

**Koitiata Pyp Grass
Control Report**

2009/2010

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1 Summary

From October 2009 to April 2010 the Department of Conservation (Palmerston North Area Office) implemented a control programme for pyp grass (*Ehrharta villosa*) in the vicinity of Koitāta. This work is part of an ongoing response funded and overseen by MAF Biosecurity New Zealand (BNZ).

The 2009/2010 programme consisted of five rounds of work beginning in October and progressing approximately monthly throughout the season. Surveying was extensive and thorough. Three of the four previously known sites were confirmed as remaining active (to varying degrees). The remaining site (Bob Major's – BM) was found clear of pyp grass throughout the season. Live plants were predominantly found immediately adjacent to the sprayed zones from 2008/2009. As such the control zones have expanded slightly to include these peripheral areas (particularly adjacent to the Sewage Pond site where a significant extension has been made). Within these areas moderate numbers of live pyp grass plants were identified (50 – down from over 151 last season) and controlled by knapsack spraying (Round Four included hose and gun spraying).

Following on from the extensive work and success in 2008/2009 this year's programme was more efficient (less hours) and equally effective. The proven herbicide Roundup Transorb was used throughout the season and gave total kill on pyp grass. Significant progress toward the programme goal and objectives has been made.

2 Goal, Objectives & Background

2.1 Goal (as defined by BNZ)

New Zealand is completely free of pyp grass and importation is prohibited, whether vegetative or reproductive material, including all viable seed.

2.2 Objectives (as defined by BNZ)

Objective 1: To eliminate *Ehrharta villosa* from New Zealand by 2011.

Objective 2: To monitor all sites:
(i) to determine the effectiveness of control operations;
(ii) to determine that pyp grass has been eliminated through monitoring of sites for a period of 10 years before declaring eradication.

Objective 3: To implement a surveillance programme to detect any unknown pyp grass sites.

Objective 4: To commence a trace-back/trace-forward for all newly located infestations of pyp grass to determine, if possible, the source of the infestation and any other infestations that may have resulted, within 5 working days of a new infestation being confirmed.

Objective 5: To establish a data management system for the analysis of data collected annually.

Objective 6: To establish a communications plan specifically tailored for the pyp grass programme.

2.3 Background

Pyp grass is native to South Africa, where it is commonly known as 'pipe grass'. It has a limited distribution in New Zealand, being known from three sites where it has invaded sand dunes (Koitiata and Waitare in the Manawatu and Blackhead in Hawke's Bay). It is a serious agricultural weed in South Australia and may affect agriculture here if left uncontrolled.

Pyp grass is a significant threat to sand dune systems throughout New Zealand. It commonly grows as a dense sward displacing most other species. It may damage New Zealand's threatened ecosystems, particularly back-dune habitats, affecting biodiversity, landscape, cultural and historic values. Pyp grass has been classified as a pest for eradication, under the national interest pest initiative led by BNZ in partnership with regional councils and the Department of Conservation. It is an unwanted organism under the Biosecurity Act 1993 and is banned from sale, propagation and distribution.

Pyp grass is a perennial grass growing from long, creeping rhizomes. The jointed stems are robust and usually around 90 cm tall, although they can be up to 150 or even 200 cm tall. Leaves are bluish-green and short in proportion to the stems, about 1.5 -13 cm long. The leaves may be absent. The inflorescence is a panicle up to 25 cm long, narrow and rather lax.

Control in the Manawatu commenced at Koitiata in 1997. A planned programme of eradication through the application of various herbicides has considerably reduced the plant's presence. With the establishment of BNZ, management of the pyp grass response was transferred from DOC to BNZ. Today, DOC undertakes delimiting surveys, control and monitoring under contract to BNZ at Koitiata.

3 Method & Results

Throughout this report four separate sites of infestation will be referred to (as detailed in Figure 1 below):

- Bob Major's (BM)
- Sewage Pond (SP)
- Forest Road (FR)
- Southern Dune (SD)

Figure 1: Map of 2009/2010 pyp grass control areas at Koitata (with actual 2009/2010 pyp grass locations).



