growth down. Monitoring is planned to see if the threatened plant and weeds are in equilibrium and note the effect of excluding browsers (Courtney and Jones pers. comm.).

### **Introduction of weed propagules by exotic animals or human activity**

Weeds are propagated through seeds, or vegetatively. Exotic fruit-eating birds help produce new exotic shrub communities. These birds favour the fruits of exotic species, therefore they spread weed seeds to areas where native plant communities can be replaced, for example, forest edges (Williams and Karl 1997). In addition, the exotic bird fauna and their different feeding and seed dispersal habits, may affect reproduction of threatened plants.

## **5. Current management problems**

Weeds are important for their part in the complex interaction of factors that put threatened plants at risk. Management problems and solutions peculiar to sites and species reflect the characteristics of individual threatened plant species. While preserving specific individuals is important in the short term, the general maintenance of ecosystem processes is required to protect threatened species in the long term. The urgency of weed control problems for managers means they often have to act without good autecological information.

At present, management can be seen as a holding action because we cannot always afford the luxury of waiting for better knowledge. Research-by-management and its documentation is important for ensuring that the opportunities to gain information are not lost. How to manage wetlands to remove or prevent weeds, and the effects of change in environmental factors (usually water) that cause wetland threatened plants or weeds to fade in and out, have been recognised as two current management issues. Many other issues exist.

## 6. Research and associated management

The following list focuses on the weed research needed to maintain and enhance the current threatened plant populations and mitigate the deleterious effects of weeds. This list has drawn on the knowledge of the staff in the Department and has been guided by the two relevant Science and Research Division Research Strategies: Draft Science and Research Threatened Plant Research Plan (de Lange 1996) and Environmental Weeds Research Plan 2006 (Timmins 1997).

The draft Conservation Requirements of New Zealand Nationally Threatened Plants (Dopson and Molloy in press) identifies research needs for individual threatened plant species. These have been integrated into the research proposals in this document.

### List of research proposals (Not in priority order.)

1. Establish a threatened plant database in each conservancy to a standard format. Base it on databases already developed in some conservancies, e.g. Wellington. This would enable efficient collation and transfer of knowledge.
2. Analyse past monitoring data to further elucidate weed threats and disseminate the results.
3. Set up representative monitoring of threatened plant-weed interactions. This would build up a more comprehensive picture of the nature of the threat posed by weeds and the efficacy of management solutions. The threatened plants not yet in high risk categories should be included before these species are in a desperate position. Some monitoring already exists.
4. Set up a standard operating procedure for control of the weeds of threatened plants (recognising site or plant specific needs). This should include documentation of the method and the results of control, including systems for information dissemination to allow science and good practice to underpin management.
5. Investigate ways to control or manage weeds which are growing intermingled with threatened plants. In particular, invasive weeds of coastal turfs; wetland edges; herbaceous turfs in tussock grassland; subalpine areas.
6. Investigate the maintenance and restoration of habitat, with regard to weeds, for the following habitats:  
**Wetland** - focusing on the impacts of grazing and changes in hydrology on weed establishment, spread and impact. *Glyceria* sp. and grey willow have been identified as being of special concern in this habitat. Research into wetland management, part of an objective in the Draft Threatened Plant Research Strategy, has been approved through the Threatened Plant Research Budget. Weed ecologists should participate in the formation of the project goals.

**Seral plants** - ways to create disturbance for the maintenance of plant communities, and the nature of weed invasions associated with disturbance.

**Coastal** - coastal communities especially dune systems, including dune slacks, and cliff communities.

8. Rank the weed species identified in terms of the need for research control methods. For example, Department of Conservation staff saw a need for research on the following species: (see Appendix 1 for scientific names)

- Heath rush, a weed of upland low fertility sites
- Stonecrop, a succulent with potential to be a significant weed in dry areas
- Sweet grass in peat wetlands
- Grey willow in wetlands
- Selaginella, a threat to liverworts and mosses in lowland forest
- Control of hawkweeds:
  - In northern areas -pampas grasses, mistflower, buffalo grass, boneseed, Mexican daisy, Mexican devil, Hakea
  - In southern areas -Hieracium, grasses particularly cocksfoot and tall fescue, star plantain

9. Investigate ways to manage grass swards which are preventing recruitment of threatened plants.

10. Investigate the role of browsers in both damaging threatened plants and in reducing weed competition.

11. Research ways of managing the weeds of forest remnants and damaged canopy forest. There is a wide audience for this information including many restoration projects and threatened plant managers.



## 7. Conclusion

- Weeds have a significant impact on threatened plants in New Zealand. Some populations of threatened plant species will be lost from the wild without appropriate weed control activity. Over 60% of the threatened plant species listed as a high priority for management (Molloy and Davis 1994) are threatened directly by weeds. In 43% of the cases of a threatened plant-weed interaction reported, the weed impact is one of the main threats.
- Weeds interact with or function as one element in a suite of factors that cause the decline of threatened plant species.
- The prevention of weed problems for threatened plant species relies in part on the restoration or maintenance of complete ecosystems.
- Some weeds that threaten native plant species are weeds widely recognised as being of conservation concern.
- Grasses are the group of weeds that most often impact on threatened plants.
- Threatened plants at risk from weeds are short, less than half a metre tall in 54% of the cases. This makes them very vulnerable to weeds.
- The problems of managing the weeds of highly threatened plants may be different from those of general ecological weeds. For threatened plants, it is the plant-plant interaction which needs managing, because each individual threatened plant is valuable. Therefore carefully targeted control methods are necessary.
- Threatened plants in coastal, damp, or disturbed habitats are most often jeopardised by weeds.

**The issues for wetlands are:** grazing, which both damages threatened plants and reduces weeds; hydrological changes, often allowing weed entry and loss of suitable threatened plant habitat; weed control, where control puts the threatened plants at risk and the removal of one weed species may allow another in; the wet areas of dune systems where weeds can change the entire hydrology and flora.

**The issues for seral plants are:** The management of land to ensure continued supply of new habitat without weeds is important, given decreasing levels of natural disturbance and the fragmented nature of the ecosystems these plants inhabit.

**The issues for coastal threatened plants are:** They usually survive modified environments, and through loss of habitat from natural and human causes are pushed into smaller habitat ranges than they once held.

- Weeds prevent regeneration for 12% of threatened plant species (excluding those species classified as Local plants).
- Weed control programmes need to consider the possibility of some weeds being neutral or beneficial to threatened plants. Control methods may allow more harmful weeds to appear.

- The impact and level of threat posed by weeds to threatened plants is not always clear. Monitoring is necessary to clarify the threats and develop better management techniques. While action to prevent weeds destroying threatened plant populations is sometimes urgent, understanding of the ecology of the threatened plant and/or its weeds is often unavailable. When weed control is carried out an opportunity for increasing knowledge is created, making research by management, and its documentation, vital.

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# Appendix 1

## Glossary of weed names used in the text

alders	<i>Alnus spp.</i>
African club moss	<i>Selaginella kraussiana</i>
bachelors button	<i>Cotula sp.</i>
boneseed	<i>Chrysanthemoides monilifera</i>
browntop	<i>Agrostis capillaris</i>
broom	<i>Cytisus scoparius</i>
buffalo grass	<i>Stenotaphrum secundatum</i>
cocksfoot	<i>Dactylis glomerata</i>
fireweed	<i>Senecio minimus</i>
forget-me-not	<i>Myosotis sp.</i>
gorse	<i>Ulex europeus</i>
grey willow	<i>Salix cinerea</i>
ivy	<i>Hedera sp.</i>
hawkweed	<i>Hieracium spp.</i>
heath rush	<i>Juncus squarrosus</i>
kanuka	<i>Kunzea ericoides</i>
manuka	<i>Leptospermum scoparium</i>
marram grass	<i>Ammophila arenaria</i>
Mercer grass	<i>Paspalum distichum</i>
Mexican devil weed	<i>Ageratina adenophora</i>
mist flower	<i>Agertine riparia</i>
needle bush	<i>Hakea spp.</i>
reed sweet grass	<i>Glyceria maxima</i>
pampas grass	<i>Cortaderia jubata</i>
pampas grass	<i>Cortaderia selloana</i>
sedge	<i>Carex spp.</i>
stone crop	<i>Sedum acre</i>
sweet grass	<i>Glyceria spp.</i>
wandering Jew	<i>Tradescantia fluminensis</i>
water primrose	<i>Ludwigia sp.</i>
willows	<i>Salix spp.</i>
willow weed	<i>Polygonum sp.</i>
Yorkshire fog	<i>Holcus lanatus</i>

# Appendix 2

## Threat categories summarised by Cameron *et al.* (1995)

Presumed extinct (Ex) - Taxa which are no longer known to exist in the wild or in cultivation after repeated searches of the type localities and other known or places.

Critical (C) - Taxa which face an extremely high probability of extinction in the wild within the immediate future.

Endangered (E) - Taxa in danger of extinction whose survival is unlikely if the causal factors continue operating. Included are taxa whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

Vulnerable (V) - Taxa believed likely to move into the Endangered category in the near if the causal factors continue operating, Included are taxa of which most or all the populations are decreasing because of over-exploitation, extensive destruction of habitat or other environmental disturbance; taxa with populations that have been seriously depleted and whose ultimate security is not yet assured; and taxa with populations that are still abundant, but are under threat from serious adverse factors throughout their range.

Rare (R) - Taxa with small populations which are not Endangered or Vulnerable but are at risk. These taxa are usually within restricted geographical areas or habitats or are thinly scattered over a more extensive range. Rare plants are often endemic with a narrow distribution whereas Vulnerable and Endangered plants have often been formerly more widespread.

Insufficiently known (IK) - Taxa that are suspected, but not definitely known to belong to any of the above categories because of lack of information. An "Insufficiently known" taxon does not have to be proved to be in any of the four categories -Critical, Endangered, Vulnerable or Rare.

Taxonomically Indeterminate (I) - This includes: (1) Taxa about which there is doubt regarding taxonomic status and which require investigation; and (2) genetic variants which are distinct at a level which may not warrant formal taxonomic recognition. Entries are grouped by probable category of threat, e.g., I,V indeterminate in vulnerable category.

