Statement of Work (SOW)

This is a Statement of Works under Contract No. 3609-23/24 which sets out the general terms of agreement for this work:

A. The Supplier and Environment Canterbury are parties to the Contract which sets out the general terms of agreement for the Supplier to provide Services to Environment Canterbury.
B. The Parties have reached agreement as to the specific terms on which the Supplier will supply Services required by Environment Canterbury in relation to the Services set out in this Statement of Work.
C. The Parties have agreed to enter into this Statement of Work to record those specific terms and the basis on which Environment Canterbury will pay the agreed Charges for the Services.
D. Environment Canterbury requests the Supplier to provide the Services as set out below in accordance with the terms of the Contract and this Statement of Work.

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

PO Box 345
Christchurch 8140

P. 03 365 3828
F. 03 365 3194
E. ecinfo@ecan.govt.nz

Customer Services
P. 03 353 9007 or 0800 324 636

www.ecan.govt.nz

Name of SOW / Job title	LHI - Fairway spraying - ground based
Job ID	30673
Description of services	Ground based chemical weed spraying on the Lower Hinds River.
Location	Downstream of Pooles road in the Lower Hinds scheme
Start date	07-02-2024
Attachments	1. Work Details 2. Site Plan 3. Health and Safety 4. Private Land Entry and Access Agreement 5. Stakeholder Consultation 6. Environmental Requirements 7. Reporting Requirements
Charges All charges exclude GST	confirm the standard hourly fee rates and materials OR other agreed rates
Purchase order number	[insert here] Please submit invoices by email to payables@ecan.govt.nz and the Environment Canterbury SOW Manager copied in.

Acceptance by SOW Managers

In signing or confirming by email this Statement of Work, each Party acknowledges that it has read and agrees to be bound by it.

	For and on behalf of the Buyer	For and on behalf of the Supplier
SOW manager name	Jenny Plank	Wayne Godfrey
Company name	Environment Canterbury	Godfrey Pest Management Ltd
Contact number	027 586 4765	027 323 6791
Email address	Jenny.plank@ecan.govt.nz	wayne@godfrey.net.nz
Signature		
Date	22/01/24	

Work Details

Chemical weed control of vegetation in the Hinds River downstream of Pooles Road using herbicide with glyphosate as the active ingredient without any spray additives.

The herbicide selected must be approved for use as an aquatic glyphosate in case of any accidental overspray or drift over water. Mixing and application rates must be in accordance with the manufacturers recommendations for the target plants as per the product label. (1L:100L of glyphosate to water mix unless otherwise agreed with work supervisor).

Target plants are any non-native, invasive weeds growing within the river fairway (open gravel area) while avoiding spraying over or into water.

Areas to be targeted as a priority are the inside corner of beaches and the central fairway. Berm weeds are to be left.

Signage must be installed at entry points to the spraying area – Please contact Mark Faichnie if you need help with signage

Spray must only be completed during favorable weather conditions (wind speeds less than 10k/hr, nil rain in the immediate forecast). When spraying near water the Contractor shall carry out the work so that spray is directed away from the water and, shall not work in wind conditions that will cause spray drift towards/over the water.

The Contractor shall abide by the resource consent conditions at all times, relevant consent is CRC981580. A copy of the Resource Consent is contained within the Spray Handbook, which has been provided to you with this Statement of Works. A copy of this must be on site with the spray operators, and they must be familiar with its contents. The environmental plan attached to this SOW sets out all of the relevant requirements for this job.

The work shall be carried out to ensure that river protection trees and other vegetation outside the fairway do not suffer chemical damage.

Daily spray logbook or equivalent records must be supplied to ECan

Lower portions of Hinds River can be difficult to maintain traction in so ATV or similar with spraying equipment may need to be used in these this location.

Please review the full requirements within attached environmental plan and the spray handbook before spraying commences, and note these other key setbacks and timing restrictions:

1. No spraying within 50m of:
    - any beehive
    - any birds nesting or rearing young on the bed or banks of the waterway

2. No spraying within the water intake setbacks shown on the attached Plan. These are both irrigation and drinking water intakes so it is vital spray does not occur within these areas. **NOTE:** these are the locations as per our GIS system and may not be accurately mapped. If you can see the pump shed is outside of this area please apply a 25m setback to that location.

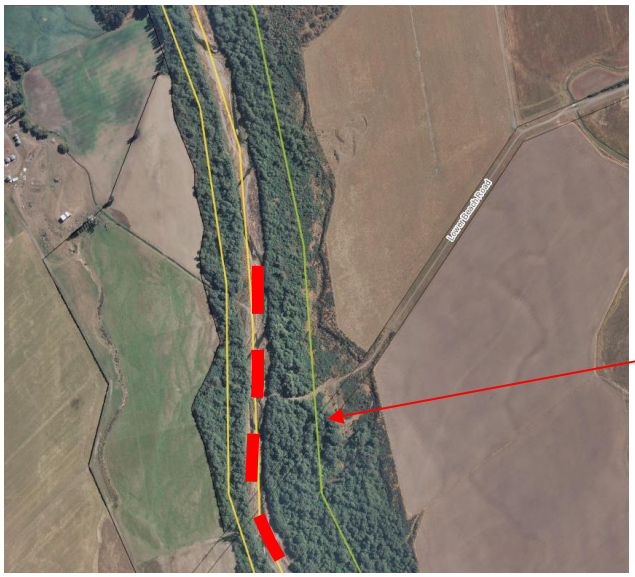
3. No spraying on public holidays or on any weekends that immediately precedes or follow a public holiday. This will include Waitangi Day, meaning no spraying **3-6th February** inclusive.

There is a budget of $25,000 for this work. Please discuss progress with regards to the budget during works with Mark Faichnie.

