

WAIMA VALLEY  
ECOLOGICAL RESTORATION  
SOCIETY INCORPORATED

**Restoration Plan  
for the Old Man's Beard  
Eradication Project**

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# Introduction

Old Mans Beard (*Clematis vitalba*) is a weed that is well established in the Waima/Ure catchment area of south Marlborough. It has been identified as a threat to the ecological values of the locality. The purpose of this restoration project is to eradicate Old Mans Beard on private land within the catchment through a combined landowner driven effort. This restoration plan provides a description of the area, background to the project's establishment, and most importantly, a way forward to methodically and practically work towards eradication of Old Mans Beard in the catchment.

## Project Vision

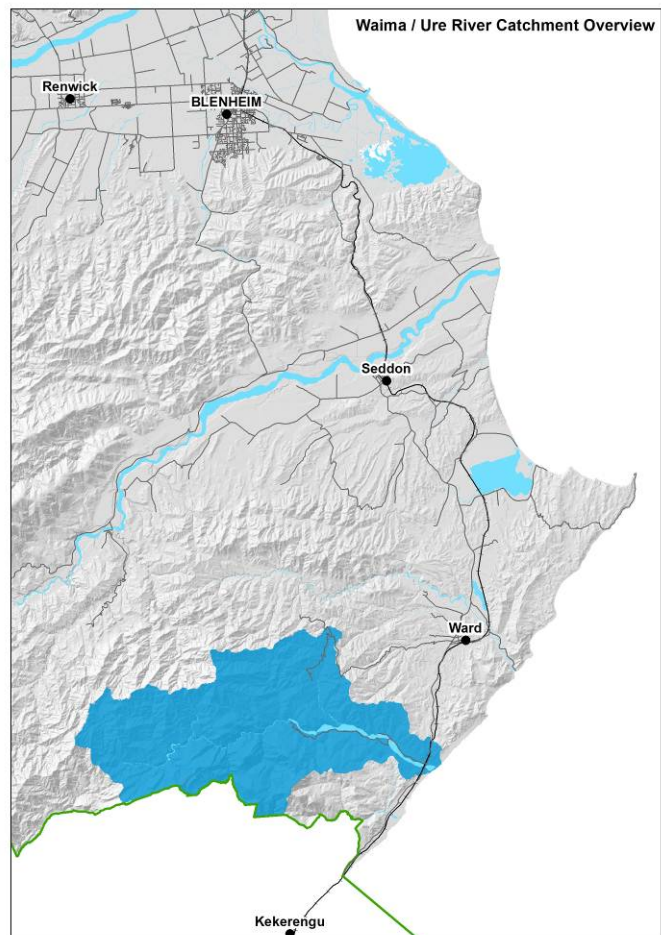
To eradicate Old Man's Beard from the Waima Valley, so that areas of regenerating indigenous vegetation on private land, and the mature forest and special vegetation of Isolated Hill Scenic Reserve, can flourish.

## Description of the Project Area

The Waima (Ure) River drains eastward out of the northern extremity of the Inland Kaikoura Range, in southern Marlborough. The catchment is approximately 16,000 ha in area, and is predominantly within the Medway Ecological District, except for the coastal hills, which are part of the Kekerengu Ecological District.

The majority of the valley is private farm land, being hill and high country sheep and beef farming, with eleven landowners. The Department of Conservation administers the 2800 ha Isolated Hill Scenic Reserve on the south side of the river.

Public road access in the catchment is limited. Peggioh Road gives access from Ward to the properties around Dunsandel Creek; otherwise there is only the Ure Valley Road, which reaches up the main river valley approximately 11 kms inland from SH1.



## **Geology, Landforms and Climate**

The valley is geologically very diverse. The Clarence Fault, a branch of the main Alpine Fault that runs up the western side of the Southern Alps, traverses the catchment in a northeast-southwest direction.

A large part of the valley on the south side of the river (and the fault zone) is young limestone, including the Scenic Reserve, Benmore, and the Chalk Range; the north side of the river is greywacke, argillite and conglomerate in the west; the eastern part of the catchment has very complex geology, with volcanics, sandstone, mudstone, limestone, post-glacial loess, and recent river deposits. The geological complexity underlies landscape and habitat diversity.

