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Broom in the Upper Awatere Valley – a successful control programme

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Broom control in the Upper Awatere Valley – a successful programme

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Summary

Project and Client

- This report includes a review of knowledge on the Upper Awatere broom control programme that began in the 1960s. Past and present landowners, council employees, and contractors have been interviewed and available documentation sourced. The work was undertaken for Marlborough District Council through Envirolink Advice Grant 2032-MLDC154.

Objectives

- Interview past and present landowners, council employees, and contractors and source documentation relevant to the broom control programme in the Awatere Valley since its inception in the 1960s.
- Describe the historical and current state of broom and the effectiveness of the control programme.
- Identify the range of interventions applied in the catchment, control methodologies, barriers to success and lessons learnt, to provide an historical record of the programme and to help inform other communities, government agencies, Council policy, the Kotahitanga Mō Te Taiao Alliance, and others wanting to run weed control programmes in future.

Methods

- A selection of past and present landowners, council employees, and contractors who contributed to this programme were interviewed and available documentation was sourced through these contacts.

Results

- Accounts from three landowners, two council staff members, and two ex-council staff members/contractors provided historical context (including some documentation), information on control methods, and more recent perspectives on weed control developments in the valley.
- Good progress was made reducing broom (and gorse) populations from 'a sea of yellow' to scattered clumps and individual bushes from the 1960s until 1987 within and around the Upper Awatere riverbed. This involved good landowner cooperation, the presence of strong champions, good consistent central government funding, regular improvements in control methods, and a shared vision for the land.
- Advances in control methods played a key role in progressing the programme. Initially, fire was used, then 245-T was applied using rudimentary spray equipment, then improved herbicide formulas with residual activity became available. From 1971 the use of helicopters allowed broom and gorse to be controlled over large areas of difficult-to-access terrain. An intimate knowledge of the terrain, which initially at least was held within the memories of key staff, allowed for efficient use of ground-based equipment and helicopter time.

- Following the replacement of the Department of Lands and Surveys by the Department of Survey and Land Information (DOSLI), the Department of Conservation (DOC), and Landcorp (Molesworth) in 1987, changes in policy and resource allocation hampered weed control strategies. Riverbed weeds in particular were left uncontrolled and landowners had to maintain the programme.
- DOC (1991) and Land Information New Zealand (LINZ, replacing DOSLI in 1996) took back some responsibility for riverbed weed control but important champions and government funding streams had been compromised. Landowners continued to work hard with new government agencies to maintain the programme.
- Currently, broom and gorse are controlled by LINZ within the Upper Awatere riverbed and by landowners on adjacent privately owned land under direction from the 2018 Regional Pest Management Plan. The council's role is now one of facilitation and monitoring, but it is increasing its focus on more collaborative approaches.
- New weed control challenges, such as controlling wilding pines, may require a renewed commitment to a shared inter-agency collaborative vision, as seen from the late 1960s to the mid 1980 during the Upper Awatere broom control programme.

Conclusions

The following factors have been key to successfully maintaining a long-term control programme for broom in the Upper Awatere Valley:

- landowner cooperation and organisation driven by a strong community spirit
- presence of key people (or champions)
- continuity of local and central government funding/support
- regulations
- the correct tools for the job
- a shared inter-generational and inter-agency vision for land-use.

1 Introduction

In the 1960s, broom was seen as a potential threat to land use practices in Upper Awatere Valley. A community/agency-led control programme involving concerned landowners, council, and central government was successfully implemented over several decades. The success of the broom control programme has seen transformational outcomes and has involved a variety of interventions and changes in the system, underpinned by fundamental principles of good cooperation between landowners and government departments.

This report documents the history of the Upper Awatere broom control programme in an attempt to identify key factors that led to its success, so that other weed pest management programmes may benefit.

2 Background

The Awatere is one of Marlborough's four largest rivers flowing over 110 km northeast from the Inland Kaikōura Range to the sea northeast of Seddon. For most of the past 10,000 years, the upper slopes of the Awatere catchment were almost entirely clad in *Podocarpus* and *Phyllocladus* dominant conifer/broad-leaved forest and the valley floor in *Prumnopitys taxifolia*. Around 6000 years BP, *Nothofagus* forest spread into the wetter, mountainous, region west of the Awatere valley (in the gullies between Castle Creek and Black Birch on the north side of the river – A. Pitts, pers. comm.) but failed to establish more than scattered stands on the drier Inland Kaikōura Ranges. During widespread burning in the early Polynesian era (750 to 600 years BP) the Awatere catchment lost most of its forest cover, which was replaced by bracken, grass, and scrub. There was a slight recovery of forest after 600 years BP when burning frequency lessened, but increased burning, grazing, and introduction of exotic weeds accompanied penetration of the region by European pastoralists in the 1860s (Williams 1989; McGlone & Basher 1995).

From the 1860s until the late 20th Century the Awatere Valley was used primarily for pastoral farming, with large sheep runs established. More recently, much of the lower valley has been planted in vineyards, with the Awatere becoming Marlborough's second most important wine-producing region after the Wairau Plain. Further inland, where frosts would damage vineyards, pastoral farming continues on a number of high-country stations. These include the Aotea, Awapiri, Blairich, Camden, Duntroon, Mt Gladstone, Glenlee, Molesworth (New Zealand's largest farm), Upcot, Middlehurst, Muller, Riverview, and Weld Hill Stations. Some farmers have also developed tourism ventures, including homestays and private walking tracks. Plantation forestry is also present in parts of the valley, particularly on the lower slopes of the Black Birch Range (Cookson 2020).

3 Objectives

- Interview past and present landowners, council employees, and contractors and source documentation relevant to the broom control programme in the Awatere Valley since its inception in the 1960s.
- Describe the historical and current state of broom and the effectiveness of the control programme.
- Identify the range of interventions applied in the catchment, control methodologies, barriers to success and lessons learnt, to provide an historical record of the programme and to help inform other communities, government agencies, Council policy, the Kotahitanga Mō Te Taiao Alliance, and others wanting to run weed control programmes in the future.

4 Methods

- A selection of past and present landowners, council employees, and contractors who contributed to this programme were interviewed and available documentation was sourced through these contacts.

5 Results

Before the 1950s, broom (*Cytisus scoparius*) was accidentally introduced, established, and started spreading down the Awatere river, possibly from an infestation at Molesworth. Gorse (*Ulex europaeus*) was probably introduced into the Valley as a hedging material in the late 1800s. 'By 1963 the riverbed was fairly well covered in a sea of yellow (mainly broom) which was spreading up the sides of the valley and out onto adjacent land' (A. Pitts, pers. comm., 13/4/20).

During the early days of weed control, the only tool available for broom and gorse control was burning, which only temporarily removed ground cover before an even denser canopy developed. Shortly after Ivon Watkins-Dow Ltd (IWD) manufactured 245-T for use during the Viet Nam war, it was released in New Zealand for weed control. During the 1960s 245-T was applied to broom and gorse by hand spraying with rudimentary low-pressure gear pumps (~50 psi) and 200 litre fuel drums as tanks, to mostly treat re-growth following burning. The subsequent development of rotary pumps enabled slightly higher pressures, but volumes were still low. At this stage there was no widespread coordinated effort with some landowners doing more than others.