Site Plan

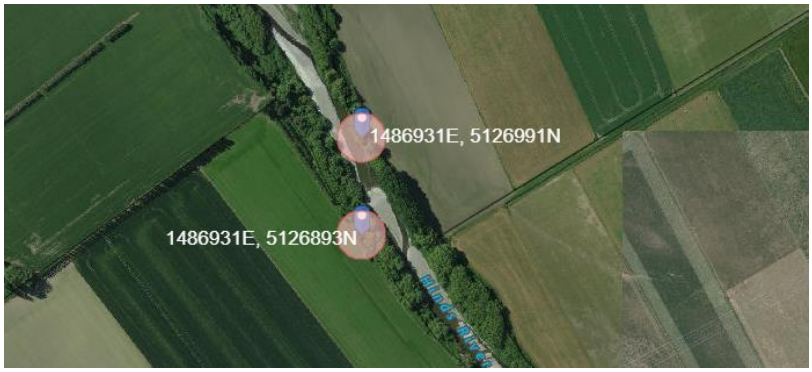
Overall works area

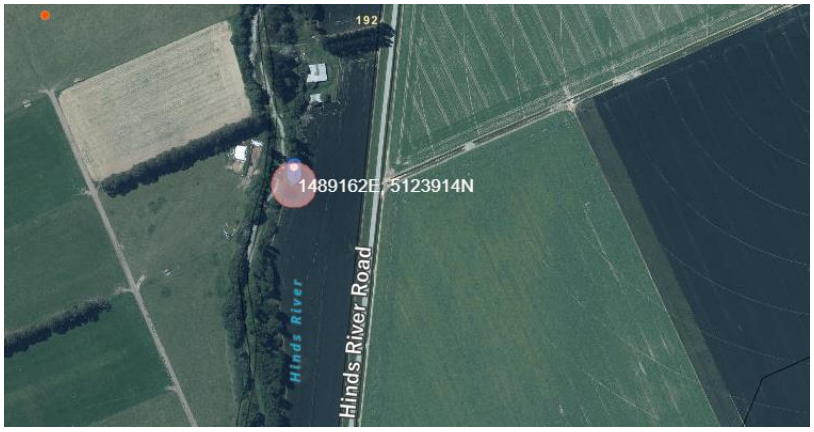
Stop spraying from 200m upstream of Lower Beach Road river access.



Stop spraying from 200m upstream of Lower Beach Road paper Road access.

Restricted spray areas – no spraying within these setbacks to irrigation and/or drinking water wells





50m setback to drinking water well

50m setback to drinking water well

Health and Safety

Site Specific Safety Plan	Suppliers are required to produce their own Site-Specific Safety Plan (SSSP) for Services set out in this SOW. The SSSP must identify on-site hazards and assess and control risks on the worksite. Where any specific risks and hazards are known, these are identified in the table below. Discuss any issues with the Environment Canterbury SOW Manager. Provide a copy of the SSSP to the Environment Canterbury SOW Manager Prior to services commencing.
Known nearby work	Gravel extraction may have started downstream of Pooles Road in the area in the attached map. Operator is BR Jones Limited.
Known nearby recreational activities	Access up the river by recreational users is likely so signage at accesses is important.
Known on-site hazards	Weather, transport, machinery, known area where vehicles can get stuck in gravels, chemicals. Overhead powerlines.
WorkSafe notification required? (Y/N)	No
Traffic management required? (Y/N)	No
Nearest emergency medical treatment	Medical Emergency, Westpac Helicopter, Ambulance - Phone 111 Ashburton Hospital, 34 Elizabeth St, 03 307 8450
Emergency contacts	Environmental Incident Response Hotline – 0800 765 588 WorkSafe New Zealand – 0800 030 040 Manager - Rivers – David Aires – 027 549 7716 Regional Lead River Operations – Cliff Thomas – 027 258 6308 Senior Environmental Advisor – Melissa Shearer – 027 562 9969 Area Engineer Central – Dan Meehan – 027 327 5387 River Engineering Officer Central – Jenny Plank – 027 586 4765 Area Supervisor Central – Mark Faichnie – 027 529 7754
Incidents and near-misses	All incidents and near-misses must be reported to the Environment Canterbury SOW Manager as soon as possible but no later than 24 hours after the incident or near-miss occurred.

Private Land Entry and Access Agreement:

Access to the river should be via existing public access points.

Stakeholder Consultation

Fish and Game, Arowhenua and local apiarists have been contacted and any details we receive from these stakeholders will be passed on to you as necessary.

It is known that Arowhenua and apiarists do not support chemical spraying in the fairway and there are members of the public who have the same view. If anyone approaches you please direct them towards Ecan customer services at 0800 324 636 who will direct them to the most appropriate person at the time.

Environmental Requirements

This job must be carried out in accordance with the following environmental plan

Environmental Plan – Lower Hinds Spraying 2024, Rangi 30673

Resource Consent Requirement	Comment on how requirement will be complied with
Before works start: 4. Pre spray checks for location of schools, dwellings, water supply points and beehives. 5. No spraying within 50m of: • any beehive • any birds nesting or rearing young on the bed or banks of the waterway 6. No aerial spraying within: • **250m** of any community water supply point 7. No land-based spraying within: • **25m** of an intake for community water supply 8. No spray vehicles may drive through flowing water within **250m u/s** of community supply points or pass within **25m** of supply points on dry bed 9. No spraying on public holidays or on any weekends that immediately precedes or follow a public holiday 10. Spraying during the period 1st January to 1st June must be avoided where possible in the **īnanga spawning habitat**	**Beehives –** Contact has been made with local beekeepers to make them aware of this spray event occurring. Operators to keep an eye out for hives and avoid. Be aware that Surfactants are toxic to honeybees and spraying over plants in flower where bees are foraging MUST be avoided. Avoid peak foraging by spraying early morning or later in the evening if possible **Nesting birds** – nesting season for birds is September to end of January inclusive. Work to commence outside of nesting season and likely habitat therefore no pre-works survey required. **Schools** – *none* **Water intakes and drinking water protection zones** – Refer to plans attached to SOW for location of water intakes. No drinking water protection zones within this spray reach. **Irrigation intakes** - Identify locations of irrigation/stockwater intakes within spray reaches prior to spraying starting, look for small pump sheds and pipework in the waterway. *Known sites have been included on the plans on the SOW.* **Timing of spraying –** job will be organised so that it does not occur on weekends on either side of a public holiday. Restriction required over Waitangi Weekend. **Īnanga Spawning habitat areas -** NA not inanga spawning habitat. **Chemical use -** Chemical transport, handling and use must be in accordance with the manufacturer's recommendations. **Spray Handbook –** A copy of the Spray Handbook (2021 version) and the full resource consent must be available to the operators on site. Pre-start toolbox meeting to discuss the key controls from this enviro plan. **Consideration of alternatives to spraying –** Spraying along this section of river is needed as excess weed growth could significantly effect capacity and or cause erosion during a high flow event as the fairway is so narrow as it is. Ground based spraying provides the least impact on the receiving environment. *We have selected*