At least three types of landform found in the catchment are listed as “originally rare” ecosystems in the 2007 Ministry of Environment “National Priorities for Protecting Rare and Threatened Biodiversity on Private Land”. These are “calcareous bluffs” (common along the river and in other locations through the catchment), the Waima braided riverbed itself, and limestone screes and boulderfields in various locations on the private land as well as in the Reserve. The well-known “Sawcut Gorge” in the Reserve is an example of a waterway cutting down through the argillaceous (Amuri) limestone rock. A number of spectacular limestone waterfalls are also present in the catchment. Spheroidal concretions occur in various places.



**View showing Sawcut Gorge in the centre of the photo. The Isolated Hill Scenic Reserve is to the right and rear and private land in the left and in the foreground. The Waima/Ure River cuts diagonally across the view.**

Because limestone is fertile and provides a range of habitats (bluffs, gullies, outcrops and screes), limestone areas support an assemblage of specialist calcicol plant species (i.e. plants that are adapted to the lime-rich substrate) and also support plants that occur in locations that they would not otherwise (like speargrass - *Aciphylla* spp – and mountain daisies – *Celmisia* spp - which are usually higher up in more alpine environments).

The catchment is moister than other parts of South Marlborough with the annual rainfall gradient varying from about 1200mm in the upper catchment to 7-800mm in the lower catchment.

## **Flora and Fauna**

Originally nearly the whole of the valley was forested, with bushline reaching almost to the tops of the highest peaks except on exposed ridges, bluffs and screes. The main canopy species would have been black, mountain and red beeches, broadleaved species such as hinau and broadleaf, and the podocarps lowland totara, Hall's totara and matai. Coastal forest species such as ngaio, titoki, kawakawa, akeake and black mamaku, would have been part of the forest community in the lower catchment. Kowhai (*Sophora microphylla*)

and prostrate kowhai (*S. prostrata*) are strongly represented. Most of the forest was probably burnt in pre-European times. However, the rugged limestone country with large areas of exposed rock has protected large patches of original forest. With disturbance by fire and grazing elsewhere, extensive areas of scrub and secondary forest have developed. The secondary forest is typically kanuka, with manuka on the wetter soils formed on papa, and there is a range of broadleaved species such as five-finger, lancewood, mahoe, putaputaweta and kohuhu. The scrub is typical Marlborough "grey scrub" dominated by matagouri, porcupine shrub and *Coprosma propinqua*. The bluffs and escarpments support a range of Marlborough endemic plants such as Marlborough rock daisy (*Pachystegia insignis*), NZ lilac (*Heliohebe hulkeana*) and pink broom (*Carmichaelia glabrescens*).

The catchment contains quite a high proportion of native plant species that are unusual, rare and/or threatened. They include:

- *Olearia hectorii* (Threatened, nationally endangered)
- *Heliohebe hulkeana* subsp. *evestita*, sun hebe (local endemic; At Risk, naturally uncommon)
- *Hebe parviflora*, tree hebe (at natural southern limit)
- *Helichrysum coralloides*, coral shrub (endemic, at natural distribution limit)
- *Podocarpus totara*, lowland totara (now a rarity in South Marlborough)
- *Alectryon excelsus*, titoki (rare in South Marlborough)
- *Myoporum laetum*, ngaio (rare in South Marlborough)
- *Brachyglottis repanda*, rangiora (rare in South Marlborough)
- *Elaeocarpus dentatus*, hinau (rare in South Marlborough)
- *Korthalsella lindsayi*, dwarf mistletoe (rare in South Marlborough)
- *Prumnopitys taxifolia*, matai (uncommon in South Marlborough)
- *Nothofagus fusca*, red beech (uncommon in South Marlborough, at distribution extreme)
- *Nothofagus solandri* var. *solandri*, black beech (uncommon in South Marlborough)
- *Hoheria angustifolia*, narrow-leaved lacebark (uncommon in South Marlborough)

There is not a lot of information on native fauna within the catchment. Long-finned eel are present. A survey conducted by the Department of Conservation in 1997 found that the lower reaches of the river provide breeding habitat for indigenous birds, including black-billed gull (Threatened, nationally endangered), pied oyster catcher (At Risk, declining), pied stilt (At Risk, declining) and banded dotterel (Threatened, nationally vulnerable).

Other birds found include bellbirds, bush robin, kereru, tui (not found north of this catchment until the Wairau River), fantail, riroriro, silvereye, tomtit, rifleman, brown creeper, shining cuckoo, NZ falcon and harrier. In recent years, blue duck have been seen in the gorged part of the river.

The catchment provides good habitat for skinks and geckos, and several common species are frequently seen, particularly in screes and boulder fields (common skink, Marlborough mini gecko).

