Appendix 8.1: Sloy Pumped Hydro Storage Scheme: Aquatic Macrophyte Outline Invasive Non-native Species Report

Appendix 8.1

Sloy Pumped Hydro Storage Scheme Aquatic Macrophyte Outline Invasive Non-Native Species Management Plan

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Sloy Pumped Hydro Storage Scheme
Aquatic Macrophyte Outline Invasive Non-Native Species Management Plan

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1 INTRODUCTION

1.1 Terms of Reference

EnviroCentre Limited was commissioned by ASH Design + Assessment on behalf of Scottish and Southern Energy Renewables (SSER) to survey aquatic macrophyte Invasive Non-Native Species (INNS) within Inveruglas Bay and Loch Sloy and provide an outline management plan for continued monitoring and mitigation.

1.2 Scope of Report

The scope of this report is to conduct a baseline site survey for aquatic INNS, particularly focusing on Nuttal's pondweed (*Elodea nuttallii*), Canadian pondweed (*Elodea canadensis*), and New Zealand pygmyweed *(Crassula helmsi*i) to determine presence/likely absence in Inveruglas Bay and Loch Sloy within the vicinity of the proposed pump storage intake/outflow.

This report will provide management recommendations for INNS on-site and/or INNS that may be established during the development's operational phase, including recommended treatment options, biosecurity measures, and future monitoring to be implemented during the construction and operational phase.

1.3 Legislation

1.3.1 Wildlife and Countryside Act 1981

Across the UK, the *Wildlife and Countryside Act 1981* prohibits anyone from allowing a Schedule 9 listed plant from growing in the wild[1].

In Scotland specifically, the law on non-native species is covered by the Wildlife and Countryside Act 1981 (as amended by the Wildlife and Natural Environment (Scotland) Act 2012.).

Under such legislation in Scotland, it is an offence to plant, or otherwise cause to grow, a plant in the wild at a location outside its native range[2].

'Native range' is defined in the 1981 Act as "*the locality to which the animal or plant of that type is indigenous and does not refer to any locality to which that type of animal or plant has been imported (whether intentionally or otherwise) by any person*."

The Non-Native Species: Code of Practice defines 'in the wild' as everywhere except for:

- arable and horticultural land
- improved pasture
- settlements
- private and public gardens

[1] Schedule 9 listed species available at: https://www.legislation.gov.uk/ukpga/1981/69/schedule/9 (Accessed July 2024)
[2] NatureScot (2020). Law on non-native species in Scotland [Online] Available at: https://www.nature.scot/professional-advice/protected-areas-and-species/protected-species/invasive-non-native-species/law-non-native-species-scotland (Accessed July 2024)

Canadian pondweed and New Zealand pygmyweed are listed as Schedule 9 species. Nuttall's pondweed is non-native to the UK but is not listed as Schedule 9 species.

1.4 Waterbody Classification

1.4.1 Inveruglas Water

Inveruglas Water is a river (ID: 10162) in the Scotland River basin district's River Leven (Loch Lomond) catchment. The main stem is approximately (approx.) 4.6 kilometres in length. The water body has been designated as a heavily modified water body because of physical alterations that cannot be addressed without a significant impact on water storage for hydroelectricity generation.

1.4.2 Loch Lomond (North)

Loch Lomond (North) is a lake (ID: 100339) in the River Leven (Loch Lomond) catchment of the Scotland River basin district. It is approx. 19.1 square kilometres in area.

1.4.3 Loch Sloy

Loch Sloy is a lake (ID: 100260) in the River Leven (Loch Lomond) catchment of the Scotland River basin district. It is approx. 1.3 square kilometres in area. The water body has been designated as a heavily modified water body because of physical alterations that cannot be addressed without a significant impact on water storage for hydroelectricity generation.

1.5 Report Usage

The information and recommendations contained within this report have been prepared in the specific context stated above and should not be utilised in any other context without prior written permission from EnviroCentre Limited.

