6.8 North Opuha River

Between 14 and 16 January 2009 a ground contractor using knapsacks searched and sprayed scattered gorse and broom in the North Opuha riverbed upstream from the Fox Peak Ski Field access road bridge.

There were a lot of small seedlings, and some older plants along the edges of the UCL riverbed which will need continued attention to prevent re-infestation of the riverbed.

The local landowner and DoC were also active in spraying other adjacent sites, and this will assist the LINZ programme.

More maintenance at a similar level will be needed in future seasons

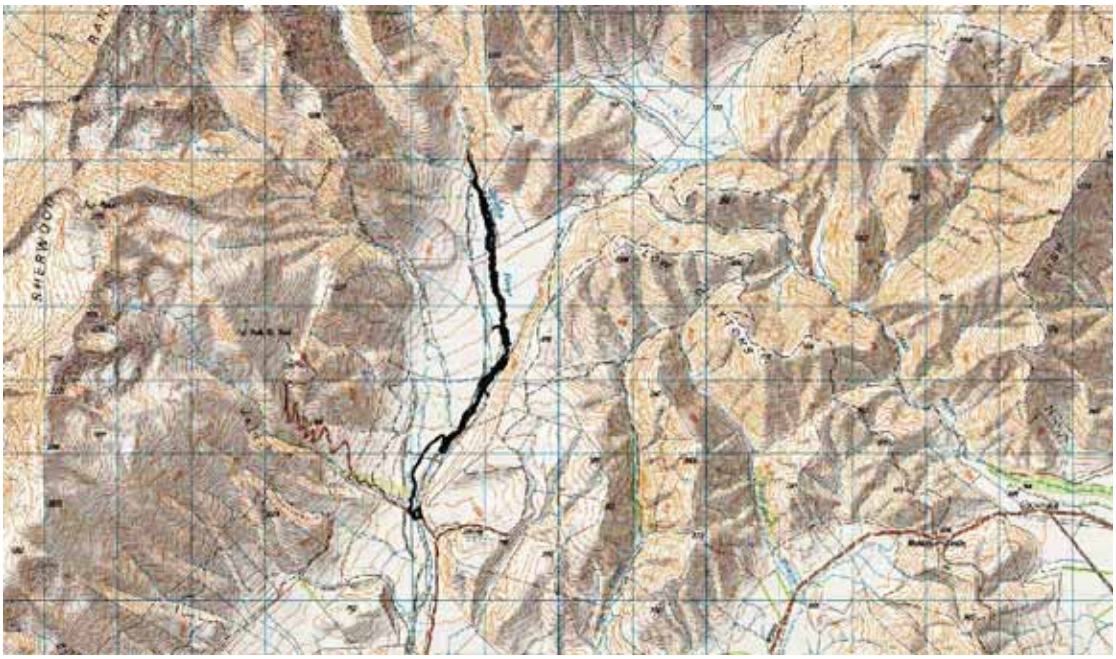

Figure 50. Treatment area in the Opuha River

7. WEED CONTROL WORKS - MACKENZIE DISTRICT

7.1 Twizel River

Ground based spraying of reasonably dense broom and some gorse was carried out over an area of approximately 42ha downstream from the SH8 road bridge in the Twizel River on 26 and 27 November 2008. A substantial amount of seedling gorse and broom was encountered especially on the river islands because it had not been treated for a couple of seasons.

The true left bank of the river is still a concern because no work has been done by either DoC or Bendrose. On the true right on marginal strip areas some gorse is starting to appear again and was not sprayed by DoC in the 2008/09 season.

Due to the lack of cooperation to control dense infestation adjacent to the Twizel River, and because upstream infestations in the Fraser River have not been controlled, there are no plans for any LINZ control work in the Twizel River for the 2009/10 season.

Figure 51. Treatment area in the Twizel River

7.2 Boundary Stream (Lake Tekapo)

This stream has had extensive weed control predominantly for broom for the past 9 years, and the results of that effort are starting to become apparent with the level of control being achieved. However there is still a large seed bank in the riverbed, and there is a lot of new growth every year.

In 2008/09 an area of 100ha was searched and 31.5ha of weed treated using aerial spot and boom spraying control methods on 18 and 19 February 2009. This resulted in an excellent level of control. Also treated were areas around the shoreline of Lake Tekapo, which were identified by ECan.

Further maintenance spraying will be required to control the prolific re-growth that is experienced in Boundary Stream.

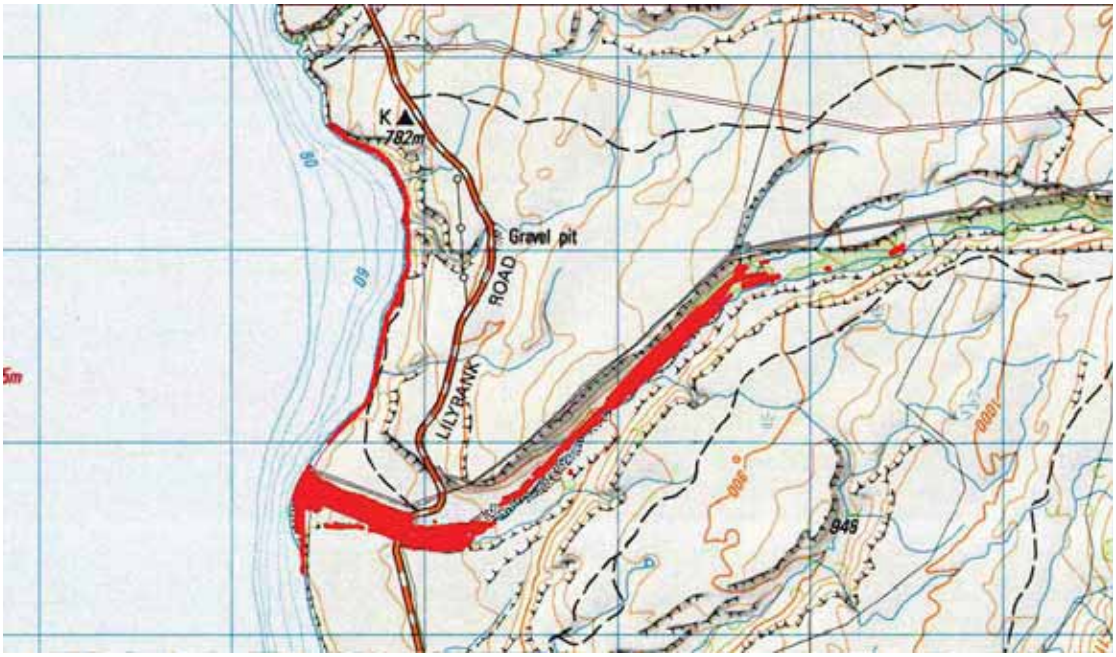

Figure 52. Treatment area on Boundary Stream

7.3 Hakataramea River

There is a scattered infestation of gorse and broom in this river, with a few large patches particularly in the middle sections. In 2007/08 about 300ha in the Hakataramea River was searched and any scattered broom plants found were sprayed. Adjacent landowners are active on weed control which obviously complements the LINZ programme well.

Adjacent landowners were concerned about the increasing amount of tree lupin in the river, and are actively targeting this weed as well. LINZ will consider control on this weed in future programmes.

This site is now in a two year maintenance cycle, with further control scheduled for the 2009/10 season.

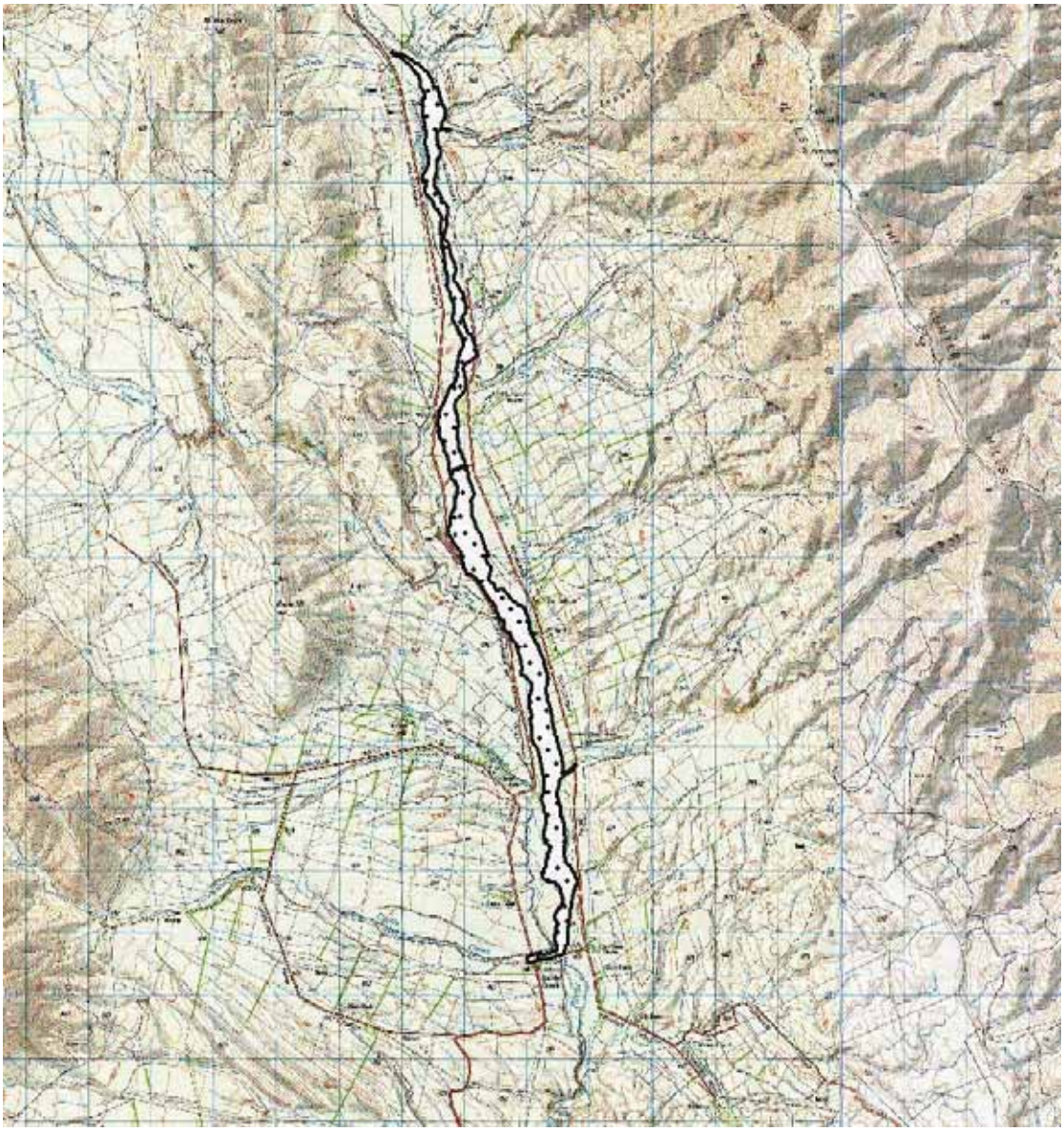

Figure 53. Treatment area on the Hakataramea River

7.4 Jollie River – First Stream

Land Information New Zealand works in conjunction with DoC's wider programme for the Jollie Catchment. This programme is designed to control all broom that is feeding into the Tasman River, which is effectively broom free. DoC carries out significant work in the riverbeds in this area, and LINZ funding contributes towards this.