The Waima (Ure) catchment area contains high natural values due to the geology, especially the limestone and its associated plant communities, and originally rare ecosystems. The presence of the Isolated Hill Scenic Reserve means that, unlike many other parts of South Marlborough, a significant area of original habitat and vegetation remains intact, providing a reservoir of species (seed sources), and ensuring the presence of forest birds like tui and kereru that are absent in the rest of South Marlborough.

## Background and History

The catchment is relatively weed free, apart from a heavy infestation of Old Man's Beard (*Clematis vitalba*), centred originally on the area around the end of the Ure Valley Road. It is likely that it was originally planted in the Blue Mountain homestead garden. It has spread extensively from here along the Waima River corridor and its tributaries, especially Blue Mountain Stream and Dunsandel Creek.

The Significant Natural Areas (SNA) Ecological Survey was carried out by the Marlborough District Council, on private land in South Marlborough from 2001 to 2004.

The Waima/Ure catchment area is part of both the Kekerengu and the Medway ecological districts. There are ten large rural properties within the catchment and a number of smaller properties. Nearly all of these properties participated in the SNA project and had SNA sites identified on them – a total of 31 sites. About two thirds of these sites had Old Mans Beard present and this was repeatedly identified as an ecological threat to the sites, which are generally low stature regenerating vegetation with large areas of 'edge' providing plenty of light for OMB to proliferate.

There are two large (600+ and 900+ hectares) Protected Private Land covenants (PPLs) , towards the top of the catchment. The vegetation in these areas has not been comprehensively surveyed but has been assessed of regional significance as it is the largest single stand of lowland and montane beech forest in the Medway Ecological District and includes limestone communities, subalpine vegetation and secondary vegetation types. The eastern portion of the covenant is continuous with indigenous forest in Isolated Hill Scenic Reserve.

There are also three relatively new QEII covenants (totalling 182 hectares) on Peggioh in the middle of the catchment.

During the SNA survey, Old Man's Beard and feral goats were identified as the main threats to the long term sustainability of many of the remaining areas of natural habitat. Possums are currently being managed at low levels by the Animal Health Board vector control programme. Other weeds of concern are willows (mainly crack) in the braided riverbed, and small areas of buddleia, along the main waterways.

Subsequent to the SNA survey, in 2004 the Marlborough District Council (MDC) initiated a project to assess the history, ecology and distribution of Old Man's Beard in South Marlborough. At that time, the Waima Valley had the heaviest infestation found of Old Man's Beard; a consequence of the fertile, moist, limestone based soils.

The Regional Pest Management Strategy for Marlborough (2007) lists Old Man's Beard as an ecological threat, but does not require any particular action to be taken. It states that the Council will encourage community initiatives and site led management programmes where they are targeted towards protecting sites with significant ecological value.

Despite the recognition of the problem, no coordinated approach has so far been set up to manage the spread of OMB anywhere in Marlborough.

The Department of Conservation has been controlling Old Man's Beard (OMB) in Isolated Hill Scenic Reserve for a number of years, by helicopter spot spraying and by ground control (cutting and poisoning). The lowering of feral goat numbers in the reserve through successive hunting operations has had the effect of increasing the amount of OMB; seedlings and vines that were previously browsed by goats are now able to grow. DoC has a programme of spraying by helicopter to maintain a more or less zero density over much of the reserve area (targeting the occasional adult OMB plants as detected) and a containment policy of boundary control over the remainder of the reserve (about one third). Because DoC does not carry out any ground surveillance or control it is difficult to provide an accurate assessment of actual infestation levels, however, overall they are thought to be relatively low. The reserve area is likely to be ranked quite highly in DoCs new "Natural Heritage Management System" for prioritising sites.

Apart from this work, all other OMB control work to date in the Waima Valley has been initiated by individual landowners. The owners of Isolation, the downstream neighbour of the Reserve, have been working at it for over 20 years on their property, and the owners of the next property downstream have done some control work in Boar Gully (east of Isolation).

Since purchasing Peggioh in 2004, the current landowners have been carrying out a major eradication project on their property, with financial support from the Biodiversity Condition Fund and the MDC.

In 2009 another major control effort was launched by the Peggioh landowners on the area between Peggioh and the Reserve, including parts of Isolation and Blue Mountain (the Ure Road End Project); once again financial support was obtained from the Biodiversity Condition Fund and MDC.

This Restoration Plan, prepared for the Waima Valley Ecological Restoration Society Incorporated (mainly local landowners), sets out a programme to build on and coordinate the efforts to date to control OMB within the catchment.