If this report is to be submitted for regulatory approval more than 12 months following the report date, it is recommended that it is referred to EnviroCentre Limited for review to ensure that any relevant changes in data, best practice, guidance or legislation in the intervening period are integrated into an updated version of the report.

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2 SURVEY METHODOLOGY

Recent consultation with the Scottish Environmental Protection Agency (SEPA) expressed the need for macrophyte sampling to be undertaken as the target INNS species highlighted as potentially occurring within Inveruglas Bay. The field work was undertaken on 25th June 2024 by Steven Duncan, Lead-Senior Ecologist at EnviroCentre Limited and an Associate member of the Chartered Institute of Ecology and Environmental Management (ACIEEM), and Gary Brown, Senior Aquatic Ecologist and full member of the Institute of Fisheries Management (MIFM).

2.1 Field Survey

The survey methodology for this project was site-specific for determining the presence/absence of the three target INNS species.

The survey consisted of three components: a strandline survey of species uprooted and washed to the shore, a survey of emergent and marginal species, and a wader survey of the shallow littoral zone. The health and safety restrictions placed on Loch Sloy by SSE meant the survey team had to conduct surveys using only a macrophyte rake, as a combination of deep water and steep banks made the waterbody unsafe for surveying by wading.

The survey included a survey utilising waders and a bathyscope, shoreline checks for vegetative material, and sampling involving rake/grapnel collections made from the shoreline within 100m of the areas of interest (sample distance approx.10m from water's edge).

The rake was thrown at a 2m distance from the edge of the water, up to a distance of 10m, and given time to sink to the bottom of the loch bed. Once sunk, the rake is pulled in and any macrophytes caught are placed into sealed containers for identification off site.

Identification was, wherever possible, to species. Where species can only be identified by the presence of flowers and/or fruiting bodies, and these were not present at the time of the survey, specimens were recorded to a level reliably attainable, typically to genus.

All staff and survey equipment were cleaned before and after the survey and when moving between Loch Sloy and Inveruglas Bay using an approved aquatic disinfectant (Virkon AQ).

2.2 Survey Locations

The survey area for Loch Sloy shown in Figure 1, and the survey area for the Inveruglas water is shown in Figure 2, both of which are displayed in Appendix A. Photographs of each sampling location are displayed in Appendix B.

Table 1: Sampling Site Locations

Date	Survey Reach	National Grid Reference
25th June 2024	Loch Sloy - Right Bank Upper Loch Sloy - Right Bank Lower	NN 28622 11191 NN 28774 11099
25th June 2024	Loch Sloy - Left Bank Upper Loch Sloy - Left Bank Lower	NN 28989 11282 NN 29010 11234
25th June 2024	Inveruglas - South Bank Upper Inveruglas - South Right Bank Lower	NN 32143 09652 NN 32122 09708
25th June 2024	Inveruglas - North Left Bank Upper Inveruglas - North Left Bank Lower	NN 32195 09819 NN 32229 09844

2.3 Limitations

2.3.1 Loch Sloy

Deep water and high turbidity limited visibility in Loch Sloy. The loch bed was obscured even in the margins. Observation and specimen collection aids such as grapnel were necessary to collect field data.

The use of grapnels or similar collection devices to substitute visual observation can lead to high levels of inaccuracy in recording. Small specimens rooted to the waterbody substrate were likely to have been overlooked.

These conditions are typical and likely to be similar in any future survey in which findings will be compared.

The minimum survey distance from the Loch Sloy dam was 10m to avoid generation flows.

2.3.2 Inveruglas Bay

It was determined during the survey that the rake was highly destructive to native macrophyte species while surveying on the south of this area. Its use was halted after a few tries and the bathyscope was considered to be best suited.

The rake was again not suitable for surveying on the north side due to the surface having been reinforced with rock armour (RipRap) as well as other detritus such as chains and other man-made objects.

The minimum survey distance from the tailrace outflow was 10m to avoid generation flows and pressure relief valve operation.