Local (L) - (Non IUCN) This category is designed to act as a 'watchlist' for taxa which are sufficiently restricted to warrant noting and monitoring. It may include taxa which habitats potentially threatened in the future, and those found in sensitive habitats which are prone to damage.



## Appendix 3

### Database Tables and Fields

The database is constructed of three linked tables: threatened species table; location table; and threat table. The source of information for each field within the tables is noted.

TABLE A3.1. THREATENED SPECIES DATABASE TABLE

FIELD	EXPLANATION
Species name	as given in Cameron et (1995)
Threat category	given in Cameron et see Appendix 2.
Priority category	as given in and Davis see text Section
Habitat	from Allan (1982), Moore and Edgar (1970), Wilson and Given (1989), Wilson and Galloway (1993).
Height category	five categories used: Low a = <0.1 m, Low b = >0.1 m <0.5 m, Low c = >0.5 m < 1 m, Med = >1 m, Med = >1 m <2 m, Tall = >2 m.

TABLE A3.2. LOCATION DATABASE TABLE

FIELD	EXPLANATION
Conservancy	Boundaries are as at 1 April 1997. (See Footnotes to Appendix 4 for list of conservancy letter codes)
Management	Weed management already carried out
Information source	Person or literature (Listed at end of Appendix 4)

TABLE A3.3. THREAT DATABASE TABLE

FIELD	EXPLANATION
Threat type	<p><i>Important</i> -where weeds are one the main threats to a threatened plant's survival.</p> <p><i>Secondary</i> - has an but is not a main threat. Would only become significant if conditions change.</p> <p><i>Past</i> - has either through control of the weed or the threatened plant has become extinct. Where plant is no longer found at a site it may be referred to as extinct in parentheses.</p> <p><i>Potential</i> -weed may be threatening in future (weed is usually found in the vicinity of the threatened plant).</p> <p><i>Undermined</i> - level of weed threat unknown.</p> <p><i>Supporting</i> - weed provides habitat for threatened plant.</p>
Weed species	Scientific name -Webb <i>et al.</i> (1988) Healy and Edgar (1980).
Common name	Webb <i>et al.</i> (1988). Nichol (1997).
Location	Given where different sites have different weed threats for the same plant within a conservancy.
Height	In metres.
Growth form	Grass, herb, sedge and rush, climber, tree, fern, aquatic.
Height category (weed)	Low a, low b, low c, med., tall, climber (see species table for definitions).
Threat mechanism	Human degradation of habitat is usually the underlying cause. The mechanism listed was that operating at the time of writing.

# Appendix 4

## Threatened Plants affected by Weeds Database (abridged)

13 March 1998

### *Acaena pallida*

Conservancy	WL*	Information Source	Threat Category Priority Category WL database	D -1
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Ammophila arenaria</i>	marsh grass	Competition	
Important	<i>Ehrharia erecta</i>	weld grass	Compete for open sites	

### *Acaena vorida*

Conservancy	WG	Information Source	Threat Category Priority Category Ogle C pers. comm. 1997, Rogers G 1993, Owen SJ 1995, de Lange P pers. comm. 1997	C A
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Hieracium pilosella</i>	mouse eared hawkweed	Invasives sites, outcompetes	
Important	<i>Holcus lanatus</i>	Yorkshire fog	Reduced in cover	
Undetermined	<i>Acaena novae-zelandiae</i>	pipipi	Hybridisation	

### *Amphibromus fluitans*

Conservancy	AK	Information Source	Threat Category Priority Category de Lange Landcare database	C -
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Paspalum paspalodes</i>	mercer grass	=	
Undetermined	<i>Cenchrus cuninghamii</i>	succaweed	=	
Conservancy	WG	Information Source	Ogle C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Ranunculus trichophyllus</i>	water buttercup	Smother	
Potential	<i>Ranunculus flammula</i>	spearwort	Smother	
Secondary (extinct) <sup>1</sup>	-	weeds	=	
Conservancy	WL	Information Source	Rebergen A pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Paspalum distichum</i>	mercer grass	Smother	
Undetermined	<i>Polygonum</i> sp.	willow weed	-	
Undetermined	<i>Ludwigia</i> sp.	water primrose	-	

### *Anogramma leptophylla*

Conservancy	WL	Information Source	Threat Category Priority Category Ogle C 1989	E -
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	-	weeds	Competition	

(Footnotes are explained at the end of this appendix.)

*Asplenium pauperequitum*

Conservancy	NL*	Information Source	Threat Category Priority Category Forester I pers. comm. 1997	C <sup>1</sup> A <sup>1</sup>
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Ageratina adenophora</i>	Mexican devil	-	

*Australopyrum calcis subsp. calcis*

Conservancy	NM	Information Source	Threat Category Priority Category Molloy BFJ 1994, Courtney S & Jones C pers. comm. 1997	C A
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Anthoxanthum odoratum</i>	sweet vernal	Competition	
Important	<i>Dactylis glomerata</i>	cockshoof	Competition	
Important	Family Poaceae	exotic grasses	Competition	
Important	<i>Ilkium lanatum</i>	Yorkshire fog	Competition	
Important	<i>Mycelis muralis</i>	wall lettuce	Competition	
Important	<i>Galium aparine</i>	cleavers	Competition	

*Australopyrum calcis subsp. opatum*

Conservancy	CA	Information Source	Threat Category Priority Category Molloy BFJ 1994, Head N pers. comm. 1997	V A
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Dactylis glomerata</i>	cockshoof	Competition for habitat	
Important	<i>Festuca rubra</i>	Chewing's fescue	Competition for habitat	
Important	-	naturalised herbs and grasses	-	
Important	<i>Bromus sterilis</i>	riggat brome	Competition for habitat	
Important	<i>Agrostis capillaris</i>	brown-top	Competition for habitat	

*Austrofestuca littoralis*

Conservancy	CA	Information Source	Threat Category Priority Category Wilson H pers. comm. 1997	R -
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Ammophila arenaria</i>	maritime grass	-	
Potential	<i>Lupinus arboreus</i>	tree lupin	-	
Conservancy	NM	Information Source	Courtney S & Jones C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Ammophila arenaria</i>	maritime grass	Competition	
Conservancy	WL	Information Source	WL database	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Lupinus arboreus</i>	woods (e.g., Lupins)	-	
Undetermined	<i>Ammophila arenaria</i>	maritime grass	-	

(Footnotes are explained at the end of this appendix.)

***Botrychium aff. lunaria***

Conservancy	NM	Information Source	Threat Category	V
			Priority Category	A
			Courtney S and Jones C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Hieracium pilosella</i>	mouse eared hawkweed	Invasion of turf	
Undetermined	<i>Trifolium</i> spp.	clover	Shades out	

***Brachycome pinnata***

Conservancy	CA	Information Source	Threat Category	-
			Priority Category	-
			Head N pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	Family Poaceae	exotic grasses	Smothering	
Important	<i>Lolium</i> sp.	ryegrass	Smothering	
Important	<i>Anthoxanthum odoratum</i>	sweet vernal	Smothering	
Important	<i>Agrostis capillaris</i>	brown-top	Smothering	
Important	<i>Holcus lanatus</i>	Yorkshire fog	Smothering	
Potential	<i>Verbascum</i> sp.	mullein	Habitat competition	
Potential	<i>Echium vulgare</i>	viper's bugloss	Habitat competition	

***Brachyglottis scladophila***

Conservancy	WG	Information Source	Threat Category	L
			Priority Category	-
			Ogle C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Past	<i>Prunus</i> sp.	plum	Some light obstruction inhibits regeneration	
Past	<i>Cotoneaster</i> spp.	-	Some light obstruction inhibits regeneration	
Past	<i>Hedera helix</i>	ivy	Prevent regeneration, climb and smother	
Past	<i>Sambucus nigra</i>	elder	Some light obstruction inhibits regeneration	
Past	<i>Euonymus europaeus</i>	spindle tree	Some light obstruction inhibits regeneration	
Past	<i>Prunus laurocerasus</i>	cherry laurel	Serious light obstruction inhibits regeneration	
Past	<i>Sorbus aucuparia</i>	rowan	Some light obstruction inhibits regeneration	

***Caladenia atradenia***

Conservancy	NL	Information Source	Threat Category	L
			Priority Category	B
			Forster L pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Cortaderia</i> sp.	pampas grass		
Supporting	<i>Hakea</i> sp.	needle bush	Creates good habitat	
Conservancy	TT	Information Source	Buddenhagen C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Supporting	<i>Cytisus scoparius</i>	broom	Creates good habitat	
Undetermined	<i>Cortaderia</i> sp.	pampas grass		

***Calochilus robertsonii***

Conservancy	BOP	Information Source	Threat Category	L
			Priority Category	-
			Beadel S 1992	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	Family Poaceae	grass seed	Oversowing with seed, competition	

***Calystegia marginata***

Conservancy	NI*	Information Source	Threat Category Priority Category	V*
			D.O.C. status report 25/6/97	-1
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Anemone cordifolia</i>	madecia vine	-	

***Cardamine "tarn"***

Conservancy	CA	Information Source	Threat Category Priority Category	E B
			Head N pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Agrostis capillaris</i>	browntop	Competition	
Important	<i>Hieracium</i> spp.	hawkweeds	Invasde habitat	
Conservancy	NM	Information Source	Courtney S & Jones C pers. comm.	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Carex ovalis</i>	oval sedge	Invasion of habitat, competition	

***Carex dolomitica***

Conservancy	NM	Information Source	Threat Category Priority Category	V -
			de Lange P & Heenan PB 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Lolium perenne</i>	perennial rye grass	Competition for open habitat	
Potential	<i>Tanacetum officinale</i>	dandelion	Competition for open habitat	
Potential	<i>Erigeron karwinskianus</i>	Mexican daisy	Competition for open habitat	
Potential	<i>Ulex europaeus</i>	gorse	Competition for open habitat	
Potential	<i>Crepis capillaris</i>	smooth hawkbeard	Competition for open habitat	
Potential	<i>Agrostis capillaris</i>	browntop	Competition for open habitat	
Potential	<i>Agrostis stolonifera</i>	creeping bent	Competition for open habitat	

***Carex druceana* var. *astonii***

Conservancy	WG	Information Source	Threat Category Priority Category	- -
			Rogers GM 1989	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	<i>Calluna vulgaris</i>	heather	-	

***Carex inopinata***

Conservancy	CA	Information Source	Threat Category Priority Category	E A
			Head N pers. comm. 1997. Given 1995	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	Family Poaceae	dense sward of short grasses	Competition	
Important	<i>Festuca rubra</i>	Crewing's fescue	Smothering	
Undetermined	<i>Cerastium</i> sp.	chickweed	-	
Undetermined	<i>Hieracium</i> sp.	hawkweed	-	
Undetermined	<i>Prunella vulgaris</i>	selfheal	-	
Undetermined	<i>Trifolium repens</i>	white clover	-	
Undetermined	<i>Ribes uva-ursi</i>	gooseberry	-	
Undetermined	<i>Leucanthemum vulgare</i>	oxeye daisy	-	

(Footnotes are explained at the end of this appendix.)