11. Only Glyphosate, Triclopyr, Diquat and surfactants may be used. Handling, mixing and application in accordance with manufacturers recommendations. 12. Copy of **Spray Handbook** on site, and operator's familiar with its contents. 13. Consideration has been given to whether or not the site can be cleared by an alternative means than spraying.	*ground based spraying as this section of the hinds river is narrow and aerial spraying can effect willow planting.*
Biosecurity	Ensure vehicles and equipment used on the job are clean and free of pest plants before use and checked for plant fragments before being taken off site. This is to help prevent the spread of biosecurity pests and diseases (including didymo)
Notification and consultation: 14. Advise the local marae at least 5 days before spraying 15. In the rivers **Selwyn, Rakaia, Ash River main and North Branch and their tributaries,** Te Taumutu Rūnanga must be given at least 5 working days notice of the spraying starting. 16. Before spraying into any fish spawning areas during spawning season – consult Fish and Game	*NOO heading out but Fish and game, Arowhenua and Apiarist contacted via email on Monday the 22nd of January*
Setting up on site: 17. Appropriate certification for users in place (e.g. approved handlers). 18. Signage – prior to spraying, signs must be erected at typical access points and maintained for the duration of the spraying event 19. Daily spray logbook used 20. Ability to measure wind speeds, and only spray during suitably calm conditions 21. Backflow prevention in place for filling spray tanks 22. Operators know process for managing accidental spills and spill kit is available on site.	**Certification** – contractors must hold the Registered Chemical Applicator qualification with the aquatic strand. **Signage** – Signs must be placed at typically entry points into a waterway. Remember to include on the sign a contact phone number for public to direct queries to. Remember to collect the signs back in after the weeds are showing signs that they have been sprayed. **Daily logbook** – remember to complete the spray diary/logbook, including an accurate description of where sprays have been applied, target plant species and weather/environmental conditions at the time. **Monitoring wind** - Typically less than 10kph is good practice. This must be monitored THROUHOUT the spray operation and spray must cease as soon as signs of drift starting to occur. **Backflow prevention** - Spray tanks may only be filled from creeks/rivers etc when backflow prevention devices are fitted. **Spill response** - Spill response procedures are listed in the Spray Handbook. A spill kit must be kept on site and readily available. Check that the spill kit is fully stocked before works start. Make sure all operators are familiar with the spill response plan actions

On the job: 23. Chemical must be mixed away from the open water, in a position where any spillages cannot get into the water 24. Only target vegetation controlled, no spraying of natives. 25. Direct spraying over water must be avoided 26. Triple rinse spray containers and tip rinsing's into the spray tank or a knapsack. Do not tip rinsing's into the stormwater network, into a waterbody or onto the ground. Old containers need to be disposed of at an appropriate facility.	**Chemical mixing** – follow manufacturers recommendations for mixing rate (on the label). Mix chemical at least 20m away from open water and wells. **Native plants** – identify areas of native plants prior to spraying commencing. Avoid spraying these areas. **Rinsing chemical containers** – do not tip rinsing's onto the ground or into waterways, tip them back into the knapsack/spray tank. Dispose of containers in approved facilities.
Refuelling and fuel storage 27. Follow good practice for refuelling	• Refuelling site away from surface water in a position where accidental spills cannot enter water • A spill tray or something similar is used during refuelling • Spill kit on site, and staff know how to use it.
SAMPLING 28. Samples must be taken within 25m downstream and upstream of spray area	***No sampling required for this job as there is currently no water flowing in the Hinds River.*** *Should flow start, a pre and post sample for glyphosate must be taken. Talk to Mark F and/or Melissa Shearer to arrange sampling.*
Incident Reporting	Report any complaints about the job or any environmental issues to Environmental Advisor melissa.shearer@ecan.govt.nz (027 562 9969) within 24 hours of issue arising.

Reporting Requirements

Please keep in close contact with Mark Faichnie with regards to progress relative to the budget and when contact is made with the public.

Make sure daily spray diaries/logs are kept.

Environmental Plan – Lower Hinds Spraying 2024, Rangi 30673

Resource consent CRC981580 – Compliance Plan for Riverbed and Berm Spraying

Resource Consent Requirement	Comment on how requirement will be complied with
Before works start: 1. Pre spray checks for location of schools, dwellings, water supply points and beehives. 2. No spraying within 50m of: • any beehive • any birds nesting or rearing young on the bed or banks of the waterway 3. No aerial spraying within: • **250m** of any community water supply point 4. No land-based spraying within: • **25m** of an intake for community water supply 5. No spray vehicles may drive through flowing water within **250m u/s** of community supply points or pass within **25m** of supply points on dry bed 6. No spraying on public holidays or on any weekends that immediately precedes or follow a public holiday 7. Spraying during the period 1st January to 1st June must be avoided where possible in the **īnanga spawning habitat** 8. Only Glyphosate, Triclopyr, Diquat and surfactants may be used. Handling, mixing and application in accordance with manufacturers recommendations. 9. Copy of **Spray Handbook** on site, and operator's familiar with its contents.	**Beehives –** contact local beekeepers to find out where they have their hives prior to starting spraying. *Contact made waiting for reply* Contact has been made with local beekeepers to make them aware of this spray event occurring. Operators to keep an eye out for hives and avoid. Be aware that Surfactants are toxic to honeybees and spraying over plants in flower where bees are foraging MUST be avoided. Avoid peak foraging by spraying early morning or later in the evening if possible **Nesting birds** – nesting season for birds is September to end of January inclusive. Work to commence outside of nesting season and likely habitat therefore no pre-works survey required. **Schools** – *none* **Water intakes and drinking water protection zones** – Refer to plans attached to SOW for location of water intakes. No drinking water protection zones within this spray reach. **Irrigation intakes** - Identify locations of irrigation/stockwater intakes within spray reaches prior to spraying starting, look for small pump sheds and pipework in the waterway. *Known sites have been included on the plans on the SOW.* **Timing of spraying –** job will be organised so that it does not occur on weekends on either side of a public holiday. Restriction required over Waitangi Weekend. **Īnanga Spawning habitat areas -** NA not inanga spawning habitat. **Chemical use -** Chemical transport, handling and use must be in accordance with the manufacturer's recommendations. **Spray Handbook –** A copy of the Spray Handbook (2021 version) and the full resource consent must be available to the operators on site. Pre-start toolbox meeting to discuss the key controls from this enviro plan. **Consideration of alternatives to spraying –** Spraying along this section of river is needed as excess weed growth could significantly effect capacity and or cause erosion during a high flow event as the fairway is so narrow as it is. Ground based spraying provides the least impact on the receiving environment. *We have selected groundbased spraying as this section of the hinds river is narrow and aeirial spraying can effect willow planting.*

