Before the Expert Panel appointed under the Fast-track Approvals Act 2024

FTAA-2604-1207

Under	**the Fast-track Approvals Act 2024 (FTAA)**
In the matter	**of the Southern Link Inland Port**
By	**Southern Link Property Limited**

STATEMENT OF EVIDENCE BY DR RICHARD MARK ALLIBONE ON BEHALF OF SOUTHERN LINK PROPERTY LIMITED

Freshwater Ecology – Freshwater Fish

19 August 2026

SIMPSON GRIERSON

Sarah Scott / Kierra Parker
sarah.scott@simpsongrierson.com
kierra.parker@simpsongrierson.com
PO Box 874 Christchurch

1. INTRODUCTION

1.1 My full name is Richard Mark Allibone My qualifications of BSC (Zoology and Geology), MSC (Zoology) and PhD (Zoology) from the University of Otago.

1.2 I have had thirty-five years' experience researching and managing freshwater ecological issues, particularly freshwater fish. At present I am a Director and the Principal Ecologist at Water Ways Consulting Limited, a position I have held for the last twelve years. Prior to this I was a Senior Freshwater Ecologist at Golder Associates Ltd, the National Services Manager at the QEII National Trust, a Species Protection Officer in the Biodiversity Recovery Unit at the Department of Conservation, and a Freshwater Fisheries Scientist at NIWA.

1.3 I have been working in Otago's water ways since 1987 and undertook my first fish surveys in the Silver Stream catchment in that year and my most recent work in the catchment was an ecological assessment and fish rescue in Quarry Stream, a tributary of the Silver Stream that flows through Mosgiel adjacent, to SH1 in 2023-2025. In the 1980s I lived alongside the Silver Stream on Silverstream Valley Road and regularly swam and fished in the stream and its tributaries.

1.4 During my career I have worked in most areas of New Zealand and have gained extensive experience with freshwater fish biology and life histories, freshwater ecological surveys and assessments. I have been involved in major consent processes for hydroelectric power schemes, wind farms, mines and irrigation developments. I have advised the Ministry for the Environment, Department of Conservation and Ministry of Primary Industries on various projects including NeMAR programme, native fish requirements for the National Environmental Standard for Plantation Forestry and DOC's threatened species management. I have also chaired the Department of Conservation's freshwater fish threat ranking expert panel and was a member of the panel for 20 years. I have developed and run electric fishing and fish ID training courses for freshwater practitioners

and co-supervise students at the University of Otago. At present I am the vice-president of the New Zealand Freshwater Science Society and has been a member of executive council since 2014.

1.5 My freshwater fisheries experience includes the discovery and description of the spawning habitats used by the four Taiari River non-migratory galaxiids and the discovery of spawning habitat for an additional two species found in Otago and Southland. I also lead the NIWA/Department of Conservation research programme that identified the spawning areas of shortjaw kokopu and koaro, discoveries that led to the more recent discovery of giant kokopu spawning. I have also researched inanga spawning and causes of inanga egg mortality. I have a current project that includes locating Chinook salmon, brown trout and rainbow trout spawning sites in the headwaters of a large Canterbury river. I have been undertaking fish surveys in the Taiari River catchment since 1988 and have recently located the largest known lamprey spawning and ammocoetes rearing stream known in the catchment – the Meggat Burn. My electric fishing courses have included providing training for rūnanga in South Canterbury, Otago and Southland. These courses include practical sessions on how to identify lamprey habitat and practical sessions fishing for lamprey.

1.6 In the last 12 months I have visited the Silver Stream at Puddle Alley and alongside the Taiari Aerodrome for other project work and to conduct freshwater sampling training exercises for one of my other client's staff.

1.7 My role in the Southern Link Inland Port Project (**SLIP**) has been to review the freshwater ecological assessment Freshwater Ecology Impact Assessment (April 2026) (**FEcIA**) included in Part B.04 of the substantive application for the SLIP, and provide additional advice with regard to freshwater fisheries issues, the proposed freshwater ecological monitoring and suggested consent conditions.

1.8 The following documents and resources have been relied on in the preparation of this evidence:

(a) E3 Scientific Limited (2026) Freshwater Ecological Impact Assessment Prepared for Southern Link Inland Port.

