

ISLAND LANDCARE (FALKLAND ISLANDS)

NATIONAL PURPLE THISTLE CONTROL PROGRAMME 2021 - 2024

POST VISIT CONTROL REPORTS 2021 - 2022 SEASON



Spear thistle growing in sea cabbage at Saunders Island

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BACKGROUND

Spear thistles *Cirsium vulgare* and creeping thistles *Cirsium arvense* are known from 12 sites around the Falkland Islands (see map below). A full history of control work carried out on these two species is described in the report *Overview of the Island LandCare Spear Thistle Control Programme 2018-2021* (Poncet and Passfield 2021). This report also contains detailed maps of the distribution of each species for each control site.

In 2021, the Falkland Islands Government's Environmental Studies Budget awarded Island LandCare three years' funding to carry out two annual control visits to the majority of sites with spear thistles and one annual visit to most sites with creeping thistles. Sites not covered by ESB funding are the MOD land at East Cove and MPC (thistles at these sites are controlled by the MOD's contractors), Stanley Common (controlled by Island LandCare with funding from the Environmental Department), and all creeping thistle sites within the Stanley town boundary, which are the responsibility of the PWD.

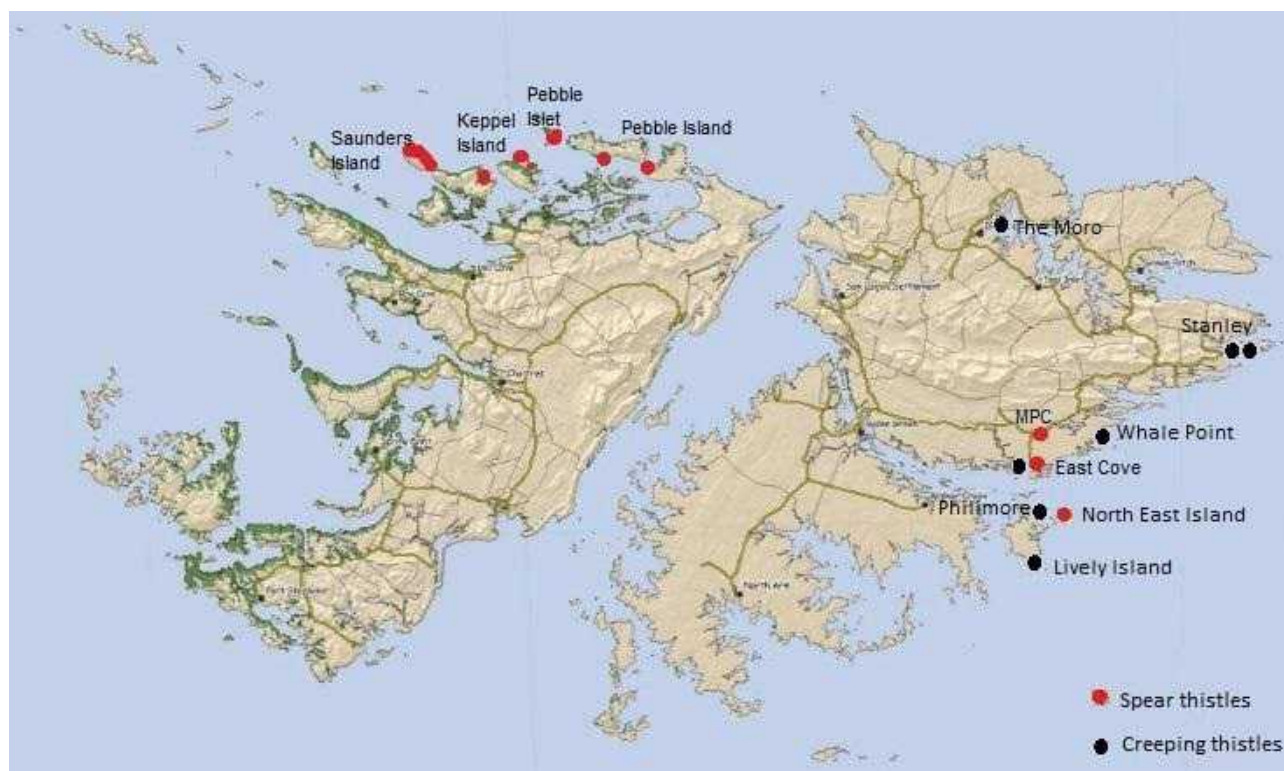


Fig 1: Spear thistle and creeping thistle locations around the Falkland Islands

METHODOLOGY

Targeted application of selective herbicides is the preferred method of dealing with thistles at all stages of growth. Herbicides used are either Meturon (active ingredient metsulfuronmethyl @ 600g/kg) or Grazon (active ingredient triclopyr 600g/litre). Both of these herbicides have been designed for use on pasture weeds. Given the very small quantities of herbicides used in targeted spot-spraying it would be impossible for livestock or geese to ingest enough poison to cause any harm. Spraying is only carried out in suitable weather conditions, ie less than 20 knots of wind and dry conditions. Manual control is occasionally carried out on spear thistles. A sharp chisel hoe or knife is used to cut the tap root about one inch below ground level. Manual control is not used for creeping thistles as this encourages the plant to spread by breaking the the root mass into smaller pieces.