3 RESULTS

3.1 Desk Study

3.1.1 New Zealand Pygmyweed

New Zealand pygmyweed is known to be present within the southern extent of the southern basin of Loch Lomond[3]. New Zealand pygmyweed is not known to be present within Loch Sloy.

New Zealand pygmyweed is listed under Schedule 9 of the WCA (1981) as amended by the Nature Conservation (Scotland) Act (2004) and the Wildlife and Natural Environment (Scotland) Act (2011).

3.1.2 Canadian Pondweed

Canadian pondweed is known to be present within the southern basin of Loch Lomond and in several other mesotrophic lochs throughout Argyll and Bute local authority area and the wider Highland area[4]. Canadian pondweed was identified within the trash line in Inveruglas Bay in Loch Lomond during 2008 macrophyte sampling for the previously consented pumped hydro storage scheme. Canadian pondweed is not known to be present within Loch Sloy.

Canadian pondweed is listed under Schedule 9 of the WCA (1981) as amended by the Nature Conservation (Scotland) Act (2004) and the Wildlife and Natural Environment (Scotland) Act (2011).

3.1.3 Nuttal's Pondweed

Nuttall's pondweed is known to be present within the shallower southern basin of Loch Lomond and has been infrequently recorded in upland lochs within the west of Scotland which are likely to be oligotrophic in condition[5]. Nuttall's pondweed is not known to be present within Loch Sloy

Nuttall's pondweed is listed on the EU Invasive Species Regulation[6].

3.2 INNS Macrophyte Survey – Loch Sloy

The survey area for Loch Sloy shown in Figure 1 (displayed in Appendix A), no aquatic INNS were located within the Loch Sloy survey area.

Plate 4 in Appendix B shows the reservoir's level during the time of the survey, which is significantly drawn down.

Some notable native species were found within the drawdown area, above the tideline, in small clumps of vegetated peat:

- Procumbent pearlwort (*Sagina procumbens*)

[3] https://records.nbnatlas.org/occurrences/search?q=lsid%3ANBNSYS0000004639&fq=occurrence_status%3Apresent&fq=-license%3A%22CC-BY-NC%22&nbn_loading=true#tab_mapView (Accessed July 2024)
[4] Search: SPECIES: Elodea canadensis | Occurrence records | NBN Atlas (Accessed July 2024)
[5] Search: SPECIES: Elodea nuttallii | Occurrence records | NBN Atlas (Accessed July 2024)
[6] The Invasive Alien Species Regulation (Regulation (EU) 1143/2014). Available from: Regulation - 1143/2014 - EN - EUR-Lex (europa.eu.) (Accessed July 2024)

- Velvet bent (*Agrostic canina*)
- Bog stitchwort (*Stellaria aisine*)
- Bulbous rush (*Juncus bulbosa*)
- Soft rush (*Juncus effusus*)
- Starry saxifrage (*Micranthes stellaris*)

These species were restricted to small sections of remnant peat cover. Vegetation cover was less than 5% and absent from the lower drawdown area, as seen in Plates 4, 5, 6, and 7 in Appendix B.

3.3 INNS Macrophyte Survey – Inveruglas Bay, Loch Lomond

The survey area for Inveruglas Bay is shown in Figure 2 (displayed in Appendix A)

No aquatic INNS were identified within the Inveruglas Bay survey area.

The south bank on the mouth of the bay had a substrate more suited to macrophytes consisting of sand, grit, gravel and pebbles. In contrast, the north bank consisted of engineered rock armour boulders (RipRap) to avoid erosion of the banks protecting the Inveruglas visitor centre. Closer to the mouth of the dam intake, the substrate was more akin to the south bank.

Macrophyte species identified submerged at the mouth of Inveruglas Bay:

- Shoreweed (*Littorella uniflora*)
- Quillwort (*Isotetes lacustris*)
- Small pondweed (*Potomageton berchtoldii*)
- Water crow-foot sp. (*Ranunculus* subgenus *Batachium* sp.)
- Alternate water-milfoil (*Myriophyllum spicatum*)

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

No aquatic invasive species were identified in the two survey areas, and no aquatic macrophyte species of conservation concern were recorded in the two survey areas.