10. Consideration has been given to whether or not the site can be cleared by an alternative means than spraying.	
Notification and consultation: 11. Advise the local marae at least 5 days before spraying 12. In the rivers **Selwyn, Rakaia, Ash River main and North Branch and their tributaries,** Te Taumutu Rūnanga must be given at least 5 working days notice of the spraying starting. 13. Before spraying into any fish spawning areas during spawning season – consult Fish and Game	*NOO heading out but Fish and game, Arowhenua and Apiarist contacted via email on Monday the 22nd of January*
Setting up on site: 14. Appropriate certification for users in place (e.g. approved handlers). 15. Signage – prior to spraying, signs must be erected at typical access points and maintained for the duration of the spraying event 16. Daily spray logbook used 17. Ability to measure wind speeds, and only spray during suitably calm conditions 18. Backflow prevention in place for filling spray tanks 19. Operators know process for managing accidental spills and spill kit is available on site.	**Certification** – contractors must hold the Registered Chemical Applicator qualification with the aquatic strand. **Signage** – Signs must be placed at typically entry points into a waterway. Remember to include on the sign a contact phone number for public to direct queries to. Remember to collect the signs back in after the weeds are showing signs that they have been sprayed. **Daily logbook** – remember to complete the spray diary/logbook, including an accurate description of where sprays have been applied, target plant species and weather/environmental conditions at the time. **Monitoring wind** - Typically less than 10kph is good practice. This must be monitored THROUHOUT the spray operation and spray must cease as soon as signs of drift starting to occur. **Backflow prevention** - Spray tanks may only be filled from creeks/rivers etc when backflow prevention devices are fitted. **Spill response** - Spill response procedures are listed in the Spray Handbook. A spill kit must be kept on site and readily available. Check that the spill kit is fully stocked before works start. Make sure all operators are familiar with the spill response plan actions
On the job: 20. Chemical must be mixed away from the open water, in a position where any spillages cannot get into the water	**Chemical mixing** – follow manufacturers recommendations for mixing rate (on the label). Mix chemical at least 20m away from open water and wells.

21. Only target vegetation controlled, no spraying of natives. 22. Direct spraying over water must be avoided 23. Triple rinse spray containers and tip rinsing's into the spray tank or a knapsack. Do not tip rinsing's into the stormwater network, into a waterbody or onto the ground. Old containers need to be disposed of at an appropriate facility.	**Native plants** – identify areas of native plants prior to spraying commencing. Avoid spraying these areas. **Rinsing chemical containers** – do not tip rinsing's onto the ground or into waterways, tip them back into the knapsack/spray tank. Dispose of containers in approved facilities.
Refuelling and fuel storage 24. Follow good practice for refuelling	• Refuelling site away from surface water in a position where accidental spills cannot enter water • A spill tray or something similar is used during refuelling • Spill kit on site, and staff know how to use it.
SAMPLING 25. Samples must be taken within 25m downstream and upstream of spray area	***No sampling required for this job as there is currently no water flowing in the Hinds River.*** *Should flow start, a pre and post sample for glyphosate must be taken. Talk to Mark F and/or Melissa Shearer to arrange sampling.*

Environment Canterbury
Standard Operating Procedure

Herbicide application – using ground based techniques

Scope of Work

This SOP covers the application of herbicides using ground-based or hand-held techniques. This includes drill and inject, cut and paste, basal bark, knapsack, truck or tractor-based gun and tractor-based spray boom. The processes outlined here have been grouped by application technique. Aerial spraying via helicopter or UAV is covered in a separate SOP.

All users of agrichemicals and other hazardous substances must adhere to a range of workplace Health and Safety and Environmental regulations as set out by WorkSafe NZ (Health and Safety at Work Act) and the Environmental Protection Agency (Hazardous Substances and New Organisms Act). These requirements are set out in the New Zealand Standard for the Management of Agrichemicals (NZS8409:2021), on product labels and on their Safety Data Sheets. Users must also comply with relevant environmental regulations including the Canterbury Land and Water Regional Plan, Canterbury Air Regional Plan, and any relevant resource consents and EPA permissions/permits.

Users must consult with the product label and safety data sheets to determine the appropriate level of qualification, Personal Protective Equipment and other environmental controls relevant for their scale of operation. The information from product labels and safety data sheets takes precedence over this SOP where there are inconsistencies (for example, low risk, infrequent spot spraying tasks do not require applicators to hold a Growsafe Standard qualification as that is not what the Product Label or SDS requires for that scale and risk of activity).

All practicable steps shall be taken to minimise adverse effects on wildlife and ecological values, including minimising spray drift and non-target species damage; and minimise impact on public access, recreation, and safety. All care must be taken to avoid damage to River Protection assets. These assets include the stopbanks (no driving or machinery on sides of stopbanks) and the willow and poplar trees planted along the lengths of these rivers.

Agrichemicals are to be used at rates prescribed by the manufacturer and listed on the product label.

The following is a brief description of the herbicide use covered by this SOP, split by Section:

RIVERS SECTION

Spraying is required to manage weed growth in riverbeds, berms, along access tracks and stopbanks. Weed species targeted include: wilding willows, alders, wattles, gorse, broom, lupine, false tamarisk, blackberry, ivy, old mans beard, hops and other woody weed species, along with a variety of aquatic weeds such as canary reed grass, yellow flag iris, monkey musk and purple loosestrife.

Spraying is a key, cost effective, tool at keeping pest weed infestations down. These infestations impact native biodiversity, smother flood protection vegetation, create stable islands which affect the natural braiding patterns of rivers and reduce flood carrying capacity of rivers.

Herbicides used by the Rivers Section for flood protection are limited to formulations of Glyphosate and Triclopyr and spray adjuvants as authorised by CRC981580 and CRC041535 (and their replacements)

BIOSECURITY

The Canterbury Regional Pest Management Plan (CRPMP) sits within an integrated framework for the Canterbury region and forms the centrepiece of this framework. The purpose is to provide for the efficient and effective management or eradication of specified harmful organisms in the region.

Plant pest control is undertaken at various sites throughout Canterbury to protect both biodiversity and agricultural production values. Biosecurity uses various ground-based control methods including

knapsack spraying, gun and hose, drill & fill and cut and paste to target a variety of species including but not limited to old man's beard, gorse, broom, bell heather, wilding conifers, boneseed, Darwin's barberry, spartina etc. Refer to the current CRPMP for the full list of target plant pest species that may be subject to control.

Herbicides used within biosecurity include formulations of Glyphosate, Triclopyr, Metsulfuron, diquat, Imazapyr, Picloram, Endathol, Aminipyralid, haloxyfop and spray adjuvants.

SCIENCE

Land ecology team – herbicide usage in the land ecology team is based around control of invasive species in areas where there are threatened or uncommon native species, or in sensitive habitats (wetlands/waterbodies) where it is deemed too risky to get contractors to do the work (due to identification of cryptic or difficult to identify species/genera). Techniques used are knapsack spray, drill and fill, cut and paste and application of granules (prill's). Herbicides used are formulations of Glyphosate, Triclopyr, Haloxyfop and Picloram.

Groundwater Science – spot spraying using a knapsack or similar around monitoring bores to maintain site access. Herbicide used is limited to formulations of Glyphosate. *NOTE: this infrequent, low risk, small scale spot spraying is unlikely to trigger any qualification or detailed record keeping requirements as outlined in this SOP. Consult your products SDS and Label.*

BIODIVERSITY

Biodiversity nodes are planted pockets of native vegetation often amongst the mixed river protection trees and river berm vegetation. We maintain and enhance a planned array of biodiversity enhancement nodes along several of Canterbury's riparian corridors through a combination of techniques such as foliar spraying and cut/paste.