Operators' search tracks and hours worked and travelled, plant GPS co-ordinates and spray information (type of treatment, herbicide, infested area and quantity of spray used) are archived with Island LandCare and backed up with our data manager, Kelvin Floyd, of Indigena Biosecurity International Ltd New Zealand. All data are recorded in the field on a mobile phone app and synced to the Falkland Islands Weed Database at the end of each fieldwork session. The app and database were developed by Kelvin who we work with on the South Georgia weed control programme and who provides expert technical advice as and when required.

BIOSECURITY

Particular attention is paid to biosecurity and cleaning all gear between sites to avoid spreading any seeds around. Boots and gear are dipped in Virkon disinfectant when travelling between islands.

SAUNDERS ISLAND

Weed species: Spear thistle *Cirsium vulgare*
 Weed locations: Elephant Point and the Sugarloaf
 ILC control initiated: 2015
 Number of annual visits: 2
 Overall search area: 300 ha
 Landowner/contact: David and Suzan Pole-Evans, Saunders Island Farm
 Co-funding: Saunders Island Farm for accommodation, use of quad bike and motorbike, food and general support. Bad weather contingency days and travel days provided by Island LandCare.
 Accommodation + Access: Either at Saunders settlement or cabin at the Neck, access by FIGAS or yacht *Porvenir II*

Saunders Island	Spear Thistles <i>Cirsium vulgare</i> - main control visit
Date(s) of visit	7 - 12 December 2021
Area searched	300 ha
Operator(s)	K Passfield, S Poncet
Weed cover	0.007 ha
Area controlled	0.007 ha
Hours of work + travel	34 + 14 (not including travel to/from Saunders Island)
No. of days invoiced	6
Control method	Foliar application of herbicide using knapsack sprayers, with some chisel hoeing
Herbicide mix	Meturon @ 0.5g/litre, organosilicone @ 1ml/litre, red dye @ 8ml/litre
Litres of mix applied	12.3 litres
Comments	Thistles were present at all areas where previously found, however both the surface area of thistles sprayed and total litres of herbicide used continue to decrease, as shown in Tables 1 and 2 below. Fewer than a dozen plants were found that had set seed the previous year and these were mostly spindly plants in dry areas that were unlikely to produce much fertile seed.
Followup work	Next visit recommended March/April 2022

Saunders Island	Spear Thistles <i>Cirsium vulgare</i> - followup control visit
Date (s) of visit	12 - 14 April 2022
Area searched	300 ha
Operator(s)	K Passfield
Weed cover	0.002 ha
Area controlled	0.002 ha
Hours of work + travel	20 + 4 (not including travel to/from Saunders Island)
No. of days invoiced	3
Control method	Hand pulling of mature plants and cutting roots of growing plants
Herbicide mix	n/a
Litres of mix applied	n/a
Comments	The majority of plants were 20 - 30 cm high and in the final stage of developing thistledown, however few had actually released any seed. Only three large 60 - 80 cm high plants were actually starting to release thistledown; all were manually removed. Seedlings and rosettes found were chisel-hoed. No plants were found in any new areas. None were visible on the islands in Big Pond. Overall it was a very heartening visit with thistle numbers continuing to decline. Saunders Island residents also continue to manually remove plants when found and this helps with the continued decline in thistle numbers.
Followup work	Next visit recommended spring 2022