3.1 Delimiting, Surveying and Control Methodology

This season, at the request of BNZ, delimiting surveys were completed for BM, SP and SD in Round One. As a result of live plant finds during the season around the periphery of FR delimiting was completed periodically here also. This consisted of at least an additional 50m survey out from the accepted infestation zone.

Delimiting and general surveying consisted of two operators, side by side in line formation. Live PYP grass sites were marked with fluorescent yellow tape (to differentiate from last season's fluorescent pink) and by GPS. Garmin GPS Map60CSx units were used. Improved familiarity with the units this season resulted in clear and precise data.

Surveying and control were undertaken in five separate rounds beginning in October 2009. Control was carried out using knapsack spraying (predominantly) of Roundup Transorb (540 g/L glyphosate as the potassium salt in the form of a soluble concentrate). A 5% mix of herbicide to water was used (500ml in 10L). Due to the lower numbers of PYP grass finds there was no need for large scale blanket spraying (many of the areas blanket-sprayed last year were still browned-off early in the season). At SP the requirement to limit non-target kills remained.

3.2 Round One (07/10/09 and 13/10/09)

Operational Timeline

07/10/09 – Delimit/survey SP and survey FR
13/10/09 – Delimit/survey BM and SD; spray FR and SP

The Koitiata Pyp Grass Control Programme commenced Wednesday 7th October. Two operators surveyed FR and SP. On Tuesday 13th October three operators (only two with GPS – third acting as backup) completed survey of BM and SD. At BM, SP and SD 50 metre buffers were incorporated into the survey programme where physically practical. One operator sprayed all identified live plants/clumps. One knapsack of Roundup Transorb was sufficient to complete the job thoroughly.

Only seven plants/clumps were found (five at FR and two at SP), all directly on the edge of previously sprayed zones (see Figure 2). No regrowth or otherwise live plants were found in zones sprayed last year.

Round One (completed in two days compared to 13 in 2008/2009) resulted in only a handful of plants being found, and proved that last year's work was effective. Only two of the four sites were found to be active at this point – FR and SP. Both SD and BM returned a nil result. The BM electric fence was not erected as the site was clear and still browned-off. SD was still showing significant effects from the aerial application last season with only annual grasses and other weeds re-growing, making surveying easier. The large blanket-sprayed areas at FR were still heavily devegetated also making for easier surveying.

Large areas of cutover wood trash at FR created some issues with surveying but this was unavoidable.

A public awareness mail drop of all residences in Koitiata, Turakina Beach Road and Turakina itself was completed.

Costs for Round One were significantly less than budgeted. No new herbicide was bought as there was still a small but sufficient inventory from last season.