Conservancy	NM	Information Source	Courtney and Jones pers. comm. 1997
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT
Important	<i>Mycelis muralis</i>	wall lettuce	Competition for space
Important	<i>Eucalyptus europaeus</i>	spindle tree	Shading, kill canopy
Important	<i>Rubus fruticosus</i>	blackberry	Shading, kill canopy
Important	<i>Clematis vitalba</i>	old man's beard	Shading, kill canopy
Important	<i>Muehlenbeckia australis</i>	pohouetue (native)	Shading, kill canopy
Undetermined	<i>Digitalis purpurea</i>	foxglove	Invade habitat
Undetermined	Family Poaceae	exotic grasses	Invade habitat
Conservancy	OT	Information Source	Barkla J pers. comm. 1997
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT
Important	Family Poaceae	pasture grasses	Seedling recruitment

### *Carex unciifolia*

Conservancy	SL	Information Source	Threat Category	R
THREAT TYPE	WEED SPECIES	COMMON NAME	Priority Category	B
			Rance B pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Juncus</i> sp.	rush	Invade habitat	
Conservancy	TT	Information Source	Burdenhagen C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	<i>Calluna vulgaris</i>	heather	-	
Conservancy	WG	Information Source	Ogle C pers. comm. 1997, Rogers G 1993	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Juncus articulatus</i>	jointed rush	Invade habitat	
Potential	<i>Calluna vulgaris</i>	heather	Invade habitat	

### *Carmichaella astonii*

Conservancy	NM	Information Source	Threat Category	L
THREAT TYPE	WEED SPECIES	COMMON NAME	Priority Category	-
			Courtney S pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Sedum acre</i>	stonecrop	Fill recruitment habitat	

### *Carmichaella curta*

Conservancy	CA	Information Source	Threat Category	V
THREAT TYPE	WEED SPECIES	COMMON NAME	Priority Category	B
			Head N pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Agrostis capillaris</i>	browntop	Prevents regeneration	
Important	<i>Cytisus scoparius</i>	broom	-	
Important	<i>Anthoxanthum odoratum</i>	sweet vernal	Prevents regeneration	
Important	<i>Rosa rubiginosa</i>	sweet briar	-	
Important	<i>Ulex europaeus</i>	gorse	-	
Important	<i>Hieracium</i> spp.	hawkweeds	Competition for water	
Potential	<i>Pinus</i> spp.	wilding pines	-	
Potential	<i>Lupinus</i> sp.	lupin	-	
Conservancy	NM	Information Source	Heenan PB 1995	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	-	pasture grasses and weeds	Prevent seedling germination & establishment	

***Carmichaelia hollwayi***

Conservancy	OT*	Information Source	Threat Category Priority Category	I, R <sup>1</sup> A
			Heenan PB 1996.	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	-	introduced grasses and weeds	Prevent recruitment	

***Carmichaelia juncea***

Conservancy	NM	Information Source	Threat Category Priority Category	I, I B
			Courtney S & Jones C pers. comm. 1997. Heenan PB 1995.	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	-	weeds & pasture grasses	Competition	

***Carmichaelia kirkiti***

Conservancy	CA	Information Source	Threat Category Priority Category	C B
			Head N pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	-	wooly weeds	Spraying (if RCD stops rabbit grazing)	
Secondary	Family Poaceae	exotic grasses	Prevent regeneration	
Undetermined	<i>Cytisus scoparius</i>	broom	-	
Conservancy	NM	Information Source	Courtney S and Jones C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Arrhenatherum elatius</i>	tall oat grass	Prevent recruitment	

***Carmichaelia vexillata***

Conservancy	Nat	Information Source	Threat Category Priority Category	- -
			Dobson S & Molloy J in press 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Hieracium</i> sp.	hawkweed	No recruitment	

***Carmichaelia williamsi***

Conservancy	NL	Information Source	Threat Category Priority Category	V B
			Forester L pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Ageratina adenophora</i>	Mexican devil	Prevent recruitment	
Important	<i>Ptytolacca octandra</i>	inkweed	-	
Important	<i>Cortaderia</i> sp.	pampas grass	Competition, smothering	
Conservancy	WK	Information Source	Rosburgh J pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Hakea</i> sp.	needle bush	Competition	
Secondary	<i>Lupinus arboreus</i>	tree lupin	Competition	
Secondary	<i>Ulex europaeus</i>	gorse	Competition	
Secondary	<i>Leptospermum scoparium</i>	manuka (native)	Competition	

(Footnotes are explained at the end of this appendix.)



**Cheesemania "Chalk Range"**

Conservancy	NM	Information Source	Threat Category Priority Category	E C
			Courtney S pers. comm. 1997	-
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Sedum acre</i>	stonecrop	Habitat invasion	
Secondary	-	weeds	Range contraction	

***Chordospartium muritai***

Conservancy	NM	Information Source	Threat Category Priority Category	E A
			Williams <i>et al.</i> 1996	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	Family Poaceae	grasses	Prevent recruitment	
Important, past	<i>Lycium ferocissimum</i>	boxthorn	Invasive habitat	
Important, past	<i>Clematis vitalba</i>	old man's beard	Shading, kill canopy	
Potential	<i>Ulex europaeus</i>	gorse	Invasive habitat	
Potential	<i>Chrysanthemoides monilifera</i>	honeseed	Invasive habitat	
Undetermined	<i>Dactyloctenium aegyptium</i>	cockatoot	Establishment of seedlings	

***Chordospartium stevensonii***

Conservancy	NM	Information Source	Threat Category Priority Category	V B
			Courtney C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Buddleja davidii</i>	buddleia	Habitat invasion	

***Christella dentata* "NZ"**

Conservancy	Nat	Information Source	Threat Category Priority Category	E A
			Dopson S & Molloy J in press 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	-	weeds	Competition	

***Clanthus puniceus***

Conservancy	HB	Information Source	Threat Category Priority Category	E A
			Walls G pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Paraserianthes lophantha</i>	brush wattle	-	
Important	<i>Dipogon lignosa</i>	mile a minute	Smothering and shading	
Important	<i>Pteridium esculentum</i>	bracken	-	
Important	<i>Pinus</i> spp.	wilding pines	-	

***Coprosma "violacea"***

Conservancy	CA	Information Source	Threat Category Priority Category	V A
			de Lange P, Head N, pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Dactyloctenium aegyptium</i>	cockatoot	Soop regeneration	
Potential	<i>Muehlenbeckia australis</i>	poohuehue (native)	Smother	
Undetermined	-	pasture grasses	Inhibit germination, habitat for slugs and snails.	

Conservancy	WL*	Information Source	Sawyer J pers. comm. 1997
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT
Undetermined	-	pest plants	Lack of regeneration

### *Coprosma obconica*

Conservancy	NM*	Information Source	Threat Category R <sup>3</sup> Priority Category -1 Courtney S and Jones C pers. comm. 1997
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT
Secondary	-	weeds	Prevent recruitment
Conservancy	WG	Information Source	Ogle C pers. comm. 1997
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT
Past	<i>Prunus laurocerasus</i>	cherry laurel	Serious light obstruction
Past	<i>Hedera helix</i>	ivy	Prevent recruitment, climb and smother
Past	<i>Cotoneaster</i> sp.	Some light obstruction	

### *Coprosma wallii*

Conservancy	CA	Information Source	Threat Category Y Priority Category B Head N pers. comm. 1997
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT
Important	<i>Ulex europaeus</i>	gorse	Threatens smaller plants
Important	<i>Dactylis glomerata</i>	cockfoot	Threatens juveniles
Conservancy	NM	Information Source	Courtney S & Jones C pers. comm. 1997
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT
Important	<i>Agrostis capillaris</i>	browntop	Prevent recruitment
Important	<i>Anthoxanthum odoratum</i>	sweet vernal	Prevent recruitment
Conservancy	SL	Information Source	Rance B pers. comm. 1997
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT
Undetermined	Family Poaceae	pasture grasses	Suppress regeneration
Conservancy	TT	Information Source	Buddenhagen C pers. comm. 1997
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT
Potential	<i>Calluna vulgaris</i>	heather	-
Potential	<i>Cynus scoparius</i>	beem	Out-compete seedlings
Conservancy	WG	Information Source	Ogle C pers. comm. 1997
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT
Past	<i>Sorbus aucuparia</i>	rowan	Prevent regeneration, some light obstruction
Past	<i>Prunus</i> sp.	plum	Prevent regeneration, some light obstruction
Past	<i>Prunus laurocerasus</i>	cherry laurel	Prevent regeneration, serious light obstruction
Past	<i>Cotoneaster</i> spp.	-	Prevent regeneration, some light obstruction
Past	<i>Sambucus nigra</i>	elder	Prevent regeneration, some light obstruction
Past	<i>Evonymus europaeus</i>	spindle tree	Prevent regeneration, some light obstruction
Past	<i>Hedera helix</i>	ivy	Prevent regeneration, climb and smother
Conservancy	WL	Information Source	Ogle C pers. comm. 1997
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT
Important	Family Poaceae	pasture grasses	Prevent regeneration

(Footnotes are explained at the end of this appendix.)