In 2007/08, LINZ funding was used to control broom infesting the sides of the First Stream Gorge. Using a helicopter equipped with spot spraying equipment, an estimated 8.5ha of broom was sprayed on 19 and 21 December 2007. This brought the river under a good level of control and DoC did not seek any LINZ funding for the 2008/09 season. However, for the 2009/10 season further maintenance work will be required at this site.

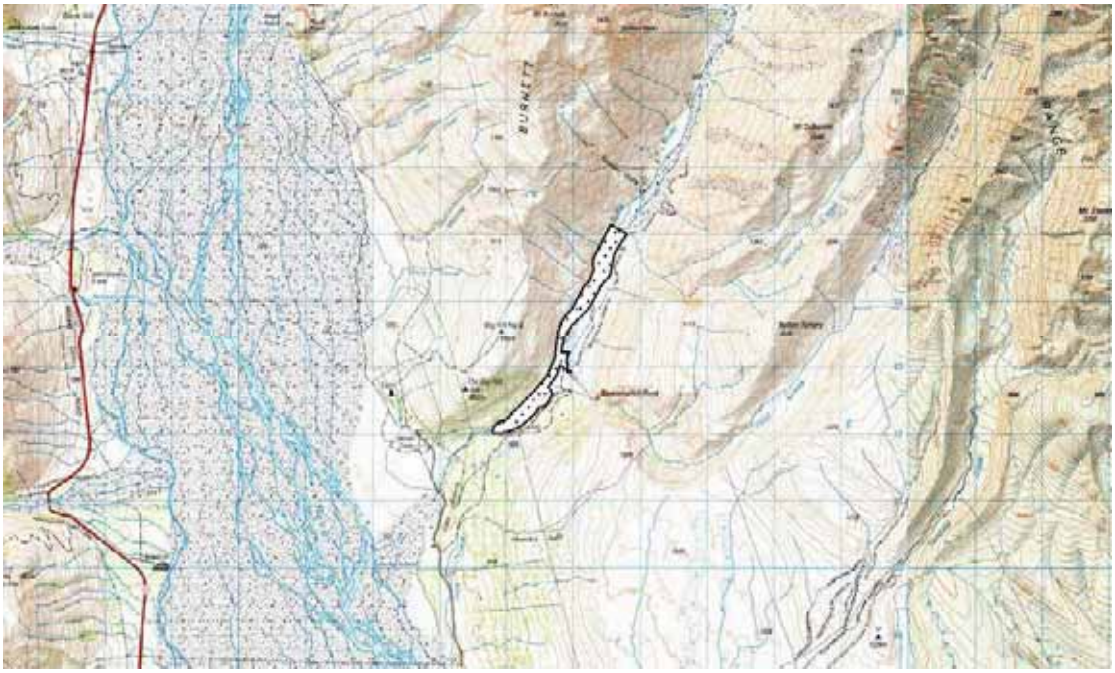

Figure 54. Treatment area at Jollie River/First Stream

7.5 Godley – McCauley Catchment

The Godley-McCauley Rivers are comprised of over 6,000ha of effectively weed free UCL. Due to the extremely large area, the most effective way of searching is with a helicopter. As this site is on a two year maintenance programme to control mainly gorse, no control took place in 2008/09.

When control last took place in 2007/08, no gorse was located in the McCauley River, and only isolated, scattered plants were sprayed in the Godley River. Both Lilybank and Godley Peaks adopt an active weed control programme with spot spraying and Tordon prills used to maintain the very low plant numbers.

This site will be scheduled for follow up in the 2009/10 season.

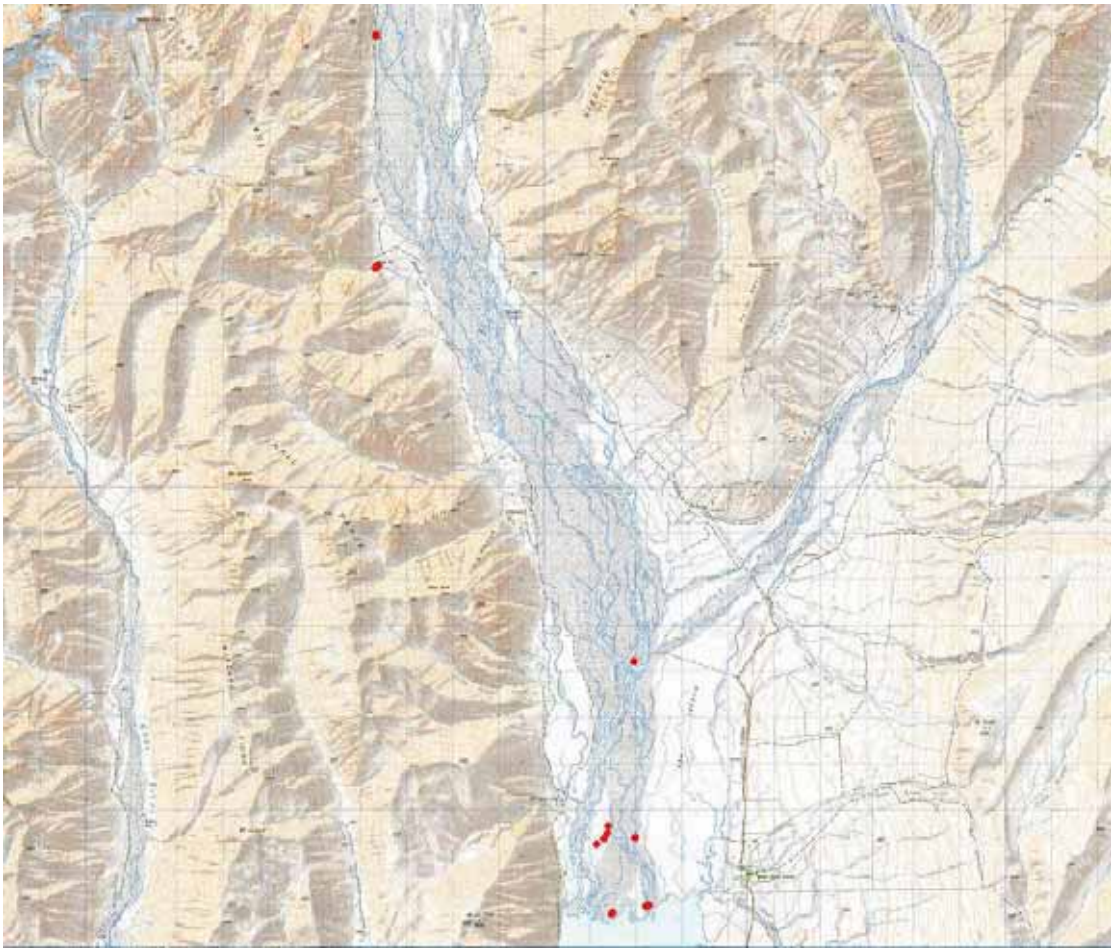

Figure 55. Location of gorse plants sprayed in the Godley River in the 2007/08 season

7.6 Tekapo River

Land Information New Zealand discussed weed control efforts in the Tekapo River with the Tekapo Pukaki Ohau Operational Group. For the 2008/09 season the outcomes of these discussions were that LINZ and DoC were to contribute to the ECan weed control programme in the Tekapo River from Scott Pond downstream to the Irishman's Stream confluence.

Land Information New Zealand land in this river extended to the "rabbit fence", which bounds the UCL on both sides. Ground control work was carried out from Scotts Pond down river using a handgun to control gorse, broom, willow and alders over about 1,100ha of UCL between 18 November 2008 and 12 March 2009. This reached a distance of almost 20km down river.

Future ground control work will be required to control seedling regrowth in the Tekapo river, and extend control further down the Tekapo River, however good progress was made in the 2008/09 season.

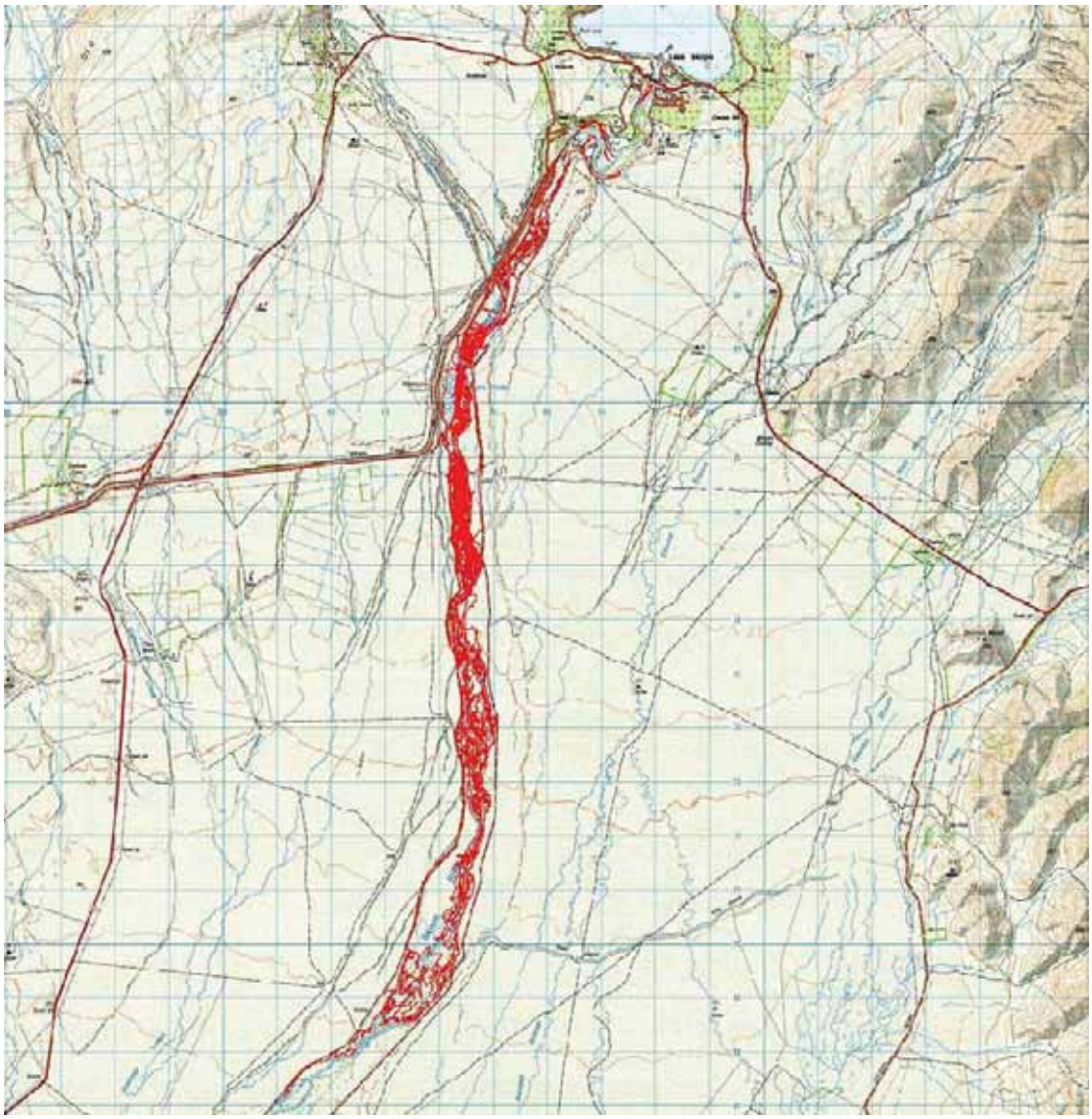

Figure 56. Treatment area in the Tekapo River

7.7 Pukaki River

Land Information New Zealand administered land in this river extends to the "rabbit fence", which bounds the UCL on both sides. The area has a low infestation of brush weeds, and control efforts are targeted to maintain the low infestation levels.