Several sheep stations changed hands in the Upper Awatere in the late 1960s and 1970s. The younger generation had similar aged families, which led to the development of a strong community spirit. Geographically, the valley is long and narrow and until recently was a no-exit road. Given the isolation, this community spirit was important because the success of individual landowners was linked to that of their neighbours. The formation of the Upper Awatere Farmers' Group (UAFG) to lobby for government funding to help with weed control was an example of this (more on this below).

In 1968, Ron Feron (Noxious Weeds Inspector) and Wayne Nicholl (Noxious Plants Officer) from the Awatere County Council started working in the area and were important driving forces, encouraging landowners to spray alongside the Awatere river as much as possible to prevent broom and gorse (and nodding thistle) spreading. Ron was firm on landowners, insisting that appropriate control was carried out and that those who ignored requests were prosecuted under the Noxious Weeds Act 1950. The Act allowed for the appointment of noxious weed inspectors, and penalties for continued defaults on requests to control certain species including broom and gorse. John Sinclair (who later became involved in helicopter spraying operations) recalled a conversation Ron had with neighbouring landowners while standing on the main road one day. Ron pointed at the centre line on the road and said, 'Do you know what that dotted line is there for?', the landowners said, 'Yeah, that's there so that you stay on your own side of the road when driving.' Ron replied, 'No, that's where I want you to be controlling your weeds up to'. On another occasion, after inaction following a request to spray nodding thistle, Ron had the work done from the air and then sent the bill to the offending address.

Right from the beginning Ron Feron and Wayne Nicholl were very proactive and attended annual mid-winter landowner meetings at Awapiri from 1968 till 1987. This was when the UAFG was first formed, and meetings were run specifically for landowners to discuss weed control and plan for the coming season. There is some suggestion that the group included some former Awatere rabbit board members who were used to working with councils, and the government, to lobby for funding. The group encouraged the council to carry out control work in the riverbed because it was recognised this was the primary seed source at that time.

Work began in earnest in the early 1970s, with all the partners contributing to costs for their share of the work done on their properties. There was an unwritten rule among landowners, which was to have all control work done by Christmas each year before broom finished flowering. This helped prevent the spread of new seed. Despite some progress using 245-T, dilution rates were made by trial and error, no wetting agents were added, and 245-T had no residual activity, meaning seeds in the ground from previous seasons germinated and populations quickly recovered. Also, during this time much of the land was not accessible by vehicle.

Two developments transformed the broom and gorse control programme in the 1970s. First, IWD developed Tordon Brushkiller 520 (245-T with Picloram), which improved control of woody weeds. It was so much more effective on broom and gorse than just 245-T and gave some residual activity (J. Sinclair, pers. comm., 30/4/20). This meant the same areas did not need to be visited every year. Second, helicopters were used for the first time. In 1971 a monsoon bucket was used to apply Tordon with high dilution rates, because Ron Feron did not think boom spraying would be effective (J. Sinclair. pers. comm.). Simon Oliver, the pilot at the time, was killed in an accident on 19 November 1971. John Sinclair contracted Helicopters NZ Ltd (from Nelson) and re-commenced aerial spraying over farmland, but this time using a spray boom. Significant progress was made with residual activity lasting for several years at some sites. During this period, only weeds on land adjacent to the riverbed were being controlled, and broom and gorse continued to re-infest these areas from the riverbed.

The first season of helicopter spraying was successful. Inspired by the progress, landowners ramped up pressure on councils to spray in the riverbed while they continued to spray on adjacent land. The UAFG, backed by the council, applied for government funding (because individual landowners could not) and the project was initially granted ~\$300K/year through the Department of Lands and Surveys to control broom and gorse in the valley from Molesworth Station down to Blairich (Fig. 1).

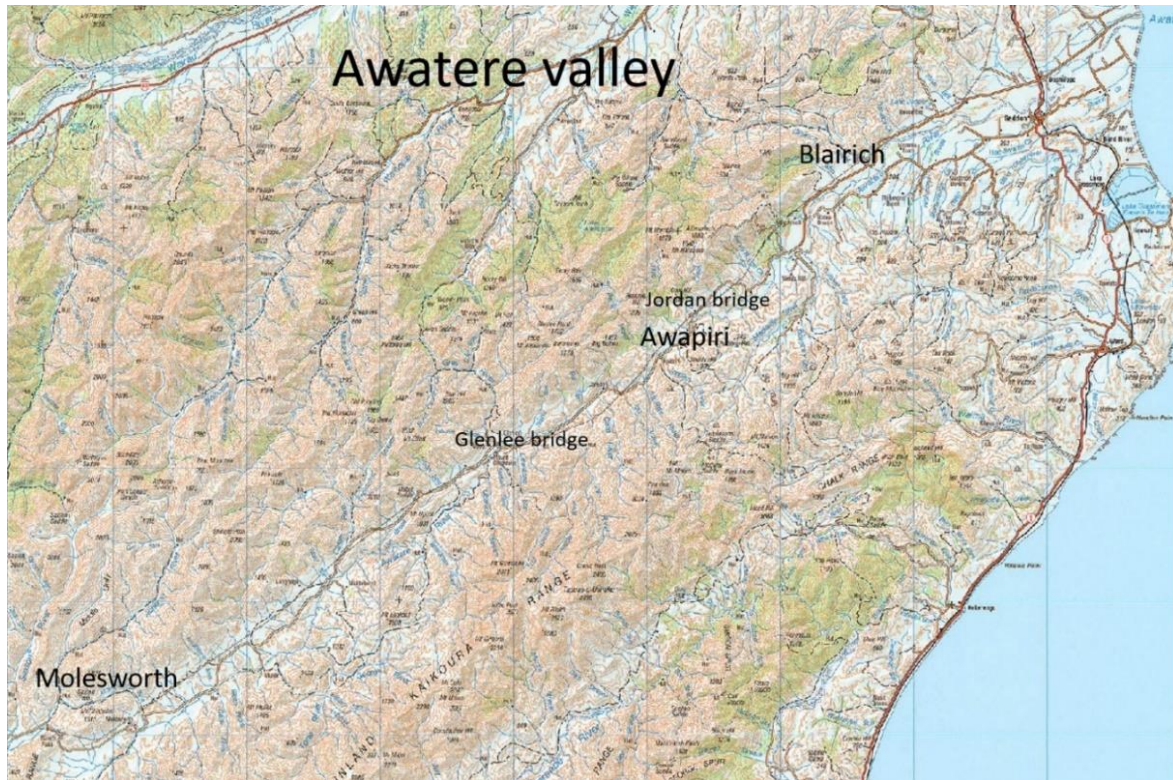


Figure 1. Key locations within the Awatere Valley that relate to broom and gorse control.

This led in 1973 to the first district weed control scheme which was funded by the Crown. The funding was administered by the Awatere County Council and was used to spray unoccupied crown land in the Awatere riverbed. The funding was conditional on landowners clearing broom and gorse on adjacent privately owned land and grants were gained up until 1987, when the Marlborough District Council was formed. This template for landowner/crown-shared responsibility for weed control, with council 'boots on the ground', was later extended to other sites in New Zealand.