***Cortaderia turbaria***

Conservancy	CA	Information Source	Threat Category Priority Category de Lange P pers. comm. 1997	C A
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Cortaderia splendens</i>	toetoe (mainland)	Hybridisation	

***Corybas carsei***

Conservancy	NIH	Information Source	Threat Category Priority Category de Lange P & Clarkson BD 1994	C A
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Secondary	Family Cyperaceae	sedges (native)	Invasi habitat	

***Crassula bunua***

Conservancy	SL	Information Source	Threat Category Priority Category Rance B pers. comm. 1997	E B
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	-	weeds tolerant of damp habitat	Invasion of habitat	
Conservancy	WL	Information Source	WL data base	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	-	pest plants	Competition	

***Crassula peduncularis***

Conservancy	CA	Information Source	Threat Category Priority Category Head N pers. comm. 1997	V B
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Asteracium</i> sp.	hawkweed	Competition	
Important	<i>Agrostis capillaris</i>	beowntop	Competition	
Important	Family Poaceae	exotic grass sward	Competition	
Potential	-	algal blooms	Smothering of riparian margins	
Potential	<i>Juncus</i> sp.	rush	-	
Potential	<i>Carex</i> sp.	sedge	-	
Undetermined	<i>Holcus lanatus</i>	Yorkshire fog	-	
Conservancy	WG	Information Source	Ogle C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Leontodon taraxacoides</i>	hawkbit	Eliminate habitat	
Important	Family Poaceae	grasses	Eliminate habitat	
Important	<i>Hypochaeris radicata</i>	catsear	Eliminate habitat	
Important	<i>Holcus lanatus</i>	Yorkshire fog	Eliminate habitat	
Important	<i>Trifolium dubium</i>	stocking clover	Eliminate habitat	
Conservancy	WL	Information Source	WL database. de Lange P pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	-	woods	Smothering	
Undetermined	<i>Ranunculus repens</i>	creeping buttercup	Smother	

*Cyclosorus interruptus*

Conservancy	BP	Information Source	Threat Category Priority Category	R <sup>1</sup> -1
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Salix cinerea</i>	grey willow	Increasing willow cover	

*Dactyloctenium aegyptium*

Conservancy	TT	Information Source	Threat Category Priority Category	E A
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Pinus ponderosa</i>	ponderosa pine	Invasives host habitat	
Potential	<i>Pinus contorta</i>	lodgepole pine	Invasives host habitat	
Conservancy	WK	Information Source	Roxburgh J pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Pinus contorta</i>	lodgepole pine	Invasives host habitat	

*Davallia "Puketi"*

Conservancy	NL	Information Source	Threat Category Priority Category	R A
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Ageratina riparia</i>	mistleflower	In surrounding forest	
Secondary	<i>Digitalis purpurea</i>	foxglove	-	

*Deschampsia caespitosa* var. *macrantha*

Conservancy	OT	Information Source	Threat Category Priority Category	V C
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	Family Poaceae	grasses	Competition	

*Desmochloa spiralis*

Conservancy	Nat	Information Source	Threat Category Priority Category	- M
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	<i>Cortaderia</i> spp.	pampas grasses	-	
Undetermined	<i>Ammophila arenaria</i>	marraam grass	-	
Undetermined	<i>Lupinus arboreus</i>	tree lupin	-	
Undetermined	<i>Pennisetum clandestinum</i>	kikuyu grass	-	
Conservancy	NM	Information Source	Courtney S & Jones C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Ammophila arenaria</i>	marraam grass	Modify habitat, competition, invade and dominate	
Important	<i>Carpobrotus edulis</i>	ice plant	Invasives and dominate	
Secondary	<i>Lupinus arboreus</i>	tree lupin	Invasives modified habitat	

(Footnotes are explained at the end of this appendix.)

Conservancy	OT	Information Source	Amiers G 1992, Partridge TR 1995
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT
Important	<i>Lupinus arboreus</i>	tree lupin	Invasde habitat
Important	<i>Ammophila arenaria</i>	marram grass	Modify habitat, competition

#### *Deyeuxia aff. quadriseta* (D. "Waima")

Conservancy	NM	Information Source	Threat Category Priority Category Courtney S & Jones C pers. comm. 1997	I, R -
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	<i>Buddleja davidii</i>	buddleia	Takes sites	
Undetermined	Family Poaceae	grass	Competition?	

#### *Dicranopteris linearis*

Conservancy	BOP	Information Source	Threat Category Priority Category Beadel S 1992	L -
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	-	weeds	Overtopping	

#### *Eleocharis neozelandica*

Conservancy	CA	Information Source	Threat Category Priority Category Head N pers. comm. 1997	V B
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Past	<i>Hordeum marinum</i>	salt barley grass	Presumed extinct <sup>1</sup>	
Conservancy	NM	Information Source	Courtney S pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Ammophila arenaria</i>	marram grass	Invasde and modify habitat	
Important	<i>Lotus pedunculatus</i>	lotus	Invasde and modify habitat	
Potential	<i>Cortaderia</i> spp.	pampas grasses	Modify habitat	
Conservancy	WG	Information Source	Ogle C pers. comm. 1997, Ogle 1989	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Juncus articulatus</i>	jointed rush	Competition, remove open sand habitat	
Important	<i>Holcus lanatus</i>	Yorkshire fog	Competition, smother	
Past	<i>Holcus lanatus</i>	Yorkshire fog	<i>Eleocharis</i> extinct <sup>1</sup> , smother	
Past	<i>Trifolium fragiferum</i>	strawberry clover	<i>Eleocharis</i> extinct <sup>1</sup> , out compete	
Past	<i>Cortaderia</i> sp.	pampas grass	<i>Eleocharis</i> extinct <sup>1</sup> , smother	
Potential	<i>Cortaderia</i> sp.	pampas grass	Invasde habitat, shade out	
Conservancy	WL	Information Source	WL database	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Pennisetum clandestinum</i>	kikuyu grass	Invasde habitat	

#### *Euphorbia glauca*

Conservancy	EP	Information Source	Threat Category Priority Category Beadel S 1992	R C
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Lupinus arboreus</i>	tree lupin	Overtopping	

Conservancy	NM	Information Source	Courtney S & Jones C pers. comm. 1997
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT
Potential	<i>Ammophila arenaria</i>	maritime grass	Competition at dune sites
Conservancy	SL	Information Source	SL Recovery plan 1996. Wilson H pers. comm. 1997
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT
Important	<i>Ammophila arenaria</i>	maritime grass	-
Important	<i>Lupinus arboreus</i>	tree lupin	-
Important	<i>Ulex europaeus</i>	gorse	Invasion of habitat/competition
Past	<i>Ammophila arenaria</i>	maritime grass	-
Conservancy	WG	Information Source	Ogle C pers. comm. 1997
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT
Important	Family Poaceae	pasture grasses	Competition invade habitat
Potential	<i>Gunnera tinctoria</i>	Chúcan (hubach)	Competition invade habitat, overtop & replace
Conservancy	WL	Information Source	WL database.
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT
Important	<i>Lupinus arboreus</i>	tree lupin	Over topping

#### *Gentiana "scree"*

Conservancy	NM	Information Source	Threat Category Priority Category Courtney S & Jones C pers. comm. 1997	I, V <sup>1</sup> -4
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	<i>Echium vulgare</i>	viper's bugloss	Invasive habitat	
Undetermined	Family Poaceae	exotic grasses	Invasive habitat	

#### *Gnaphalium luteo-album var. compactum*

Conservancy	CA	Information Source	Threat Category Priority Category Head N pers. comm. 1997	E B
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Agrostis capillaris</i>	browntop	-	
Conservancy	NM	Information Source	Jones C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	<i>Rosa rubiginosa</i>	sweet briar	Invasive habitat	
Undetermined	<i>Agrostis capillaris</i>	browntop	Invasive habitat	
Conservancy	SL	Information Source	Rance D pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Hieracium sp.</i>	hawkweed	Invasive habitat	
Important	<i>Agrostis capillaris</i>	browntop	Invasive habitat	
Undetermined	<i>Cytisus scoparius</i>	broom	-	

(Footnotes are explained at the end of this appendix.)

**Gratiola nana**

Conservancy	NM	Information Source	Threat Category	R
			Priority Category	-
			Courtney S & Jones C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Myosotis laxa</i>	water forget-me-not	Invade habitat	
Conservancy	WG	Information Source	Threat Category	
			Ogle C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Juncus articulatus</i>	jointed rush	Competition, overtopping	

**Gunnera hamiltonii**

Conservancy	SL	Information Source	Threat Category	E
			Priority Category	B
			Rance B pers. comm. 1997, SL Recovery plan 1996, Wilson H pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Ammophila arenaria</i>	maritime grass	Competition	
Important	<i>Ulex europaeus</i>	gorse	Competition	
Important	<i>Lupinus arboreus</i>	tree lupin	Habitat modification	
Important	Family Poaceae	exotic grasses	Competition	
Past	<i>Lupinus arboreus</i>	tree lupin	Competition (1960) site extinction <sup>1</sup>	

**Hebe "bartlett"**

Conservancy	NL	Information Source	Threat Category	R
			Priority Category	-
			de Lange P pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Cortaderia selkama</i>	pampas grass	Invade habitat after opened up by browser damage	
Potential	<i>Ageratina riparia</i>	mistflower	Invade habitat after browser damage	
Potential	<i>Cortaderia jubata</i>	pampas grass	Invade habitat after browser damage	

**Hebe acutiflora**

Conservancy	NL	Information Source	Threat Category	V
			Priority Category <td>C</td>	C
			Forester I pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Ageratina riparia</i>	mistflower	-	

**Hebe bisbopiana**

Conservancy	AK	Information Source	Threat Category	V
			Priority Category <td>A</td>	A
			de Lange P 1996	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Cortaderia selkama</i>	pampas grass	Invade habitat	
Important	<i>Cortaderia jubata</i>	pampas grass	Invade habitat	
Important	<i>Ageratina riparia</i>	mistflower	Invade habitat	