Ground control on this river was carried out over two days on 25 and 26 November 2008, covering an area of 1,200ha. The contractor used four trucks with hose and gun to spot spray gorse and broom plants. Work was initially targeted on known infestations, and then the area was searched for new sites. Significant new infestations were found on the true left bank of the river about 500m downstream from the SH8 Bridge.

For 2009/10 a similar maintenance programme will be required over the whole area to keep weed levels low**.** This will be best achieved by concentrating on the known sites of infestation. As the area is so large, consideration may be given to an aerial search by helicopter while the plants are in flower to make spotting them easier.

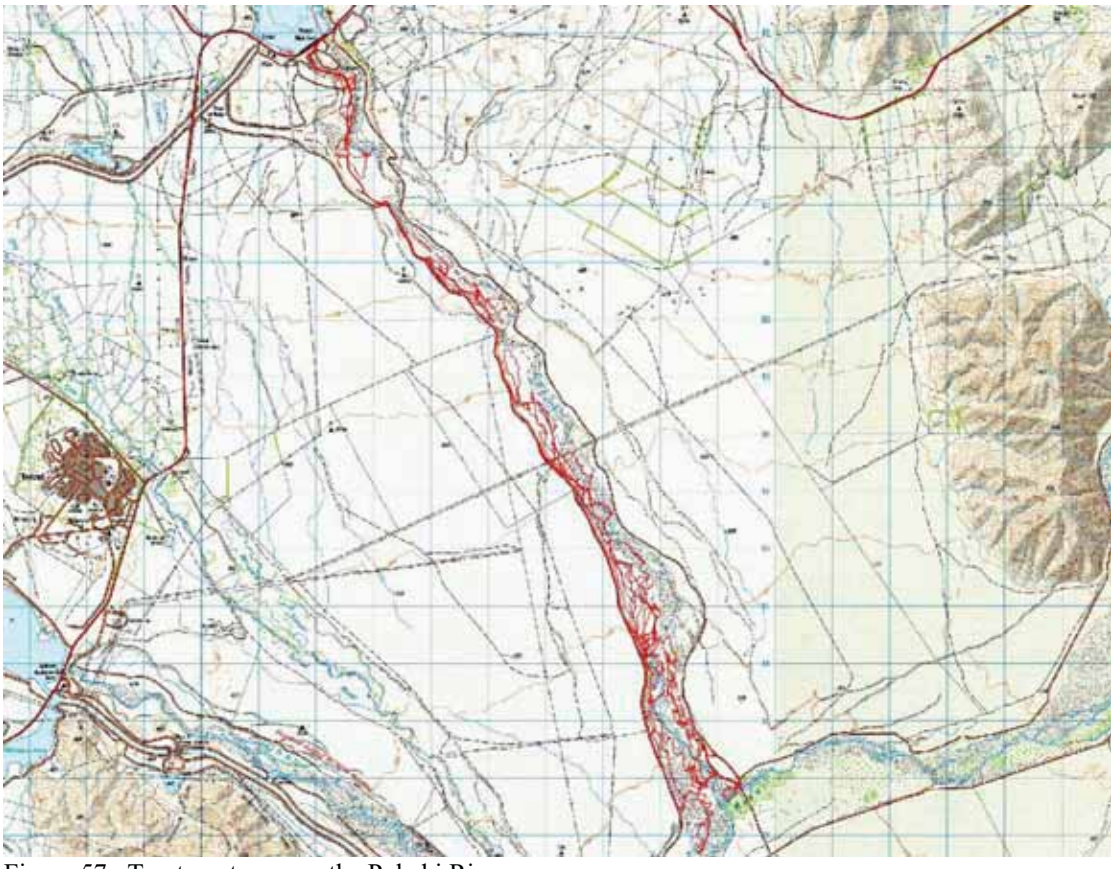

Figure 57. Treatment area on the Pukaki River.

7.8 Eastern Lake Pukaki Shoreline

There is a very low level of gorse and broom infestation on the Eastern shoreline of Lake Pukaki north of Tekapo B Power Station. This site is on a two year maintenance cycle, and control was due in the 2008/09 season.

On 28 November 2008 ground control using a truck with hose and gun was carried out in this area. The contractor sprayed very scattered broom at low levels throughout the site, as well as one area of seedling gorse.

There are quite high levels of wilding conifers appearing along this shoreline and these may need to be controlled at some future stage.

This area will next be scheduled for control in the 2010/11 season.

Figure 58. Eastern Shoreline Lake Pukaki Gorse and Broom ground treatment area

7.9 Lake Pukaki Western Shoreline

Gorse and broom were controlled on this site by using hose and gun spray trucks on 28 and 29 November 2008 and also between 1 and 28 February 2009. The area searched was 25ha and scattered plants were treated by spot spraying, especially at known sites.

There is a reasonably large gorse infestation above the road on Ferrintosh Station near Boundary Creek, and this will continue to supply seed to the LINZ land via the many culverts under the road. The adjacent land owners (Ferrintosh Station) will need encouragement to control this area.

Significant wilding tree control has occurred along this shoreline in the 2008/09 season by LINZ. Details of this will be provided in Section 8.

Further maintenance will be required in the 2009/10 season.

Figure 59. Treatment area of Lake Pukaki Western Shoreline on the left. The upper end of the treatment area for the Eastern Shoreline is on the right.

7.10 Lake Benmore Foreshore

The Lake Benmore foreshore programme focuses on the Ahuriri Arm of Lake Benmore.

Gorse and lupin control work was undertaken by contractors using a specialised lance sprayer mounted on a boat through the Ahuriri Neck on 24 March 2009 and 15 April 2009. In addition to this, vehicle mounted gun and hose spraying took place between Sailors Cutting and the Ahuriri Delta. This work was to control scattered plants along the foreshore of the Ahuriri Arm and Junction Island that had previously been both aerially and ground sprayed.

Further maintenance work will be required in these locations in the 2009/10 season.

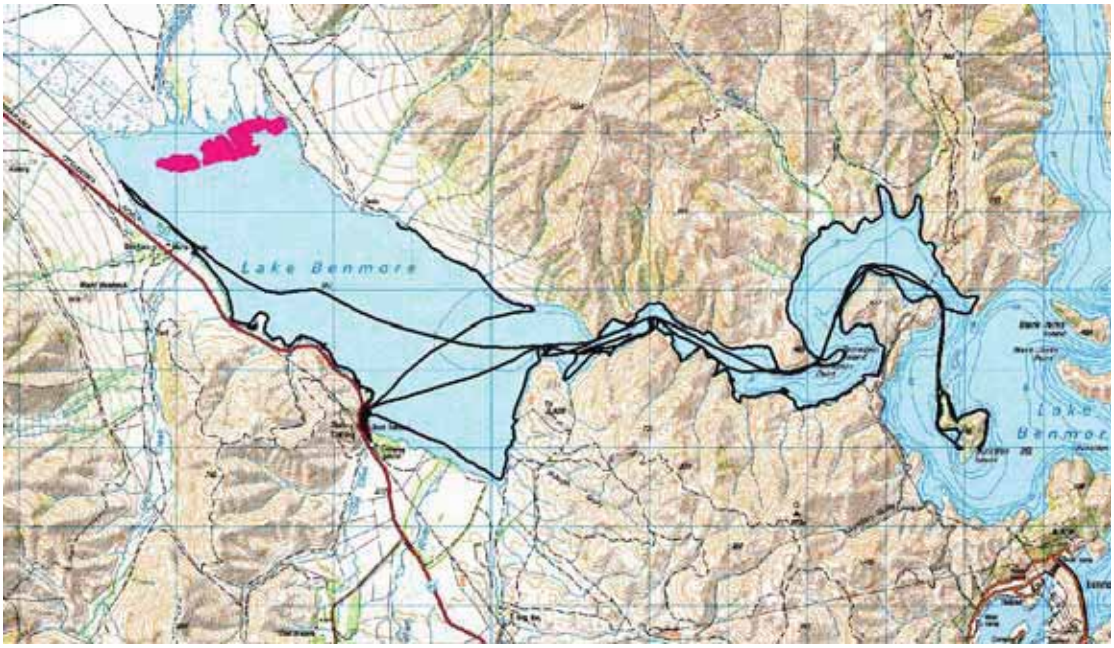

Figure 60. Treatment area on the Lake Benmore Foreshore and Junction Island shown in black

7.11 Ohau 'C' Crown Land

Broom growth occurs around the unofficial camping area adjacent the Ohau "C" power station. In 2008/09 control took place using vehicle mounted gun and hose between 10 and 13 October 2008. This meant that the work was completed before the arrival of campers at Labour Weekend.

A significant amount of seedling broom re-growth had appeared amongst previously treated areas, however no previously sprayed plants had shown any re-growth.

An inspection in April 2009 showed that there had been significant broom seedling regrowth at this site, so annual maintenance of this site will need to continue. The regrowth is mainly under trees near camping sites, so the best method to control the broom is for ground spraying in spring prior to the arrival of campers.

It was disappointing to note the amount of rubbish left behind by campers, particularly beer cans and bottles.

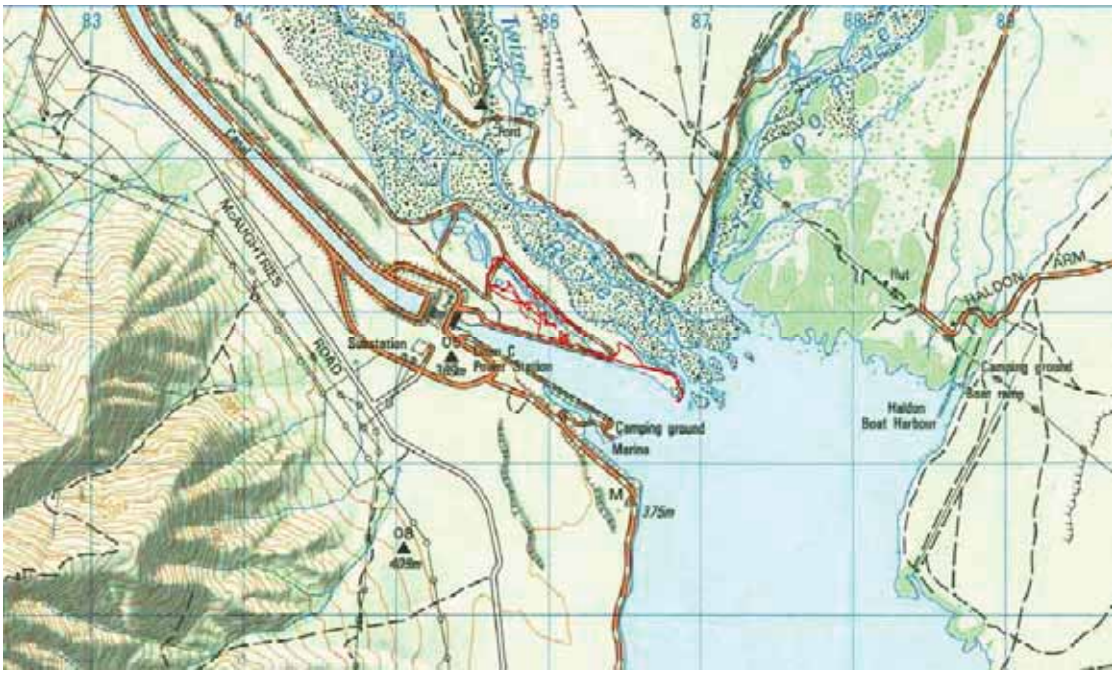

Figure 61. Ohau "C" control site

7.12 Lake Ohau Eastern Shoreline

In 2004/2005, a broom infestation was found on the Eastern Shoreline of Lake Ohau adjacent to Glen Lyon Road. This required rapid treatment to prevent further spread around the shoreline and onto surrounding land. Since then, an annual maintenance programme has been put in place to control any re-growth.