In 1973, Aerial Work Ltd, piloted by Allan Hackston with assistance from John Sinclair, replaced Helicopters NZ Ltd. Ron Feron was persuaded that boom spraying of Tordon was a more effective method than he had thought. It was at this stage that broom and gorse along riverbeds was boom sprayed along with as much private land as landowners could afford. The control operation was coordinated by the council. Colin Bint was the helicopter pilot from 1981. He and John Sinclair had personal connections with the Upper Awatere and were well respected in the area. They went above and beyond minimum requirements to help make the spray programme a success. The boundary between crown and private land was extended slightly from the riverbed to help catch escapes spreading onto

adjacent private land. This is an example of the attitude that spurred the council and landowners and helped encourage all parties to persist with the control efforts.

Again, results were impressive. In fact, during a large flood in 1974 so much previously sprayed dead broom and gorse washed down the Awatere river and piled up against the Middlehurst bridge that there were fears that the bridge might get swept away. This progress allowed some landowners to focus on other weeds such as briar and matagouri, when disposable incomes allowed.

Considerable strides were made in the 1970s and 80s when government funding was available, and in 1979 further subsidies were put in place to cover 75% of herbicide costs for farmer operations on private land. This followed replacement of the Noxious Weeds Act 1950 with the Noxious Plants Act 1978, an 'Act to make better provision for the control of noxious plants, to co-ordinate actions aimed towards such control, and to foster a spirit of co-operation and assistance among persons adversely affected by the spread or growth of noxious plants in achieving such control'. This, and years of previous work, had the desired result, with riverbed and surrounding areas of the Upper Awatere catchment down to Awapiri being largely clear of established plants with only annual control of seedlings required. Areas below Awapiri down to Blairich were treated by Wayne Nicholl for 2–3 years but this was beyond the reach of the UAFG and a lack of support from a downstream landowner made it difficult to keep these areas clear. They are still infested with broom and gorse today. However, downstream from Blairich the weeds have largely been confined to the riverbed by landowners (J. Sinclair. pers. comm.).

During the late 1980s, Escort (Metsulfuron-methyl) was trialled and after some experimentation with dilution rates, and more importantly with wetting agents, was used instead of Tordon to control matagouri, briar, and bracken. However, Tordon was still required for broom and gorse. This reduced overall herbicide costs because Escort was much cheaper; Tordon manufacturers later reduced their prices, so that their product was more competitive. This allowed more effort to be put into weed control. In 1987, 245-T was banned for use in New Zealand and Tordon Brushkiller 520 was replaced by Tordon DS (Triclopyr with Picloram).

After the Department of Lands and Surveys was replaced in 1987 by the Department of Survey and Land Information (DOSLI), the Department of Conservation (DOC), and Landcorp (Molesworth¹), the programme suffered through discontinuity of policy and funding. Weed control within the riverbed stalled as funding from the district weed control scheme, which had been funded by the Crown since 1973, dried up. Responsibility for riverbed maintenance was debated. Landowners did their best during this time to extend their operations into riverbeds; however, after a 3-year hiatus in crown activity, broom and gorse densities again rapidly increased.

¹ Since the crown took ownership of Molesworth during the '30s and '40s it has always supported the efforts of landowners and the Upper Awatere Valley Research Group but has worked alongside, rather than as part of, the group.

After a lot of pressure from landowners and the council, DOC took back some responsibility for riverbed control on behalf of the crown in 1990/91. However, the control operation was only carried out over a reduced area initially (Appendix 1), citing lack of finance (A. Pitts, pers. comm.) and uncertainty over riverbed ownership (Appendix 2) as reasons for the reduction. For example, riverbed responsibilities were assumed by the crown and administered by DOC but only where there were no riparian rights. By 1993/94 the area of riverbed DOC controlled had extended down to Glenlee bridge, and from 1994/95 down to Jordan bridge (Fig. 1). Annual control operations were tendered, with aerial operations done by Marlborough Helicopters and ground-based work by Wayne Nicholl. Some mapping work was also carried out (see Appendix 3 for a 1993/94 weed control performance report supplied by Allan Pitts) but could not be located for inclusion in this report.

The extension of DOC responsibilities for the control of weeds in the Awatere riverbed may have also been facilitated by a public submission made by Allan Pitts on behalf of the Upper Awatere Research Group (UARG)² in 1994/95³ to the Regional Pest Management Discussion Document that summarized the history of the Awatere Broom and Gorse control project (Appendix 4). The letter suggested that the status of broom, gorse, nodding thistle, and wilding trees be changed to 'target weed species' for control in the Upper Awatere catchment area above the Jordan Bridge. This was a motion voted on at a meeting held on 3 June 1994 at Gladstone Downs at which J. Herdman (weed officer for DOC), S. Boswell and A.H. Grigg (MDC), and members of the UARG were present. The letter stated that 'Pastoral viability in the Upper Awatere catchment area is largely dependent on keeping the land clear of pests, particularly woody weeds', and that 'The Upper Awatere Research Group sees a Regional Pest Management Strategy (RPMS) as a tool to assist in maintaining that viability'. The development of a RPMS for Marlborough, following the passing of the Biosecurity Act in 1993, provided another opportunity to formalise the community driven broom control programme in the Upper Awatere Valley. Under the RPMS broom was declared a pest and the subsequent control programme prescribed clear objectives and set a range of implementation methods for achievement. Rules required landowners to carry out broom control and the council's role was now one of facilitation and monitoring.

Land Information New Zealand (LINZ) replaced DOSLI in 1996 and took over responsibility for weed control in riverbeds. Meetings were held in 1996 and 1997 to tender out work for contractors to control weeds in the Awatere Valley riverbed and in other major South Island rivers. No landowners or councils were present at these meetings, and the tenders had specific criteria to treat crown-owned land only, and within a limited budget. The Hazardous Substances and New Organisms Act 1996 regulated herbicide spraying over waterways and past methods for controlling broom and gorse in riverbeds were no longer environmentally acceptable. Operations were altered to include targeted ground-based spraying on, and adjacent to, the riverbed, but 3–5 m back from the water's edge, replacing helicopter application. Patch spraying by helicopter continued at locations

² Previously known as the Upper Awatere Farmers' Group (UAFG).

³ Undated.

further away from the river and in the Middlehurst Gorge, where access by ground was virtually impossible. Landowners put considerable initial effort into ensuring LINZ weed control operations along the river were carried out properly as the operations were not always well coordinated (e.g. controlled weeds working upstream instead of downstream) or were incomplete (as funding ran out; S. Satterthwaite, pers. comm.). LINZ and landowners eventually developed a better understanding and a closer working relationship.