## **Ecology of Old Man's Beard (*Clematis vitalba*)**

Old Man's Beard (OMB) is a vine that likes high light conditions, fertile well drained soils, moist conditions (like streamsides and gully bottoms) and freedom from grazing animals, in order to establish and thrive. Regenerating forest and open shrubland both provide large "edge" areas with high light conditions and so are vulnerable to infestation. In South Marlborough, OMB is particularly fond of matagouri and bush lawyer (*Rubus* spp) as host plants, as they both protect the young plants from browsing. It is deciduous when growing out in the open; seedlings and young plants growing under a canopy of other vegetation can retain their leaves throughout the winter.

The flowers are perfect (both male and female parts in each flower), and plants are self-fertile, so only one vine is required to establish a new isolated population. Flower buds are produced from November to March, and the seed begins to ripen after that. It seeds prolifically, and seed production is possible within 3 years given favourable conditions supporting vigorous growth. The seeds are primarily transported by wind and water, and can remain viable in the seed bank for up to 10 years, although 6 –7 years is a more likely reasonable assumption to use when planning a control programme.

When conditions are suitable for germination many of the seeds in the seed bank will germinate at once leading to a mat of seedlings; however, many of these seedlings do not survive past the early seedling stage.



The plant impacts on native vegetation by shading out the light, competing for nutrients and moisture, and the weight of plant material in the canopy leads to collapse and smothering. The growth of OMB is limited by available light, soil fertility and structure, spring and summer moisture levels, and the grazing of stock (including feral animals like deer).

Two bio-control agents, a leaf miner and a fungus, are present throughout the Waima catchment. When dry summer conditions stress the OMB plants, these bio-control agents have a significant effect on their health, even defoliating young plants; however this seldom kills them. With repeated summer dry conditions in consecutive years, this bio-control effect can keep young plants in the seedling stage for many years. However, eventually a year with moister summer conditions will allow these stunted plants to take off.

## Extent of OMB Infestation in the Waima Valley

The fertile moist soils of the Waima Valley make the area very vulnerable to OMB infestation. After several years of drought conditions, the last 8 seasons (2004 – 2012) have been much more favourable, and the infestations have spread rapidly.

The heaviest infestation is along the faces and up all the gullies along the Waima River, from Blue Mountain Stream to Dunsandel Creek. Up river from here, Headache Stream and Box Creek, northern tributaries of the Waima, are both known to have some OMB, although the extent of these infestations has not been assessed recently. They are both thought to be relatively small. Dunsandel Creek also contains some badly infested areas; the lower parts of all the gullies and faces in this tributary contain some OMB.



**March 2006, Peggioh: an example of the extensive smothering capabilities of OMB: this infestation has been successfully dealt with by repeated gorse gun spraying**

The 2004 MDC-initiated project to study the extent of OMB attempted to map the infestations in the Waima. However, with limited time for surveying, and in some cases limited (or no) access to the land, this mapping was indicative only, and is now out of date.

For the purposes of planning and budgeting control strategies for the project, landowners and lessees have assisted with mapping the extent of the infestations on each property. They have been provided with large-scale topographical maps and aerial photos of their properties, and given plenty of time to survey the extent of the OMB. This has had the added benefit of raising the awareness of the landowners of the OMB in their landscape. Recognising the extent of the problem has encouraged them to become involved in the project.

# The Strategy

## Overview: Project Evolution

As a consequence of the SNA survey, 3 sites covering 182 ha on Peggioh were fenced and protected with QEII Open Space covenants in 2005. At the time of fencing, all 3 of these sites contained heavy infestations of Old Man's Beard. The rest of Peggioh contained scattered infestations of varying levels of severity, the Dunsandel Creek faces and gullies being the worst. The landowners began clearing OMB in 2004, quickly gearing up to a major eradication project with support from the Biodiversity Condition Fund (\$64,437.33 over 6 years to June 2012, with a further \$26,667 secured for 2012 - 2015) and MDC (\$15,100 to June 2012, with a further \$8,625 secured for 2012 - 2015). The majority of the funded work has been focussed on the covenant areas; the landowners have done most of the work elsewhere on the property.

It rapidly became obvious that to protect the Peggioh covenants, which adjoin Blue Mountain Stream and the Waima River, from re-infestation, control work would need to be done on the adjacent land on Blue Mountain station to provide a satisfactory

buffer. So in 2009 a new project area encompassing the block of land to the south west of Peggioh upstream to the Reserve, was mapped and funding was secured for 3 years' work (2009-2012) from the Biodiversity Condition Fund (\$131,692), MDC (\$26,775.00) and one of the landowners (\$9,000). A further \$35,000 has been secured from the Biodiversity Condition Fund for the 2012/2013 season.