In 2008/09 an area of 30ha of shoreline was ground searched using hose and gun spray trucks between 1 and 15 December 2008. This followed previous searching of the site by boat which helped identify the location of any broom.

All broom at this site was treated during 2008/09, however future maintenance will be required to control new weed growth from the seed bank in the ground and also from an infestation on neighbouring property. The main source of the infestation has been from up the Greta Stream. This is DoC property and has been treated by helicopter spraying to control all the broom up this stream. The LINZ contractor also sprayed broom on the other side of Flanagans Pass which will help ensure that broom does not creep back into the Greta.

Wilding pines are becoming more obvious at this site and any future programme should consider wilding pine control as well as broom.

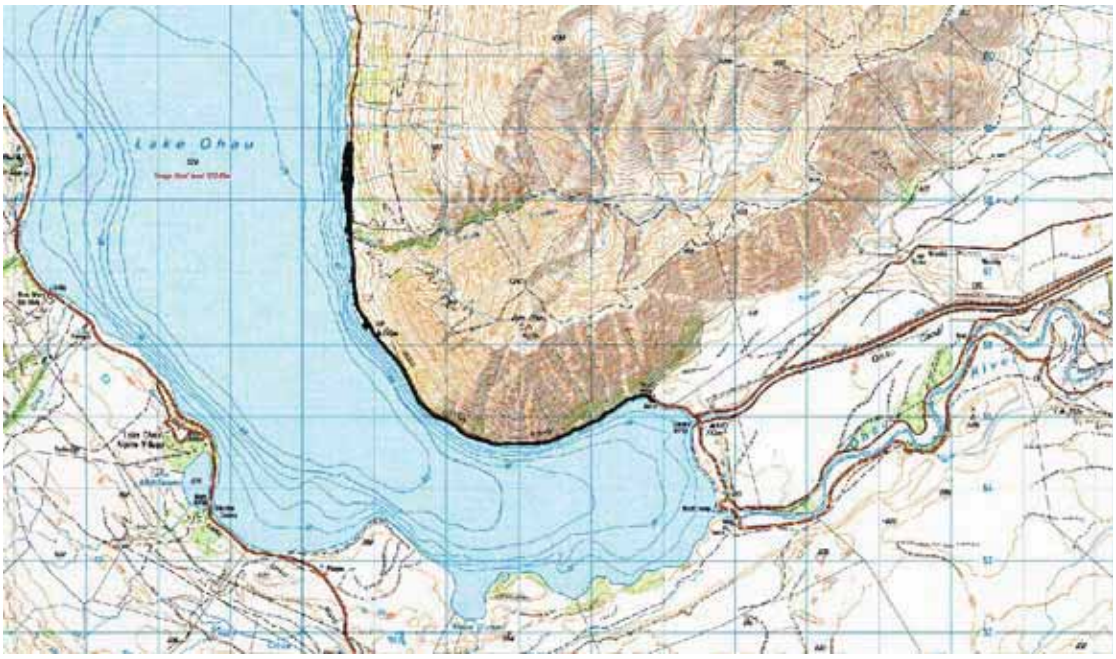

Figure 62. Treatment areas along the Lake Ohau Eastern shoreline

7.13 Upper Ahuriri River

This area of UCL is part of the DoC programme of gorse and lupin clearance through Project River Recovery. A contribution to this project was made in 2007/08, and 165ha of the UCL upstream of SH8 was searched with isolated plants sprayed using gun and hose on 26 January 2008.

Ongoing maintenance every two years will be required in this UCL to ensure it remains in a weed free state so further control will be scheduled for 2009/10.

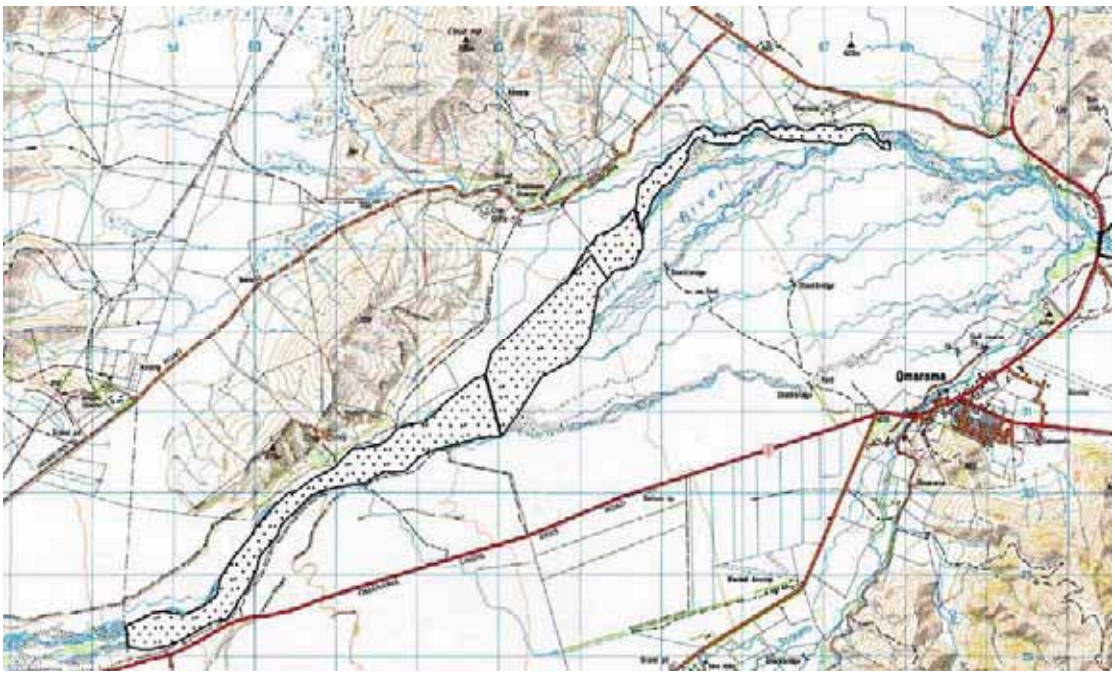

Figure 63. Treatment area in the Upper Ahuriri River

7.14 Lower Ahuriri River

This UCL is part of a DoC programme of gorse and lupin clearance through Project River Recovery.

An area of 365ha downstream from the SH8 Road Bridge was searched using hose and gun spray trucks between 24 November 2008 and 14 January 2009 and extensive areas of gorse and broom were sprayed.

There is significant gorse infestation on adjacent DoC marginal strip and private land, so they will be encouraged to carry out control works in conjunction with the LINZ programme.

For 2009/10 season a maintenance ground control over the areas already sprayed will be required, as well as more work on heavy gorse infestation downstream towards the lake.

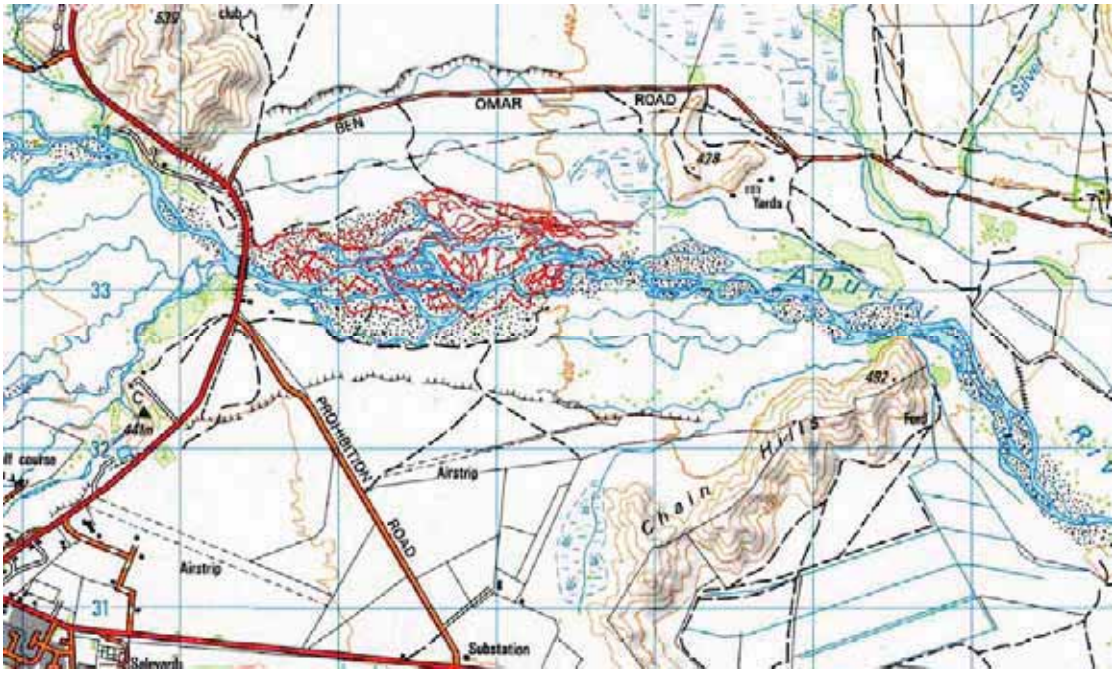

Figure 64. Treatment area in the lower Ahuriri River

7.15 Lake Aviemore Shoreline

In 2008/00 the ground control work near any camping areas was done on 13 and 14 October 2008, before any campers had set up on the edge of the lake. Further ground control using a gun and hose was carried out on 12 December 2008. An area of approximately 40ha was searched and gorse and broom plants were spot sprayed over the entire area to the Aviemore Dam.

This site is under good control, with no gorse or broom being left untreated. However, there are significant numbers of mature and young wilding conifers, mainly larch, along this shoreline which has been commented on at the Waitaki Lakes Shorelines Authorities meetings. The Te Akatarawa Station owner has also requested control of larch along this shoreline, although many of the larch affecting his property are seeding from mature trees on Waimate District Council (WDC) property near the Te Akatarawa Road. Future control of the wilding conifers will need to be considered, particularly if the WDC carry out any control on trees on their land.

For the 2009/10 programme more maintenance ground spraying will be required to control any seedling regrowth of gorse and broom.

Figure 65. Lake Aviemore shoreline treatment area

8. WEED CONTROL WORKS - WILDING TREES

8.1 Eastern Lake Pukaki shoreline

There is a large area along the eastern shoreline of Lake Pukaki between the Pukaki spillway and the Tekapo B Power Station that required maintenance wilding pine control. The original work was carried out in the 2003/2004 programme. Because the tree removal opened up large areas for wilding pine re-growth, and other weeds such as briar rose, gorse and broom, a maintenance programme was put in place to control any seedlings.

For the 2008/09 season control focused on felling the final wilding trees on the site, which included a patch of Contorta pine, and several areas of larch. This occurred between 3 and 28 February 2009. Also felled were some silver birches. These trees were either mulched or neatly stacked to leave the site tidy, as this shoreline is along a visible tourist route.

Continued maintenance will be required to prevent seedling re-growth of wilding trees, broom, gorse and briar rose along this shoreline.