The ecological quality of Loch Sloy within the surveyed areas is representative of oligotrophic high-altitude lochs. Much of the vegetation surrounding the loch had been heavily grazed by sheep. Areas surrounding the banks of Loch Sloy had patches of eroding peat, which contained scattered cover of native plant species recorded in section 3.2.

The ecological quality of Inveruglas Bay within the surveyed areas is representative of mesotrophic low-altitude lochs. The area had a derelict jetty with the old anchor points left and the chains attached to some points which caused issues while trying to survey with the rake as it would snag on the chains.

The targeted invasive plant species thrive with higher levels of available nutrients. As Loch Sloy is nutrient deprived (oligotrophic), the target INNS species are unlikely to colonise this area.

During the time of the survey, Loch Sloy had been operating at a significantly reduced capacity for several days. This reduced capacity would mean that if there were any INNS present within the drawdown area, they would have desiccated and died as described in the cited literature.

For emerging, floating, or submerged plants to survive, they would need to be present within the littoral zone of Loch Sloy. None would survive within the limnetic zone where they would be deprived of nutrients and sunlight for photosynthesis to occur.

4.2 Recommendations

No invasive species were identified, and it has been acknowledged that the proposed Sloy Pumped Hydro Storage Scheme will increase the risk of transferring invasive species to Loch Sloy, which has been constructed.

Monitoring of Loch Sloy and Inveruglas Bay for INNS should be undertaken twice per year during the construction phase, once in mid spring and once again nearing the end of the summer. A regular monitoring regime should be established during the operational phase.

It is recommended that a less destructive method be used for monitoring going forward, using current technology, such as eDNA or Diatom survey sampling. These techniques could also inform SSE and other stakeholders of changes in biodiversity in these areas.

It would also be wise to monitor the Inveruglas Water as invasive plants can be carried up on people, vehicles, and wildlife. This watercourse may also highlight if INNS are present in Loch Sloy and passed through the outflow into the watercourse.

5 OUTLINE INNS MANAGEMENT PLAN

5.1 Summary

As no active infestations were discovered during the site survey, INNS management during development will be focussed on monitoring for new infestations of target species that have been identified by the desk study and SEPA within the greater Loch Lomond ecosystem. Regular monitoring will be focussed on Early Detection – Rapid Response (EDRR) so that new infestations are not able to establish and spread further. Additionally, management recommendations will also include biosecurity measures to reduce the likelihood of spreading infestations into Loch Sloy.

In the event new infestations are identified on site during monitoring, the best management practices for treatment detailed below should be adhered to. Further species and task specific method statements can be provided if required. In the event of an INNS that is not listed below is discovered on site, a suitably qualified ecologist should be consulted to provide species specific best management practices.

5.2 Chemical Treatment Considerations

Often, chemical treatment with non-persistent herbicide provides the best long-term efficacy for control of INNS infestations. Herbicides with the active ingredient glyphosate are most commonly used, especially in proximity to water. The regulations around glyphosate are changing as of 2025 and is planned to be withdrawn from use[7]. Glyphosate is a non-selective systemic herbicide which will kill any vascular plants whose foliage it comes in contact with; glyphosate should only be used if INNS become too difficult to manage using selective methods or if the plant species cannot be effectively controlled by other means. Manual/mechanical removal can be considered where it will not actively spread the infestation to reduce the introduction of herbicide into the water ecosystem.

Glyphosate is only effective against plants which have part of their foliage exposed above the water surface, i.e. New Zealand pygmyweed. There is also a human element that highlights concerns about using chemicals in water when unnecessary[8] . Canadian and Nuttal's pondweed are submerged plants and are not likely to be controlled by glyphosate.

Herbicide application in or near water will require an Authorisation under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR). Consultation and notification should be sought with SEPA prior to works commencing as it will be undertaken in or near water bodies.