Other landowners in the valley have also done control work on their own properties, and with this interest and a growing concern about the spread of the infestation, the Waima Valley Ecological Restoration Society Incorporated was established in 2010. It is now appropriate to take a catchment-wide approach to the project.

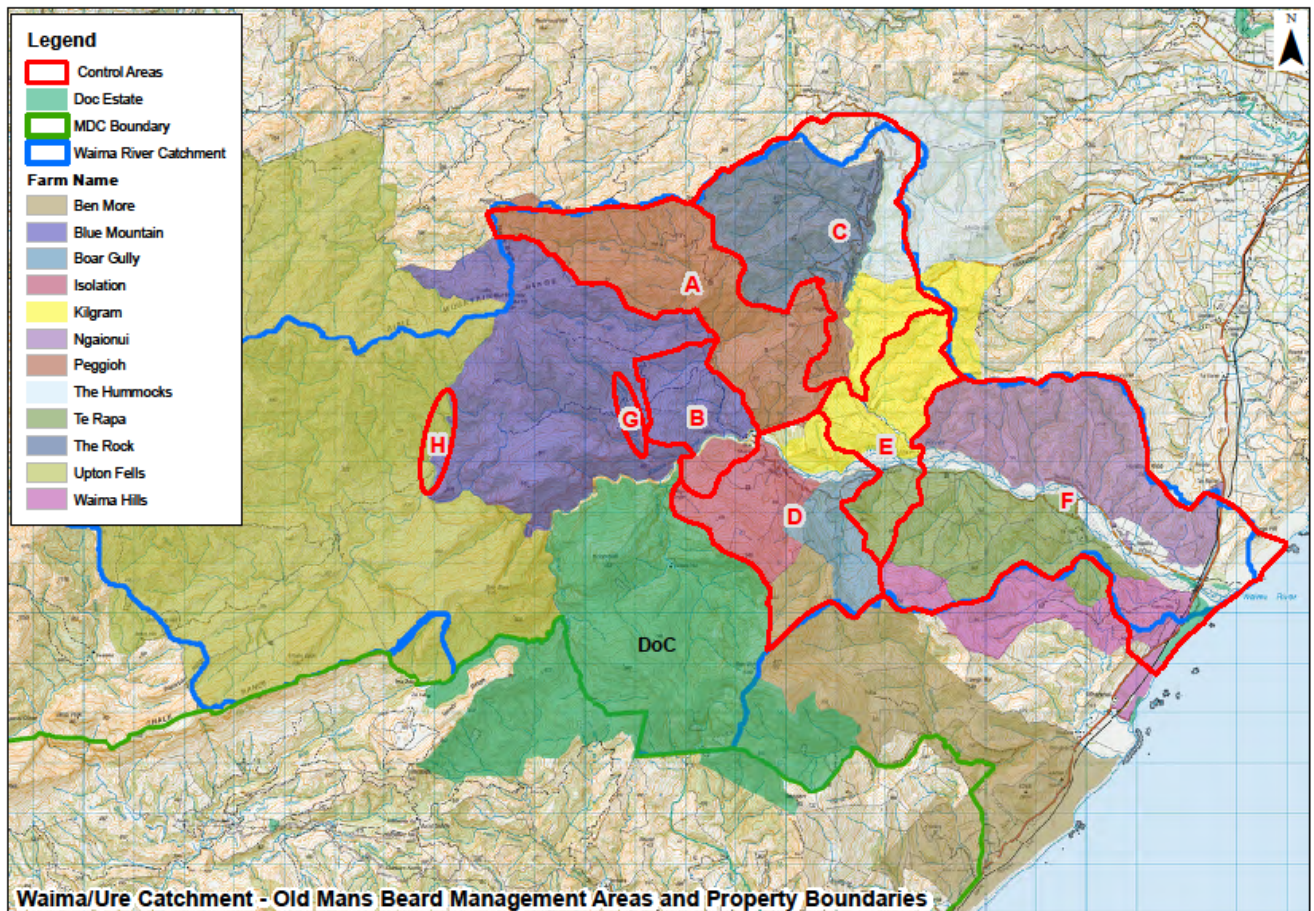


**Marlborough District Council staff and Peggioh landowner discuss the project; looking north across the Waima/Ure River to the Peggioh property beyond.**



## Project Management Areas

For planning purposes the catchment has been divided into project areas. These are largely based on geographic features, take into account land ownership, and are of a size and scale on which it is possible to undertake effective ground based control.