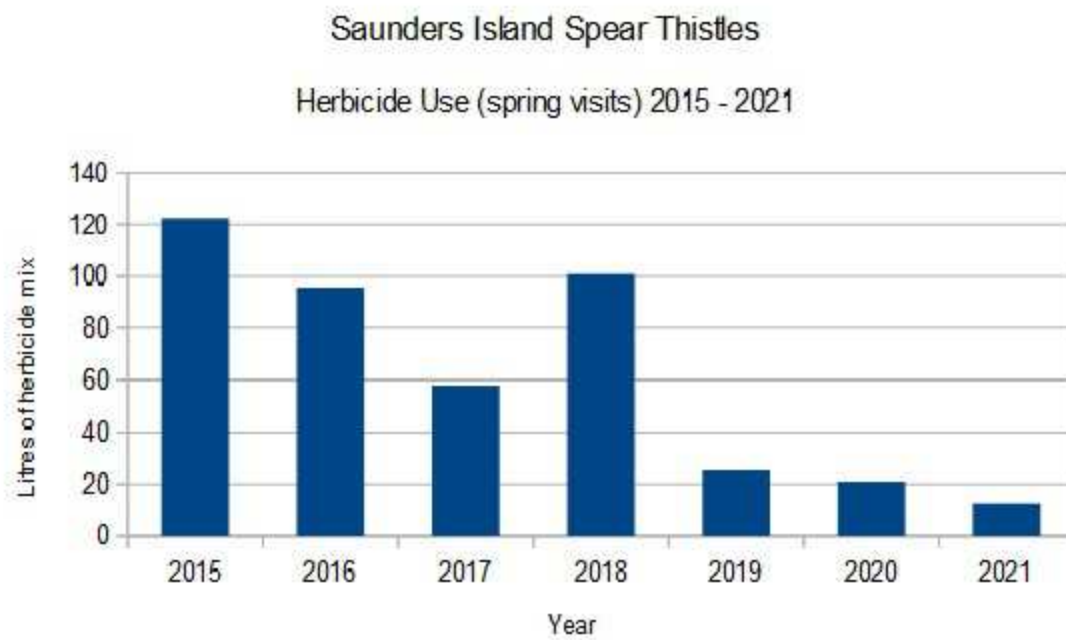


Table 1. Changes in the quantity of herbicide applied to spear thistles on Saunders Island between 2015 and 2021.

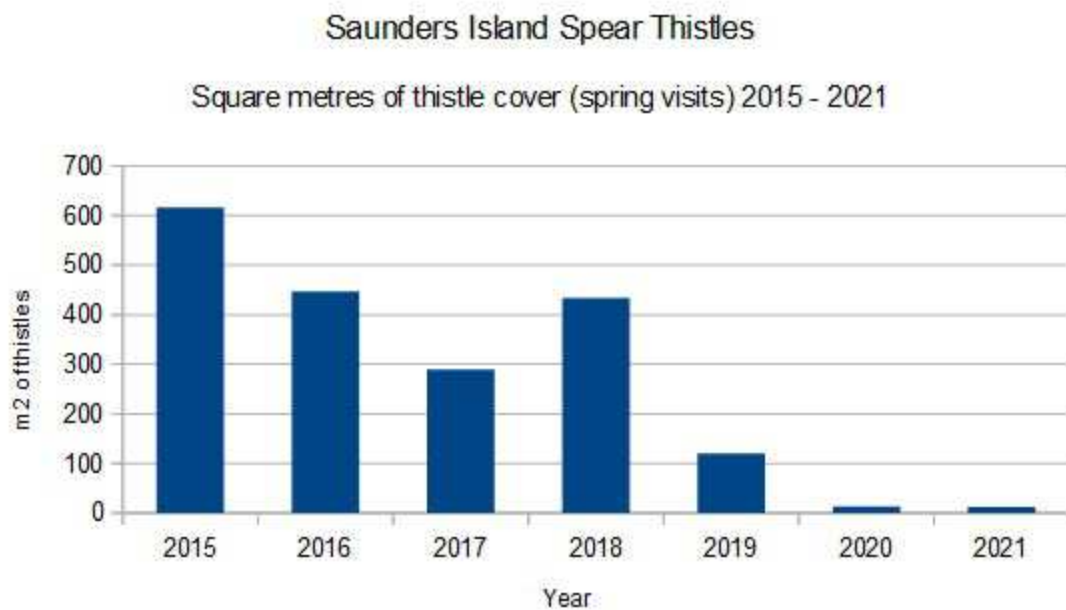


Table 2. Changes in the surface area (square metres) of spear thistles on Saunders Island between 2015 and 2021.

KEPPEL ISLAND

Weed species: Spear thistle *Cirsium vulgare* and Calafate *Berberis microphylla*
 Weed locations: Spear thistles mostly between Robinson Point and North Point, plus some east coast outliers. Calafate core area around the settlement paddocks, plus a few outliers
 ILC control initiated: 2017
 Number of annual visits: 2
 Overall search area: 400 ha
 Landowner/contact: Mr L Fell
 Co-funding: Use of motorbike and bad weather contingency days and travel days provided by Island LandCare. Grazon herbicide donated by Government of South Georgia and South Sandwich Islands
 Accommodation + Access: Yacht *Porvenir II*