*Hebe brevifolia*

			Threat Category	L <sup>1</sup>
			Priority Category	3
Conservancy	NL <sup>2</sup>	Information Source	de Lange P 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Hakea sericea</i>	prickly hakea	Invade habitat	
Potential	<i>Cortaderia setiformis</i>	pampas grass	Invade habitat	
Potential	<i>Hakea gibbosa</i>	downy hakea	Invade habitat	

*Hebe cupressoides*

			Threat Category	E
			Priority Category	B
Conservancy	CA	Information Source	Head N pers. comm. 1997. Wilson H pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Agrostis capillaris</i>	browntop	Regeneration and juveniles	
Important	Family Poaceae	exotic grass	Prevent regeneration by swamping juveniles	
Undetermined	<i>Rosa rubiginosa</i>	sweet beier	-	
Conservancy	OT	Information Source	Barkla J pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	Family Poaceae	grasses	Seedlings not establish	

*Hebe elliptica var. crassifolia*

			Threat Category	L
			Priority Category	B
Conservancy	Nat	Information Source		
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	-	weeds	Competition	

*Hebe speciosa*

			Threat Category	V
			Priority Category	C
Conservancy	NL	Information Source	Courtney S & Jones C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	Family Poaceae	grasses	-	
Undetermined	<i>Ulex europaeus</i>	gorse	-	

*Helicbrysum dimorphum*

			Threat Category	E
			Priority Category	A
Conservancy	CA	Information Source	Head N pers. comm. 1997. Given DR 1993b	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Cytisus scoparius</i>	broom	Competition for water	
Important	<i>Cytisus scoparius</i>	broom	Spraying	
Important	<i>Ulex europaeus</i>	gorse	Spraying	
Important	<i>Dactylis glomerata</i>	cockfoot	Prevent regeneration	
Important	Family Poaceae	exotic grasses	Prevent regeneration	
Undetermined	<i>Cirsium arvense</i>	Californian thistle	-	
Undetermined	<i>Verbascum thapsus</i>	woolly mullein	-	
Undetermined	<i>Hieracium</i> sp.	hawkweed	-	
Undetermined	<i>Rosa rubiginosa</i>	sweet beier	-	

(Footnotes are explained at the end of this appendix.)



Conservancy	SL	Information Source	SL Recovery plan 1996
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT
Important	<i>Cytisus scoparius</i>	broom	Aerial spraying
Important	-	brush weeds	Competition

### *Ipbigenia novae-zelandiae*

Conservancy	CA	Information Source	Threat Category	V
THREAT TYPE	WEED SPECIES	COMMON NAME	Priority Category	B
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Stipa trichotoma</i>	masella tussock	Habitat invasion	
Potential	<i>Cytisus scoparius</i>	broom	Habitat invasion	
Potential	<i>Acaena agnispila</i>	sheep's bur	Habitat invasion	
Secondary	<i>Dactylis glomerata</i>	cockfoot	Habitat invasion	
Secondary	<i>Holcus lanatus</i>	Yorkshire fog	Habitat invasion	
Secondary	<i>Agrostis capillaris</i>	browntop	Habitat invasion	
Conservancy	SL	Information Source	SL Recovery plan 1996	
THREAT TYPE	WEED SPECIES	COMMON NAME	Rance B pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	Family Poaceae	exotic grasses	Invade habitat	
Important	<i>Cytisus scoparius</i>	broom	Invade habitat	
Important	<i>Agrostis capillaris</i>	browntop	Invade habitat	
Important	<i>Hieracium</i> sp.	hawkweed	Invade habitat	

### *Ischnocarpus novae-zelandiae*

Conservancy	NM	Information Source	Threat Category	E
THREAT TYPE	WEED SPECIES	COMMON NAME	Priority Category	B
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Secondary	-	pasture grasses	Competition for space	
Conservancy	SL	Information Source	Rance B pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Secondary	<i>Anthoxanthum odoratum</i>	sweet vernal	Competition	
Secondary	<i>Agrostis capillaris</i>	browntop	Competition	

### *Isolepis basilaris*

Conservancy	CA	Information Source	Threat Category	V
THREAT TYPE	WEED SPECIES	COMMON NAME	Priority Category	B
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	-	sgal blooms	Smother riparian edge	
Undetermined	<i>Hordeum maritimum</i>	salt barley grass	-	
Undetermined	<i>Salix</i> sp.	willow	-	
Conservancy	SL	Information Source	SL Recovery plan 1996	
THREAT TYPE	WEED SPECIES	COMMON NAME	Rance B pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Juncus articulatus</i>	jointed rush	Invade habitat	
Important	<i>Salix fragilis</i>	crack willow	Invade habitat	

Conservancy	WG*	Information Source	Ogle C pers. comm. 1997 Burkitt J pers. comm. 1997
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT
Important	<i>Juncus articulatus</i>	jointed rush	Invasion, outcompete
Important	<i>Holcus lanatus</i>	Yorkshire fog	Invasion, shading
Important	<i>Cortaderia selowana</i>	pumpas grass	Invasion, shading
Potential	<i>Senecio glastifolius</i>	holly-leaved senecio	Shading
Conservancy	WL	Information Source	WL data base.
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT
Important	<i>Cortaderia</i> sp.	pumpas grass	Invasde habitat as irrigation changes soil s

***Itil lacustris***

Conservancy	SL	Information Source	Threat Category Priority Category SL Recovery plan 1996	B <sup>4</sup> B <sup>4</sup>
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Secondary	<i>Salix fragilis</i>	crack willow	Invasde habitat	
Secondary	<i>Juncus articulatus</i>	jointed rush	Invasde habitat	

***Lepidium bankstii***

Conservancy	NM	Information Source	Threat Category Priority Category Courtney S & Jones C pers. comm. 1997	C A
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Ulex europaeus</i>	goose	Invasde and modify habitat	
Potential	<i>Rubus fruticosus</i>	blackberry	Takes sites	
Potential	<i>Festuca arundinacea</i>	tall fescue	Take regeneration sites	
Potential	<i>Beta vulgaris</i>	silver beet	Takes sites	
Potential	<i>Glaucium flavum</i>	horned poppy	Takes sites	
Secondary	-	weeds	Take regeneration sites	
Secondary	<i>Carpobrotus</i> sp.	ice plant	Take regeneration sites	

***Lepidium flexicaule***

Conservancy	Nat	Information Source	Threat Category Priority Category Dopson S & Molloy J in press 1997	E B
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	-	weeds	Competition	

***Lepidium kirkii***

Conservancy	OT	Information Source	Threat Category Priority Category Allen RB 1992	E B
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	-	pasture plants	-	

(Footnotes are explained at the end of this appendix.)

***Lepidium oleraceum* agg.**

Conservancy	CA	Information Source	Threat Category Priority Category	E B
			Head N pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Past (extinct) <sup>1</sup>	<i>Lycium ferocissimum</i>	boxthorn	Invasion habitat	
Past (extinct) <sup>1</sup>	<i>Dactyloctenium aegyptium</i>	cockatoo	Invasion habitat	
Conservancy	NL	Information Source	Forster L pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Ageratina adenophora</i>	Mexican devil	-	
Important	<i>Cortaderia</i> sp.	pampas grass	-	
Conservancy	WG	Information Source	Ogbe C pers. comm. 1997 Barka J pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Past	<i>Lycium ferocissimum</i>	boxthorn	Shade out	
Conservancy	WL	Information Source	Sawyer J pers. comm. 1997. de Lange P pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Ehrharta erecta</i>	velvet grass	Competition	
Undetermined	<i>Cardamine hirsuta</i>	bitter cress	Gary albugo fungi	

***Lepidium sisymbrioides* subsp. *sisymbrioides***

Conservancy	CA	Information Source	Threat Category Priority Category	R -
			Head N pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Festuca rubra</i>	Chewing's fescue	Smothering	
Important	<i>Leucanthemum vulgare</i>	oxeye daisy	Smothering, habitat destruction	
Conservancy	OT	Information Source	Barka J pers. comm. 1997, Allen 1992	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Secondary	-	weeds of salt pans	Modify habitat	
Secondary	Family Poaceae	pasture grasses	Prevent recruitment	

***Lepidium tenuicaule***

Conservancy	SL	Information Source	Threat Category Priority Category	V C
			SL Recovery plan 1996	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	-	weeds		

***Leptinella filiformis***

Conservancy	NM	Information Source	Threat Category Priority Category	IK X
			Courtney S & Jones C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Past (extinct) <sup>1</sup>	Family Poaceae	pasture grasses	Invasion and modify habitat	

**Leptinella nana**

			Threat Category	R <sup>1</sup>
			Priority Category	A <sup>1</sup>
Conservancy	CA*	Information Source	Head N pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Cytisus scoparius</i>	broom	Invasde habitat	
Important	<i>Echium vulgare</i>	viper's bugloss	Invasde habitat	
Important	<i>Lolium</i> sp.	ryegrass	Invasde habitat	
Important	<i>Ulex europaeus</i>	gorse	Invasde habitat	
Important	<i>Poa cita</i>	silver tussock	Smothering, invades habitat	
Undetermined	<i>Dactylis glomerata</i>	cocksfoot	Invasde habitat	
Undetermined	<i>Poa pratensis</i>	Kentucky bluegrass	Invasde habitat	
Conservancy	NM	Information Source	Courtney S & Jones C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Prunella vulgaris</i>	selfheal	Invasde habitat	
Important	<i>Melissa officinalis</i>	lemon balm	Invasde habitat	
Potential	<i>Crococsmia scrocosmiflora</i>	monbretia	Shade	
Secondary	<i>Cytisus scoparius</i>	broom	Shade	
Secondary	<i>Clematis vitalba</i>	old man's beard	Smother habitat	
Secondary	<i>Rubus fruticosus</i>	blackberry	Smother habitat	
Conservancy	WL	Information Source	Ogle C pers. comm. 1997 Seywer J pers. comm. 1997. WL data base	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Ulex europaeus</i>	gorse	Overtop	
Important	Family Poaceae	exotic grasses	Overtop, invades recruitment sites	

**Leptinella rotundata**

			Threat Category	R
			Priority Category	B
Conservancy	Nat	Information Source	Dopson S & Molloy J in press 1997	

THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	-	weeds	Competition	

**Libertia peregrinans**

			Threat Category	IK
			Priority Category	-
Conservancy	WG	Information Source	Ogle C pers. comm. 1997	

THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Lycium ferocissimum</i>	boxthorn	Smothering	
Important	<i>Festuca arundinacea</i>	tall fescue	Smothering	
Past	<i>Cortaderia selloana</i>	pampas grass	Smothering	
Conservancy	WL	Information Source	WL database.	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Festuca arundinacea</i>	tall fescue	-	
Important	<i>Isoplepis nodosa</i> (native)	knobby chubrush	-	

**Luzula celata**

			Threat Category	V
			Priority Category	-
Conservancy	NM	Information Source	Courtney S pers. comm. 1997	

THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	<i>Agrostis capillaris</i>	browntop	Invasde habitat	
Undetermined	<i>Hieracium</i> sp.	hawkweed	Take potential regeneration site	

(Footnotes are explained at the end of this appendix.)