[7] The Scottish Government (2022) Pesticide usage in Scotland: Local Authority Integrated Weed Control Survey - 2019, Scottish Government. Available at: https://www.gov.scot/publications/pesticide-usage-scotland-local-authority-integrated-weed-control-survey-2019 (Accessed: 08.07.2024).

[8] Greaves, M.P. & Shaw, R., 1999. Biological Control of Riparian and Aquatic Weeds. Abstracts/Proceedings of the 1999 Robson Meeting, Aquatic Plant Management Group, Institute of Arable Crops Research, Long Ashton Research Station, Reading, UK.

5.3 Best Management Practices for Managing New Infestations

5.3.1 Prevention

Many aquatic INNS are spread through small plant fragments being broken off and washed downstream, by species being transferred in residues left on equipment or clothing, and via soil movement.

Early detection of the presence of freshwater aquatic INNS is important.

Because many aquatic INNS are small and difficult to see, the highest standards of biosecurity should always be followed as a precaution, even if there are no viable INNS present during work.

If personnel or equipment are in contact with the water environment, the principles of Check, Clean, Dry should be followed.

Check - Check your equipment, boat, and clothing after leaving the water for mud, aquatic animals or plant material. Remove anything you find and leave it at the site.

Clean - Clean everything thoroughly as soon as you can, paying attention to areas that are damp or hard to access. Use hot water if possible.

Dry - Dry everything for as long as you can before using elsewhere as some invasive plants and animals can survive for over two weeks in damp conditions.

Detecting invasive species requires persistent monitoring where there is an increased risk. This means regular surveying to check if INNS have been transported to either of the areas. As these species have rapid growth rates, they would likely be discovered quickly.

Visitors and their vehicles should decontaminate before entering using a disinfectant such as Virkon AQ which will help to significantly reduce the risk of fragment transport to these areas.

5.3.1.1 New Zealand Pygmyweed

New Zealand pygmyweed reproduces by vegetative reproduction, which is a form of asexual reproduction occurring in plants in which a new plant grows from a fragment, cutting of the parent plant, or specialised reproductive structures. Vehicles, boats, equipment, and clothing should all be checked for fragments of the plant to prevent New Zealand pondweed from being spread into new locations.

The most effective method of removing this invasive species would be physical (mechanical or by hand) means. Every precaution must be taken during the removal not to leave fragments behind, as these fragments will repopulate the area. Fine mesh netting (0.4mm) must be installed around the target area

Cutting once per year in early spring has been shown to be effective.

Multiple layers of light-excluding jute matting could be used to shade out New Zealand pygmyweed. The jute also compresses the plant. The matting is to be left for up to 17 months, as described in the treatment of other species, to allow the plant material to decompose. During the 17 months, the jute

matting may need to be changed for fresh material, as the jute is designed to decompose[9]. The removed jute material should be placed in sealed hazardous bags to be incinerated.

The only chemical treatment effective against New Zealand Pondweed currently is glyphosate, which has been used for an extended period post-Brexit but is due to cease in December 2025. This regulation may change depending on how the environmental and agriculture sectors deal with invasive species going forward.

5.3.1.2 Canadian Pondweed

Canadian pondweed reproduces by vegetative reproduction, which is a form of asexual reproduction occurring in plants in which a new plant grows from a fragment, cutting of the parent plant, or specialized reproductive structures.

No chemicals are currently licensed in the UK for the treatment of this species.

High applications of lime, concentrations to pH 10.8-11[10], have been highly effective against Canadian pondweed by suppressing root growth and significantly reducing biomass. This method would also have other ramifications for the water body and would need to be sealed in a cell before applying.

Shading has been reported as a successful control measure for Canadian pondweed. This shading would be created by natural methods such as restoration planting of riparian trees and shrubs[11].

Jute matting has been used to shade out Canadian pondweed, the jute also compresses the plant[12]. The matting is to be left for a period of up to 17 months to allow the plant to decompose. During the 17 months, the jute matting may need to be changed for fresh material as the jute is designed to decompose also[11].