Keppel Island	Spear Thistles <i>Cirsium vulgare</i> - main control visit
Date (s) of visit	22 October and 30 November to 3 December 2021
Operator(s)	K Passfield, S Poncet
Area searched	400 ha
Weed cover	0.134 ha
Area controlled	0.134 ha
Hours of work + travel	79 + 22 (not including travel to/from Keppel Island)
No. of days invoiced	10
Control method	Foliar application of herbicide using knapsack sprayers plus some chisel hoeing
Herbicide mix	Mix 1: Grazon @ 6ml/litre, organosilicone @ 1ml/litre, red dye @ 8ml/litre Mix 2: Meturon @ 0.5g/litre, organosilicone @ 1ml/litre, red dye @ 8ml/litre
Litres of mix applied	Mix 1: 84 litres, Mix 2: 181 litres
Comments	<p>A single day visit was made on 22 October, in order to assess the state of thistle growth and to spray the core area only, using a Grazon mix (a faster acting herbicide than Meturon), so that all plants sprayed would be visibly dead on return in November.</p> <p>Overall, on the second visit in November/December we felt that thistle cover was reducing compared to previous years and this was confirmed by the spray data and square metres of coverage (see Tables 3 and 4 below). Given the fact the plants had been spreading exponentially and setting seed for at least a decade prior to the start of sustained control in 2017, there is undoubtedly a high seed bank in the ground and it will take several more years to see the dramatic reduction in coverage achieved on neighbouring Saunders Island.</p> <p>Chisel hoeing was trialled in the sandgrass areas for one day on 30 November, however it was felt to be less efficient than spraying so was not continued.</p>
Followup work	Next visit recommended March/April 2022

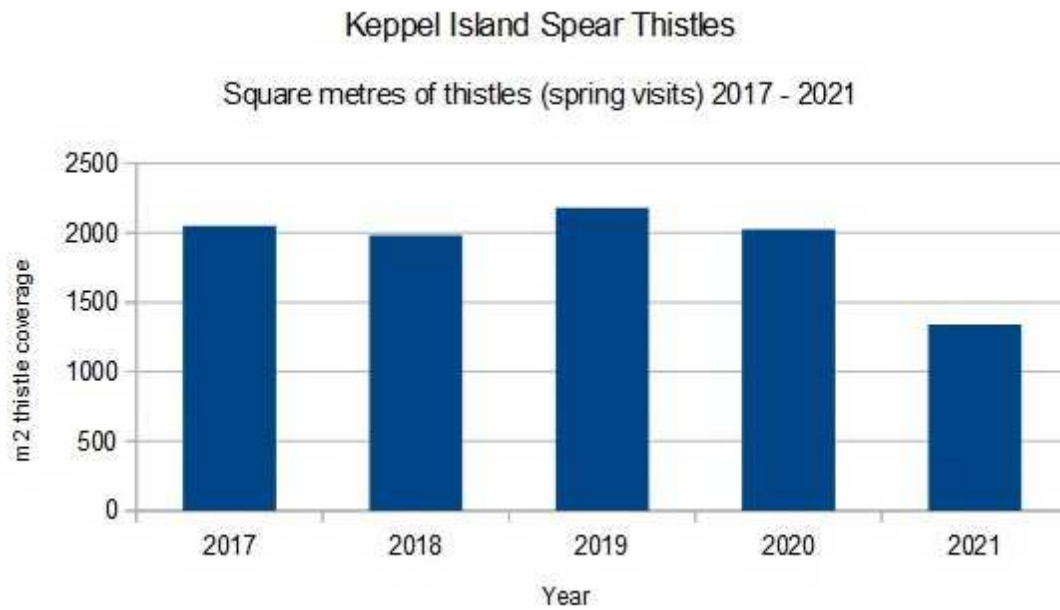


Table 3. Changes in surface area of spear thistles on Keppel Island on spring visits between 2017 and 2021.