(b) E3 Scientific Limited Freshwater (2024) Silver Stream Maintenance Freshwater ecological Assessment. Prepared for Otago Regional Council.

(c) E3 Scientific Limited (June 2026) Southern Link Inland Port – Stormwater Monitoring Plan. Memo Prepared for Southern Link Property Limited.

(d) Brown trout spawning survey database information provided by Otago Fish & Game (Appendix A).

(e) Aerial images of the Silver Stream available on Google Earth.

1.9 I have been asked by Southern Link Property Limited (**SLPL**) to provide a response to specific matters within my areas of expertise of freshwater ecology (specialising in freshwater fish) contained in written comments on the SLIP application from persons invited by the Panel to comment under s 53 of the FTAA. The issues concerning freshwater fish are in the following comments / reports:

(a) Raymond Chang and Emily Lion-Cachet (**Beca Review**), Appendix 4 to the comments of Otago Regional Council (**ORC**) regarding matters focused on freshwater fish; and

(b) Otago Fish & Game (**F&G**) comments as it related to brown trout habitat, spawning and instream exclusions.

1.10 I note that Bryony Miller of e3Scientific also provides a statement on freshwater ecology responding to a broader range of matters contained in these same comments.

Code of Conduct

1.11 I confirm that I have read the Code of Conduct for Expert Witnesses contained in section 9 of the Environment Court Practice Note 2023 and have complied with it in preparing this evidence. I confirm that the issues addressed in this evidence are within my area of expertise, and I have not omitted material facts known to me that might alter or detract from my evidence.

2. MR RAYMOND CHANG REPORT, APPENDIX 4 TO THE COMMENTS OF OTAGO REGIONAL COUNCIL

2.1 Mr Chang, raises concerns at page 3 of his report over the "Adequacy of Effects Assessment-bullet point 2 loss of spawning habitat."

2.2 The FEcIA on pages 27-28 provides an accurate assessment of the spawning behaviour and spawning habitat requirements for the fish species found or detected by eDNA in the vicinity of the proposed discharge. I agree with the FEcIA that the Silver Stream in the discharge area does not provide suitable spawning habitat for lamprey. Habitat for spawning does become available at the Puddle Alley bridge and the required boulder habitat becomes more common as you progress upstream from this location.

2.3 I undertook a fish survey on the Invermay Agricultural Research Station in 2021 (Allibone, 2021) and this survey located giant kokopu in a tributary of the Silver Stream. This observation together with others in the New Zealand Freshwater Fish Database (**NZFFD**) all report giant kokopu in tributaries of the Silver Stream rather than in the Silver Stream itself. Franklin et al (2015) provide the only report of giant kokopu spawning and this occurred amongst riparian vegetation where the giant kokopu live. There was no downstream migration involved in their spawning. Therefore, based on my knowledge of the catchment, kokopu spawning habits, the lack of giant kokopu records in the NZFFD at the SLIP location and the published

spawning information, I do not expect giant kokopu to be spawning in the vicinity of the discharge.

2.4 The FEcIA also correctly reports that the two eel species do not spawn in freshwater and that inanga will migrate to the tidal reach to spawn. The tidal zone in the Taiari River extends upstream to approximately the Taiari River bridge at Allanton. This is downstream of the confluence of the Taiari River and Silver Stream so inanga will not be spawning in the Silver Stream.

2.5 The eDNA data detected a non-migratory galaxiid – the Taiari flathead and the FEcIA discusses in some length the lack of supporting fish survey records for Taiari flathead in the Silver Stream. In my experience in this catchment, I have never caught Taiari flatheads nor have I heard of any being caught. The NZFFD and the Department of Conservation non-migratory galaxiid spatial layer[1] also do not report Taiari flatheads in the Silver Stream. Since 1988 I have regularly visited the Eldon's galaxias population in a headwater tributary, Whare Creek. This Eldon's galaxias population is restricted to the headwaters of Whare Creek where they are isolated from predatory brown trout. I do not expect any non-migratory galaxiid to be spawning anywhere in the main-stem of the Silver Stream. Therefore, in my opinion there is no requirement for a spawning assessment for any non-migratory galaxiid.