Figure 2: Round One Delimiting/Survey Tracks and Live Pyp Grass Plants



3.3 Round Two (11/11/09 and 13/11/09)

Operational Timeline

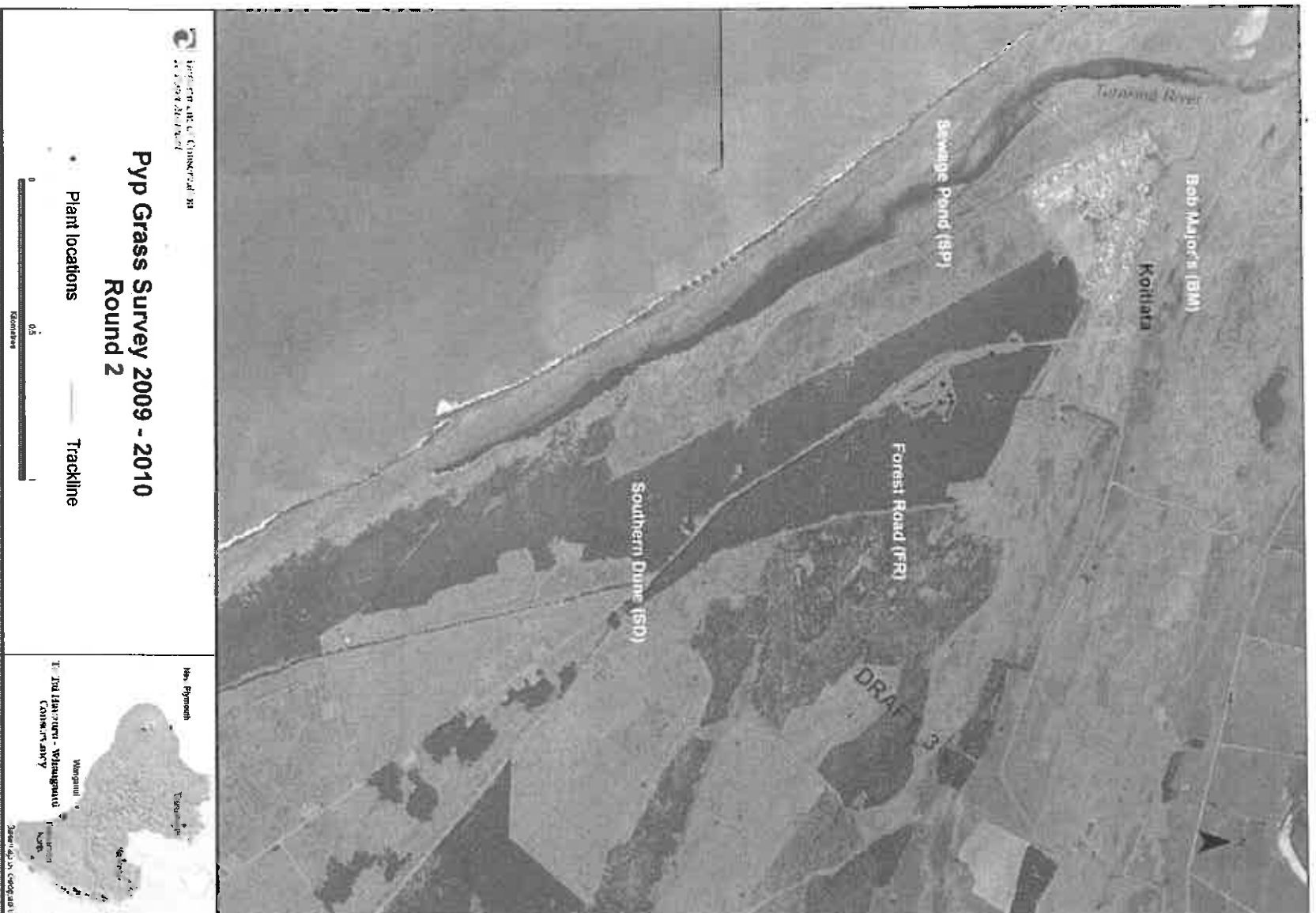
11/11/09 – Survey FR and SP
13/11/09 – Survey BM and SD, spray FR

Round Two commenced Wednesday 11th November and was completed in less than two days on Friday 13th November. Two operators surveyed all sites. One operator sprayed all plant/clumps found. One knapsack of Roundup Transorb was sufficient to complete the job thoroughly. The seven clumps sprayed in Round One were 95% browned off.

Only five plants/clumps were found (all at FR), all directly on the edge of previously sprayed zones (see Figure 3). No regrowth or otherwise live plants were found in zones sprayed last year. At this point the main area of live plants found was on the dune directly to the north of the silver poplar/pond area at FR. This was an area that was surveyed last year but no control work was required. It is likely that a few of the current plants were missed then and that the remainder are new growth this year (going on the size and health of what was found). This was an area that was logged conventionally so there were trees lying amongst the plants found. Reassuringly there were only small scattered plants evident.

Costs for Round Two were again significantly less than budgeted.

Figure 3: Round Two Surveying and Live Pyp Grass Plants



3.4 Round Three (21/01/10 and 26/01/10)

Operational Timeline

21/01/10 – Survey FR and SP
26/01/10 – Survey BM and SD, spray FR and SP

Round Three commenced Thursday 21st January and was completed in two days on Tuesday 26th January by two operators.