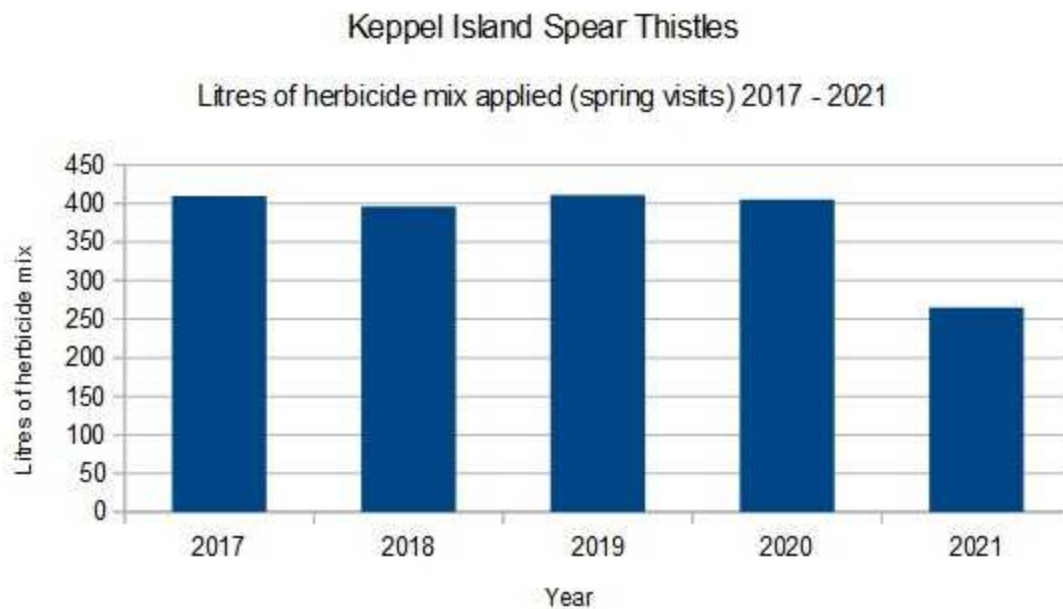


Table 4. Changes in the surface area (square metres) of spear thistles on Keppel Island on spring visits between 2017 and 2021.

Keppel Island	Spear Thistles <i>Cirsium vulgare</i> - followup control visit
Date (s) of visit	4 - 8 April 2022
Operator(s)	K Passfield
Area searched	400 ha
Weed cover	0.0932 ha
Area controlled	0.0932 ha
Hours of work + travel	38 + 6 (not including travel to/from Keppel Island)
No. of days invoiced	5
Control method	Foliar application of herbicide using knapsack sprayers plus some hand pulling
Herbicide mix	Meturon @ 0.5g/litre, organosilicone @ 1ml/litre, red dye @ 8ml/litre
Litres of mix applied	185.5
Comments	Plants were found at all stages from seedlings to large (1m +) mature bushes. However there were only 10 very large bushes that were actually releasing thistle down. The latter, plus all bushes with developing seed heads, were handpulled and stamped into the ground in ditches or between sandgrass bogs. It was thought unlikely that these would all go on to set seed at this late stage of the year. No plants were found in completely new areas; however there does seem to be a slow creep of plants into areas adjacent to infested areas. As the seed production has been cut by 99% since control started in 2017 it is likely that these seeds were already in place and have taken several years to germinate.
Followup work	Next visit recommended spring 2022

The Purple Thistle Control Programme 2021 - 2024 also includes four days per annum for calafate spraying on Keppel Island. As we are on the island spraying thistles anyway, it makes sense to continue calafate follow up and maintain the momentum on eradicating this noxious weed from Keppel Island, which, prior to control, was the second largest infestation in the Falklands after the Port Sussex area. More information on calafate control on Keppel, and distribution maps, can be found in the report *Island LandCare's Remote Sites Weed Control Program 2020-2021* (K. Passfield and S Poncet (2021).

Keppel Island	Calafate <i>Berberis microphylla</i> - main control visit
Date (s) of visit	22 to 27 October 2021
Operator(s)	K Passfield, S Poncet
Area searched	200 ha
Weed cover	0.056 ha
Area controlled	0.056 ha
Hours of work + travel	37 + 3 (not including travel to/from Keppel Island)
No. of days invoiced	5
Control method	Foliar application of herbicide using knapsack sprayers
Herbicide mix	Eliminate® (triclopyr & picloram) @ 6 ml/litre, Eradicate® (metsulfuron) @ 0.5g/litre, organosilicone @ 1ml/litre, red dye @ 8ml/litre
Litres of mix applied	119 litres
Comments	Followup was carried out in all areas. Plants were found at all stages from tiny seedlings to creeping suckers spreading out from previously dead bushes. For monitoring purposes the number of plants sprayed within the cemetery area is counted every year. As this is a small area, it can be presumed that all plants are found every time, therefore the continued appearance of new seedlings (but fewer every year) is a useful indicator of the size and longevity of the seed bank in the soil.
Followup work	Next visit recommended October 2022

PEBBLE ISLET

Weed species: Spear thistle *Cirsium vulgare*
 Weed locations: One patch on S coast, one on N coast
 ILC control initiated: 2018
 Number of annual visits: 2
 Overall search area: 2 ha
 Landowner/contact: Dean Brothers Ltd.
 Co-funding: Bad weather contingency days and travel days provided by Island LandCare.
 Accommodation + Access: Yacht *Porvenir II*

Pebble Islet	Spear Thistles <i>Cirsium vulgare</i> - main control visit
Date of visit	06/12/21
Operator(s)	K Passfield, S Poncet
Area searched	2 ha
Weed cover	0.008 ha
Area controlled	0.008 ha
Hours of work + travel	6 + 8
No. of days invoiced	2
Control method	Foliar application of herbicide using knapsack sprayers
Herbicide mix	Meturon @ 0.5g/litre, organosilicone @ 1ml/litre, red dye @ 8ml/litre
Litres of mix applied	16 litres
Comments	Thistles did not appear to have spread beyond the original infested patches of both the north and south coast sites. Only 4 small dead plants with thistledown were found, all on the south coast site, these are plants that were missed past year.
Followup work	Next visit recommended March/April 2022. May be worth searching the entire coast again for thistles, this was last done in 2017.