5.3.1.3 Nuttall's Pondweed

Nuttall's pondweed reproduces predominantly from small plant fragments. It is also spread by herbivores and turions. This species also outcompetes Canadian pondweed very quickly if introduced into the space.

No chemicals are currently licensed in the UK for treatment of this species. Until recently, a herbicide called Diquat was used to control Nuttall's pondweed, but it has also been removed by the Scottish Government for use[13].

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[9] Caffrey, J. M., Millane, M., Evers, S., Moron, H. and Butler, M. 2010. A novel approach to aquatic weed control and habitat restoration using biodegradable jute matting. Aquatic Invasions 5: 123-129.

[10] James, W.F. 2008. Effects of lime-induced inorganic carbon reduction on the growth of three aquatic macrophyte species. Aquatic Botany 88: 99-104.

[11] Newman, J.R. and Duenas, M.A. 2010a. Information Sheet 7: Elodea canadensis (Canadian Waterweed). Centre for Ecology and Hydrology, Oxon. Available online at: http://nora.nerc. ac.uk/10424/3/N010424_leaflet.pdf (accessed 19.08.16).

[12] Bell, S. 2013. Experimental shading to control/eradicate Canadian waterweed. Scottish Natural Heritage Commissioned Report No. 557.

[13] F. Burnett, M. Bowsher-Gibbs and D. Dunbar (2021). Economic Impact of Pesticide Withdrawals to Scotland, with Case Studies: Project Summary Report. PHC2020/09. Scotland's Centre of Expertise for Plant Health (PHC). DOI: 10.5281/zenodo.4581146

Removing by physical (mechanical or by hand) means would be the most effective method of removing this invasive species. Every precaution must be made during the removal not to leave fragments behind as these fragments will repopulate and area. Removal by this method should take place after the end of June and before the end of August.

Shading has been reported as a successful control measure for Nuttal's pondweed. This shading would be by natural methods such as restoration planting of riparian trees and shrubs[13].

Jute matting has been used to shade out Nuttall's pondweed, the jute also compresses the plant[14]. The matting is to be left for a period of up to 17 months to allow the plant to decompose. During the 17 months, the jute matting may need to be changed for fresh material as the jute is designed to decompose also[9].

The only chemical treatment effective against New Zealand Pondweed currently is glyphosate, which has been used for an extended period post-Brexit but is due to cease in December 2025. This regulation may change depending on how the environmental and agriculture sectors deal with invasive species going forward.

5.3.2 Manual Removal

5.3.2.1 New Zealand Pondweed

Simple manual removal methods include cutting, dragging, raking or forking plants out of the water[15].

New Zealand pygmyweed has been successfully controlled by mechanical removal using amphibious machines either by cutting or dredging to remove the roots; all cut weeds must be removed from the water to prevent de-oxygenation. If cutting, two cuts per year is optimal as a single cut can increase biomass[16]. Carrying out this treatment regularly has shown to significantly reduce biomass. Continued cutting will weaken the plant and may lead to its disappearance from the body of water.

After being removed completely, all fragments must be incinerated to reduce the risk of spreading and recolonising the area.

5.3.2.2 Canadian Pondweed

Simple manual methods include cutting, dragging, raking or forking plants out of the water[17].

Canadian Pondweed has been successfully controlled by mechanical removal using amphibious machines either by cutting or dredging to remove the roots; all cut weeds must be removed from the water to prevent de-oxygenation. If cutting, two cuts per year is optimal as a single cut can increase biomass. If this treatment is carried out regularly, then peak biomass should not be reached. Continued cutting will weaken the plant and may lead to its disappearance from the body of water.

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[14] Hoffmann, M. A., González, A. B., Raeder, U., and Melzer, A. 2013. Experimental weed control of Najas marina ssp. intermedia and Elodea nuttallii in lakes using biodegradable jute matting. Journal of Limnology 72: 39.

[15] Murphy, K.J., 1988. Aquatic weed problems and their management: a review. II. Physical control measures. Crop Protection, 7, 283-302.