Figure 66. Location of wilding tree control (pink) along the Lake Pukaki Eastern shoreline

8.2 Western Lake Pukaki Shoreline

Large scale control works were scheduled to take place along the Lake Pukaki Western Shoreline in 2008/09 between Boundary Stream and the boundary with Pukaki Downs Station (Areas D to J). Much of this area is covered in large mature wilding trees made up of a number of different species, including Contorta Pine, larch, Douglas fir, *Pinus mugo*, Ponderosa pine, Big Cone pine and Corsican pine.

Unfortunately, the Climate Change Act 2008 meant that this work had to be postponed due to the risk of heavy fines should control of any dense mature stands of trees that were present prior to 1990 be felled. Control of these areas will be considered in future programmes should exemption be granted to LINZ by the Ministry of Agriculture and Forestry (MAF) to clear these trees.

However, despite this, wilding pine control work was able to be carried out at several sites on the western shore of Lake Pukaki in the 2008/09 season. Locations of these sites are shown in figure 67.

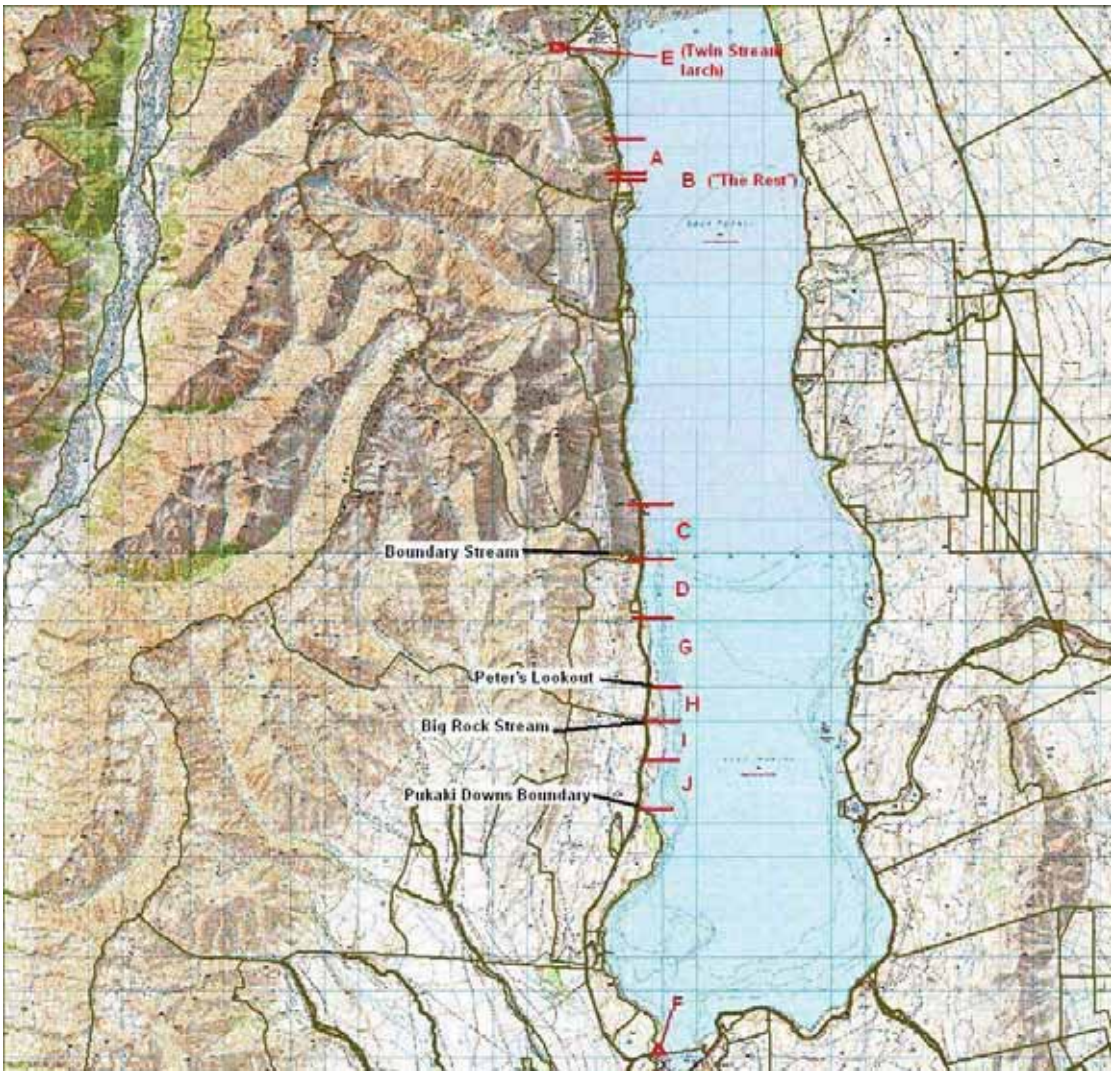

Figure 67. Location of sites on the western shoreline of Lake Pukaki

Details of this control are as follows:

8.2.1 Area A – North of "The Rest"

This site has received a lot of attention over the last two seasons, with larch progressively felled between the road and the lake edge. This has not only removed an area of larch that has been seeding onto adjacent land, but has opened up views from the road towards Mount Cook.

In 2008/09 specified trees, most of which were larch and silver birch, were felled at this site between 8 January and 31 March 2009. This resulted in the final section of the shoreline at Area A being controlled, so there is no more mature tree felling required at this site.

Also at this site were a number of mature Radiata pine trees, which were left exposed by the larch removal in earlier operations. These were deemed a hazard now that they were exposed to strong north-westerly winds, and threatened to fall onto the road. Therefore, these trees were also felled as part of the control at this site.

Future control at this site will entail maintenance spraying or hand pulling of mostly larch seedlings. However, this follow up will not be required until the 20011/12 season.

8.2.2 Area B – "The Rest"

This site, known as "The Rest", is a popular area for people to picnic and enjoy. It is also one of very few sites where the public can access Lake Pukaki without crossing private land. This area had a number of fallen trees, broken branches and smaller, unwanted trees that made the area look untidy and were potentially affecting access to the shoreline. In previous seasons this area was tidied up, with the contractor mulching or removing the trees that were cut down so the site was left tidy.

In the 2008/09 season, a number of specified trees, mainly larch and silver birch, were felled and removed from this site between 4 January and 15 January 2009, to complete the tidy-up of the area. In addition, this site had an extensive understorey of hemlock and scattered briar rose bushes, so this was sprayed using a vehicle mounted gun and hose.

This site is now in a tidy condition, and no wilding tree control should be required for at least a couple of seasons. Some maintenance spraying of hemlock and briar rose may be needed in the 2010/11 season.

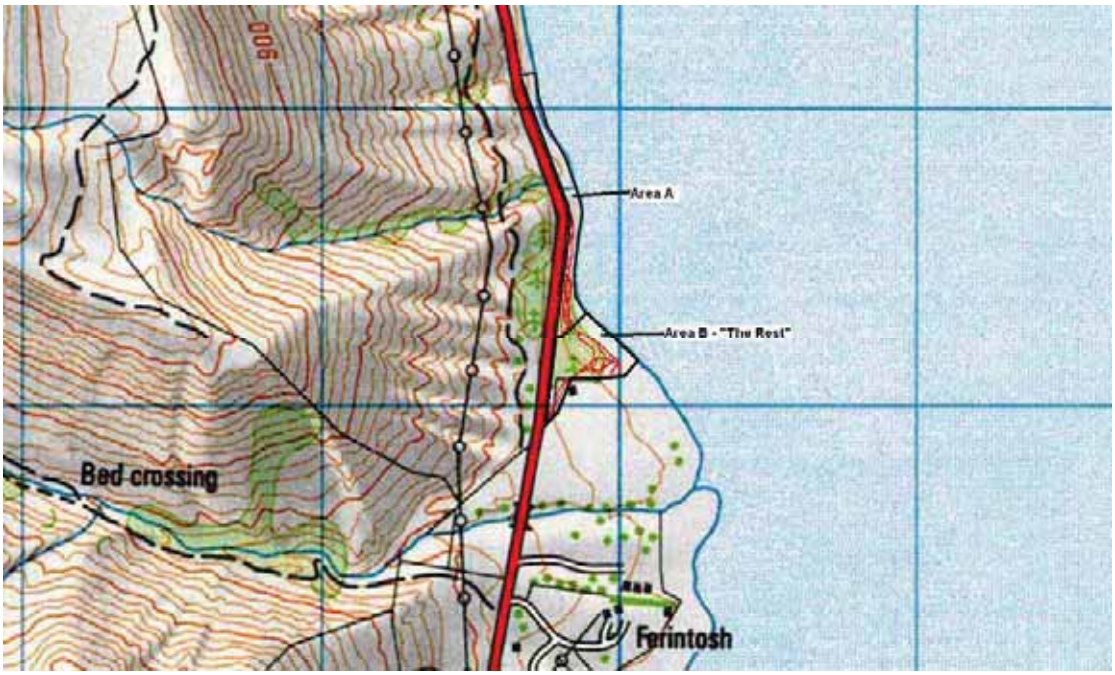

Figure 68. Areas A & B on Lake Pukaki western shoreline

8.2.3 Area C – North of Boundary Stream

Area C on the Lake Pukaki Western Shoreline is located north of Boundary Stream. A number of wilding species were present at this site, the worst being Mountain Pine (*Pinus mugo*). In the 2007/08 season the contractor removed most species in this area that potentially wild. This was done in consultation with the land owners of Ferrintosh Station. Desirable species left included the occasional willow and silver birch.

In 2008/09, the final few trees at this site that needed controlling were felled, effectively completing all capital works at this site. Follow up control on any seedling regrowth will be required in about three season's time.

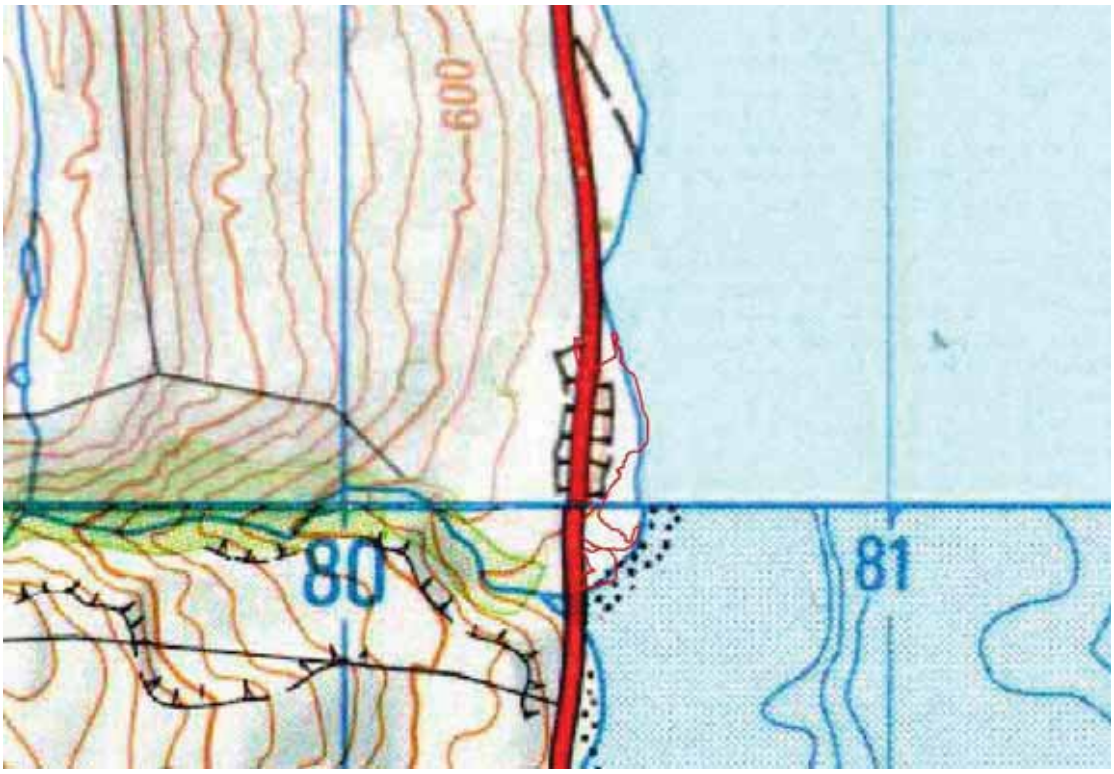

Figure 69. Area C on the Lake Pukaki western shoreline

8.2.4 Area D

This area which is located from Boundary Stream south to the freedom camping area did not receive any treatment in 2008/09.