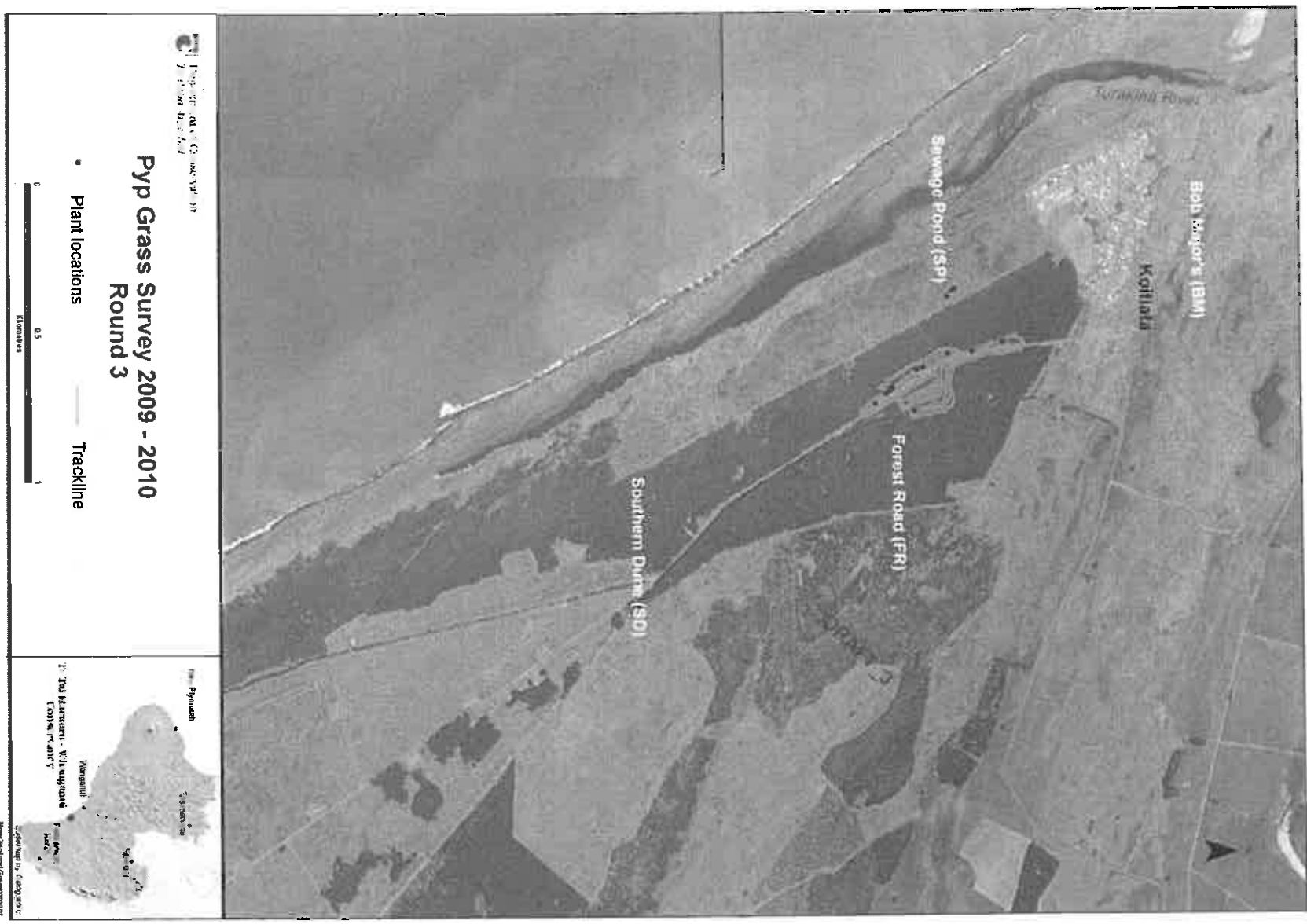
Ten new plants/clumps were found at FR, generally directly on the edge of previously sprayed zones (see Figure 4). These plants were more scattered than in previous rounds but still show the same trend of occurring outside of the blanket sprayed zones from last year. A strip of scattered plants was found near the southern end of FR. The majority of plants found were healthy and showing good growth – this is likely to be due to very favourable growing conditions on site during the summer. As a result of these conditions there was significant growth of other weed types (across the entire area), particularly lupin increasing the difficulty of survey.