2.6 The FEcIA reports the present of redfin bully DNA in the eDNA sampling. The NZFFD has no records for this fish in the Silver Stream. However, other eDNA samples for the Silver Stream do report redfin bully eDNA (Wilderlab map https://wilderlab.co/explore). Therefore, it is possible redfin bullies are present in the vicinity of the discharge. However, McDowall (1965) found that redfin bullies, (like most bully species) spawn under boulders and cobbles. The FEcIA reports the stream bed substrate in the discharge area has no boulder material and little cobble so the required spawning habitat for redfin bullies in this reach appears to be lacking. As noted above

1https://docdeptconservation.opendata.arcgis.com/datasets/0a8fe178906944a08a9d3ef3e0d133d5_0/explore?location=-0.451586%2C0.000000%2C1.00

in regard to lamprey there is suitable habitat upstream of the SLIP site for fish species that require boulder habitat.

2.7 Brown trout are the fish species that routinely spawn in the Silver Stream. The spawning run of brown trout extends well upstream into the upper Silver Stream above the Whare Creek confluence (Otago Fish & Game redd survey data, Allibone personal observation). Monitoring and avoidance of impacts on brown trout spawning is discussed below in response to the Fish & Game comments.

2.8 Therefore, I do not support Mr Chang's concern regarding a lack of a spawning impact assessment in the FEcIA report. Rather, aside from brown trout I would conclude the reach in question is not a significant spawning area for fish.

2.9 At page 3,bullet point 3 of MrRaymond Chang's Report, he states that a key effect is "Disruption of fish migration and ecological connectivity."

2.10 Neither the construction or operational phase intermittent stormwater discharge creates any physical barrier to upstream or downstream fish passage. Therefore, the only possible fish migration effect could be via unsuitable water quality conditions in the Silver Stream because of the discharge. The proposed discharge will be intermittent discharge occurring only after significant rainfall with an estimated 12 discharge periods a year. These discharge periods are short lived and any ability for them to affect fish's migration is limited. Each of the fish migration seasons extends over several months (Water Ways Consulting 2014) so the Silver Stream will be free of any discharge related effects for most of any fish species' migration period.

2.11 At page 6 under the heading "d. Monitoring programme", Mr Chang states that "For example, the proposed lamprey monitoring programme is proposed within the SMP, but the FEcIA does not clearly assess effects on

these values or explain how monitoring results would inform management response."

2.12 Mr Chang also states on page 6 under the heading "Fine deposited sediment" that "baseline sediment cover surveys have not been undertaken as part of the baseline aquatic ecology investigations, therefore, no baseline sediment condition has been established for Silver Stream. Additionally, no survey methods have been detailed within the monitoring programme."

2.13 The proposed lamprey monitoring programme is designed to assess effects on the ammocoete life history stage. This is the juvenile feeding life history stage that hatches from eggs and remains in freshwater for two to four years. This is the only life history stage that feeds in freshwater and its duration of life in freshwater makes it the important life history stage to provide habitat for and to monitor. Proposed ORC consent condition B.33 has been updated to require the monitoring of this life history stage.

2.14 There are three other life history stages. The second life history stage, the macrophthalmia, is a migratory life history stage. It develops from the ammocoetes in late summer and migrates downstream in autumn and out to sea in winter. Therefore, it is transient in freshwater. Similarly, the adult lamprey migrating upstream are also transient and will also pass through the lower Silver Stream to reach upstream spawning habitat, where eggs (the last life history stage) are laid.

2.15 The ammocoetes bury themselves in silt deposits and raise their heads out of the mud to filter feed for items drifting downstream. The substrate data at the FEcIA sample sites found no silt substrates within the area surveyed near the proposed SLIP site. Therefore, habitat is expected to be limiting for the ammocoetes within the section of the Silver Stream near the site. Notwithstanding this, proposed condition b.33 provides for the requirement to undertake a baseline survey lamprey ammocoetes habitat survey. The first requirement of the monitoring will be to locate lamprey

habitat (mud or silt deposits) and then sample them for ammocoetes using the NIWA (2024) methods. This will require a baseline sediment survey of the monitoring reach to map the occurrence of fine sediment deposits. This will also be coupled with sediment surveys required as part of the proposed Aquatic Habitat and Macroinvertebrate Monitoring using the Protocol 2 fine sediment survey methods of Clapcott et al (2011). It is possible that no habitat is available and /or few lamprey are present due to limited habitat.