8.2.5 Area E – Twin Stream

It was uncertain whether this site fell under the responsibility of the Crown, or was part of the Glentanner Station pastoral lease. A status check was therefore carried out prior to any control commencing, which confirmed that this site was the responsibility of the Crown.

There was a large area of mature larch located at Area D upstream of the SH80 Road Bridge, with smaller patches of seedlings (larch and Radiata pine) starting to spread out onto the riverbed of Twin Stream and further along the bank.

Control of Area D took place between 6 and 29 January 2009 using chainsaws. All of the mature larch located on the bank were felled and left tidily in windrows on site. The contractor also searched and felled any smaller larch and Radiata pine trees that had spread off the main mature block. There was also prolific seedling growth occurring in Twin Stream itself, so these were sprayed with the desiccant herbicide, Reglone using a vehicle mounted gun and hose.

Regenerating larch seedlings will need control in future programmes for this area. A small patch of gorse was also noted in the Twin Stream bed which will be controlled.

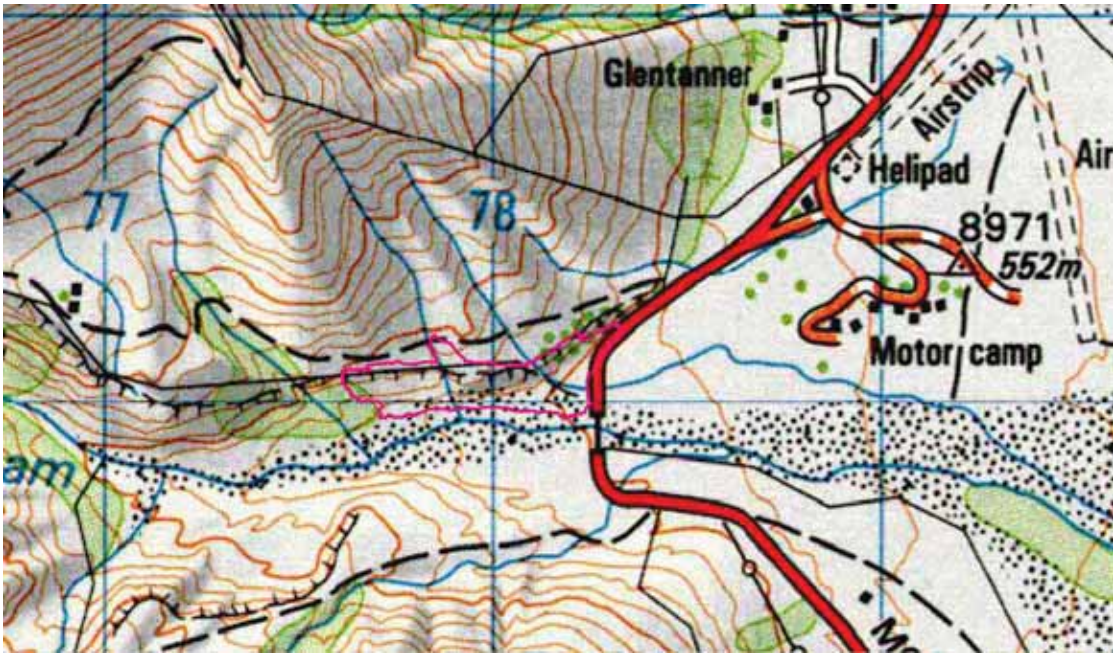

Figure 70. Treatment Area E at Twin Stream Lake Pukaki

8.2.6 Area F – Pukaki Dam

Area F is located in an area highly visible to the public travelling along SH80. This site had prolific wilding tree infestation which was rapidly forming a pine forest. There were also areas of broom and significant amounts of briar rose and thistles.

Control on this site commenced on 26 November 2008 and finished on 13 February 2009. All of the wilding trees at this site were felled and left tidy on site by being placed in windrows. Some mature pines were also felled and removed along the lake front adjacent to the Lakeshore Estates boundary. This improved views up Lake Pukaki from Area F.

In addition to the wilding tree control, the contractor sprayed the briar rose, thistle and broom infestations located on this 8ha site. A subsequent inspection by LINZ resulted in a directive to mulch all of the briar rose to make the site much tidier, which also occurred. By spraying the briar rose prior to the mulching, seedling regrowth of briar rose should be minimised.

This site had a large concrete pit which was starting to crack and was potentially becoming a hazard on the site. Therefore, many of the felled trees from this site were placed in the concrete pit and subsequently covered with soil. This has left an area of disturbed soil which will eventually be covered in grasses.

Follow up work will be required to control regenerating pines, briar rose, broom and thistles. This should be scheduled for the 2010/11 season.

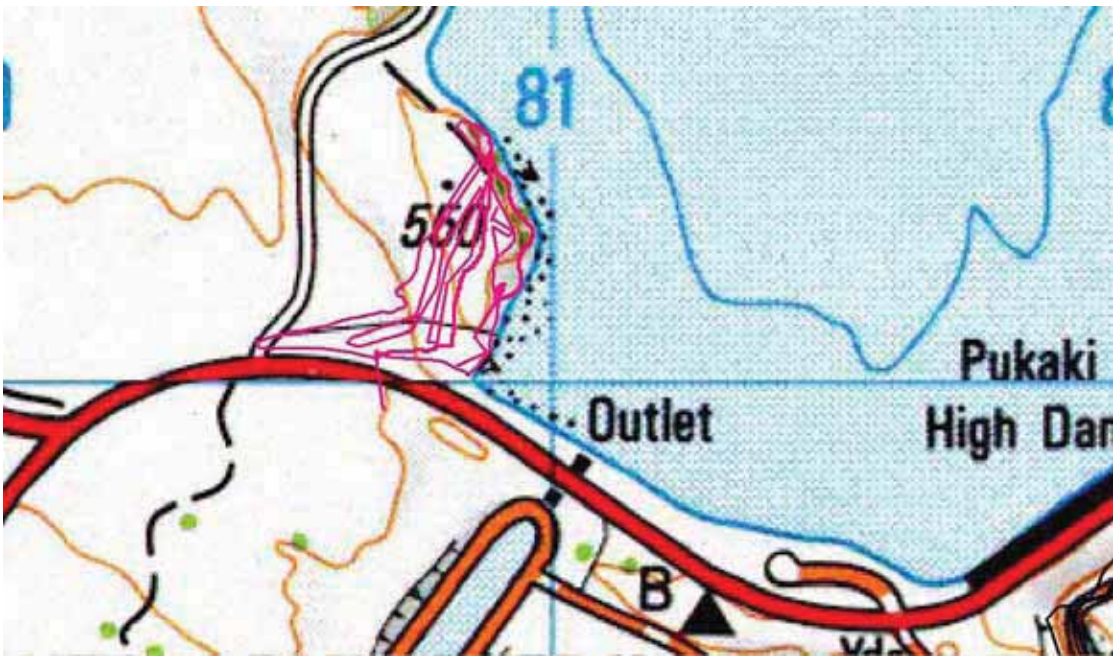

Figure 71. Treatment Area F at the Lake Pukaki Western Shoreline

8.2.7 Area G - Peters Lookout

This site was controlled a couple of seasons ago as part of a New Zealand Transport Authority (NZTA) programme to improve views from Peters Lookout. An area of approximately 4ha of mature wilding trees was felled and removed from site.

Since this NZTA control had taken place, there was a reasonable amount of regenerating wilding tree seedlings, as well as broom and briar rose. Therefore, this regrowth was controlled at this site by ground contractors using hose and gun spray trucks on the briar rose and broom, and chainsaws and hand tools on the regenerating wilding pines. This occurred between 4 and 15 January 2009.

Ongoing control of the briar rose and wilding pines on this site will be required in the 2010/11 season.

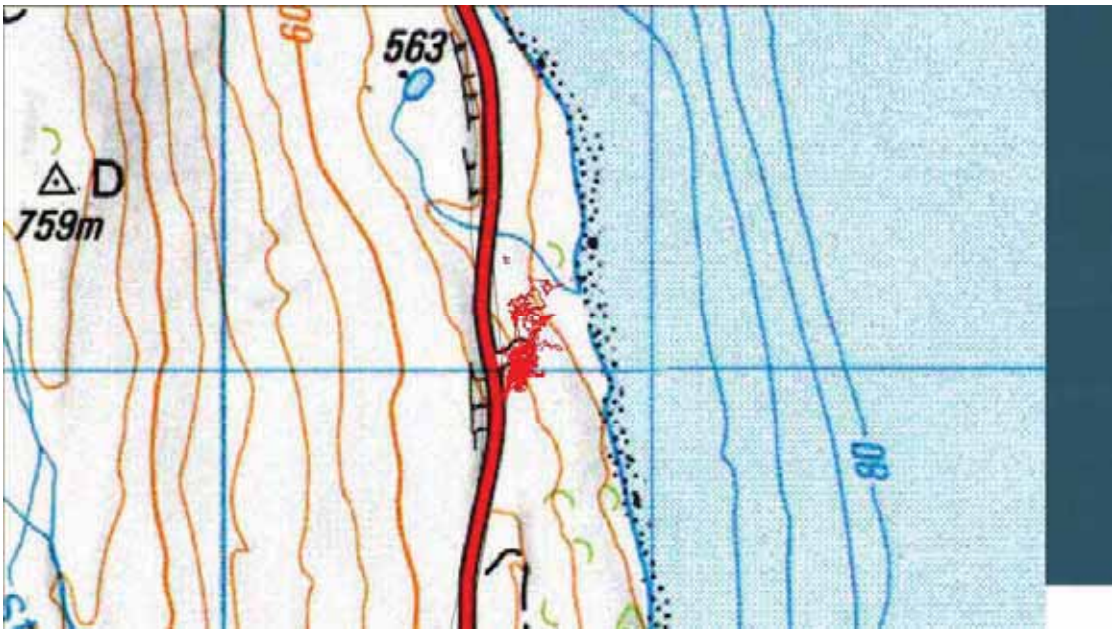

Figure 72. Treatment area at Peters Lookout Area G Lake Pukaki

8.2.8 Area J – Pukaki Downs Station Boundary

Area J of the western Shoreline is located from Jack Steel Stream south to the boundary with Pukaki Downs Station. There is dense wilding tree cover in this area comprised of a number of species, however Contorta pine comprises a large proportion of this cover, particularly towards the southern end of the site. At the lake edge the wilding trees are large mature trees and were likely to be some of the original trees at this site. Towards SH80 the trees are much younger, approximately 15 years old, and are likely to have been seed spread from the more mature trees at the lake edge. These younger trees are post-1990 and therefore are not subject to the Climate Change Act 2008 preventing closed canopy forests from being felled under the Emissions Trading Scheme (ETS) carbon credit restrictions.