Three new plants/clumps were found at SP, two growing out of manuka (the other a very small and weak tendril in the low wet area). The area of the proposed sewerage extension was surveyed and found to be clear.

All plants were thoroughly sprayed. Two knapsacks of Roundup Transorb were sufficient to complete the job.

Costs for Round Three were again significantly less than budgeted.

Figure 4: Round Three Surveying and Live Pyp Grass Plants



3.5 Round Four (02/03/10 and 11/03/10)

Operational Timeline

02/03/10 – Survey FR & SP
11/03/10 – Survey BM and SD, spray FR and SP

Round Four commenced Tuesday 2nd February and was completed in two days on 11th February by two operators.

Twelve new plants/clumps were found at FR, often directly on the edge of previously sprayed zones (see Figure 5), but there were several found inside previously blanket-sprayed zones and a new site to the east. The new site to the east consisted of scattered healthy plants in the area that was previously infested with pampas grass. The majority of plants found were healthy and showing good growth – this is likely due to very favourable growing conditions on site this summer.

Eight new plants/clumps were found at SP, three growing out of manuka in the previously known zone. The other plants were identified immediately east of the vehicle track and slightly north of SP. This is a site that had a very old report of pyp grass but had not been surveyed recently. There were several individual sites found with the most northerly being small plants scattered over 20×10m. This site had unfortunately suffered severe disturbance during recent tree removal.

All plants were sprayed. The majority were sprayed using the hose and gun (employed this round due to need) however towards the end of spraying at SP the pump equipment failed and the remainder had to be knapsack sprayed.

SD and BM remained clear at survey.

Costs for Round Four were again significantly less than budgeted.

Figure 5: Round Four Surveying and Live Pyp Grass Plants



3.6 Round Five (07/04/10 and 08/04/10)

Operational Timeline

07/04/10 – Survey FR and SP
08/04/10 – Survey BM and SD, spray FR, SP and SD

Round Five commenced Wednesday 7th April and was completed in two days on Thursday 8th February by two operators. Additional surveying was carried out between FR and SD (see Figure 6) to search for any growth from plants carried during shelterbelt removal adjacent to the SP vehicle track. These additions to the survey were found to be clear.

Three new plants/clumps were found at FR, two on the dune to the north of the poplar/pond area and one at the vehicle entrance to that area. This plant was a surprise in particular, as it is a highly visible site. The thin new shoot was therefore likely from an old, but live, root. The two dune plants were regrowth immediately adjacent to sites sprayed in Round One this year.

At SP the new site was a scattering of stems adjacent to a site noted in Round Four (in the newly active strip to the east of the vehicle track). Due to the scattered nature it was deemed worthy to be denoted as a new site.

The first and only live pyp grass plant at SD for 2009/2010 was identified in the shelterbelt running along the eastern boundary of the site. It was from an area where plants were identified last year so was not altogether surprising. However, it does mean that SD is defined as a live site for the 2009/2010 season, having been surveyed clear up to this point.

All new sites were thoroughly knapsack sprayed and some of the sites from the previous round also given a top-up. Due to the small time elapsed since the previous round of control a handful of plants sprayed then were still showing signs of life (although almost were totally browned-off). These were resprayed.

BM remained clear at survey.

On Friday 9th April I attended on-site at FR to advise spraying operations for the complete aerial spray of Compartment 130. This had been organised between Ernslaw One Ltd and BNZ with consultation from DOC. Against normal Ernslaw One Ltd practice, but to ensure that any unknown pyp grass was controlled, the spray used was Roundup Transorb. Conditions were perfect and the entire compartment was sprayed. This included the entire FR site right up to the macrocarpa shelterbelt and the new eastern portion of SP (west of the vehicle track).

At short-notice it was also agreed to spray SD as there was chemical available and therefore an opportunity to ensure control was maintained at this site (even though only one live plant was found there all season).

Costs for Round Five were again significantly less than budgeted.