The land tenure review began with the passing of the Crown Pastoral Land Act 1998. This resulted in some land being returned to the crown along with the responsibility for weed control. Tenure review been seen as a potential threat to continued successful weed control in the Upper Awatere Valley with some landowners worried about the amount of investment DOC can afford and the level of commitment to keeping areas free of existing weeds like broom and gorse, as well as of emerging weeds like wilding pines. Until 2018 the crown (DOC and LINZ) were not bound by any rule obligations under previous RPMSs. In 2018 the new RPMP introduced Good Neighbour Rules, which were made available through the 2012 amendments to the Biosecurity Act 1993. While these rules do bind the crown to control weeds, they only address boundary control, not management across entire landscapes. Nonetheless, LINZ has committed to the status quo and the council continues to advocate for this.

More recently, control methods for broom and gorse have been refined to deal with smaller, more remote patches and individual outliers, as opposed to the treatment of large blocks. An example of a LINZ biosecurity control programme annual report (2010/11) for broom and gorse in the Upper Awatere River can be found in Appendix 5. This has included efforts to reduce spray drift to improve the accuracy of application through utilising larger droplet size. In the late 1990s and early 2000s, Max Nelson, and later Jono Underwood, undertook periodic helicopter surveillance flights to map outlying flowering broom and gorse plants away from the riverbed and relayed this information, on maps, to landowners to help control work (Appendix 6). This council surveillance work is ongoing.

Most of the Awatere Valley (including the riverbed) has now been restored to pre-colonial weed-free cover, albeit with more productive grasses. No helicopter application has been required along most of the riverbed for the past 5 years, with remaining outlying plants controlled by ground operations. The exception is an area of broom between Castle Creek and the Winterton River, known as the Middlehurst Gorge (Appendix 7). The margins of this area are still aerially sprayed. This area is uneconomic from a pastoral point of view but is probably acting as a seed source. Some biocontrol agents have been released there, including broom psyllids (1999), broom seed beetles (2000), and broom gall mites (2016). Gall mites had probably already self-established, given their propensity to spread since being first released at Black Birch in 2010 (J. Underwood, pers. comm.) From the visible damage seen on broom, it is also likely that gall mites are already having a significant impact (S. Macdonald, pers. comm.). However, challenges remain. While landowners remain vigilant monitoring and controlling broom and gorse annually, there are concerns that invasive weeds on neighbouring crown-owned land are becoming increasingly difficult to control, due mainly to lack of government funding. In fact, some landowners feel obliged to control weeds on crown land adjacent to their own properties in order to protect the gains made over the last 40+ years. Persisting with weed control efforts now

and into the future, when plants are in very low densities, is seen as critical by both landowners and contractors. John Sinclair noted that this includes 'chasing single bushes over huge areas'.

6 Discussion

Despite the loss of documentation during amalgamation of counties into the current district council, it is evident from the collective history gleaned from past and present Upper Awatere landowners, council staff, and contractors, that landowner cooperation and organisation, the presence of champions, continuity of local and central government funding/support, legislation, the correct tools for the job, and a shared inter-generational and inter-agency vision for land use are required to be successful when dealing with long-term weed control programmes. The Upper Awatere Research Group, together with the wider community, have achieved sustained control of broom and gorse in the Upper Awatere Valley due to gaining success in all these areas at one time or another.

Landowner cooperation and organisation

Strong cooperation between landowners over a long period has been key to the success of this project. The formation of the UAFG to lobby for government funding simply formalised the commitment the group already had to working together but made it easier to be heard, and to hold external agencies accountable in the longer-term. Since the name of the group changed to the UARG, it has initiated other weed management projects, including 20 years of research by Alan Rose on the spread of hieracium. More recently, the group has been involved with the South Marlborough Landscape Restoration Trust to control wilding pines, which have been an issue at the head of the Awatere Valley since the late 1960s. The group has also gained government funding for roading improvements and united to build a sale yard complex, which was used for many years. It has also worked together to secure fibre optic cabling for phones and internet in the Valley.

Early adoption and long-term involvement of champions

Over the years several individuals were strong champions of the project, providing motivation and co-ordinating activities across landowners and organisations. The Noxious Weed Inspector and Noxious Plant Officer roles were important during then early period of the Upper Awatere Broom and Gorse control programme from 1968 to 1989. Critical funding was secured, and knowledge passed on that allowed landowners to maintain control efforts when government policy changed and funding dried up in 1987. Unfortunately, most written records and other material produced during the control programme were lost during transitions between the Awatere County Council and the Marlborough County Council in 1976 and after the Department of Lands and Surveys was dissolved in 1987. There also appeared to be a lack of recognition and retention of existing personnel, skills, and knowledge during these transitions.

The lower Awatere Valley, south of the Jordan bridge and beyond the reach of the UARG, still contains some broom and gorse, as does the neighbouring Wairau Valley, especially in

the lower reaches. Landowners in these areas with ongoing problems may not have been as actively involved, or compliant, or had council champions to work with and help provide advice in the past.

Government and council support

Consistency of funding and support for this project has been patchy, hampered at times by legislative changes, restructuring, and inconsistency in policy between organisations. While government funding was relatively generous during the 1970s and 1980s, it reduced over time and eventually stopped completely in 1987 followed a major restructure after the Department of Lands and Surveys was dissolved. There appeared to be confusion over which government department was responsible for riverbed maintenance and the project lost some momentum. It is likely that the strength of the UARG prevented the project failing altogether during this time as landowners did their best to maintain control themselves. Eventually some crown support was reinstated after the UARG and the council banded together to apply pressure. First, DOC took responsibility, then LINZ. However, the same cooperation between external agencies and landowners enjoyed in the 1970s and 1980s did not appear to be as strong. This was probably due to two main issues: a lack of adequate and consistent government funding to maintain broom and gorse in the riverbed through a single agency; and a reduction in hands-on involvement by the council. Councils were now tasked with the role of providing overarching coordination to ensure that landowners and the crown undertook their obligations rather than involvement in ground operations. Nevertheless, the council has been in regular contact since the formation of the RPMS/RPMPs reminding landowners of their responsibilities and have required feedback detailing weed control activity on their land, on an annual basis (see Appendix 8). However, it is evident from the difference in the current broom and gorse control outcomes between the Upper and Lower Awatere Valley that the attitude and commitment of landowners has been a key component of the success of the programme.

Regulations

Regulations from the 1960s through to the present have helped shape the programme to control broom and gorse in the Upper Awatere Valley in several ways. The Noxious Weeds Act 1950 allowed council staff to encourage and enforce weed control habits at a time when decisive and 'persuasive' action was critical. The Noxious Plants Act 1978, which was designed to 'foster a spirit of co-operation and assistance among persons adversely affected by the spread or growth of noxious plants', helped drive, or coincided with, increased subsidies to landowners to pay for herbicide from 1979. This provided a timely incentive to continue with control operations and work collaboratively to lock in gains made over the previous two decades. The tools available for use were also influenced by regulation. The use of 245-T was banned in 1987, forcing a change in chemical use, and the Hazardous Substances and New Organisms Act 1996 regulated the use of herbicides over waterways, forcing changes to methods.