### Project Area A: Peggioh

Peggioh station covers 1304 ha, and has 182 ha of regenerating forest and shrubland protected by QEII covenants. It was the first area to be tackled with a comprehensive eradication plan. It is moderate to steep hill country, has extensive regenerating shrubland and forest outside the covenants, and access to OMB control sites can be difficult. The property has road access to its north-eastern corner from Ward via Peggioh Road.

#### Progress to date

- In the ninth year of work, all original flowering/seeding plants have been eradicated and significant seedling follow up work has been successfully completed;
- Seedlings are now absent or at low/very low density over 99% of the covenant areas, and low density elsewhere except for the Dunsandel Creek gullies and faces which will be part of Project Area C.
- Work is now focussed on clearing seedlings and preventing any new plants from seeding.

## Restoration Plan for the Old Man's Beard Eradication Project

- Funding has been secured from the Biodiversity Condition Fund (\$26,667) and MDC (\$8,625) for the next 3 seasons 2012– 2015.

### Goals

- A.1** Complete the initial eradication project by winter 2015, with OMB completely cleared from the covenant areas and as much of the rest of the property as possible.
- A.2** Monitor the covenant areas and other sites of previous heavy infestation from 2015 to 2019, and where possible during this period eradicate any OMB plants found anywhere on the property (work to be carried out by landowners).
- A.2** Seek funding for follow-up control work for the 2019/2020 season, to enable a thorough check of the covenant areas and all other SNA sites.

### **Project Area B: Ure Road End**

This project area of approximately 400 ha, comprises parts of 2 properties including the western part of Isolation from the Ure Road End to the Reserve boundary, and the Blue Mountain Stream and Waima River faces on Blue Mountain Station between Peggioh and the Reserve. It serves as an important buffer for the Peggioh covenants, and also for the Reserve.

Road access is via the Ure Valley Road from State Highway 1. The river corridor and fairly good farm tracks provide internal access.

This project area contains the likely site of the original infestation (Blue Mountain homestead), and the most publicly accessible and visible (and some of the heaviest) infestations where the popular walking route to Sawcut Gorge follows along the Waima River.

The infestations on Isolation have received some attention from the landowners in past years: this has helped to restrict the extent of the problem on their property.

### **Progress to date:**

- Initial helicopter spot spraying followed by 3 years ground based search and destroy work is now completed (2009 – 2012):
- There are still extensive areas of seedlings requiring follow up, and some small pockets of flowering plants;
- Work programme set for years 4 –6; funding secure for year 4 (Biodiversity Condition Fund \$35,000); funding required for years 5 and 6.

### Goals

- B.1** Obtain funding to enable the work programme for years 5 and 6 to be completed.
- B.2** Complete the initial eradication project by winter 2015.
- B.3** Monitor the area after 2015 and plan to do follow up control work over the whole area in 4 or 5 years.

**Project Area C: Dunsandel Creek from the top (north end) down to just past the Peggioh/Kilgram boundary**

This area comprises parts of 4 properties, 2 on the eastern side of Dunsandel Creek, and two on the west. On the east side is part of The Hummocks in the north and part of Kilgram south of that. On the west side is The Rock in the north, and part of Peggioh to the south. This project area has reasonable access from Peggioh Road.

**Progress to date:**

- planning underway for a funding application (mapping and costing);
- ongoing work on Peggioh by landowners;
- work beginning on The Rock by landowners (new to the property in 2011);
- hope to secure funding for 2013/14 season and following 2 seasons.

**Goals**

- C.1** Complete mapping of OMB by January 2013.
- C.2** Submit a funding application to WWF for 3 years work 2013 – 2016 by March 2013
- C.3** Spot spray by helicopter all the worst infestation sites in December 2013 or January 2014
- C.4** Complete the ground search and destroy work over the whole area by winter 2020.

**Project Area D: The Waima River faces and gullies from the eastern edge of Project area B down to just past the Narrows**

This area comprises parts of 4 properties. On the north side of the river is a small block adjacent to one of the Peggioh covenants, and part of Kilgram. On the south side of the river is part of Isolation, and east of that part of Boar Gully.

Some control work on OMB has been done, and is ongoing, on both properties on the south side of the river.

**Progress to date:**

- mapping of OMB is completed
- planning underway for a funding application in 2013.