Figure 6: Round Five Surveying and Live Pyp Grass Plants



4 Operational Costs

Figure 7: Summary of Operating Costs for Koitāra Pyp Grass Control (2009/2010)

Activities / Milestones	Estimated Costs	Estimated Budget	Actual Costs	Actual Spend
Delimiting Survey (Round One)				
Staff	\$2,000.00		\$707.24	
4WD vehicle	\$400.00		\$74.40	
Mapping grid references	\$300.00		\$28.00	
Total		\$2,700.00		\$809.64
Initial Control (Round One)				
Staff	\$2,400.00		\$0.00	
4WD vehicle	\$400.00		\$0.00	
Herbicide	\$1,200.00		\$0.00	
Advance Preparation	\$200.00		\$28.00	
Total		\$4,200.00		\$28.00
Repeat Control and Monitoring (Round Two)				
Staff	\$1,600.00		\$672.00	
4WD vehicle	\$400.00		\$223.20	
Herbicide	\$1,200.00		\$0.00	
Total		\$3,200.00		\$895.20
Repeat Control and Monitoring (Round Three)				
Staff / 4WD vehicle	\$1,000.00		\$820.80	
Total		\$1,000.00		\$820.80
Repeat Control and Monitoring (Round Four)				
Staff / 4WD vehicle	\$1,000.00		\$820.80	
Total		\$1,000.00		\$820.80
Repeat Control and Monitoring (Round Five)				
Staff / 4WD vehicle	\$1,000.00		\$820.80	
Total		\$1,000.00		\$820.80
Aerial Control				
Aerial control at FR and SD	\$5,000.00		\$5,000.00	
Total		\$5,000.00		\$5,000.00
Administration				
Annual Report and Meetings	\$1,000.00		\$1,000.00	
Total		\$1,000.00		\$1,000.00
TOTAL COSTS		\$18,100.00		\$10,195.24

Figure 7 includes costs for aerial control completed at FR and SD after the conclusion of Round Five. These costs were not carried by DOC (BNZ covered this cost directly) but are shown here as they form part of the overall costs of the pyp grass control programme. They cover the cost of herbicide (Roundup Transorb) used for controlling general weed growth at Compartment 130 (including FR and SD). Helicopter costs were covered by Ernslaw One Ltd.

The total spend for the season has come in significantly under that budgeted as a result of greater overall programme efficiency and less live pyp grass occurrence. No herbicide costs were incurred in the main programme as the small inventory remaining from 2008/2009 was sufficient for the needs of the 2009/2010 season.

5 Comparison with Previous Years

The 2009/2010 pyp grass programme has consolidated the significant gains made during 2008/2009 season and reached further towards the overall programme goal. This year's programme took the same format as last: consisted of five rounds of surveying and control; was managed by the same organisation and personnel; used the same chemical and general methods; and provided similar progression towards programme goals.

Last year's programme included more wide-ranging surveying and extensive spray control in comparison to this year. This year, with increased knowledge of the extent of infestation and improved methods, the programme was more targeted and efficient.

In this report section last year the following statement was made:

'At May 2009 (prior to commencing 2009/2010 programme) it is unclear how the long-term efficacy of the 2008/2009 will compare against previous seasons. It is believed that the 2008/2009 programme has provided the most complete kill of new and known pyp grass plants.'

It is now clear (April 2010) that the 2008/2009 programme was highly efficacious - this year's programme identified a smaller infestation than last year (especially early in the season as a response to the previous season) and particularly in zones sprayed during 2008/2009.

6 Discussion

The 2009/2010 pyp grass control programme at Koitiata was highly successful. Thorough surveying and spraying has led to almost complete control of new and known sites.

Factors that increased the efficiency and efficacy of the programme were as follows:

- Thorough and efficacious 2008/2009 programme laid the platform for this year resulting in less time and budgetary requirements whilst still achieving high levels of control;
- Improved operator familiarity with the programme as whole (GPS use, site topography, spray equipment);
- Removal of trees at FR allowed remaining live pyp grass material optimum conditions for growth and hence identification;
- The aerial application completed by BNZ/Ernslaw One Ltd at FR and SD after Round Five has provided 'insurance' against unidentified pyp grass.