The Biosecurity Act 1993 provided for the formation of Regional Pest Management Strategies (later called Plans), which were designed to take a regionally co-ordinated approach to minimising actual and potential adverse effects associated with pests. Broom and gorse were placed under the category Containment Control Pests with the objective

'To prevent any increase in the distribution of Broom (and gorse) in the Upper Awatere Containment Area and reduce infestation levels where possible'. The weed control programmes prescribed clear objectives and set a range of implementation methods for achievement. Early versions of the strategy had a punitive focus stating firstly that councils would inspect and carry out enforcement action if required, and letters were sent annually to remind landowners of their responsibilities. It was also stated that the council would provide advice and carry out control of broom and gorse plants found during an inspection, but the role of council staff had changed to one of facilitation and monitoring as LINZ had taken over controlling weeds in the riverbed. In 2007 the new RPMS wording was changed in the Means of Achievement section so that council obligations started with 'Provide advice and information on the control of broom...', signalling a shift to a more collaborative approach. Today, under the 2018 RPMP, broom and gorse are listed under the 'sustained control' category within the Upper and Mid-Awatere (Appendix 9) and the wording and emphasis have continued to change. In the 'Principle measures to achieve the objective' there is more emphasis on advocacy and education as councils renew their focus on collaborative approaches to pest management.

The tools to do the job

A weed control project such as this can only succeed if effective control tools are available. Control methods were initially rudimentary, but as improvements were made the gains motivated all involved to increase efforts even further. The advent of improved land-based pumps and spray carrying capacity, improved herbicides formulas that gave residual action, and finally helicopter involvement that allowed access to vast, and sometimes inaccessible, areas, were all important steps to achieving control. It appears that a consistent method for monitoring control progress, like aerial mapping, has not been employed. In fact, one landowner suggested that there was no requirement to have this type of monitoring and that Mark One Eyeball was the preferred choice. Much of the overall local knowledge was something that individuals, and in particular a few council staff members, held. More recently council staff are now involved with helicopter surveillance flights to spot outlying plants and they pass this information onto landowners. However, it is possible that a more formal aerial mapping approach may be relevant now that outlying plants are becoming more difficult to locate, to help inform and motivate continued control efforts. This is something the council could investigate.

Shared inter-generational and inter-agency vision for land-use to maintain long-term continuity

A project such as this requires a clear, long-term vision shared by the landowners, funders, policy makers and regulators. Landowners appreciate the long-term nature of the weed control programme because they have a vested interest in the land and have for 50 years consistently controlled broom and gorse in the Upper Awatere Valley. Central and local government, however, have not been as consistent with their support. From the 1970s till the mid-1980s funding was generous, and a collaborative approach was taken. During the late 1980s and 1990s, government and council commitment to the long-term viability of the programme was less clear during periods of restructuring and funding cutbacks. Since then, the formalisation of the programme through RPMSs and the latest RPMP has helped

provide a longer-term vision but changes in land ownership as a result of the Land Tenure Review have brought into question whether or not some areas of crown land can be managed to help protect pastoral farming as a land use

https://www.landcareresearch.co.nz/_data/assets/pdf_file/0014/52232/the_future_of_pest_management_in_nz.pdf, despite central government assurances to meet 'good neighbour' obligations in regional pest management strategies.

<https://www.beehive.govt.nz/release/government-delivers-pest-management-promise>.

The issue of land use and land use change is beyond the scope of this report, but while high country farming continues in this area, it is, as stated in the 1994/95 public submission made by the UARG to the RPM discussion document, '...largely dependent on keeping the land clear of pests, particularly woody weeds', and, more recently, exotic trees. To achieve this, control efforts cannot be relaxed, otherwise broom and gorse, like wilding pines, will transform the landscape.

7 Conclusions

The following factors have been key to successfully maintaining a long-term control programme for broom in the Upper Awatere Valley:

- landowner cooperation and organisation driven by a strong community spirit
- presence of key people (or champions)
- continuity of local and central government funding/support
- regulations
- the correct tools for the job
- a shared inter-generational and inter-agency vision for land-use.

8 Acknowledgements

Allan Pitts (Mt Gladstone station) provided much of the historical context and documentation on the weed control project within the Upper Awatere valley. Sections of text were also based on written material he provided.

Wayne Nicholl (ex-Noxious Plants Officer) and John Sinclair (ex-helicopter weed control contractor) provided information on aerial and ground-based spray operations.

Steve Satterthwaite (Muller station) and Susan Macdonald (Middlehurst station) gave perspective on recent developments in the Valley.

Alan Johnson and Jono Underwood (MDC) supplied information on how council responsibilities and inputs have changed over the years, particularly following the formation of the RPMSs/RPMP. Jono provided maps and photos from 2010.

9 References

McGlone MS, Basher LR 1995. The deforestation of the upper Awatere Catchment, Inland Kaikoura Range, Marlborough, South-Island, New-Zealand. *New Zealand Journal of Ecology* 19: 53–66.

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Appendix 1 – Letter to Allan Pitts from MDC on DOC's spray programme

MARLBOROUGH DISTRICT COUNCIL



File Ref: NOX/9/2
Ask For: Mr Boswell

20 July, 1993

Mr A Pitts
Gladstone Downs
Private Bag
AWATERE VALLEY

Dear Allan

Awatere Broom Control

I have recently received the Department of Conservation's Broom Control Programme for the area Molesworth Station to the Jordon bridge.

As you can see from the attached copy, it is DOC's intention to respray, as part of a maintenance phase, the bulk of last years work where necessary. In addition there is a commitment by DOC to spray further downstream to the Glenlee bridge.

It is vitally important that for the project to produce the desired results, Broom control on contiguous private land will need to coincide with DOC control work. I believe that this is the intention of neighbouring landowners so do not anticipate any problems.

It is also DOC's intention in 1994 to continue downstream from the Glenlee bridge to the Jordon bridge with appropriate maintenance on areas sprayed this year. Once again I am sure the commitment from adjacent landowners is such that it will only serve to support DOC's bid for treasury funds for this work.

Given the positive commitment from both DOC and the local landowners, I really wonder about the need for a change in the status of Broom from a widespread to a target plant. If, after consideration of these proposals, there is still a majority view that a status change is necessary then I will explore the matter further.

Can you please advise me of the outcome of your next Broom control committee meeting.

Regards.

A handwritten signature in black ink, appearing to read 'J S R Boswell'.

J S R BOSWELL
SENIOR PESTS AND PLANTS OFFICER.

@P@R@M@C@N@T@R@L@P@I@T@T@S@I@.D@O@C
JTB

Appendix 2 – Unoccupied Crown land weed control notification (supplied by Allan Pitts)

(RJB153)

UNOCCUPIED CROWN LAND WEED CONTROL

Department of Conservation Involvement in Riverbeds

There is a common belief that DOC is responsible for all riverbeds which is not correct. The issue is very complicated but the following is a brief description of how Department of Conservation (DOC) gets involved.

Crown Owned Riverbed

Where no "riparian rights" exist the riverbed responsibilities are assumed by the Crown and the administration of Crown owned riverbed lies with the Department of Survey and Land Information (DOSLI). That department has delegated the control of pests and weeds on that land to DOC and this is the situation throughout the mid and upper Awatere Valley, except where "riparian rights" exist.