Pest plant control is required as part of the protection and enhancement of remnant native vegetation across Canterbury. Target species include old man's beard, ivy, grey willow, Japanese honeysuckle and sycamore. These weeds displace native species and prevent seedling recruitment. Control is carried out via foliar spray, cut and paste and drill and fill application.

Herbicides used in restoration and biodiversity protection are Glyphosate, Triclopyr, Metsulfuron, Picloram and spray adjuvants.

PARKS AND FORESTS

Foliar spraying is required for landscape planting upkeep and maintenance in Environment Canterbury's regional parks. These gardens provide visual amenity enhancement at key areas of our Parks and benefit from a regular maintenance programme.

Environment Canterbury's forestry estate provides erosion control, flood protection and an alternative revenue stream which supplements costs of flood protection work throughout Canterbury. The forestry estate also serves as a recreation space in the regional parks. Foliar spraying via contractors is required to ensure successful establishment of newly planted forestry stands post-harvest.

Herbicides used by Parks and Forest staff are limited to Glyphosate, Triclopyr, Metsulfuron, Terbuthylazine and spray adjuvants.

Activity / Task Health and Safety Risk Profile – see attachment 1

Task/Activity Environmental Risk Profile		
Risk description	**Impact**	**Mitigation**
By kill of non-target plant species	Loss of desirable species, reduction in local biodiversity value, damage to flood protection vegetation	Take all practicable steps to minimise spray drift, including spraying during low wind conditions with appropriate gear and nozzle settings. Carry handheld anemometer to measure windspeeds and only spray below 15kph ID all plants before spraying, only spray if you know what it is
Contamination of surface water	Adverse effects on aquatic ecology (invertebrates, fish, plants) Contamination of stock, irrigation or drinking water	Spill plan and kit in place Mixing carried out away from open water Recommended mixing and application rates adhered to Setbacks to waterways (where applicable) adhered to
Contamination of groundwater	Contamination of stock, irrigation or drinking water Potential impacts on groundwater stygofauna	Spill plan and kit in place Mixing carried out at least 5m away from groundwater wells Avoid spraying substances such as Triclopyr over shallow groundwater or seepage areas
Spraying of edible plants	Human or stock consumption of plant products (leaves, fruits, berries) that may have herbicide residue	Public communication/notification and signage warning of spraying in known foraging areas Avoid spraying set aside areas (eg Mahinga Kai sites in Ashburton drainage network) Consider use of marker dyes to demarcate spray presence
Harm to bees / bee death	Bee deaths, hive collapses, loss of production for apiculturist	Avoid spraying mixtures with surfactants over plants where there are bees actively foraging Plan spray timing to avoid peak foraging time Plan spray timing to allow herbicide to dry on the plant before bees are likely to forage
Contamination of honey or bee products	Honey contaminated, impacts on exporting products, reputational risk for NZ honey industry, loss of income	As above for bee deaths Minimise spraying to what is absolute necessary

Staff or Contractor Pre-requisites	
Qualifications & Training	Competencies & Experience
- First Aid Training - Growsafe Standard Certificate or Growsafe Basic Certificate and under direct supervision of a qualified person while under training (NOTE: qualifications required depend on the classifications of substances being used, the location of application and application technique. Not	- At least one spray season of experience before being allowed to be spraying independently - Spill response and clean-up procedure - For tractor driving: Experienced operators only, or under the direct supervision of experienced operators.

all applications will require qualifications to be held). - Contractors must hold Registered Chemical Applicator (RCA) - Heavy machinery licence (where applicable)	

Equipment Requirements

Task / Activity / Site Equipment	PPE*
- Chemical - Spray unit - Spray tank, pump (with back flow prevention fitted), knapsack etc - Truck or Tractor (where applicable) - Portable spill kit - Handheld digital anemometer (wind speed monitor) - Copy of resource consent or permits and SDS on site - Clean water and soap for hand washing - Daily spray log book for keeping records - Warning signs and site demarcation tools - Sample bottles for the substance being sprayed (if sampling is required)	**Note: Refer to the safety data sheet for the herbicide you are using for the specific PPE requirements.** <u>Typical PPE requirements include:</u> - Spray Overalls (fabric or disposable) with tight fitting hood and cuffs - Respirator with Organic Vapours and particulate filters, fit tested for the user on an annual basis by a suitably qualified and experienced fit testing contractor - Eye protection (safety googles or full face visor - Chemical resistant Gloves - Gumboots/suitable waterproof work boots *All PPE regularly checked for wear and tear and replaced as per expiry/required.

Establish work sites

1. Arrive to site
2. Conduct a site induction/set up toolbox meeting. Carry out Hazard identification and on-site risk assessment – develop and implement controls. Document this.
3. Identify sensitive areas and non-target plant species that must be avoided, document this in your on-site risk assessment.
4. Establish work site and set out site demarcation, options as appropriate for your site: signs, ropes, tape, cones and spotters. Remember to consider the access into the site from the river side of the works area (boaties and pedestrians). Spray warning signs must be located at the typical access points to the waterway for large scale spraying (over 0.5ha)
5. Confirm wind conditions and rainfall forecasts are still suitable for spraying to proceed. If it is too windy or there is a high risk of spray drifting outside of the target area, then spraying must be delayed.
6. Put on PPE (including, but not limited to: gloves, eye protection, overalls, boots).

Mixing chemical and filling spray tank

1. Ensure spray equipment is clean before use and there is no risk of cross-contamination of substances (eg using equipment that has applied glyphosate before applying triclopyr) to minimise the risk of non-target damage.
2. Double check water is of suitable quality to be used for spray mixing – must have low suspended sediment levels
3. Mixing of chemical must occur at least 5m away from open (flowing or pooled) water and groundwater bores, preferably over an impervious surface or spill tray where available.
4. Ensure spill kit is to hand for mixing to assist in immediate clean-up of any accidental spills of concentrated chemicals.
5. Ensure chemicals and adjuvants are compatible – check the product(s) labels.
6. When pumping to extract water to fill the tank: Place pump hose in the water, suspended off the bed to avoid sucking in sediment or mud. Ensure backflow prevention is in place on pump and pump hose is screened to prevent fish being sucked into the tank. Pumping operation must be supervised at all times to ensure immediate action can be taken should any issues arise.
7. Fill spray tank with fresh water to 50% full
8. Measure out concentrated chemical with a calibrated measuring device/jug. Concentration of chemical must be to the manufacturers recommendations for the product being used and the target plant species (see Novachem Manual or Product Label if unsure).
9. Order of adding chemicals: Add any insoluble materials (eg granules), then add liquids, then add adjuvants or oils then top up the tank to the required level with water. Add any chemicals that cause foaming when the tank is nearly full.
10. Wash hands after handling concentrated chemical.