2.16 The existing lamprey survey data indicates that the monitoring will detect few ammocoetes. The NZFFD indicates that fishing at many sites in the Silver Stream fails to detect lamprey (**Appendix 1, Figure 1**). Therefore, in the absence of lamprey and no habitat detected at the survey sites linking the SLIP proposal to potential effects is not possible. I note that as the ammocoetes use muddy bottom areas as habitat and some addition of sediment to an otherwise gravel cobble stream bed would actually improve habitat for lamprey, albeit not necessarily for other species.

2.17 Richardson & Kavazos (2024) also provide evidence that lamprey are rare in the Silver Stream. They fished two sites in the Silver Stream for lamprey. At their downstream site near the confluence with the Taiari River only a single migratory macrophthalmia was present whereas upstream of the SLIP site at Puddle Alley a combination of ammocoetes and macrophthalmia were present, but only three individuals were found.

2.18 Given the lack of lamprey habitat near the SLIP site and the expectation from the existing data is that few if any lamprey are present, no specific management response has been developed. This may only be warranted if both lamprey habitat and lampreys are found in the monitoring reach. I understand that this monitoring was raised as being necessary by local rūnanga and was added to the conditions as a result. It is expected that the proposed monitoring will be conducted in conjunction with local rūnanga and any management responses can be determined in consultation with the rūnanga.

2.19 Additional freshwater fish monitoring could be considered aside from brown trout the most commonly reported fish in the vicinity of the SLIP site is longfin eel. This fish is tolerant of poor water quality conditions, and I would expect its abundance to be more limited by the available cover habitat and low flows (due to upstream water abstraction). Linking any changes to the abundance of longfin eel to the SLIP discharge would be very difficult if not impossible. Furthermore, both chronic or acute effects will impact on other more sensitive species such as salmonids and sensitive macroinvertebrates before the eels are impacted. Therefore, the other more sensitive species would be more appropriate to monitor as they will indicate any detrimental effects well before longfin eel.

3. OTAGO FISH & GAME COUNCIL COMMENTS

3.1 At paragraph 23, F&G state "The Cawthron Institute has produced helpful guidelines intended to maintain near optimal conditions for trout populations."

3.2 The Cawthron Report (Hay et al, 2006) does provide very useful guidelines for optimal conditions for maintaining trout populations and trout spawning. However, a key factor that does not appear to be considered by Hay et al (2006) is duration of non-optimal conditions. The report provides recommendations for long-term in-river conditions and for the spawning and incubation periods. It also reports results of investigations that show that the long duration sub-optimal conditions for trout will lead to less that maximum trout growth and abundance. For the SLIP project, the stormwater discharges are the water quality modifier. These discharges only occur for short periods and are estimated to occur twelve times a year. The short-duration, low frequency stormwater discharges from the SLIP site means that the SLIP project cannot exert long duration or continuous discharge effects that could have negative effects on the trout and trout spawning. In my experience when these guidelines have been raised before it has been associated with turbidity increases that are potentially generated by continuous discharges.

3.3 A second key consideration with the discharge effect is that any discharge is driven by rainfall events. Any discharge from the SLIP site will occur during and immediately after rainfall events when the Silver Stream is subject to increased runoff that will raise the turbidity and contaminant load. These rainfall events and associated stormwater runoff from urban, rural and forestry areas are already part of the Silver Stream ecosystem that as Mr Paragreen notes supports a productive brown trout spawning area. The key ecological factor for the SLIP development is not to have a cumulative effect in conjunction with the existing modifications to the Silver Stream that degrades the aquatic ecosystems rather than attempt to meet guidelines that are on occasion already exceeded.

3.4 At paragraph 54, F&G state: "the applicant has proposed a regime whereby work can occur within the wetted bed of the Silverstream between the start of May and the start of November provided that it undertakes a spawning survey prior to identify whether there are any redds present and delay the work until the next flood (refer to proposed ORC condition C.15.)."

3.5 At paragraph 59, F&G state: "If this is not possible, then a more robust redd identification methodology will be required, along with a clear definition of a flood which will guarantee the destruction of redds. For the former, F&G has in the past had success using fortnightly spawning surveys to reliably identify whether spawning has occurred in a particular reach. This would involve a suitably trained person walking the bank of the proposed work site each fortnight and recording any redds that are seen. Because the work sites are so small, just two discharge points on each end of the site, this would be a reasonably small job. F&G has offered its services to either undertake the work using its staff or train one of its employees to undertake the work, so that the burden of such intense monitoring is lessened. However, the flood definition remains outstanding."