**Goals**

- D.1** Spot spray by helicopter all the worst infestation sites in December 2013 or January 2014.
- D.2** Start ground search and destroy follow up work no later than summer 2014/2015.
- D.3** Complete ground search and destroy work by winter 2021.

**Project Area E: Lower Dunsandel Creek and Waima faces and gullies down to the Waima River/Dunsandel Creek junction**

This area comprises part of Kilgram and part of Te Rapa. This is the eastern end of the worst of the OMB.

**Progress to date:** most of the mapping of OMB has been done

**Goals:**

**E.1** Complete the mapping of OMB

**E.2** Secure funding to do spot spraying by helicopter of the worst of the infestations before autumn 2015

**E.3** Develop a ground control search and destroy work programme, secure funding and get work underway by summer 2016/2017.

**Project Area F: Lower Waima River adjacent gullies and faces from Dunsandel Creek to SH1**

This area comprises parts of 3 properties: Kilgram, Te Rapa, and Waima Hills. Old Man's Beard is present, but only in scattered small pockets.

**Progress to date:** at the time of writing it is not known what work is being done on these properties.

**Goals:**

**F.1** Establish the extent of the OMB infestations in this area by winter 2014.

**F.2** Develop an eradication plan and timetable once the extent of the problem is known.

**Project Area G: Headache Stream**

This area is on Blue Mountain Station, and received some control work in the 2009/2010 season. The extent of the infestation requires further investigation, although it is known to be relatively small. Its location upstream of the other project areas gives it a high priority for further work.

**Goals**

**G.1** Map the extent of the infestation by the end of the 2012/13 summer

**G.2** Apply for funding to continue eradication work in the 2013/14 season

## **Project Area H:     **Box Creek****

This area is the western-most known infestation of OMB in the catchment. It is yet to be surveyed. It is known to be a relatively small area. Because of its location upstream of the other project areas and its location on the eastern side of the 927ha Horse Stream Covenant (Protected Private Land) it is a high priority for attention.

The area is very remote. It lies right at the back of 2 large properties, Blue Mountain (accessed from the Ure Valley Road) and Upton Fells (accessed from the Medway Valley).

### **Goals**

- H.1**    Investigate and map the extent of the infestation by the end of the 2012/13 summer.
- H.2**    Determine the most practical method of accessing the area and develop a control strategy in consultation with the landowners.

The following table summarises the control programmes proposed for each Project Area:

CONTROL AREAS	WHAT'S AT RISK	PROGRESS TO DATE: S = SURVEY GC = GROUND CONTROL AC = AERIAL CONTROL F = FOLLOW-UP									GOALS: WHAT IS PLANNED							
		Pre 2005	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020+ beyond
<b>A</b>	3 OSCs (182ha), native forest, shrubland, riparian communities	S GC	GC	GC	GC	GC	GC	GC	GC	F	F	F	F					F
<b>B</b>	native forest, shrubland, riparian communities					S	AC GC	GC	GC	GC	F	F	F					F
<b>C</b>	native forest, shrubland, riparian communities							GC	GC	S GC	S GC AC	GC	GC	F				F
<b>D</b>	native forest, shrubland, riparian communities	GC	GC	GC	GC	GC	GC	GC	GC	S GC	S GC AC	GC	GC	F	F	F	F	F
<b>E</b>	native forest, shrubland, riparian communities										S		AC	GC	GC	GC	GC	F
<b>F</b>	native forest, shrubland, riparian communities											S	AC?					F
<b>G</b>	native forest, shrubland, riparian communities							GC		S	S GC	GC	GC	F	F			F
<b>H</b>	PPL (927ha), native forest, shrubland, riparian communities									S	S GC	GC	F	F				F



## General Control Strategy for each Project Area

1. Each project area is **subdivided into management areas**, based on terrain type and the level of infestation. Large parts of some of the project areas have no OMB, or only a few isolated small patches.
2. **An initial work programme is developed**, with estimated hours for each management area. Records kept for work completed in the 2 projects already underway allow a reasonable estimation of time to allow per hectare.
3. The aim of the initial search and destroy work in any Project Area is to **stop the seeding cycle**. This is the key to an effective eradication programme: once the population is prevented from flowering and seeding, then the seed bank will be largely exhausted within 6 - 7 years.
4. Once work is underway, an **annual assessment** is done of the state of the infestation and the work required, for example young seedlings, climbing plants, seeding plants; using this information, management areas are prioritised and a work programme planned.
5. **Records are kept** of work done and progress achieved for each management area.