Figure 8: Live Pyp Grass Plants Identified (by Round)

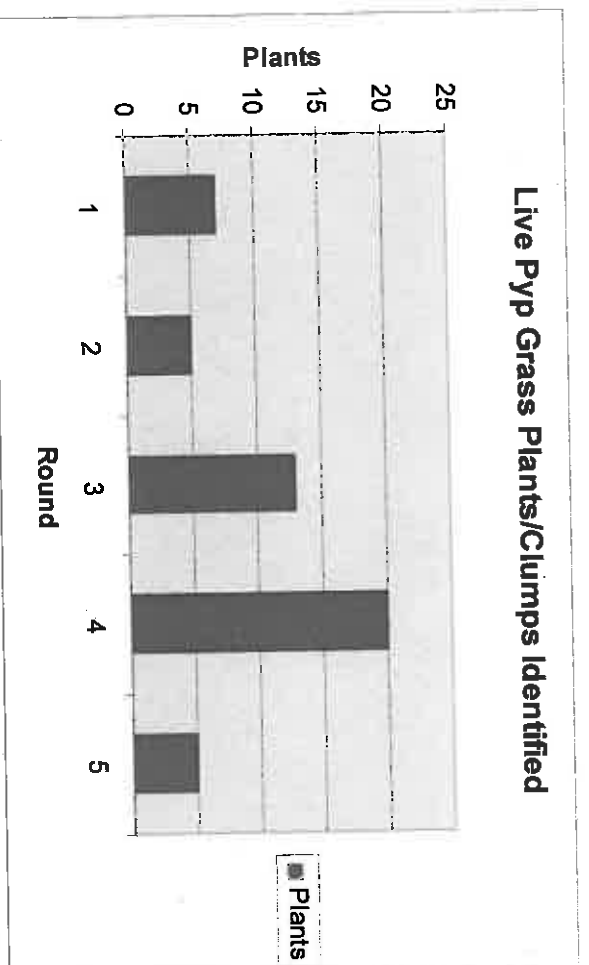
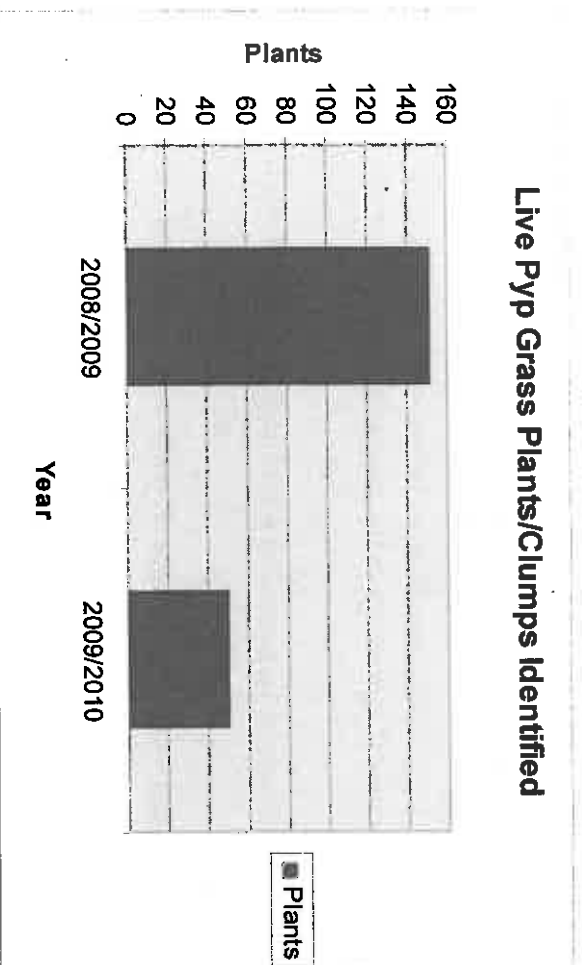


Figure 9: Live Pyp Grass Plants Identified (by Year)



As can be seen in Figures 8 & 9, there has been a significant reduction in numbers of identified live pyp grass plants/clumps. It is likely that this reduction has been even greater than that shown due to the likelihood of unidentified 2008/2009 sites being controlled by blanket spraying. Removal of trees at FR, precipitating the production of aerial portions of the pyp grass from seemingly dormant root systems, has also allowed the programme to move forward quickly. A very favourable growing season also helped live plants to produce significant aerial growth allowing for identification and control.