***Mazus arenarius***

Conservancy	SL	Information Source	Threat Category Priority Category SL database	R -
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	Family Poaceae	exotic grasses	Invasion	

***Mazus novaezeelandiae* agg.**

Conservancy	CA	Information Source	Threat Category Priority Category Hcad N pers. comm. 1997	V C
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important Potential	<i>Ammophila arenaria</i> Family Poaceae	marram grass exotic grass	Smothering Smothering	
Potential	<i>Ulex europaeus</i>	gorse	Smothering	
Conservancy	NM	Information Source	Courtney S pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential Potential Potential	<i>Lolium perenne</i> <i>Trifolium</i> sp. <i>Hokus lanatus</i>	perennial rye grass clover Yorkshire fog	Smother the small population Smother Smother	
Conservancy	WG	Information Source	Ogle C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Juncus articulatus</i>	jointed rush	Competition for space, smothering	

***Meliccytus flexuosus***

Conservancy	NM	Information Source	Threat Category Priority Category Courtney S Jones C pers. comm. 1997 Molloy DJJ and Druce AP 1994	V C
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	Family Poaceae	exotic grasses	Stop recruitment	
Conservancy	SL	Information Source	SL recovery plan	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	-	pasture plants	Competition for regeneration sites	
Conservancy	TT	Information Source	Buddenhagen C pers. comm. 1997 Jones C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important Potential Potential Potential Potential	Family Poaceae <i>Cortaderia</i> sp. <i>Calluna vulgaris</i> <i>Pinus contorta</i> <i>Cytinus scyriarius</i>	pasture grass pampas grass heather lodgepole pine broom	Prevent recruitment - - - -	
Conservancy	WG	Information Source	Ogle C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Past Past Past Past Past Past Past	<i>Prunus</i> sp. <i>Sorbus aucuparia</i> <i>Sambucus nigra</i> <i>Cotoneaster</i> spp. <i>Euonymus europaeus</i> <i>Prunus laurocerasus</i> <i>Hedera helix</i>	plum rowan elder cotoneaster spindle tree cherry laurel ivy	Some shading of adult, prevent recruitment Some shading, prevent recruitment Some shading, prevent recruitment Some shading, prevent recruitment Some shading, prevent recruitment Shade all stages of growth Prevented recruitment, climb and smother	

***Muehlenbeckia astonii***

			Threat Category	g <sup>1</sup>
			Priority Category	A <sup>3</sup>
Conservancy	CA*	Information Source	Head N pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Pinus</i> sp.	wilding pine	Competition for light	
Potential	<i>Ulex europaeus</i>	gorse	-	
Potential	<i>Cytisus scoparius</i>	broom	-	
Conservancy	EC	Information Source	de Lange P & Silbery T 1993	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Ulex europaeus</i>	gorse	Competition	
Important	<i>Cytisus scoparius</i>	broom	Competition, harbour diseases	
Important	<i>Cassinia leptophylla</i>	tuhinu (native)	Smother, harbour scale	
Important	Family Poaceae	pasture grasses	Competition with seedlings	
Conservancy	NM	Information Source	Courtney S & Jones C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Echium vulgare</i>	viper's bugloss	Prevent recruitment	
Important	<i>Muehlenbeckia complexa</i>	scrub pohutukue (native)	Smother	
Important	<i>Ammophila arenaria</i>	marram grass	Fall over on it	
Important	Family Poaceae	grasses	Prevent recruitment	
Conservancy	WL	Information Source	Micalfe B pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Cassinia leptophylla</i>	tuhinu (native)	Site competition, harbour scale	
Undetermined	Family Poaceae	exotic grasses	-	

***Muehlenbeckia epbedroides***

			Threat Category	L
			Priority Category	-
Conservancy	CA	Information Source	Head N pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Lupinus</i> sp.	lupin	Smothering	
Important	<i>Ammophila arenaria</i>	marram grass	Smothering	
Conservancy	NM	Information Source	Courtney S & Jones C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Ulex europaeus</i>	gorse	Invade habitat	
Undetermined	<i>Lycium ferocissimum</i>	boxthorn	Competition	
Undetermined	<i>Carpobrotus edulis</i>	ice plant	Competition	
Conservancy	WG	Information Source	Ogle C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Salix</i> spp.	willows	Invade habitat, stabilise shingle, shade	

***Myosotis albo-sericea***

			Threat Category	R
			Priority Category	B
Conservancy	OT	Information Source	Barkla J pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Sedum acre</i>	stonecrop	Invade habitat	

(Footnotes are explained at the end of this appendix.)

*Myosotis australis* var. *lytteltonensis*

Conservancy	CA	Information Source	Threat Category Priority Category	V A
			Head N pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Cytisus scoparius</i>	broom	Smothering	
Important	<i>Ulex europaeus</i>	gorse	Smothering	
Important	-	weeds	Smothering	
Potential	<i>Muehlenbeckia complexa</i>	scrub pohutukae	Smothering	
Potential	<i>Lycium ferocissimum</i>	boxthorn	Smothering	

*Myosotis colensoi*

Conservancy	CA	Information Source	Threat Category Priority Category	V B
			Courtney S & Jones C pers. comm. 1997. Head N pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	Family Poaceae	grasses	Invas habitat	
Important	<i>Festuca rubra</i>	Chewing's fescue	Smothering	
Undetermined	<i>Hieracium</i> sp.	hawkweed	-	
Conservancy	NM	Information Source	Courtney S pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Setum acre</i>	stonecrop	Invas habitat	
Undetermined	Family Poaceae	pasture grasses	Invas habitat	

*Myosotis laeta*

Conservancy	NM	Information Source	Threat Category Priority Category	V -
			Courtney S pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Pinus nigra</i>	black pine	Destroy habitat	
Potential	<i>Larix</i> sp.	larch	Destroy habitat	
Potential	<i>Pinus contorta</i>	lodgepole pine	Destroy habitat	
Potential	<i>Pinus radiata</i>	radiata pine	Destroy habitat	
Potential	<i>Pseudotsuga menziesii</i>	Douglas fir	Destroy habitat	

*Myosotis pygmaea* var. *glauca*

Conservancy	OT	Information Source	Threat Category Priority Category	R B
			Barka J pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	-	grasses and weeds	Modify habitat, competition	
Conservancy	WG	Information Source	Ogle C pers. comm. 1997. Rogers GM 1989	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Hieracium</i> sp.	hawkweed	Invas habitat	
Potential	<i>Senecio jacobaea</i>	ragwort	Invas habitat	
Potential	<i>Calluna vulgaris</i>	heather	Invas habitat	

*Myosurus minimus* subsp. *novae-zelandiae*

Conservancy	NM	Information Source	Threat Category Priority Category	R -
			Courtney S & Jones C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	<i>Plantago coronopus</i>	duck's horn plantain	Competition	

***Myriophyllum robustum***

Conservancy	Nat'	Information Source	Threat Category Priority Category de Lange P 1985	R' B <sup>a</sup>
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	<i>Glyceria maxima</i>	reed sweet grass	-	
Undetermined	<i>Ludwigia palustris</i>	water purslane	-	
Undetermined	<i>Myriophyllum aquaticum</i>	Brazilian water milfoil	-	
Undetermined	<i>Salix</i> sp.	willow	-	
Undetermined	<i>Alisma plantago-aquatica</i>	water plantain	-	
Conservancy	NL	Information Source	Tanner C et al. 1988	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Alternanthera philoxeroides</i>	alligator weed	-	
Potential	<i>Eichhornia crassipes</i>	water hyacinth	-	
Potential	<i>Zizania latifolia</i>	Manchurian wild rice	-	
Potential	<i>Salvinia molesta</i>	salvinia	-	
Undetermined	<i>Polygonum</i> sp.	willow weed	-	
Undetermined	<i>Glyceria maxima</i>	reed sweet grass	-	
Undetermined	<i>Ludwigia palustris</i>	water purslane	-	
Undetermined	<i>Juncus articulatus</i>	jointed rush	-	
Conservancy	WK	Information Source	Roxburgh J pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Secondary	<i>Myriophyllum prostratum</i>	common water milfoil	Competition	
Conservancy	WL	Information Source	WL data base.	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Salix</i> sp.	willow	-	
Important	<i>Alisma</i> sp.	water plantain	-	
Important	<i>Ludwigia</i> sp.	water primrose	-	

***Myrsine "Burnett"***

Conservancy	NM	Information Source	Threat Category Priority Category Courtney S & Jones C pers. comm. 1997	R -
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Erigeron karotkinianus</i>	MEXICAN daisy	Invas habitat	

***Notospartium carmichaellae***

Conservancy	NM	Information Source	Threat Category Priority Category Courtney S & Jones C pers. comm. 1997	L -
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	<i>Cytinus scoparius</i>	broom	Spraying of weed, taking sites	
Undetermined	<i>Ulex europaeus</i>	gorse	Spraying of weed, taking sites	

(Footnotes are explained at the end of this appendix.)