Control at this site was targeted at the younger trees adjacent to SH80 and the Pukaki Downs Station boundary. Control using chainsaws commenced on 18 May and finished on 22 May 2009. An area of approximately 2ha was felled and placed in windrows to leave clear access to the boundary fence. Any trees felled near creeks and waterways were cleared and the site left as tidy as possible.

Work could have continued however as control progressed towards to lake edge the age of the trees increased and there was a risk of breaching the ETS legislation.

This site still has significant areas of wilding trees that will require future control should enough funding become available. There will also need to be maintenance control of regenerating seedlings in about three season's time through the 2ha that has been controlled thus far.

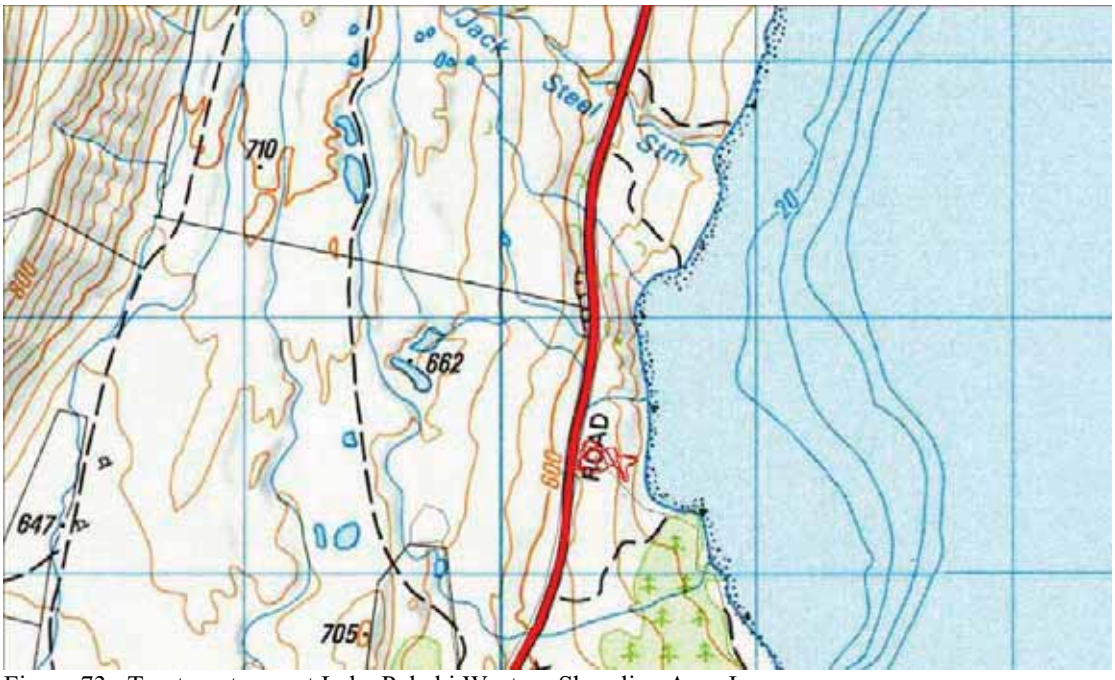

Figure 73. Treatment area at Lake Pukaki Western Shoreline Area J

8.3 Ohau River Wilding Trees

The Ohau River and surrounding areas are severely infested with wilding trees comprising several species. Many of the infested areas are the result of previous plantings and resulting seed spread from these plantings.

In terms of the Ohau River itself, UCL appears to extend well outside the physical riverbed in many areas. An example of this is a large stand of Ponderosa pine located about 3km downstream of Lake Ohau. This stand covers the large bank on the true right of the Ohau River and has the unsealed road running through it.

The physical bed of the Ohau River is fringed with low lying, scrubby, native vegetation. However due to the amount of seed spread occurring in the Ohau basin, a lot of wilding conifers were starting to grow along the edge of the waterway and on riverbed islands. To prevent high future costs of removing these trees when they become larger, it was decided that control this season would be appropriate. Another benefit of controlling these smaller wilding conifers is it would protect the native vegetation in the Ohau River, and also protect habitat for native riverbed nesting birds.

Control occurred over two periods, initially between 1 and 31 March 2009, and then again between 4 and 29 May 2009. Work started at the weir near Lake Ohau and commenced towards Lake Ruataniwha. The contractor encountered huge numbers of small wilding conifers growing amongst the native scrub, especially below large stands of mature trees. The trees were also growing amongst quite rocky ground which made any chainsaw work difficult as the rocks ruined chainsaw chains rapidly. Despite this, both sides of the river were effectively controlled.

The Ohau River has the potential to become completely forested if no wilding conifer control takes place. This site will need to be monitored for the next couple of seasons, and in three season's time a maintenance programme on regenerating trees will likely be required. Unfortunately, due to the amount of mature wilding trees infesting the adjacent land, this programme will need to be ongoing if the Ohau River is to remain clear of trees.

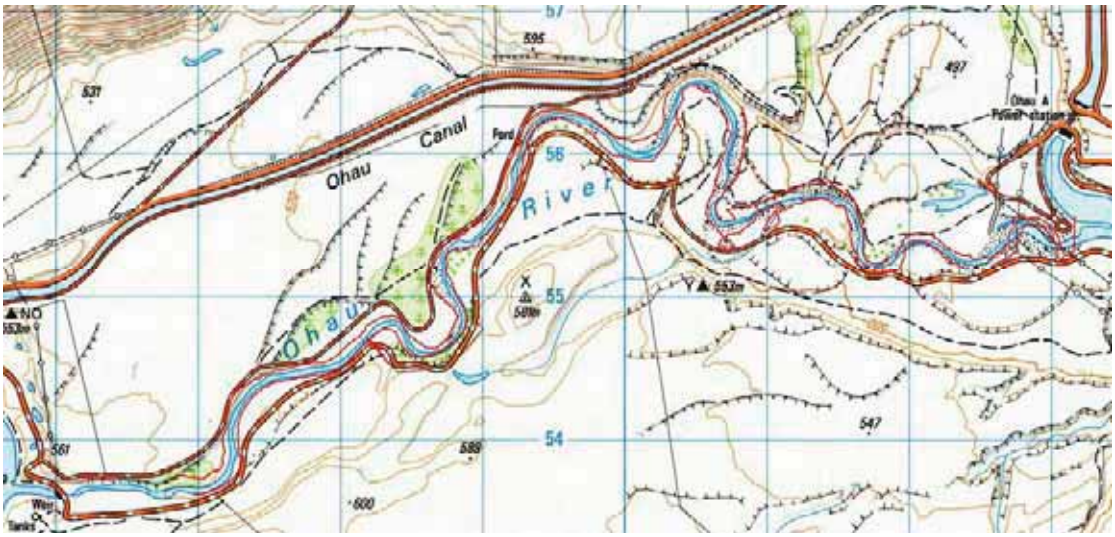

Figure 74. Location of wilding conifer control on the Ohau River

8.4 Pukaki River Wilding Trees

The Pukaki River has a combination of large patches of wilding trees, as well as scattered trees throughout the riverbed. The worst affected area is located from the Pukaki Dam to approximately 3km downstream, but this area is owned by Meridian Energy. There are a variety of species at this site, including Contorta pine, larch, *Pinus mugo*, and Ponderosa pine.

Control commenced at the LINZ boundary about 3km below the Pukaki Dam on 1 May and was completed by 30 May 2009. Initially the contractor was instructed to remove all conifers in LINZ land as far as the confluence with the Tekapo River.

During the course of work, a local environmentalist contacted LINZ complaining about some of the trees that were being removed. A meeting with this individual revealed that some of the conifer species had been planted in the mid-1980's for riverbank protection and groundwater retention. Although not all of the species planted for these purposes were known to be wilding trees, many were, including larch and Contorta pine. The contractor had already felled two areas on the banks prior to the meeting, one comprising of larch and the other of mixed species. However, as a result of the meeting, it was decided that the remaining areas where trees had been planted in the mid 1980's would be retained, except the contractor would search the areas and control any trees that were the result of seeds spreading off the original plantings. This was regarded as an effective compromise by the environmentalist. As other species establish below the original plantings, the mature trees could be progressively removed in future seasons thereby eventually reducing seed sources.

With the exception of the plantings, the contractor managed to control almost all conifers in the Pukaki River from the start of the LINZ land to the confluence with the Tekapo River.

The South Island experienced one of the wettest autumns on record, and as a result of this the Southern Lakes, including Lake Pukaki, were filled above capacity. During the month of May, Meridian Energy was spilling large amounts of water (up to 700 cumecs) into the normally dry Pukaki River. Because of this, there are still some islands that still have some conifers on them because the contractor was not able to access them.

Future control will involve removing the remaining conifers located on the islands that were inaccessible. A maintenance programme of seedling control will also be required every two to three years.

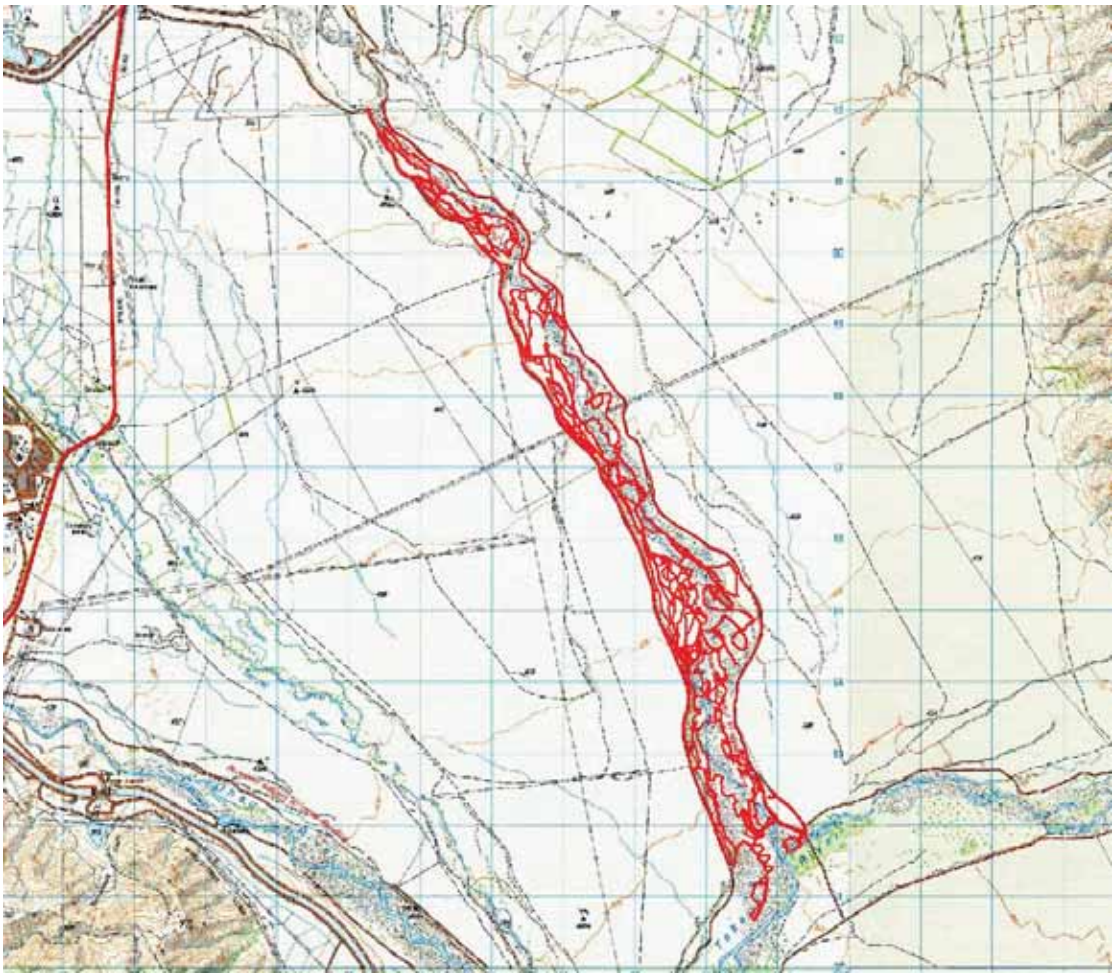

Figure 75. Wilding tree control area in the Pukaki River

8.5 Tasman River Wilding Trees

The Tasman River has a large infestation of young larch trees on the true left side of the river upstream of the Jollie River confluence. These larch trees have spread from a large stand of mature larch located on conservation land east of the Tasman River. The Department of Conservation have advised that they plan on gradually clearing the mature larch off this hill, and requested LINZ to start controlling the young larch in the riverbed to complement their own programme.