The 2009/2010 Koitata pyp grass control programme has taken a significant step towards the overall goal of national eradication. This season has cemented the gains made in the 2008/2009 season and built on them.

7 Recommendations

The 2009/2010 season has proven successful and it is recommended that the 2010/2011 programme be run in similar, if not identical manner. The format is now proven to produce results and should be supported.

Costs for the 2010/2011 season are very likely to be lower (again) than those proposed in the October 2009 Operational Agreement as the programme has been more successful than planned.

Careful surveillance and control (in particular) will be required at FR if this is replanted with seedling pines.

As always surveillance will form the backbone of the overall programme, particularly early in the season to establish survival from 2009/2010. It is likely that knapsack spraying will be the method used throughout.

It is recommended that the proposed survey of the entire Compartment 130 area be delayed until autumn 2011 at a minimum, if not 2012. This will allow any remaining live PYP grass material (post the April 2010 aerial control) to produce aerial vegetative matter significant enough to be identified at survey.

8 Acknowledgments

- Thank you to Sue Jones for the provision of maps.
- Thank you to Kevin Jenkins, Michael Lockwood and Chau Ping Ong for their work throughout the 2009/2010 season.

9 Appendix

9.1 Photos

Photo 1: Forest Road active site macro (eastern dune)



Photo 2: Southern Dune active site (eastern shelterbelt)

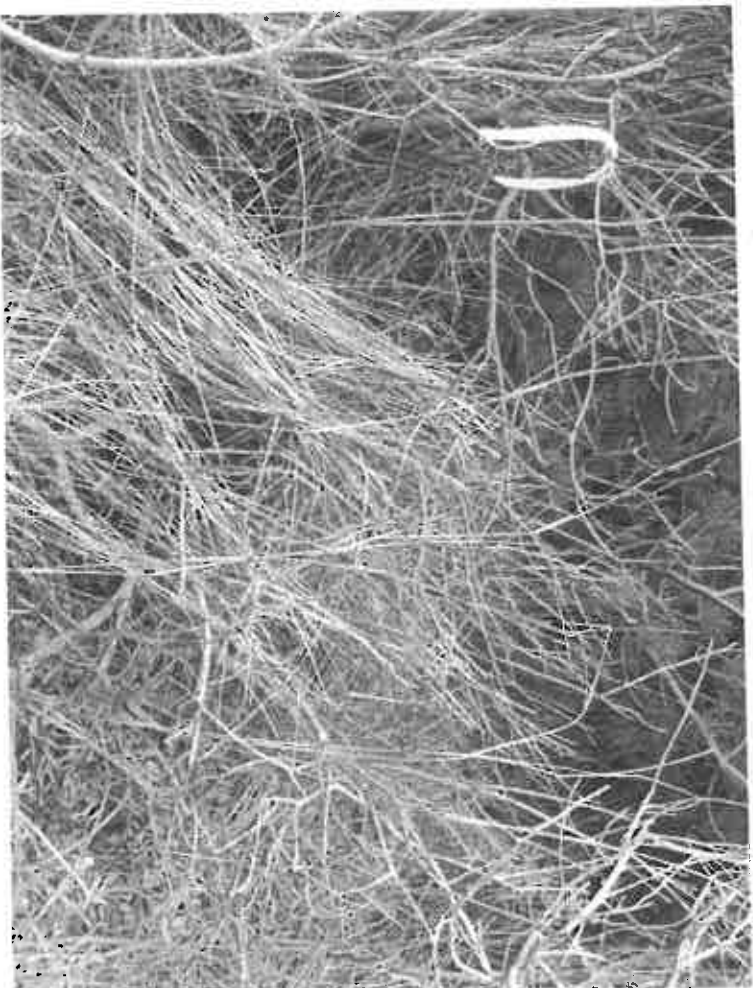


Photo 3: Forest Road knapsack spraying



Photo 4: Forest Road brown-off (northern pond site)



Photo 5: Forest Road browned-off pyp grass (eastern dune)



Photo 6: Rotorworks aerial application at Forest Road