## Methods

### Helicopter Spot Spraying

This is an important, cost effective first step when infestations are heavy and widespread, and in difficult host vegetation (e.g. bracken, matagouri) and terrain. Without the ability to take this first step, tackling an infestation on the scale of the one we started with in the Waima Valley would not be possible.

It will kill the OMB if there is sufficient foliage to spray (works well in shrubland), and otherwise it will knock it back severely, preventing it from flowering and seeding for at least 2 years. This allows time for ground follow-up work.

The disadvantage of helicopter spraying is the unavoidable collateral damage; some species are highly susceptible to metsulfuron e.g five-finger and broadleaf; some will suffer damage but can recover e.g large kowhai and *Hoheria angustifolia* (lacebark), kanuka, mahoe, *Olearia paniculata*; and some are not affected e.g putaputaweta,



**March 2010, Ure Road End Project Area B: helicopter spot spraying Waima River faces adjacent to Peggioh Matai Bush covenant (dense kanuka forest top right); area has since been successfully followed up by ground search and destroy work.**

*Muehlenbeckia* spp, the podocarps ( matai, totara) and Marlborough daisies (*Pachystegia* sp). This damage is regretted but accepted. There are widespread and plentiful seed sources in the landscape for regeneration.

### Ground Search and Destroy

There are 4 possible general techniques involved here

1. cutting and stump swabbing of climbing plants
2. knapsack foliage spraying of seedlings and young climbers
3. gorse gun foliage spraying of heavy infestations in places where helicopter spraying is not an option (e.g. close to waterways or other sensitive areas)
4. "weeding": pulling out seedlings and young plants or cutting through the roots. Any of these require great care and some skill to be sure that the plant will not grow again.



**December 2009, Blue Mountain Stream, Project Area B: search and destroy team at work**

Any foliage spraying will involve collateral damage of other species to some degree. Contractors are expected to take care to minimise this damage.

NB: Marlborough District Council rules allow for the clearance of small areas of indigenous vegetation as a permitted activity in certain circumstances. This is taken into account when project work is planned.

### Chemicals

There are a number of chemicals available for stump swabbing, and a variety have been used in this project. Generally, neat Glyphosate is the preferred option.

For foliage spraying generally a metsulfuron spray (with an organosilicone penetrant) is preferred, although there a variety of possible chemicals to use. It is effective and reasonably quick acting. Dye is used for knapsack foliage spraying to minimise the risk of missing plants.



**Gorse gun foliage spraying of a heavy infestations. Evidence of previous spraying evident on the left.**

## **Monitoring**

The effectiveness of the OMB work is monitored with photo points, an annual survey of infestation sites and written records of infestation levels.

Vegetation recovery and ecosystem health is monitored with photo points.

## References

Department of Lands and Survey (PA Williams), 1982, Scenic Reserves of South Marlborough. Biological Survey of Reserves Series No. 9.

Marlborough District Council, July 2005, South Marlborough Significant Natural Areas Project: A summary of results from an ecological survey of Significant Natural Areas on Private Land in Marlborough, south of the Wairau.

Marlborough District Council (T Stein), 2005, Old Man's Beard (*Clematis vitalba*) in South Marlborough.

Marlborough District Council, July 2007, Regional Pest Management Strategy for Marlborough.

Marlborough District Council, 2008 State of the Environment Marlborough

Ministry for the Environment, 2007, Protecting our Places: Statement of National Priorities for Protecting Rare and Threatened Biodiversity on Private Land.



## PHOTOS



View down the lower Waima/Ure Valley to the coast showing farm land with low density infestations – Project Area F.



View of the mid Waima/Ure Valley with Project Area D in the foreground to the narrow point visible in the river.



View from mid valley looking to Isolated Hill and the scenic reserve including Saw Cut Gorge – Project Area B foreground on right.





**March 2009, Peggioh, inside a covenanted area; showing rampant growth of young OMB plants (99% of the green growth visible in the photo) following mass germination of the seedbank after fencing, removal of grazing and destruction of old seeding vines: this infestation has been successfully dealt with by gorse gun spraying, followed up with knapsack spraying**



**May 2012, Peggioh, inside the covenanted area shown above after successful OMB control (old dead vine still visible hanging from the trees), showing mahoe regenerating.**



**Restoration Plan for the Old Man's Beard Eradication Project**



**May 2007, Dunsandel Creek faces, Project Area C: seeding OMB infesting regenerating forest and shrubland requiring urgent ground control.**



**May 2007, Dunsandel Creek faces, Project Area C; seeding OMB overtaking shrubland: this area is at the point where it could be either gorse gun sprayed or helicopter sprayed.**