Pebble Islet	Spear Thistles <i>Cirsium vulgare</i> - followup visit
Date of visit	10 April 2022
Operator(s)	K Passfield
Area searched	2 ha
Weed cover	0.002 ha
Area controlled	0.002 ha
Hours of work + travel	3 + 4
No. of days invoiced	1
Control method	Foliar application of herbicide using knapsack sprayers
Herbicide mix	Meturon @ 0.5g/litre, organosilicone @ 1ml/litre, red dye @ 8ml/litre
Litres of mix applied	4
Comments	No large plants found, only half a dozen stunted ones with some thistledown starting to release
Followup work	Next visit recommended spring 2022.

PEBBLE ISLAND

Weed species: Spear thistle *Cirsium vulgare*
 Weed locations: Rabbit Point and Pebble Settlement
 ILC control initiated: 2020
 Number of annual visits: 2
 Overall search area: 2 ha
 Landowner/contact: Alex and Dot Gould, Pebble Island Farm
 Co-funding: Bad weather contingency days and travel days provided by Island LandCare.
 Accommodation + Access: Yacht *Porvenir II*

Pebble Island	Spear Thistles <i>Cirsium vulgare</i> - main control visit
Date of visit	10/12/21
Operator(s)	K Passfield, S Poncet
Area searched	2 ha
Weed cover	0.003 ha
Area controlled	0.003 ha
Hours of work + travel	4 (not including travel to/from Pebble Island)
No. of days invoiced	1
Control method	Foliar application of herbicide using knapsack sprayers
Herbicide mix	Meturon @ 0.5g/litre, organosilicone @ 1ml/litre, red dye @ 8ml/litre
Litres of mix applied	12 litres
Comments	<p>The Rabbit Point site had its usual growth of seedlings in the shingle at the high tide mark indicating that the seeds must be very salt tolerant. One plant was found at the top of the bank that had been missed last year and had gone on to set seed. A very heavy spray rate was used along the beach.</p> <p>In the settlement, there were several extremely large thistles growing in the fertile ground around old gardens, although none had developing flower heads. These were easy to find and deal with.</p>
Followup work	Next visit recommended March/April 2022.

Pebble Island	Spear Thistles <i>Cirsium vulgare</i> - followup control visit
Date of visit	10 - 11 April 2022
Area searched	2 ha
Weed cover	0.0001 ha
Area controlled	0.0001 ha
Hours of work + travel	4 (not including travel to/from Pebble Island)
No. of days invoiced	0.5
Control method	Foliar application of herbicide using knapsack sprayers
Herbicide mix	Meturon @ 0.5g/litre, organosilicone @ 1ml/litre, red dye @ 8ml/litre
Litres of mix applied	0.2
Comments	<p>Only one seedling and one small rosette found at Rabbit Point. High tides plus erosion of the clay bank appeared to have covered over most of the thistle habitat.</p> <p>In the settlement a dozen plants were found at the usual locations, none with thistle down.</p>
Followup work	Next visit recommended spring 2022.

FITZROY FARM

Weed species: Spear thistle *Cirsium vulgare* and creeping thistle *Cirsium arvense*
 Weed locations: Spear thistles: March Ridge old dump site, Bertha's Beach Gate, Bertha's Valley, Portops
 Creeping thistles: Portops and Whale Point
 ILC control initiated: 2018
 Number of annual visits: 2
 Overall search area: 10 ha
 Landowner/contact: Gilberto Castro, Fitzroy Farm Manager, Falklands Landholdings Corporation
 Co-funding: One additional day of thistle control funded by FLH
 Accommodation + Access: Day visit by road from Stanley

Fitzroy Farm	Spear Thistles <i>Cirsium vulgare</i> - main control visit
Date (s) of visit	12/10/21
Operator(s)	K Passfield, S Poncet
Area searched	10 ha
Weed cover	0.0078 ha
Area controlled	0.0078 ha
Hours of work + travel	12 + 4
No. of days invoiced	2
Control method	Foliar application of herbicide using knapsack sprayers and chisel hoe
Herbicide mix	Meturon @ 0.5g/litre, organosilicone @ 1ml/litre, red dye @ 8ml/litre
Litres of mix applied	14 litres
Comments	We trialled the use of a chisel hoe and knife (instead of herbicide) to remove spear thistles between the whitegrass bogs at Bertha's Valley and found it was far more time-consuming than spraying. The latter is faster and more effective because the waft of spray reaches not only the visible seedlings but those hidden by vegetation.
Followup work	Next visit recommended December 2021.