Truck or Tractor mounted spray gun

For berm, road and track, stopbank, fairway and drainage network spraying targeting pest plant species using foliar spray technique.

If you cannot identify the plant species DO NOT SPRAY IT. Take a photo and report the plant to Environmental Advisors to determine if it is a pest weed that can be killed or native plant to be protected.

Specification:

Spot spraying of targeted pest plants along tracks, stopbanks and within the river berm areas to control weed growth where it may impede access, overwhelm flood protection vegetation or compromise stopbank integrity.

Spraying completed with truck mounted spray unit and handheld gun. Nozzle and flow rate set to achieve specified application rate and coverage whilst reducing spray drift beyond target area. This method should not be carried out when rain is imminent and/or during windy periods (winds greater than 15kph).

Spraying carried out by a two-person team, one driving the spray vehicle and one applying the herbicide.

Refer to each specific spray vehicles SOP for determining appropriate weight loading and seat configuration.

Stopbank spraying:
Spray target plants along stopbank batter and crest. Target plants include, but are not limited to, willow, silver poplar, pine, broom, gorse, lupine and blackberry.

Area to spray includes all surfaces of the stopbank (or as specified by the Area Engineer and outlined on the Job Sheet) and land within 5 metres of each toe of the stopbank, or to the fence if the fence is within 5 metres of the toe of the stopbank. Grass growing on the stopbank must not be killed (no glyphosate-based sprays to be used).

Fairway Spraying must occur within the "vegetation control lines" on riverbed islands as marked out on Job Sheet. Broom, gorse and lupin shall be sprayed before seed formation takes place.

Drain spraying target pest plants along drain banks and drain access tracks. Emergent aquatic weed may only be sprayed using approve glyphosate-based spray with no spray additives.

Blanket spraying, spraying over water and spraying of native vegetation must be avoided.

Triclopyr based herbicides MUST NOT be sprayed directly to water.

Knapsack Spraying

Task / Steps

For plant maintenance and pest plant control by foliar spray

Specification:
This method should not be carried out when rain is imminent and/or during windy periods (winds greater than 15kph). Marker dye may be used for quality control purposes. No herbicides shall be discharged into or over flowing water or where there is potential for spray drift into or over water. All mixing of spray chemicals and cleaning of equipment shall be undertaken at a sufficient distance (>5m) from any surface water body, with appropriate techniques used to reduce the risk of spillage.

Plant maintenance:
Maintenance consists of controlling weeds to a 0.6m radial area around each of the planted native plants within that site (roughly equivalent to two passes with a standard knapsack nozzle sprayer). Care should be taken to ensure all native seedlings growing within the maintenance radius are avoided.

Pest plant control:
Foliar spraying via knapsack is effective for large low-lying weed infestations, seedlings, and isolated plants where there are no immediately adjacent desirable species. Foliar spray should be applied evenly to the target plant, ensuring good cover is achieved.

Basal bark technique:
The basal bark technique uses a knapsack to apply 120g/l triclopyr with an oil adjuvant (eg X-Tree Basal) onto the lower trucks of woody tree species including pines, willows, alders, sycamores, hawthorns, cotoneasters etc. The technique is most effective on saplings and trees with a stem diameter of less than 20cm and which have not yet developed thick bark. The kill may take up to one year, and trees are left standing dead.

Use an adjustable cone nozzle or narrow angle flat fan spray tip at very low pressure (ie one or two pumps of the knapsack) to prevent spray drift beyond the trunk or splashback off the trunk.

Apply the herbicide to at least twice the heigh of the diameter of the tree being treated, be generous with the amount applied to the bark. Spray to saturate the entire circumference of the bottom of the trunk, including the root collar area. Take care to stop spraying at the point runoff from the bark, otherwise herbicide may get into the ground and damage other non-target plants.

Do not spray during or immediately after rain, wet bark will reduce effectiveness and increase runoff.

Drill and inject application

Task / Steps

For control of woody weeds with a stump diameter of 200mm or larger. Note: Drill and inject is technically an 'off-label" use of herbicide, however it is an accepted industry standard methodology and may be used by Environment Canterbury staff and contractors following this SOP.

Specification:

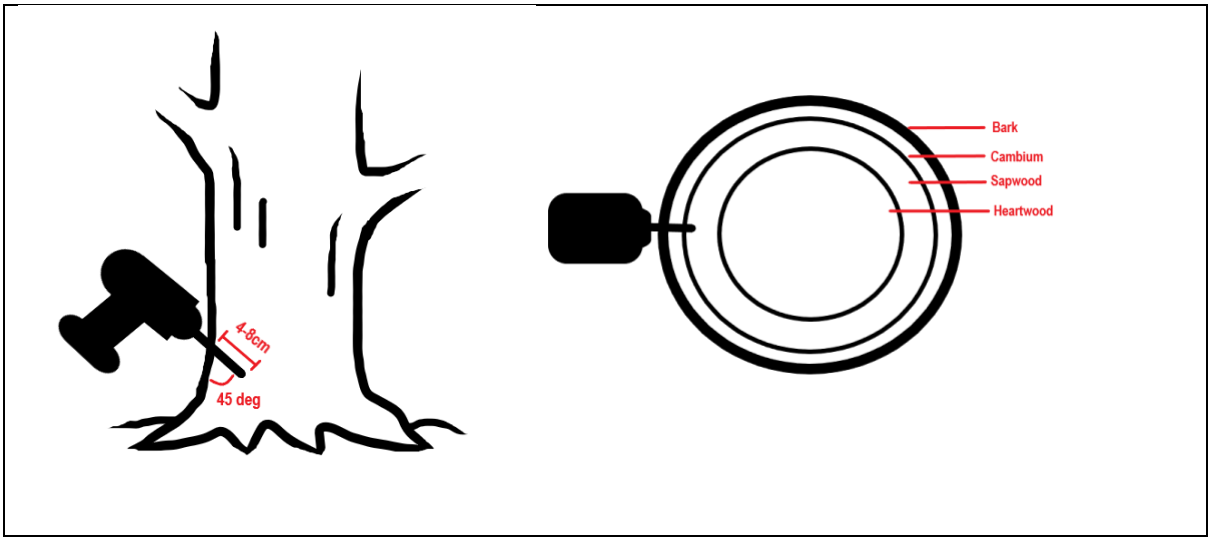
Carried out via battery or petrol-powered drill fitted with a 10-20mm wood bit or auger. Petrol-powered drills should not be used in environments where there is a high fire risk, or if being used in such a situation, portable fire extinguishers must be carried. If in steep terrain, consider whether petrol-powered drills can be used safely. If battery powered drills are being used a LiPo bag must be used to safeguard batteries during charging, transportation, and storage to prevent the severity of fire. Application is via a bottle or a backpack applicator with a nozzle that extends outwards to allow dispensing of the herbicide into the drilled hole.