3.6 F&G's suggestion of fortnightly redd searches has merit and he notes this is a small reach of the river to search. Providing training to locate redds is

relatively easy and all redd locations can be marked using GPS so in the event of floods the location of existing redds has already been recorded. These redd surveys would only have to occur during the spawning period April to July and only if works were intended to occur in the period April to November.

3.7 However, F&G have provided me with the results of their redd surveys for nine years between 2008 and 2021 for the Silver Stream. Examining the full dataset, it is apparent there are clusters of redds reported over the 13-year period along the SLIP reach and more widely in areas of the Silver Stream (**Figure 2**). These clusters include areas at or near to the proposed discharge locations and works instream during the period when redds are present are not guaranteed to avoid spawning habitat.

3.8 To avoid instream works over brown trout redds, it is proposed, in consent conditions, to avoid instream works during the spawning season. The National Environmental Standard for Commercial Forestry does provide an example of an exclusion period to avoid harm to redds. This exclusion period is the 15 May to 15 September each year

3.9 There is some concern raised over just when trout fry may emerge from the gravel and the NES-CF maybe not provide a long enough exclusion period. Therefore. I would recommend the instream works period is set from the 15 May to 30 September. After this period egg hatching and fry emergence will be under way. Residual slow developing redds may still have eggs but as the works is restricted to two small locations on the Silver Stream and the spawning area extends over 17 km of the stream (see **Figure 3** below) the effect on any remaining eggs and fry could not be detected when the annual brown trout fry production in the Silver Stream is considered.

4. CONCLUSIONS

4.1 The key conclusions I reach in my evidence are:

(a) the loss or effects on spawning habitat is limited to effects on brown trout. These effects are addressed with proposed exclusions areas and exclusions periods to avoid effects on brown trout spawning;

(b) I do not expect any effects on upstream or downstream fish migrations;

(c) a monitoring plan for lamprey is proposed that will assess the presence of resident juvenile lampreys, the ammoncoetes. This will include habitat availability assessments and the occupancy over time of lamprey. Any management actions will be developed in conjunction with rünanga that participate in the lamprey monitoring;

the intermittent stormwater discharges from the SLIP site will not create detrimental conditions for trout growth and survival due to their short-duration; andBrown trout redds will be protected from instream works from the 15 May to 30 September.

Dated: 19th August 2026

Richard Mark Allibone

References

Allibone RM. 2021. Fish survey: Invermay Forest block. Memo to John Turkington Forestry.

Clapcott, JE., Young, RG., Harding, JS., Matthaei, CD., Quinn, JM. and Death, RG. 2011. Sediment Assessment Methods: Protocols and guidelines for assessing the effects of deposited fine sediment on in-stream values. Cawthron Institute, Nelson, New Zealand.

E3 Scientific 2026. Southern Link Inland Port – Stormwater Monitoring Plan. Memo date June 2026 to Southern Link Property Limited

Franklin, PA., Smith, J., Baker, CF., Bartels, B., & Reeve, K. 2015 First observations on the timing and location of giant kokopu (*Galaxias argenteus*) spawning. New Zealand Journal of Marine and Freshwater Research 49: 419-426. https://doi.org/10.1080/00288330.2015.1045004

Hay, J., Hayes, J.W., & Young, R.G. (2006). Water Quality Guidelines to Protect Trout Fishery Values. Cawthron Institute, September 2006, Cawthron Report No. 1205, prepared for Horizons Regional Council.

McDowall RM. 1965. Studies on the biology of the red-finned bully *Gobiomorphus huttoni* (Ogilby): Part II Breeding and life history. *Transactions of the Royal Society of New Zealand Zoology 5(17)*: 177-196.

NIWA. (2024). Locating Lamprey - Guidelines for identification of critical habitats and population monitoring. Hamilton: Prepared by NIWA for the Department of Conservation.

Richardson M & Kavazos C. 2024: Kanakana monitoring in the Taiari. Summer 2024 electrofishing and pheromone study. Department of Conservation report.