Upper Awatere Valley Weed Control Programme for 1993/94

Molesworth to Muller	DOC crew	November
Muller to Middlehurst Gorge	Contractor	November
Middlehurst Gorge to Winterton River	Helicopter	November/December
Winterton River to Glenlee Bridge	Contractor	November/December

Programme from 1st July 1994

A bid for the funding of weed control on all the Crown owned riverbed between Molesworth and the Jordon Bridge will be prepared and submitted this year. The amount of control carried out from 1st July 1994 on will depend on the amount of funding received from Treasury.

Appendix 3 – Blenheim Field Centre 1993/94 weed control performance report

BLENHEIM FIELD CENTRE 93/94 UCL WEED CONTROL PERFORMANCE REPORT

92/93 Cost \$21 606.50

LOCATION: Awatere Riverbed, between Molesworth boundary and the Glenlee Bridge.

MAP REFERENCE: NZMS 260 030 411

TARGET WEEDS: Broom and Gorse

PURPOSE OF CONTROL:

1. Protect wildlife habitat for birdlife.
2. Containment of Spread.
3. Compromise wild/ascetic/scenic values.
4. Good neighbour boundary Clearance.
5. Protection of previous investment.

DURATION OF EFFORT: 16 years. Annual assessment.

CONTROL TARGET: Aim to reduce infestation within the riverbed and crownlands so that input into maintenance control programmes is reduced significantly, and only minimal input is required.

CONTROL MEASURES USED: 300.5 manhours.
Spraying with mist blowers and truck unit. -\$7285
4.2 hours helicopter spraying - \$3528.

CHEMICAL USED:

Hand application	38 Lt Grazon	\$1577
	4.5 Lt Spray dye	\$184.

AERIAL APPLICATION:

200 Lt Grazon	\$ 8 300
40 Lt Tordon	\$ 2 174
25 Lt Roost	\$ 700
Post & Adverts	\$ 100
Mapping	\$ 1 101

BUDGET: 22470 **EXPENDITURE:** \$24 948

ACTUAL PERCENTAGE OF CONTROL: Assessed in November 1994.

WHO DID THE WORK: Marlborough Helicopters
Marlborough Noxious Plant Control.

BIO CONTROL Nil

Appendix 4 – Draft copy of Upper Awatere Research Group submission to the Regional Pest Management Discussion Document (Author: Allan Pitts, undated but likely to be 1994/95).

DRAFT COPY

PUBLIC SUBMISSION TO THE REGIONAL PEST MANAGEMENT DISCUSSION DOCUMENT.

The Marlborough District Council has sought submissions on the above document with the view to formulating a Regional Pest Management Strategy.

The Upper Awatere Research Group believes a strategic plan for pests should be formulated for the Awatere Valley and its tributaries upstream of the Jordan Bridge.

WEEDS.

The aim of this strategy is to retain and build on the gains made over the last 25 years of weed control undertaken in the Upper Awatere Valley by the Crown, (in the name of Lands & Survey - now D.O.C.) and adjoining landowners.

BACKGROUND.

In the 1960s broom and gorse in the Awatere riverbed had reached choking proportions and the weeds were spreading rapidly up the riverbanks and onto adjoining properties, being spread by birds to outlying areas where plants established to provide a nucleus for further spread. By 1969 a proposal by local landowners to the Awatere District Council led to one of the first District Weeds Schemes being established. This scheme was funded proportionally by the Crown and the landowners, each funding control work on their respective properties.

This work was greatly enhanced by the Govt. subsidy, initially on half the applied cost of herbicide, reducing to half the chemical cost, before being discontinued. Enormous strides were made in eradication at this time and at the conclusion of Govt. subsidies the riverbed and surrounding areas of the Awatere catchment from Awapiri upstream were largely clear of established plants with only regular annual control of seedlings being necessary.

The dissolution of Lands & Survey and the establishment of Dept. of Conservation with its associated upheavals, led, with a lack of understanding of the problem, to a lack of finance to carry out sufficient control work. Rapid deterioration of the 'clear' status of the riverbed took place over a three year period to the point where it became increasingly difficult to keep adjoining land clear when annually reseeded from the riverbed.

The Dept. of Conservation was persuaded to meet its responsibilities in 1990/91 but did not cover the original area, giving lack of finance and uncertainty over ownership

of riverbed areas as reasons for not doing so. The majority of riverbed areas have since been identified as being the responsibility of the Dept. of Conservation, as the repository of the Crown's interest. Any future changes to the Land Act may make these areas the responsibility of a yet unnamed authority.

TARGET SPECIES

At a meeting held at Gladstone Downs on 3.6.94 at which the Weeds Officer for D.O.C. J Herdman, and S Boswell and A H Grigg for the M.D.C. were present, the motion :-

"That the status of Broom be changed to a Target Weed in the Awatere Catchment above the Jordan Bridge, subject to S. Boswell looking into the legal ramifications." - was carried with no opposing votes.

At a subsequent meeting of the Upper Awatere Research Group it was agreed that within that same area :-

- Gorse
- Nodding Thistle
- Wilding Trees

be also given the equivalent rating of 'Target Species' weeds.

The Upper Awatere Research Group acknowledges the current classification of Class B (terrestrial) weeds in the current Noxious Plants Policy, and seek to retain the status given to the other weeds mentioned, including :-

- Briar
- Pinus Contorta
- Barberry
- Boxthorn

HIERACIUM

The Upper Awatere Research Group acknowledges the huge problem that this pest species represents in this region, but as no economic method of blanket control exists at present, we merely include it in the list. The Group wishes to encourage communication between District/Regional Councils, The Hieracium Control Trust, and other research agencies to further the control of this rapidly moving widespread plant species. Biological control of this pest is the only long term means of total control.

In order to fulfil its legal and moral responsibilities, the Upper Awatere Research Group requires continued access to Herbicides for use in controlling weed pests and particularly in maintaining the ability to apply these agents by air. Also required is the continuing ability to use fire as a

clearing tool (as laid down in the RMA.)

FUNDING

Currently the cost of control of the "target" weeds is being met by the owner of the land or its agent. We do not see this policy changing and feel that the proposed 'Target' weed species status, (or its equivalent), will bring more pressure to bear on recalcitrant owners to fulfil their obligations to other New Zealanders. (vis. DOC.)


The Upper Awatere Research Group sees the Marlborough District Council retaining its role as the Management Agency in its supervisory and monitoring capacity, along with the ability to undertake research, breed and release biological control agents, with funding for these activities being met from the general rate.

CONCLUSION

Pastoral viability in the Upper Awatere Catchment Area is largely dependant on keeping the land clear of pests, particularly woody weeds.

The Upper Awatere Research Group sees a Regional Pest Management Strategy as a tool to assist in maintaining that viability.