[16] Newman, J.R. and Duenas, M.A. 2010b. Information Sheet 25: Elodea nuttallii, Nuttall's pondweed. Centre for Ecology and Hydrology. New Zealand Aquaculture Council 2005.

[17] Murphy, K.J., 1988. Aquatic weed problems and their management: a review. II. Physical control measures. Crop Protection, 7, 283-302.

After being removed completely, all fragments must be collected and incinerated to reduce the risk of spreading and recolonising the area.

5.3.2.3 Nuttall's Pondweed

Simple manual methods include cutting, dragging, raking or forking plants out of the water[15].

Nuttall's Pondweed has been successfully controlled by mechanical removal using amphibious machines either by cutting or dredging to remove the roots; all cut weeds must be removed from the water to prevent de-oxygenation. If cutting, multiple cuts from February throughout the summer has been shown to be most effective cutting strategy; a single cut can increase biomass by spreading fragments[16]. If this treatment is carried out regularly, then peak biomass should not be reached. Continued cutting will weaken the plant and may lead to its disappearance from the body of water.

After being removed completely, all fragments must be collected incinerated to reduce the risk of spreading and recolonising the area.

5.3.3 Shading

5.3.3.1 New Zealand Pondweed

Shading has been reported as a successful control measure for Canadian pondweed and has been suggested as a possible method for controlling New Zealand pygmyweed. This would be by natural methods such as restoration, riparian trees and shrubs and the use of jute matting.

5.3.3.2 Canadian Pondweed

Shading has been reported as a successful control measure for Canadian pondweed and has been suggested as a possible method for controlling Nuttal's pondweed. This would be by natural methods such as restoration, riparian trees and shrubs and the use of jute matting[11].

5.3.3.3 Nuttall's Pondweed

No evidence has shown that shading is an effective method of controlling this species.

5.3.4 Drawdown

5.3.4.1 New Zealand Pygmyweed

There is no evidence that drawing down the water levels to fully expose New Zealand pygmyweed during the summer has any effect on this species[18].

5.3.4.2 Canadian Pondweed

Drawing down the water levels to fully expose the macrophytes during the summer has a 100% mortality rate for Canadian pondweed[18].

5.3.4.3 Nuttall's Pondweed

Drawing down the water levels to fully expose the macrophytes during the summer has a 100% mortality rate for Nuttal's Pondweed when suffering from drought conditions for more than eight continuous days[18].

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[18] Hussner, A., Stiers, I., Verhofstad, M.J.J.M., Bakker, E.S., Grutters, B.M.C., Haury, J., van Valkenburg, J.L.C.H., Brundu, G., Newman, J., Clayton, J.S., Anderson, L.W.J. and Hofstra, D. 2017. Management and control methods of invasive alien freshwater aquatic plants: A review. Aquatic Botany 136:112-137.

APPENDICES

A SURVEY TRANSECTS

Do not scale this map

Legend

Transect

Client
ASH Design + Assessment

Project
Sloy Pumped Hydro Storage Scheme

Title
Inveruglas Water INNS Transects

Scale
1:23,000 @A3 0 115 230 460 690 Metres

Status
FINAL

Drawing No.	Revision	Date
176783-GIS018	1	11/07/2024
Drawn	**Checked**	**Approved**
GB	SD	18/07/2014