Smith, J. (2014). Freshwater Fish Spawning and Migration Periods. National Institute of Water & Atmospheric Research (NIWA), November 2014, NIWA Client Report No. HAM2014-101, prepared for the Ministry for Primary Industries.

Water Ways Consulting Limited 2014; National Environmental Standard' Plantation Forestry Additional Fisheries Advice. MPI Technical Paper No 2014/27.

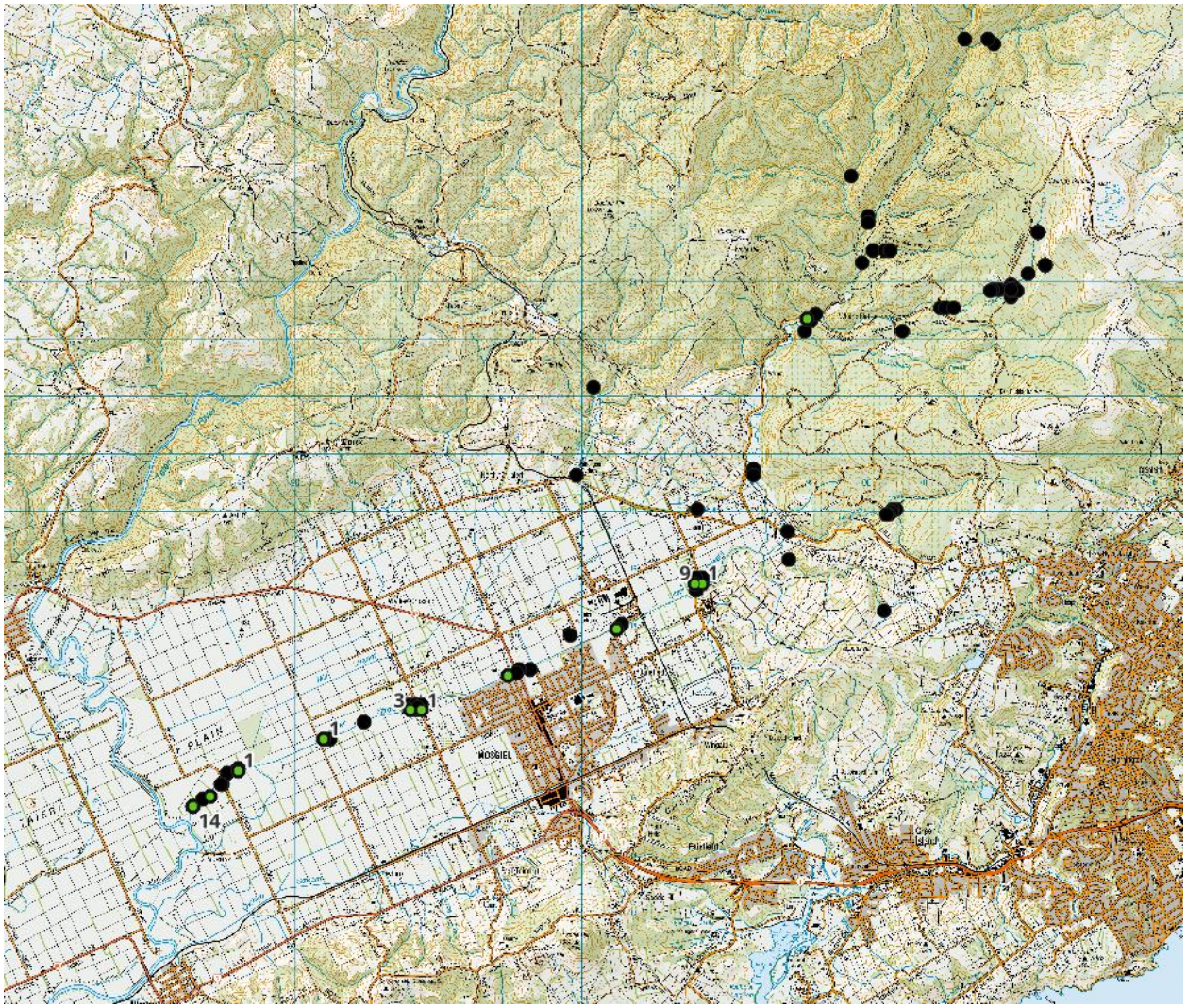

Figure 1: Fishing sites recorded in the NZFFD (black circles) and lamprey sites (green circles) with number caught when reported.