Appendix 5 – Excerpt from the Land Information New Zealand Biosecurity Control Programme 2010/11 Annual Report



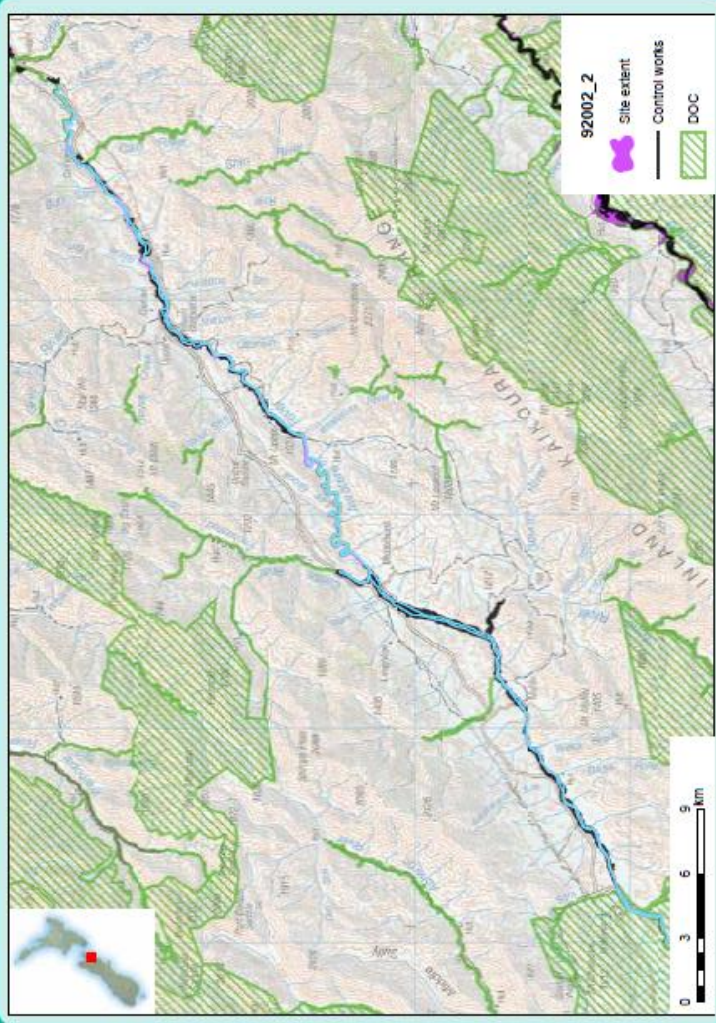
LINZ BIOSECURITY CONTROL PROGRAMME 2010/11

Site Detail

Property: Awatere River
 Site: Upper Awatere River
 District: Marlborough District
 Region: 92002_2
 Reference: Broom/Gorse
 Pest: 427ha

Control Work

Actual start date: 26/01/2011
 Actual end date: 18/03/2011
 Treatment method: Chemical
 Primary Application method: Terrestrial - mistblower
 Infestation area: 120ha
 % of area with pest: 10-20%
 Area treated: 100ha



Background

There is an existing weed control programme in the Awatere River for a 21 km stretch from Molesworth Station downstream to Jordan Bridge. The programme consists of maintenance control of scattered broom and isolated broom and gorse bushes / patches. The LINZ riverbed control programme has been working in conjunction with the local run holders in the area, and the upper reaches of the Awatere Riverbed are now in a state where only maintenance weed control is required. Through the Middlehurst Gorge there remains larger infestations which require ongoing containment control. The control works carried out in the 2010/11 season were an ongoing ground spraying programme to maintain and reduce the present level of infestation.

Work Detail

Control of gorse and broom took place at this site using mistblowers. Broom and gorse was mostly scattered and was able to be controlled efficiently from the ground. Some thick patches were located and treated indicating that there is still significant recruitment potential from the seedbank.

Infestation Detail

The Jordan to Upcot Bridge stretch comprises mainly scattered plants. From the Upcot Gorge to the end of Middlehurst (including Castle Creek) larger plants and thicker infestations are present, and from the Muller to the site boundary, small scattered broom is present becoming denser where the riverbed widens above the Muller Bridge.

Proposed Future Work

Further control will be required in 2011/12 to maintain the low infestation levels. The Middlehurst Gorge will also require containment control again.

Appendix 6 – Upper Awatere Broom Surveillance

29 October 2010

William A MacDonald
Middlehurst Station
Private Bag
Blenheim 7240

Record No: 10236053
File Ref: PN184866
Ask For: Jonathan Underwood

Dear William

Upper Awatere Broom Surveillance - Middlehurst October 2010

As a follow-on from the broom surveillance carried out on 27 October 2010, I have prepared some maps and GPS coordinates of what we come across.

We found a cluster of a few plants in MHP/GCs just above the Winterton and an outlier at Winterton Faces.

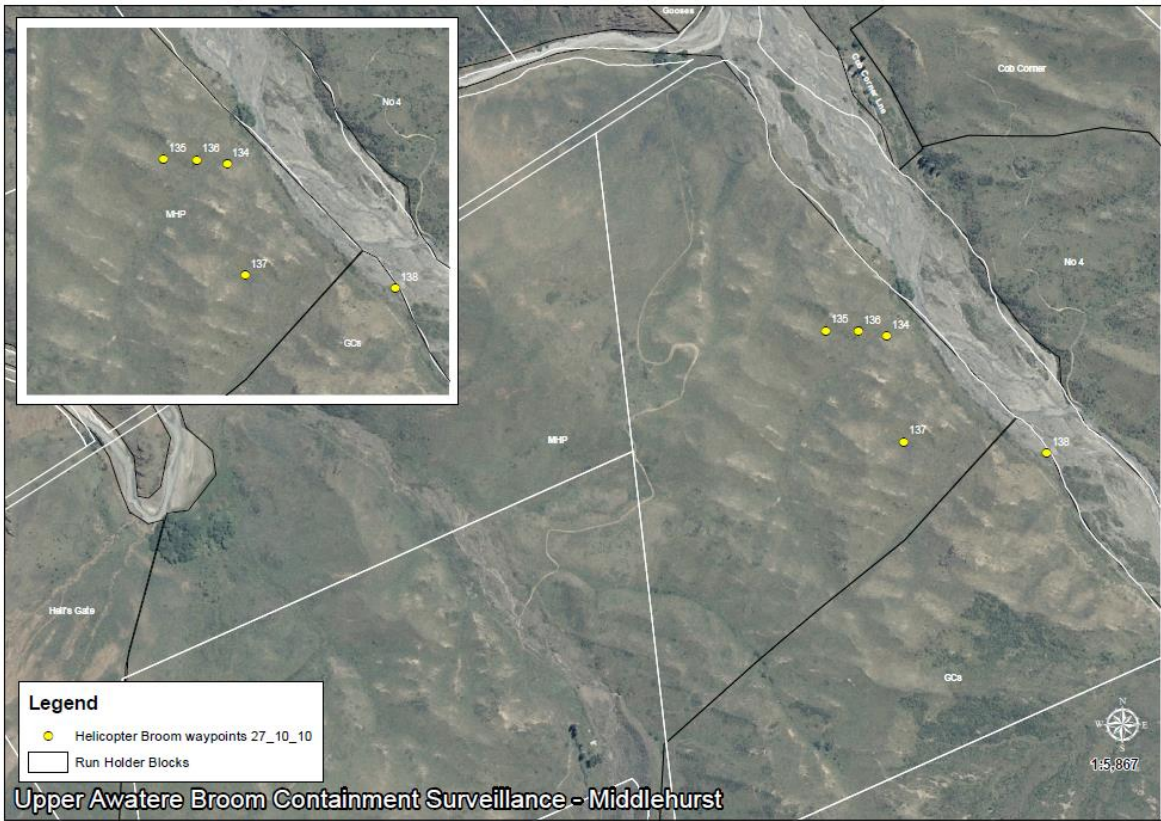
Middlehurst			
ID	Pest	Easting (NZTM)	Northing (NZTM)
134	Broom	1643960	5354549
135	Broom	1643833	5354560
136	Broom	1643901	5354557
137	Broom	1643996	5354327
138	Broom	1644296	5354302
141	Broom	1645642	5351751

I hope your control this season goes well.