Control of larch at this site occurred over two periods; from 23 to 26 March 2009, and 15 to 27 May 2009. Due to the extent and dense nature of much of the infestation on the riverbed, the contractor concentrated on removing outlying trees around the larger patches. By doing this, future control using a helicopter to boom spray the large patches will be possible, and this would be much more cost effective than using ground control methods. Larch is very susceptible to some herbicides such as metsulfuron formulations, and as most of the site is well away from any water it could be effectively and safely sprayed. Ground spraying will need to continue for outlying trees and also larger trees, however by employing both forms of control, effective management of the larch should be able to be attained.

Juvenile larch infestations such as has been encountered at this site can be difficult and time consuming to control. This is because they have branches growing from the main trunk at ground level making chainsaw work difficult and increasing the chance of rock strike with chains. In fact, in some cases the tree branches were growing out of the main trunk below ground level, and were emerging 2 to 3 meters away. For this reason, a lot more time needs to be spent on stumps than with other species.

Next season control will involve aerial spraying of the large patches that have been left from this season's control. Unfortunately complete control will not be achievable until the mature larches on DoC land are felled. However, ongoing control is important if the natural braided ecology of the Tasman River is to be retained.

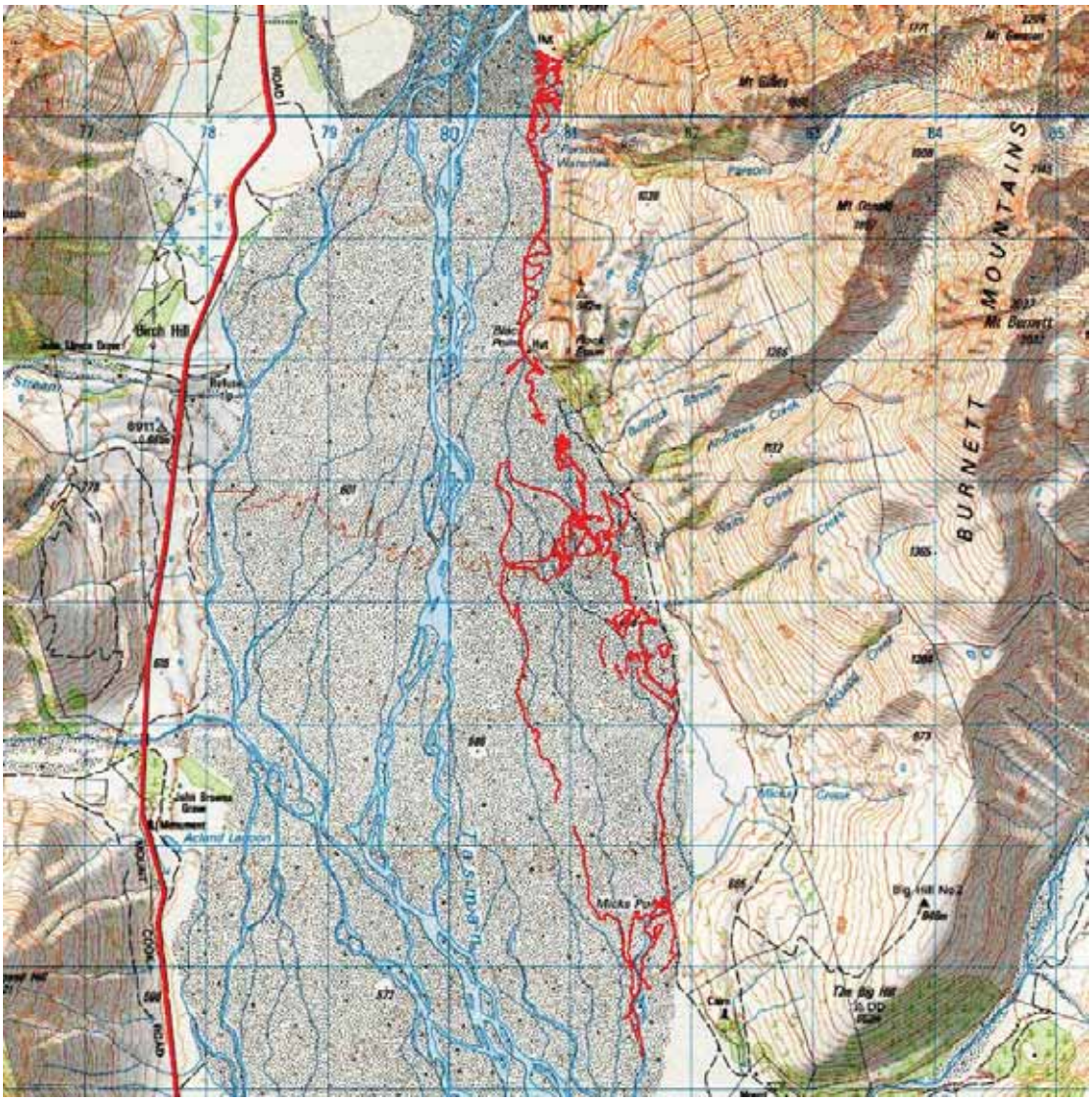

Figure 76. Ground control areas in the Tasman River

8.6 Tekapo River Wilding Trees

The Tekapo River has a variety of species of wilding conifers scattered throughout the length of the riverbed. The adjacent land is effectively free of wilding conifers, so control in the Tekapo River is deemed a worthwhile exercise.

To practically control the entire length of the Tekapo River would be a huge undertaking given the width and length of the river, which amounts to over 4,000ha. However, a start to this job was made this season, with a 6.5km stretch of the river being controlled between 28 March and 28 April 2009. This amounted to over 300ha being controlled from Scott Pond to the Transmission Lines.

The operation was a success with all wilding conifers removed in the control area. Methods used varied, but mainly involved removal of small trees and seedlings with loppers and by hand pulling, followed by felling of the larger trees with chainsaws. The trees were then raked into windrows running parallel to the river. This left a tidy and easily negotiable worksite. The use of an excavator also worked well and ensured that the contractor was able to remove all of the trees out of the river bed and up onto the banks so as not to interfere with Meridian Energy's spilling procedures.

Future control will need to include ongoing maintenance of the section controlled this season, and if possible continued progress down river.

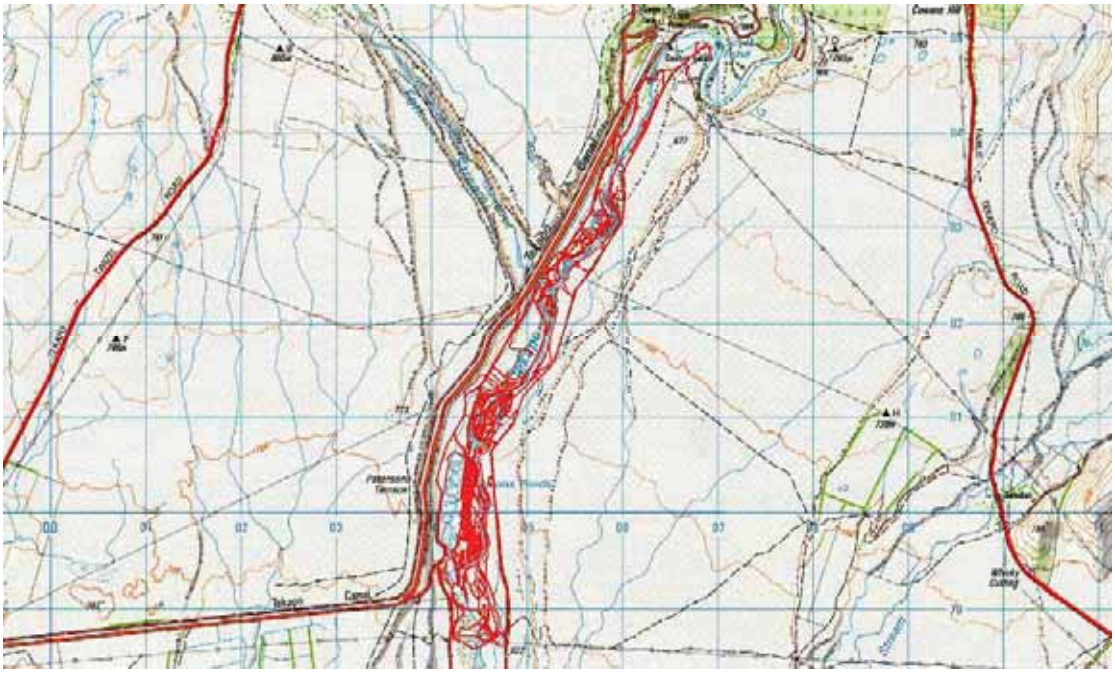

Figure 77. Wilding tree control area in the Tekapo River

9. SUMMARY

The LINZ Biosecurity programme in Canterbury is the most extensive of any region in New Zealand. In previous seasons there have been very favourable conditions for seedling growth of gorse, broom and OMB in many of the sites where control takes place. Although this was again the case in 2008/09 at some sites, e.g. the Hurunui River, at other sites seedling regrowth appeared to be hampered by flooding that occurred in the sprung months. Unfortunately, this will likely mean that there will be a flush of seedlings germinating next season due to the disturbance of the riverbed and deposition of fertile river silts.

One of the building issues in biosecurity today is the spread of wilding trees, in particular some of the pine species such as Contorta pine. Land Information New Zealand has continued to carry out maintenance work on the Eastern Shoreline of Lake Pukaki, and has also done considerable capital work now along the Western Shoreline of Lake Pukaki. It will be important in future to ensure these works are maintained. In addition, significant control works have also been undertaken on a number of rivers in McKenzie Country. Most notable was the clearing of wilding conifers out of the Tekapo and Pukaki Rivers. Despite the significant amount of work that has occurred in the 2008/09 season, there are still plenty of potential areas where further wilding tree control could take place.

Overall, the Biosecurity programme for Canterbury progressed well in the 2008/09 season. This was certainly helped by significant additional funding that was provided by the LINZ General Manager and through additional funding provided by the government for control of weeds listed in RPMS. Sites that most notably benefited from this additional funding were the Boyle, Hope, Tengawai, North Branch of the Hurunui, Rangitata, Leader, Swift and Clarence Rivers.

Additional funding allows rivers to progress rapidly from capital works on well established weed infestations, into a maintenance programme where control is aimed at treating seedling regrowth before it has a chance to mature to a stage where it can start setting significant amounts of seeds.

The programme for 2009/10 should aim at continuing the progress being made from a productive control season this year, and address any new threats that are identified.