Figure 2; Redd clusters in the Silver Stream (red circles).

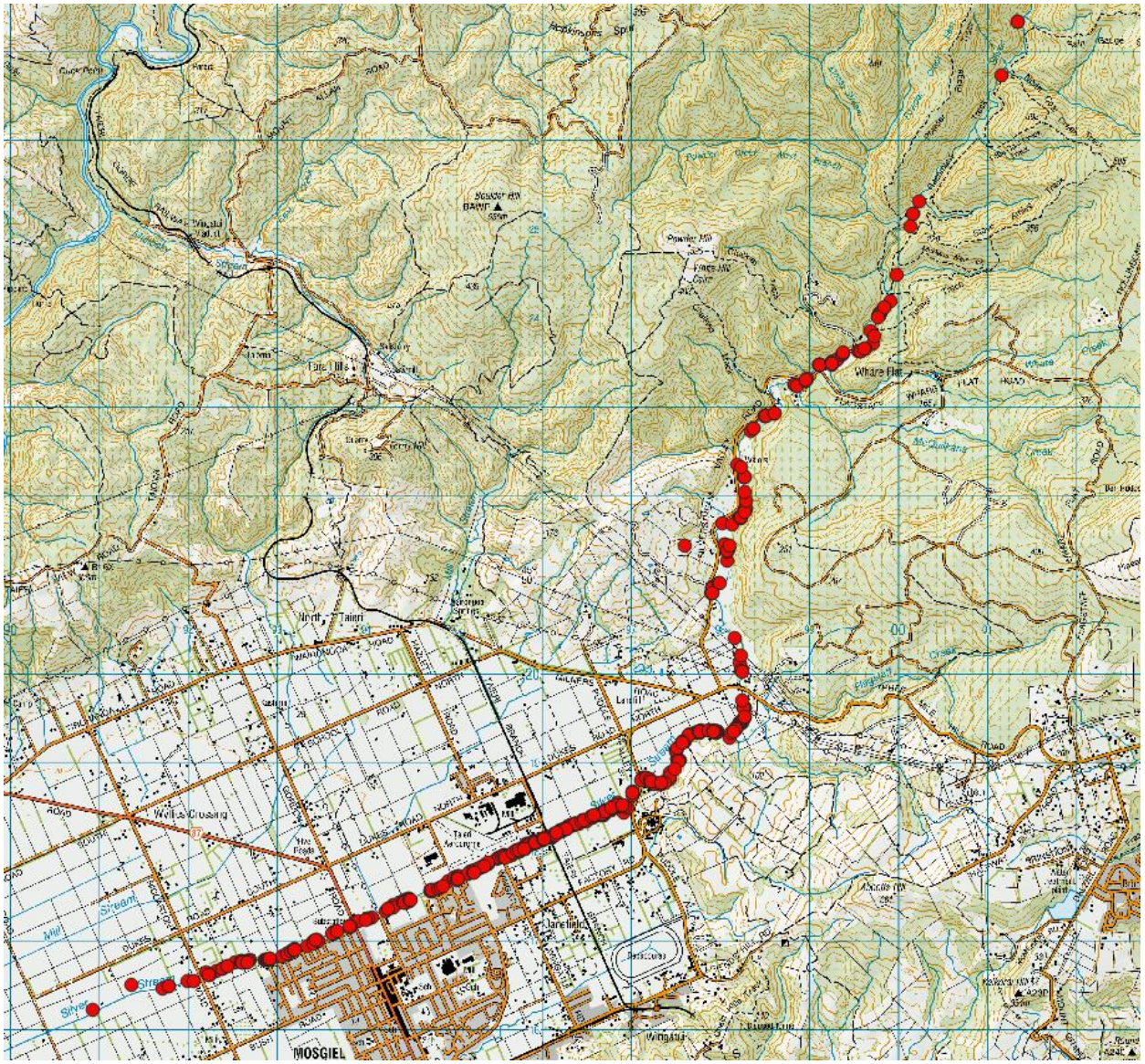

Figure 3 Brown trout spawning redds in the silver Stream located by Otago Fish & Game (2008 – 2021).