Yours sincerely



JONATHAN UNDERWOOD
SENIOR BIOSECURITY OFFICER (ANIMALS)



Appendix 7 – Middlehurst Gorge 2010



Appendix 8 – Upper Awatere Wild Broom Containment Control Area – 2010 Season (letter to landowners)

12 October 2010

Attention «Attention»
«Occupiers_First_Name»«Occupiers_Name»
«Address1»
«Address2»
«Address3»
«Address4»

File Ref: R390-06-06
Prop No: PN«Property_No»
Ask For: Jono Underwood

Dear «Greet»

Upper Awatere Wild Broom Containment Control Area - 2010 Season

Please find enclosed a 'Pest Control Programme' which identifies your obligation to control the pest plant Wild Broom on your property for the 2010 season.

Occupier obligations specified in the control programme are consistent with the Regional Pest Management Strategy for the Marlborough district.

Following the completion of your control programme, please notify Council by returning the attached Wild Broom Compliance Return Form in the self-addressed envelope. Council officers may inspect your property after you have completed your Wild Broom control work.

If Council officers find that the required control work has not been carried out to a satisfactory standard, further work will be required under a Notice of Direction. Any costs incurred for the preparation of a notice and further inspections as a consequence of that notice shall be directly recovered from the land occupier.

If you have any questions or queries regarding this programme, please do not hesitate to contact me on (03) 520 7400 or 021 911 480.

Yours sincerely,



JONO UNDERWOOD
SENIOR BIOSECURITY OFFICER (ANIMALS)

Encl

MARLBOROUGH DISTRICT COUNCIL
Pest Control Programme




Occupier's Name: «Occupiers_First_Name»
 «Occupiers_Name»

Pest Site: «Pest_Site»

Postal Address: «Address1» «Address2» «Address3» «Address4»

«Control_Number»

Pest Control Information:			Financial Year of Programme: 2010-11	
PROPERTY NUMBER	PEST	OCCUPIER OBLIGATION/RULES	RECOMMENDED METHOD OF CONTROL	PROGRAMME COMPLETION DATE
«Property_No»	Wild Broom	Destroy all plants before they seed. «Insert»	Spraying with a registered herbicide.	24 December 2010
Signature of authorised person: 			Date: 12 October 2010	
Name of authorised person: Jono Underwood				

Appendix 9 – Objectives and rules under the Marlborough District Council Regional Pest Management Plan

https://www.marlborough.govt.nz/repository/libraries/id:1w1mps0ir17q9sgxanf9/hierarchy/Documents/Environment/RPMP_2018.PDF

5.4.1 Objectives

5.4.1.1 Over the duration of the RPMP, control broom (*Cytisus scoparius*) in the Upper Awatere Broom Control Zone (excluding the Middlehurst Gorge Containment Area), Upper Wairau and Waima/Ure Broom and Gorse Control Zones to minimise adverse effects on economic wellbeing, the environment and enjoyment of the natural environment.

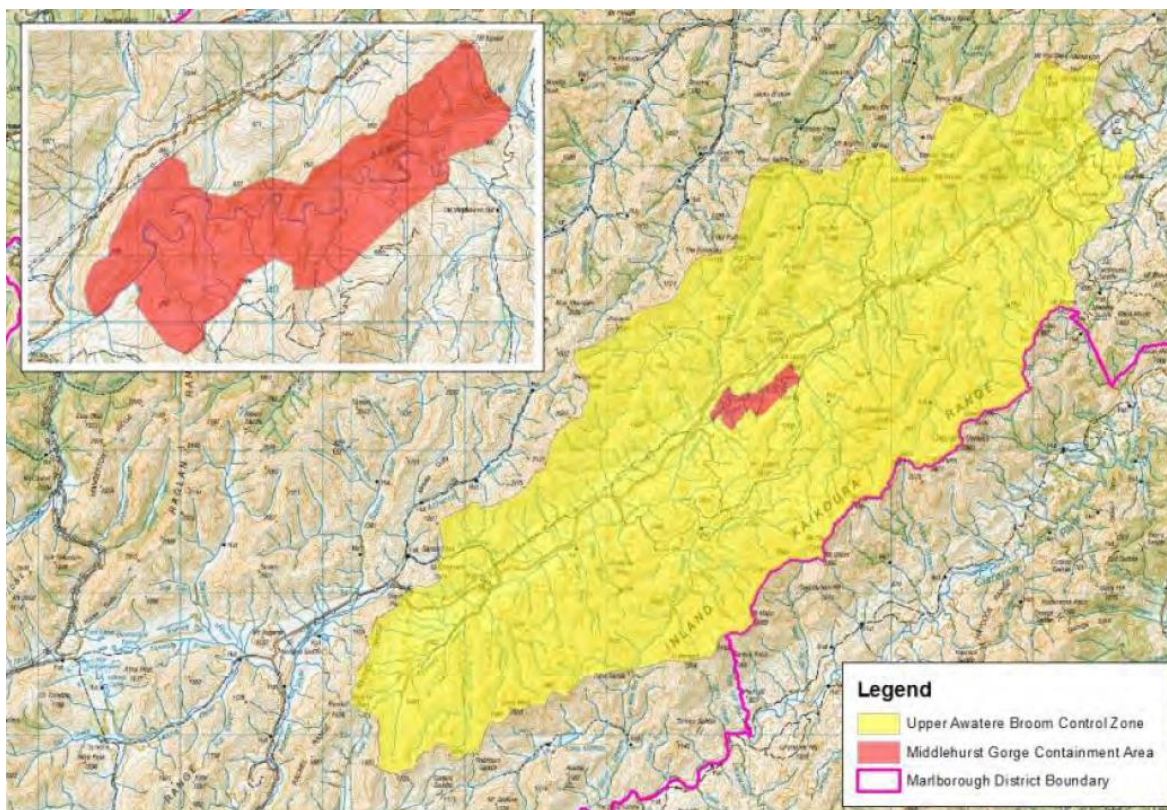
5.4.2 Rules

Rule 5.4.2.1

Occupiers within the Upper Awatere Broom Control Zone (see Map 2, page 16) shall destroy all broom (*Cytisus scoparius*) plants, on land that they occupy, each year before they produce seed, unless:

- a) The land they occupy falls within the Middlehurst Gorge Containment Area (see Map 2, page 16) which is subject to Rule 5.4.2.2, or;
- b) A management plan approved by Council is in place.

A breach of this rule will create an offence under section 154N (19) of the Biosecurity Act.



Map 2. Upper Awatere Broom Programme.