Fitzroy Farm	Spear Thistles <i>Cirsium vulgare</i> - followup control visit
Date (s) of visit	21/12/21
Area searched	2 ha
Weed cover	0.0155 ha
Area controlled	0.0155 ha
Hours of work + travel	12 + 4
No. of days invoiced	2
Control method	Foliar application of herbicide using knapsack sprayers
Herbicide mix	Meturon @ 0.5g/litre, organosilicone @ 1ml/litre, red dye @ 8ml/litre
Litres of mix applied	31 litres
Comments	<p>Spear thistles had grown considerably since October, when the majority were only seedlings and small rosettes. Had they not been sprayed in October, it was apparent that they would still have not set seed by December, and furthermore they would have been larger and easier to spot. We conclude that early season visits in October are not necessary, and that main control can be left till December.</p> <p>There was no noticeable reduction of thistles at any of the sites. At the Bertha's Valley site, this is most likely due to the current rotational sheep grazing regime which has opened up the whitegrass canopy, allowing more thistle seeds to germinate than would have been the case when set-stocked. The other spear thistle sites continue to be colonised by seeds blowing in from MOD managed land next door, with the result that thistles are spreading into new areas of whitegrass at the Bertha's Beach Gate site.</p>
Followup work	Next visit recommended March/April 2022.

Fitzroy Farm	Spear Thistles <i>Cirsium vulgare</i> - followup control visit
Date (s) of visit	11/04/22
Operator(s)	S Poncet, S Lee
Area searched	10 ha
Weed cover	0.0009ha
Area controlled	0.0009ha
Hours of work + travel	7 + 2
No. of days invoiced	1
Control method	Manual removal
Herbicide mix	n/a
Litres of mix applied	n/a
Comments	A knife was used to remove thistles; the majority were small mature plants with purple flower heads. Only a very few of them had developed thistledown and these were removed and placed in ditches, then covered with rocks. All of the thistles on the adjacent MOD managed land had been sprayed very effectively for the first time at some point over the summer, with far more dead thistles seen than live ones.
Followup work	Next visit recommended spring 2022

Fitzroy Farm	Creeping Thistles <i>Cirsium arvense</i> (Portops) - main control visit
Date (s) of visit	21/12/21
Operator(s)	K Passfield, S Poncet
Area searched	1 ha
Weed cover	0.002 ha
Area controlled	0.002 ha
Hours of work + travel	done concurrently with spear thistle visit above
No. of days invoiced	done concurrently with spear thistle visit above
Control method	Foliar application of herbicide using knapsack sprayers
Herbicide mix	Meturon @ 0.5g/litre, organosilicone @ 1ml/litre, red dye @ 8ml/litre
Litres of mix applied	4 litres
Comments	Coverage continues to decrease from 200 square metres in 2019 to 20 square metres on this visit. However it is necessary to remain vigilant for small outlying patches that are spreading out from the main infestation along the rotovated tracks near Portops.
Followup work	Next visit recommended November/December 2022.

Fitzroy Farm	Creeping thistles <i>Cirsium arvense</i> (Whale Point)
Date (s) of visit	n/a
Area searched	n/a
Weed cover	n/a
Area controlled	n/a
Hours of work + travel	n/a
No. of days invoiced	n/a
Control method	n/a
Herbicide mix	n/a
Litres of mix applied	n/a
Comments	A single patch of 200 sq. m. at Whale Point was first sprayed in December 2019. Only 0.3 sq. m. remained on the February 2021 followup visit. A followup visit every 2 years will be sufficient to monitor this site.
Followup work	Next visit recommended summer 2022/23.

NORTH EAST ISLAND

Weed species: Spear thistle *Cirsium vulgare*
 Weed locations: North East Island northern part
 ILC control initiated: 2020
 Number of annual visits: 2
 Overall search area: 10 ha
 Landowner/contact: Ian Bury, Stanley
 Co-funding: Bad weather contingency days and travel days provided by Island LandCare.
 Accommodation + access: On yacht *Porvenir II*

North East Island	Spear Thistles <i>Cirsium vulgare</i> - main control visit
Date of visit	17/12/21
Operator(s)	K Passfield, S Poncet
Area searched	10 ha
Weed cover	0.0135 ha
Area controlled	0.0135 ha
Hours of work + travel	12 + 4
No. of days invoiced	2
Control method	Foliar application of herbicide using knapsack sprayers
Herbicide mix	Meturon @ 0.5g/litre, organosilicone @ 1ml/litre, red dye @ 8ml/litre
Litres of mix applied	28 litres
Comments	We were somewhat surprised on arrival by the discovery that the approach channel to the usual anchorage, one of the best in the Falklands, had silted up and would not allow access so it was necessary to anchor off the north coast instead. Fewer plants were found than last year (and only 28 litres of herbicide used compared with 39 last year) so one hopes this infestation is getting nipped in the bud at an early stage.
Followup work	Next visit recommended March/April 2022.