All mixing/filling of spray chemicals and cleaning of equipment shall be undertaken at a sufficient distance (>20m) from any surface water body, with appropriate techniques used to reduce the risk of spillage. Effort should be made to fill/mix on open hard surfaces and areas with suitable access to an emergency spill kit. If possible, the mixing site should have an impervious surface to avoid soil contamination.

All practicable steps shall be taken to minimise impact on public access, recreation, and safety. Consider alternative control methods if a tree will become a significant hazard around public walking/access tracks, power lines, fence lines once controlled and left standing.

Pest plant control:
The best time to drill and fill is during active growing conditions, typically between September and February each year, although this may vary with climate and target species. Target species include sycamore, willow species, elder, hawthorn, alder, and pine species.

Holes should be drilled at even spaces around the trunk to ensure an even distribution of the chemical throughout the tree. The number of holes drilled depends on the size of diameter at breast height (DBH) and herbicide mix used. On multi-stem trees, each stem should be treated as a separate tree. Holes should be drilled on a downward angle (approx. 45° down) to a depth of between 4 – 8cm. The hole should be filled with 10mls of the herbicide immediately after drilling. The herbicide should reach up to the cambium layer at the outer edge of the sapwood to ensure uptake via xylem and phloem.



Cut and Paste application

Task/Steps

Used to control woody weeds, larger climbers that have woody stems and multi-stemmed shrubs, e.g., broom, old man's beard, alder, blackberry, cotoneaster, juvenile willow etc. Generally, for pest plants between 0.5 metres and 3.0 metres high.

Specification:

Direct application or manual methods such as cut and paste application should be used to minimise the volume of herbicide used and non-target effects.

Trunks/stems of the plant will be cut close to the ground as possible. This is most commonly carried out using a handsaw, however, chainsaws and axes may also be used. Ensure cut is made away from you and the area around you is clear of any obstructions. Herbicide should then be immediately applied to the stump as the vascular tissue starts to seal relatively quickly, this will ensure herbicide uptake into the stump and root system. Cutting stems level to the ground will also reduce herbicide run off. This will be either a gel-based herbicide in an applicator bottle, or a liquid in a small hand-held spray bottle. A coloured dye in the solution is useful to mark and track stumps that have been treated.

Frilling

Task/Steps

For control of woody weeds

This method is commonly used as an alternative to the cut/paste or drill and fill method for trees and woody weeds with stems or trunks greater than 5cm in circumference.

All practicable steps shall be taken to minimise impact on public access, recreation, and safety. Consider alternative control methods if a tree will become a significant hazard around public walking/access tracks, power lines, fence lines once controlled and left standing.

Specification:

Frilling involves making deep cuts at a downward angle into tree trunks at regular intervals around the base to expose the cambium layer. Herbicide is then immediately applied to the fresh cut using a paint brush or low-pressure sprayer (such as a knapsack). Care must be taken not to 'ring bark' the tree as this will reduce the herbicide absorption. This is usually carried out with a handsaw or hatchet, but chainsaws may be used also.

Lower branches may need to be cut to gain access to the tree for chemical application. When frilling, take into consideration the terrain. Ensure you have stable footing and the area around you is clear of any obstructions.

Water Sampling procedure (where required)

For specific guidance on the type of sampling required, timing and frequency, consult the consent or permission you are operating under

1. Make sure you have the correct bottles on site for the substance being sampled (Note: Hills Lab will supply the correct sample bottle for the substance being sampled for so only use what has been supplied by Hills Lab for that task).
2. With clean hands, label your bottle **before** taking the sample. Label with site name, date and time.
3. Taking care not to touch the inside of the sample bottle or lid, unscrew the lid, place bottle facing upstream into the flow of water and take sample from a mid-position within the water column and completely fill the sample bottle to the top. Replace lid tightly.
4. Wash hands after sampling.
5. Keep samples cool and out of direct sunlight.
6. Fill out the sample submission form (called a chain of custody form) – sample name on the form must match what is on the label on the bottle. Clearly note the date and time the sample was taken. Create a purchase order number and add this to the sample submission form.
7. Send or deliver the samples to the Lab (Hills Laboratory, 101C Waterloo Road Hornby)
8. Where sample results show a breach of prescribed limits under consent or permission conditions, there may be a requirement to undertake further sampling, please consult the consent and/permission conditions to understand what these may be

Work in the road corridor

Any pre-work inspections, spraying operations and post-work inspections within the road corridor must only be carried out by suitably qualified staff operating under an approved traffic management plan.

Disestablishing work site/work completion

- Clean down spray equipment at a depot or in a position where spillages cannot enter open water (>20m from water's edge) or shallow groundwater or wells. Thoroughly clean down gear to prevent cross-contamination of sprays.
- Remove site demarcation but leave any deployed spray signs in place for at least 24hours after application has been completed. Collect signs back in within 72 hours of spray completion.
- Take all empty spray containers back to a depot for recycling. Containers must be triple rinsed, and the rinsings tipped into the spray tank. Rinsing must not be tipped on the ground or into stormwater.
- Complete daily spray logbook, recording the following information:
    - Date of application
    - Applicators name

- Start and finish time of application
- Description of spray Location (area)
- Target plants
- Chemicals (including additives) used, manufacturer's name, mixing rates and quantities used
- Method of application (including equipment, nozzles, speed, pressure, water rate)
- Weather conditions, including estimated wind speed and direction and rain.

Additional information that may be recorded includes:

- PPE worn
- Measures taken to avoid spray drift from occurring
- Sensitive sites surrounding spray area
- Any re-entry/withholding requirements for substance
- Notes about signage or site demarcation used
- Any issues encountered

<table>
<tr><th colspan="3">Emergency Planning</th></tr>
<tr><td>Feasible Emergency Events</td><td colspan="2">Location of Emergency Resources</td></tr>
<tr><td rowspan="4">• Hazardous substance spills
• Ingesting chemical through exposure – breathing, skin, consumption
• Public entering into spray area</td><td>First Aid Kit</td><td>In truck</td></tr>
<tr><td>Fire Extinguisher</td><td>In truck</td></tr>
<tr><td>Other</td><td>Spill Kit in truck</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Method of Emergency Communications</td><td colspan="2"></td></tr>
<tr><td>Cell phone or hand held radio, InReach or similar device for remote work away from reception.</td><td colspan="2"></td></tr>
<tr><td>Location and Contacts for Hospital / Med Centre</td><td colspan="2">Emergency Site Access Point / Address</td></tr>
<tr><td>See Job Sheet for nearest medical centres to work site</td><td colspan="2">Truck</td></tr>
</table>