***Olearia* "Pomahaka"**

Conservancy	SL	Information Source	Threat Category Priority Category	R B
			Rance B pers. comm. 1997 SL recovery plan 1996	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	=	brush weeds, e.g., Gorse	Weed control	
Secondary	=	pasture species	Suppresses regeneration	

***Olearia fragrantissima***

Conservancy	SL	Information Source	Threat Category Priority Category	V B
			Rance B pers. comm. 1997. SL data base	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	-	pasture species	Suppresses regeneration	

***Olearia bectorii* "North Island"**

Conservancy	WG	Information Source	Threat Category Priority Category	E A
			Ogle C pers. comm. 1997. Rogers G 1996	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	Family Poaceae	grasses	Prevent recruitment	
Important	=	pasture species	Prevent recruitment	
Past	<i>Hedera helix</i>	ivy	Smother young plants, climb & smother adults	
Conservancy	WL	Information Source	Sawyer J pers. comm. 1997. WL database	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	-	pest plants	Prevent regeneration	

***Olearia bectorii* s.str.**

Conservancy	NM	Information Source	Threat Category Priority Category	E A
			Courtney S & Jones C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	Family Poaceae	grasses	Invade seedling habitat	
Conservancy	OT	Information Source	Buckle J pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	Family Poaceae	grasses	Prevent recruitment out compete seedlings	
Conservancy	SL	Information Source	Rance B pers. comm. 1997 SL recovery plan 1996	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	Family Poaceae	grasses	Prevent regeneration	
Important	=	native lianes	Smothering	

***Olearia polita***

Conservancy	NM	Information Source	Threat Category Priority Category	E B
			Williams PA & Courtney S 1995	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Carex ssp. coriacea</i> (native)	sedge	Invade seedling habitat	

***Opbioglossum petiolatum***

Conservancy	WL*	Information Source	Threat Category	R
			Priority Category	-
			WL database, de Lange P pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Pinus</i> sp.	pine	Change environment allowing other weeds to enter	

***Oreomyrrhis colensoi* var. *delicatula***

Conservancy	TT	Information Source	Threat Category	-
			Priority Category	-
			Rogers G 1989	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	<i>Calluna vulgaris</i>	heather	-	

***Ourisia modesta***

Conservancy	CA	Information Source	Threat Category	R
			Priority Category	
			Courtney S pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Ranunculus repens</i>	creeping buttercup	-	

***Parsonsia* "Surville Cliffs"**

Conservancy	NL	Information Source	Threat Category	-
			Priority Category	-
			Forester L pers. comm. 1997	
			de Lange P unpub.	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Hakea</i> sp.	needle bush	-	
Important	<i>Cortaderia</i> sp.	pampas grass	-	

***Pimelea arenaria***

Conservancy	NM	Information Source	Threat Category	R
			Priority Category	-
			Courtney S & Jones C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Ammophila arenaria</i>	maritime grass	Invade and dominate habitat	
Conservancy	WL	Information Source	Ogle C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Ammophila arenaria</i>	maritime grass	-	

***Pimelea aridula* agg.**

Conservancy	NM	Information Source	Threat Category	L, I
			Priority Category	-
			Courtney C & Jones C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	*	grasses	Recruitment ?	
Conservancy	WL	Information Source	Ogle C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Pinus contorta</i>	lodgepole pine	Shading out	

(Footnotes are explained at the end of this appendix.)

*Plumelea tomentosa* s.str.

Conservancy	NM	Information Source	Threat Category Priority Category Courtney S & Jones C pers. comm.	R -
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Ulex europaeus</i>	gorse	Competition	

*Pitosporum ellipticum* subsp. *serpentinum*

Conservancy	NL	Information Source	Threat Category Priority Category de Lange P in press	E A
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Cortaderia seloana</i>	pampas grass	-	
Potential	<i>Hakea sericea</i>	prickly hakea	-	
Potential	<i>Hakea gibbosa</i>	downy hakea	-	

*Pitosporum obcordatum*

Conservancy	EC	Information Source	Threat Category Priority Category Clarkson BD 1991	R B
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Secondary	<i>Rubus fruticosus</i>	blackberry	Competition to seedlings	
Secondary	<i>Lonicera japonica</i>	Japanese honeysuckle	Competition to seedlings	
Secondary	Family Poaceae	grasses	Competition to seedlings	
Conservancy	NL	Information Source	McCluggage T pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Tradescantia fluminensis</i>	wandering Jew	Prevent germination	
Potential	<i>Selaginella kraussiana</i>	African club moss	-	
Conservancy	OT	Information Source	Simpson N 1995	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Dactyloctenium aegyptium</i>	cockfoot	Prevent recruitment/establishment	
Conservancy	WL	Information Source	Sawyer J per. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	Family Poaceae	exotic grasses	Prevent regeneration	
Potential	<i>Sequoia sempervirens</i>	Californian redwood	Change the site	
Potential	<i>Sequoia giganteum</i>	Californian big tree	Change the site	
Undetermined	<i>Quercus palustris</i>	oak	-	
Undetermined	<i>Betula pendula</i>	silver birch	-	

*Pitosporum turneri*

Conservancy	TT	Information Source	Threat Category Priority Category Ogle 1989, Buddenhagen C pers. comm. 1997	R B
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	-	woods	Exclude seedlings	
Potential	<i>Cytisus scoparius</i>	broom	-	
Potential	<i>Pinus contorta</i>	lodgepole pine	-	
Conservancy	WG	Information Source	Ogle C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Pinus contorta</i>	lodgepole pine	Shade, possible allelopathy	

*Prasophyllum aff. patens*

Conservancy	Nat*	Information Source	Threat Category Priority Category Dopson S & Mollay in press 1997	V <sup>1</sup> B <sup>1</sup>
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	-	weeds	Competition	

*Pseudopanax ferox*

Conservancy	NM	Information Source	Threat Category Priority Category Simpson P 1991	L -
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	<i>Ulex europaeus</i>	gorse	Weed spraying	
Undetermined	<i>Cytisus scoparius</i>	broom	Weed spraying	

*Pterostylis micromega*

Conservancy	TT	Information Source	Threat Category Priority Category Courtney S & Jones C pers. comm. 1997 Buddenlugin C pers. comm. 1997	E A
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Festuca arundinacea</i>	tall fescue	Invade habitat	
Important	<i>Carex</i> spp.	sedges	Invade habitat	
Important	<i>Juncus</i> spp.	rush	Invade habitat	
Past	<i>Pinus contorta</i>	lodgepole pine	-	
Potential	<i>Berberis darwinii</i>	Darwin's barberry	-	
Conservancy	WG	Information Source	Ogle C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	Family Poaceae	wet pasture grasses	Take habitat	
Potential	<i>Salix</i> spp.	willows	Shade out	

*Pterostylis puberula*

Conservancy	WK	Information Source	Threat Category Priority Category Roxburgh J pers. comm. 1997	- -
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	<i>Salix cinerea</i>	grey willow	-	
Undetermined	<i>Glyceria maxima</i>	reed sweet grass	-	
Undetermined	<i>Salix fragilis</i>	crack willow	-	
Conservancy	WL	Information Source	WL data base	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Ulex europaeus</i>	gorse	Replacement of usual succession plant after fire	

*Pterostylis tasmanica*

Conservancy	NM	Information Source	Threat Category Priority Category Courtney S pers. comm. 1997	R -
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Ulex europaeus</i>	gorse	Invade and dominate	

(Footnotes are explained at the end of this appendix.)

***Puccinella rariflorens***

Conservancy	Nat	Information Source	Threat Category Priority Category	R B
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	-	weeds	Dopson S & Molloy J in pres 1997	
			Competition	

***Ranunculus "Hope"***

Conservancy	NM	Information Source	Threat Category Priority Category	L, R -
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	<i>Ranunculus repens</i>	creeping buttercup	Courtney S & Jones C pers. comm. 1997	
			Invade and dominate	

***Ranunculus brevis***

Conservancy	NM	Information Source	Threat Category Priority Category	L -
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Juncus squarrosus</i>	beath rush	Courtney S & Jones C pers. comm. 1997	
			Invade and dominate habitat	

***Ranunculus recens* s.lat.**

Conservancy	OT	Information Source	Threat Category Priority Category	C V A
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	-	flat weeds	Buckla J pers. comm. 1997	
Undetermined	Family Poaceae	introduced grasses		
Undetermined	<i>Hieracium pilosella</i>	mouse eared hawkweed		
			Modify habitat and prevent recruitment	
			Modify habitat and prevent recruitment	
			Modify habitat and prevent recruitment	
Conservancy	SL	Information Source	Rance B pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Agrostis stolonifera</i>	creeping bent		
Important	-	pasture species		
			Invade habitat	
			Invade habitat	
Conservancy	WG	Information Source	Ogle C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Hieracium pilosella</i>	mouse eared hawkweed		
Important	<i>Juncus articulatus</i>	jointed rush		
Important	<i>Leontodon taraxacoides</i>	hawkbit		
Important	Family Poaceae	exotic grasses		
Important	<i>Hypochaeris radicata</i>	catscar		
Important	<i>Trifolium dubium</i>	suckling clover		
Potential	<i>Cortaderia selloana</i>	pampas grass		
Potential	<i>Holcus lanatus</i>	Yorkshire fog		
Potential	<i>Lycium ferocissimum</i>	boxthorn		
Potential	<i>Gunnera tinctoria</i>	Chilean rhubarb		
			Outcompete take regeneration space	
			Outcompete take regeneration space	
			Outcompete take regeneration space	
			Smother, shade out	
			Outcompete take regeneration space	
			Outcompete take regeneration space	
			Smother, shade out	
			Smother shade out	
			Shade out	
			Smother, shade out	

***Ranunculus ternatifolius***

Conservancy	SL	Information Source	Threat Category Priority Category	V C
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	Family Poaceae	exotic grasses	SL Recovery plan 1996	
			Invade habitat, competition	