North East Island	Spear Thistles <i>Cirsium vulgare</i> - followup control visit
Date of visit	January 2022
Operator(s)	Grant Munro
Area searched	10 ha
Weed cover	1 square metre
Area controlled	1 square metre
Hours of work + travel	n/a
No. of days invoiced	n/a
Control method	manual removal
Herbicide mix	n/a
Litres of mix applied	n/a
Comments	Island visited by Falklands Conservation staff who found only 2 spear thistle plants which they manually removed. With thanks to Grant Munro and David Higgins.
Followup work	Next visit recommended November/December 2022.

PHILIMORE ISLAND

Weed species: Creeping thistle *Cirsium arvense*
Weed locations: Single site on Philimore Island, see map below
ILC control initiated: 2021 (January)
Number of annual visits: 1
Overall search area: 1 ha
Landowner/contact: Sally Poncet, Stanley
Co-funding: none
Accommodation + Access Yacht *Porvenir II*

Philimore Island	Creeping Thistles <i>Cirsium arvense</i> - main control visit
Date (s) of visit	16/12/21
Operator(s)	K Passfield, S Poncet
Area searched	1 ha
Weed cover	0.05 ha
Area controlled	0.05 ha
Hours of work + travel	4 + 4
No. of days invoiced	1
Control method	Foliar application of herbicide using knapsack sprayers
Herbicide mix	Meturon @ 0.5g/litre, organosilicone @ 1ml/litre, red dye @ 8ml/litre
Litres of mix applied	114 litres
Comments	Seawater was used for the herbicide mix as a trial in January 2021 in a marked area, with freshwater used on the rest. The saltwater mix had killed the plants but there did appear to be more regrowth in this area than in the freshwater sprayed area - this may have been due to the saltwater mix being a very light waft - only 10 litres was used. This year nearly all was sprayed with saltwater and at a much heavier rate across the entire patch.
Followup work	Next visit recommended December 2022.

LIVELY ISLAND

Weed species: Creeping thistle *Cirsium arvense*
Weed locations: Single site at south end
ILC control initiated: 2021
Number of annual visits: 1
Overall search area: 1 ha
Landowner/contact: Stephen and Chris Poole, Lively Island
Co-funding: Vehicle access from settlement provided by Stephen Poole
Accommodation + Access: On yacht *Porvenir II* or by FIGAS

Lively Island	Creeping Thistle <i>Cirsium arvense</i> - initial control visit
Date (s) of visit	15/12/21
Operator(s)	K Passfield, S Poncet
Area searched	1 ha
Weed cover	0.016 ha
Area controlled	0.016 ha
Hours of work + travel	2 + 4 (not including time to travel to/from Lively Island)
No. of days invoiced	1
Control method	Foliar application of herbicide using knapsack sprayers
Herbicide mix	Meturon @ 0.5g/litre, organosilicone @ 1ml/litre, red dye @ 8ml/litre
Litres of mix applied	36 litres
Comments	This is the first control for this patch reported by Stephen Poole in 2020. The single dense tall patch of thistles is located at the top of the beach, and conveniently near a freshwater pond.
Followup work	Next visit recommended December 2022.

LORENZO FARM

Weed species: Creeping thistle *Cirsium arvense*
Weed locations: Single site at the Moro
ILC control initiated: 2021
Number of annual visits: 1
Overall search area: 1 ha
Landowner/contact: Michael and Jeanette Clarke, Douglas Station
Co-funding: none
Accommodation + Access: Day visit only, access by road from Stanley

Lorenzo Farm	Creeping Thistle <i>Cirsium arvense</i> - initial control visit
Date (s) of visit	24/12/21
Operator(s)	K Passfield, S Poncet
Area searched	1 ha
Weed cover	0.0125 ha
Area controlled	0.0125 ha
Hours of work + travel	2 + 6
No. of days invoiced	1
Control method	Foliar application of herbicide using knapsack sprayers
Herbicide mix	Meturon @ 0.5g/litre, organosilicone @ 1ml/litre, red dye @ 8ml/litre
Litres of mix applied	25 litres
Comments	This was the first control undertaken at this site, reported by Michael Clarke in 2021. The main infestation was along the beach to the north of the jetty with outliers nearby, around the old gardens. Plants were mostly small, some with young developing flower buds (none with purple flowers).
Followup work	Next visit recommended December 2022.