Attachment 1 - Activity / Task Health and Safety Risk Profile

	In the absence of controls						With controls				
Hazard	Potential Harm	Likelihood	Consequence	Risk Rating: E/H/M/L	Eliminate/ isolate/ minimise	Preventative actions / controls	Likelihood	Consequence	Risk Rating: E/H/M/L	Monitoring	Review
Heavy / mobile machinery mounted spray equipment -trucks - tractor	Roll or tip over harming the operator	Moderate	Catastrophic	E	Have currently eliminated sitting on spray equipment until full review of safest mode of operation has been completed	Roll/tip over protected Operate only at walking pace Operate only on ground conditions where the risk of rolling or tipping over is negligible Ensure gear is in good working order with regularly maintenance and prestart checks Competent and qualified drivers only	Unlikely	Moderate	M This may be Low once review finalised	Monitoring as determined through work review	Annually
Hazardous Substances - Chemical handling and use,	Exposure to toxic products resulting in skin, eye,	Likely	Moderate – major depending on	H-E	Minimise	Trained operators Safety gear in use and fit for purpose	Moderate	Unlikely	M	Inspections of works sites to check requirements	Annually

including mixing	respiratory irritation or damage (harm is dependent on product classification)		substance and dose			Carried out in appropriate locations				are being followed	
Hazardous Substances - Storage of chemicals	Emergency events or spillages at chemical stores	Likely	Moderate	H	Minimise	Regularly inspected and maintained to standards Minimum vols held as possible PIC of store with overall oversight Emergency management plans in place and routinely practiced	Unlikely	Insignificant	L	6 monthly audits of stores and updates to record keeping Annual practice of emergency response	Annually
Public entering spray sites	Exposing members of the public to agrichemicals Aggressive behaviour towards ECan or contractor operators	Moderate	Moderate	H	Minimise	Pre communication Site demarcation and spotters	Unlikely	Moderate	M	Inspections of works sites to check requirements are being followed	Annually
Working outdoors	Slips. Trips, falls Sprains and Strains	Moderate	Likely	E	Minimise	Site specific risk assessments and Hazard ID	Moderate	Unlikely	M	Inspections of works sites to check requirements	Annually

- Rough terrain - Unstable footing - Weather extremes	Heat stress					carried out before works Appropriate footwear Fitness of operators				are being followed	
Working outdoors - Encountering wild or aggressive farm animals, wasps, bees etc	Injury to staff Stings or bites and potential for serious allergic reaction	Major	Moderate	E	Minimise	Site specific risk assessments and Hazard ID carried out before works Pre works notification to landowners Medications to hand as needed	Moderate	Unlikely	M	Inspections of works sites to check requirements are being followed	Annually
Working in or near water - Including rivers and lakes	Falling in Drowning	Unlikely	Catastrophic	E	Minimise	Water safety training completed Work in pairs when adjacent to unwadable or fast flowing water Safety gear in use	Rare	Moderate	M	Inspections of works sites to check requirements are being followed	Annually
Working alone or in remote locations with limited comms	Restricted access to emergency assistance	Moderate	Major	E	Minimise	Pre-check for cell coverage Tell someone plans for the day Two way monitored comms at all times including InReach / GetHomeSafe in use	Unlikely	Moderate	M	Inspections of works sites to check requirements are being followed	Annually

						Office buddy keeping an eye on progress					
Works or inspections in the road or rail corridor	Death or injury to staff or public if there is an accident	Moderate	Catastrophic	E	Minimise	Trained operators only Follow requirements set out in applicable TMP Time work to avoid busy traffic Obtain Kiwirail approval prior to any works in the rail corridor	Unlikely	Moderate	M	Inspections of works sites to check requirements are being followed	Annually
Sprayed trees affecting powerlines - Dead trees falling over etc	Power outages Fires	Unlikely	Major	H	Eliminate	Risk assessment carried out prior to works starting Fell tree (using appropriately qualified operator) if possible it may affect lines	Rare	Insignificant	L	Inspections of works sites to check requirements are being followed	Annually

RISK RATING TABLE				
Likelihood of injury or harm to health	Consequences of injury or harm to health			
	Insignificant *no injuries*	Moderate *first aid and/ or medical treatment*	Major *extensive injuries*	Catastrophic *fatalities*
Very likely	High	Extreme	Extreme	Extreme
Likely	Moderate	High	Extreme	Extreme
Moderate	Low	High	Extreme	Extreme
Unlikely	Low	Moderate	High	Extreme
Highly unlikely (rare)	Low	Moderate	High	High

Extreme = immediate action

	Version	Date Published	Section Managers		Health, Safety, Wellbeing partner	General Manager – Field Operations
SOP Approval	3	21/09/2023	**Rivers**	David Aires	Tony Higgison	Leigh Griffiths
			Biosecurity, Parks and Forests	Carl Diamond		Leigh Griffiths
			Zone Delivery	Johannes Welsch		21/09/23
			Science	Carl Hansen		

Notice of Operations | Hekeao Hinds River targeted weed regrowth control

WHAT: Ground spraying for targeted weed control of gorse, broom, lupin and willow in the fairway.

WHY: Improve flood-carrying capacity of the river within the fairway, manage weed infestations and enhance biodiversity values, and reduce erosion to the bed and banks of the river.

WHERE: The Hekeao Hinds River, downstream of the Pooles Road River crossing and above lower beach road river access - see maps.

WHEN: Starting after the Waitangi public holiday week (February the 12th) as weather conditions allow for up to three weeks.

Works will involve a modified ute or ATV with a boom or other vehicle mounted spraying equipment for targeted spraying. Water will be avoided. Hand spraying of larger vegetation (gorse gun) will occur where needed. Signage indicating that spraying is occurring will be placed near all spray operation areas and at public access points to the affected river areas.

Why do we control weeds in the riverbed?

Qualified Environment Canterbury staff and contractors carry out weed control measures in the open riverbed to help flood flows pass through, and to enhance biodiversity values.

Left unchecked the vegetation is a flood risk, occupying the channel and forcing flood waters towards farmland and riverside communities. Weed growth can also contribute to the loss of aquatic and terrestrial habitats for endemic fauna including native birds.

What chemicals are we using for this targeted weed control?

For this project, Environment Canterbury contractors will be using herbicide with glyphosate as the active ingredient, under strict controls in accordance with approved resource consent conditions.

Glyphosate is regulated in New Zealand by the NZ Environmental Protection Authority (EPA) and there are laws around its use. Products containing Glyphosate are considered safe, provided the safety instructions on the product labels are followed.

For more information about why and how we control weeds in rivers see: www.ecan.govt.nz/weedcontrol.

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For any enquiries, please contact:

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Map 1 | Zone of operation

'The area of works is outlined in Yellow'.