**Rorippa divaricata**

Conservancy	NU*	Information Source	Threat Category Priority Category	E B
			Forester L pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Ageratina riparia</i>	mistflower	-	
Important	<i>Hakea</i> sp.	needle bush	-	
Conservancy	WG	Information Source	Ogle C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Past	Family Poaceae	pasture grasses	Smothering, covering open ground	
Potential	<i>Cortaderia</i> sp.	pampas grass	Smothering, covering open ground	

**Scutellaria novae-zelandiae**

Conservancy	NM	Information Source	Threat Category Priority Category	E B
			Williams P A 1991	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Carex</i> spp.	sedges	Suppresses adult	
Important	<i>Senecio minimus</i>	fireweed	Competition with seedlings	
Important	<i>Tradescantia fluminensis</i>	wandering Jew	Smothering, takes sites	
Important	Family Poaceae	grasses	Suppresses adult	
Important	<i>Agrostis capillaris</i>	browntop	Competition with seedlings	

**Sebaea ovata**

Conservancy	CA	Information Source	Threat Category Priority Category	C A
			Head N pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Past (extinct)?	<i>Ammophila arenaria</i>	marram grass	-	
Conservancy	WG	Information Source	Ogle c pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Trifolium fragiferum</i>	strawberry clover	Competition for space	
Important	<i>Leontodon taraxacoides</i>	hawkbit	Competition for space	
Past	<i>Cortaderia selleana</i>	pampas grass	Competition for space	
Secondary	<i>Holcus lanatus</i>	Yorkshire fog	Competition for space	
Secondary	<i>Festuca arundinacea</i>	tall fescue	Competition for space	
Secondary	<i>Agrostis stolonifera</i>	creeping bent	Competition for space	

**Senecio scaberulus**

Conservancy	CA	Information Source	Threat Category Priority Category	V B
			Head N pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Past	<i>Ammophila arenaria</i>	marram grass	-	
Potential	<i>Lupinus</i> sp.	lupin	Invasive habitat	
Undetermined	<i>Lyctium ferocissimum</i>	boxthorn	-	

(Footnotes are explained at the end of this appendix.)

***Sicyos australis***

Conservancy	NL	Information Source	Threat Category Priority Category DOC status report 25/6/97	V C
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	<i>Auredera cordifolia</i>	maderia vine	-	

***Simplicia laxa***

Conservancy	OT/C	Information Source	Threat Category Priority Category Johnson PN 1995	R B
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Rosa rubiginosa</i>	sweet briar	-	
Potential	<i>Sambucus nigra</i>	elder	-	
Undetermined	<i>Festuca rubra</i>	Chewing's fescue	-	
Undetermined	<i>Poa pratensis</i>	meadow grass	-	

***Teucrium parvifolium***

Conservancy	NM	Information Source	Threat Category Priority Category Courtney S & Jones C pers. comm. 1997 Simpson P 1991	V C
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Berberis glaucocarpa</i>	barberry	Invasde habitat	
Potential	<i>Tradescantia fluminensis</i>	wandering Jew	Smothering	
Undetermined	<i>Salix</i> sp.	willow	Invasde habitat	
Undetermined	<i>Clematis vitalba</i>	old man's beard	Smothering, decrease light	
Undetermined	<i>Hedera</i> sp.	ivy	Smothering, decrease light	
Undetermined	<i>Rubus fruticosus</i>	blackberry	Smothering, decrease light	
Undetermined	Family Poaceae	exotic grasses	Recruitment	
Undetermined	<i>Ulex europaeus</i>	gorse	Invasde habitat, fire risk	
Conservancy	SL	Information Source	SL Recovery plan	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Secondary	-	wooly weeds	Competition, control operations	
Conservancy	WG	Information Source	Ogle C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Past	<i>Prunus</i> sp.	plum	Some shading	
Past	<i>Hedera helix</i>	ivy	Prevents regeneration, smothering adult plants	
Past	<i>Cotoneaster</i> spp.	cotoneaster	Some shading	
Past	<i>Sambucus nigra</i>	elder	Some shading and smothers adults	
Past	<i>Euonymus europaeus</i>	spindle tree	Some shading	
Past	<i>Sorbus aucuparia</i>	rowan	Some shading	
Past	<i>Prunus laurocerasus</i>	cherry laurel	Serious shading	
Conservancy	WL	Information Source	WL Database	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Past (extinct) <sup>2</sup>	<i>Tradescantia fluminensis</i>	wandering Jew	Regeneration	

***Thelypteris confluens***

Conservancy	BP	Information Source	Threat Category Priority Category Beadel S 1992	R C
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	-	weeds	Smothering	

*Urtica linearifolia*

Conservancy	CA*	Information Source	Threat Category	V†
Priority Category			Head N pers. comm. 1997	N‡
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Potential	<i>Dactyloctenium aegyptium</i>	cockspur	Smothering, prevent regeneration	
Potential	<i>Secale</i> sp.	ryegrass	Smothering, prevent regeneration	
Potential	<i>Agrostis stolonifera</i>	creeping bent	Smothering, prevent regeneration	
Secondary	<i>Salix</i> sp.	willow	-	
Conservancy	NM	Information Source	Courtney S & Jones C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	Family Poaceae	pasture grasses	Reduce habitat	
Important	<i>Trifolium</i> sp.	clover	Reduce habitat	
Undetermined	<i>Salix fragilis</i>	crack willow	Alter habitat	
Conservancy	SL	Information Source	SL Recovery Plan 1996	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Important	-	weed species	Invasion	
Conservancy	WG	Information Source	Ogle C pers. comm. 1997	
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Supporting	<i>Salix</i> spp.	willows	-	

*Wahlenbergia albomarginata* subsp. *flexilis*

Conservancy	NM	Information Source	Threat Category	IK
Priority Category			Courtney S pers. comm. 1997	-
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	<i>Echinops vulgare</i>	viper's bugloss	Take space	

*Wilsonia backhousei*

Conservancy	NM	Information Source	Threat Category	V
Priority Category			Courtney S & Jones C pers. comm. 1997	-
THREAT TYPE	WEED SPECIES	COMMON NAME	MECHANISMS OF THREAT	
Undetermined	<i>Festuca arundinaceae</i>	tall fescue	Competition	

Footnotes to Appendix 4

\* Conservancy letter codes and names:

NL	Northland	AK	Auckland
WK	Waikato	BP	Bay of Plenty
EC	East Coast	TT	Tongariro/Taupo
WG	Wairarapa	HB	Hawkes Bay
WL	Wellington	NM	Nelson/Marlborough
WC	West Coast	CA	Canterbury
OT	Otago	SL	Southland
Nat	National		

† Extinct w plant no longer at a site.

‡ Threat category codes are listed and explained in Appendix 2.

§ Priority Ranking System codes are explained in Section 1.2.2 of the text.



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## Appendix 5

### Weeds of threatened plants not currently listed as weeds of conservation concern in "Ecological weeds, a working draft" (Owen 1997)

<i>Acaena agropila</i>	sheep's bur	<i>Larix</i> sp.	larch <sup>1</sup>
<i>Acaena novae-zelandiae</i>	(indigenous)	<i>Leontodon taraxacoides</i>	hawkbit
<i>Agrostis stolonifera</i>	creeping bent	<i>Leucanthemum vulgare</i>	ox-eye daisy
<i>Alliaria plantago-aquatica</i>	water plantain	<i>Limnoligia palustris</i>	water purslane <sup>2</sup>
<i>Antibismuthum odoratum</i>	sweet vernal	<i>Melissa officinalis</i>	lemon balm
<i>Beta vulgaris</i>	silver beet	<i>Muehlenbeckia australis</i>	poaetoe (indigenous)
<i>Betula pendula</i>	silver birch	<i>Mycelis muralis</i>	wall lettuce
<i>Bromus sterilis</i>	barren brome	<i>Myosotis laxa</i>	forget-me-not
<i>Cardamine hirsuta</i>	bitter cress	<i>Myriophyllum propinquum</i>	common water milfoil
<i>Carex coriacea</i>	cutty grass (indigenous)	<i>Plantago coronopus</i>	buck's horn plantain
<i>Carex ovalis</i>	oval sedge	<i>Poa cila</i>	silver tussock
<i>Carpobrotus edulis</i>	ice plant <sup>2</sup>	<i>Poa pratensis</i>	meadow grass
<i>Cassinia leptophylla</i>	tauhina (indigenous)	<i>Polygonum</i> spp.	willow weed
<i>Centipeda cunninghamii</i>	staccaweed	<i>Pronella vulgaris</i>	self heal
<i>Cerastium</i> sp.	chickweed	<i>Pronus lauroceras</i>	cherry laurel <sup>1</sup>
<i>Crepis capillaris</i>	smooth hawkbeard	<i>Prunidium esculentum</i>	bracken (indigenous)
<i>Digitalis purpurea</i>	foxglove	<i>Quercus palustris</i>	pin oak
<i>Eichhornia crassipes</i>	water hyacinth	<i>Ranunculus flammula</i>	spearwort
<i>Festuca rubra</i>	chewing's fescue	<i>Ranunculus repens</i>	buttercup <sup>2</sup>
<i>Galium aparine</i>	cleavers	<i>Senecio minimus</i>	fireweed
<i>Glaucium flavum</i>	horned poppy	<i>Sequoia giganteum</i>	Californian big tree
<i>Glyceria maxima</i>	reed sweet grass <sup>1</sup>	<i>Sequoia sempervirens</i>	Californian redwood
<i>Gunnera tinctoria</i>	Chilean rhubarb <sup>1</sup>	<i>Taraxacum officinale</i>	dandelion
<i>Holcus lanatus</i>	Yorkshire fog	<i>Trifolium dubium</i>	socking clover
<i>Hordeum marinum</i>	silt barley grass	<i>Trifolium fragiferum</i>	strawberry clover
<i>Hypochaeris radicata</i>	catsear	<i>Trifolium repens</i>	white clover
<i>Isoplepis nodosa</i>	knobby club rush (native)	<i>Verbascum thapsus</i>	woolly mullein

<sup>1</sup> Noted in Owen (1997) as species yet to be included on the database.

<sup>2</sup> Noted in Owen (1997) as not considered significant enough to warrant inclusion on the database.