Rev	Date	Amendment	Initials
-	-	-	-

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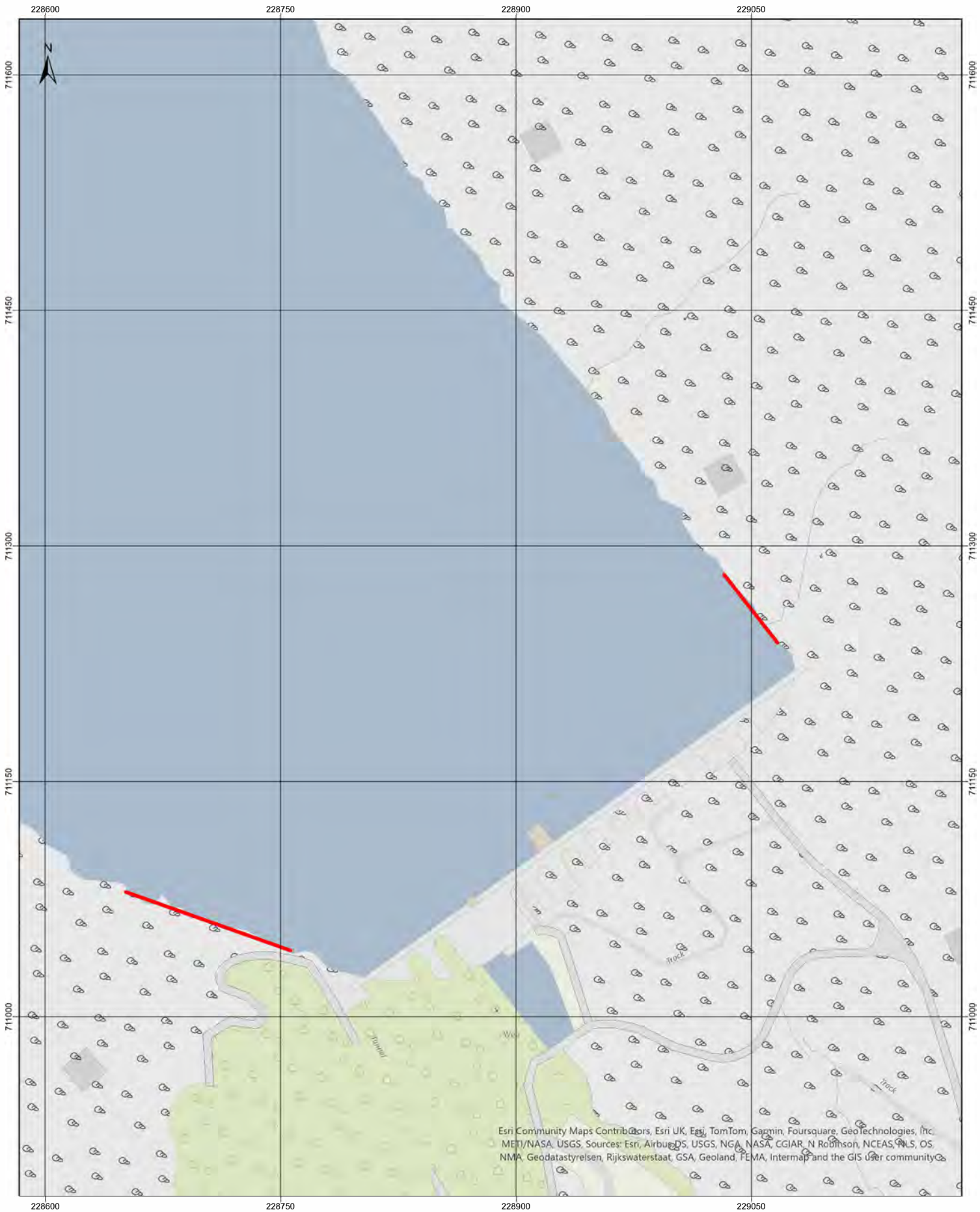

Do not scale this map

Legend

Transect

Client	ASH Design + Assessment
Project	Sloy Pumped Hydro Storoge Scheme
Title	Loch Sloy INNS Transects
Scale	1:23,000 @A3 (0, 115, 230, 460, 690 Metres)

Status	FINAL	
Drawing No. 176783-GIS017	**Revision** 1	**Date** 11/07/2024
Drawn GB	**Checked** SD	**Approved** 18/07/2014

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B PLATES

Plate 1: Right bank of Loch Sloy area

Plate 2: Small patches of vegetation on the right bank of Loch Sloy

Plate 3: Left bank of Loch Sloy survey area

Plate 4: Left bank slope at Loch Sloy

Figure Plate: Right bank of Inveruglas Bay survey area

Plate 5: Left bank of Inveruglas Bay survey area