

**BEFORE THE COMMISSIONERS APPOINTED ON BEHALF  
OF THE OTAGO REGIONAL COUNCIL, CENTRAL OTAGO DISTRICT  
COUNCIL AND QUEENSTOWN LAKES DISTRICT COUNCIL**

<b>Under</b>	The Resource Management Act 1991 (the <b>Act</b> )
<b>In the Matter</b>	of an application for resource consents for Suction Dredge Mining on the Clutha River/ Mata Au
<b>Between</b>	<b>COLD GOLD CLUTHA LIMITED</b>  <b>Applicant</b>
<b>And</b>	<b>OTAGO REGIONAL COUNCIL</b> <b>(RM22.434)</b>  <b>QUEENSTOWN LAKES DISTRICT</b> <b>COUNCIL (RM220834)</b>  <b>CENTRAL OTAGO DISTRICT</b> <b>COUNCIL (RC220255)</b>  <b>Local Authorities</b>

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**SUPPLEMENTARY EVIDENCE OF MARK PETER HAMER**

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## SUPPLEMENTARY EVIDENCE OF MARK PETER HAMER

1. The purpose of this supplementary evidence is to answer questions from the panel and address some of the matters raised by submitters.

### Macroinvertebrate data

2. NIWA has supplied the Macroinvertebrate raw data and taxonomic comparisons have been possible. The following key observations have been made from the NIWA Data:
  - a. The Taxonomic Richness varied between 21 and 27 taxa in any year, with 49 taxa found across the 5 years.
  - b. Percent EPT Richness ranged between 33 and 48% in the last five sampling occasions. Whereas the sampling results from the e3scientific assessment of Jager and Doheny (2022) found Taxonomic Richness varied between 4 to 7 taxa and Percent EPT Richness ranged between 25 and 29%.
3. As I would expect the NIWA data collected at the Clutha River at Luggate Bridge is a useful supplement to the data gathered previously by e3s as there are more invertebrate individuals and taxa present, due to the length of time and frequency of sampling. Nevertheless, the MCI metrics discussed in the e3s report and in my evidence are comparable and provide useful information about lower parts of the affected stretch of the river.
4. NIWA MCI scores for Luggate Bridge range from 85-96 and the e3s sites range from 85-100. The similar scores mean my conclusions remain much the same, although reinforced by the availability of further data from a known site in similar habitat nearby.
5. In paragraph 13 of Dr Duxson's submission and in response to questions from the Commission, Dr Young commented that "extremely high abundance of filter-feeding caddis flies" at lake outlets will be responsible for the low MCI scores present at these sites. The net spinning hydropsyche caddisfly "Aoteapsyche" is known to proliferate within the first 75 m of some lake outlets

(Harding, 1994) and has a low MCI score of 4 as suggested by Dr Young. However, by the distance sampled downstream (approximately 18 km) the invertebrate community has returned to a more normal and diverse community. This is demonstrated by Aoteapsyche comprising between 0 and 5% of the invertebrate community total individual count and 3.7 to 4.7% of the taxa count in the last 5 years at the NIWA at Luggate Bridge site. Therefore, having little impact on the overall MCI score for the sites.

6. The NIWA collected data presented on LAWA shows the Luggate Bridge site to have a 5-year median below Attribute “band D”. This is consistent with the sampling undertaken by e3s. This would typically indicate poor water quality. However, the low MCI scores found at the NIWA Luggate Bridge site and the three e3s sites is more likely to be due to the nature of the shallow, slower flowing areas sampled. These were safely accessible but are depositional areas with a greater amount of sediment present (See Figures 5-7, Jager and Doheny 2022). Therefore, more sediment tolerant taxa are present lowering the MCI scores for the sites.

### **Exclusion areas**

7. I was asked to confirm the reasons for the two exclusion areas:
  - a. Luggate Confluence/Devil’s Nook
  - b. Downstream of Lindis Crossing
8. The two exclusion zones were to ensure the habitat for Clutha Flathead Galaxias, Longfin eel, and Koaro and the likely spawning areas for the Clutha Flathead Galaxias and Koaro were protected. As these areas are near the Luggate Creek confluence and the small tributaries below the Lindis river confluence. The section between the Lindis River and Lake Dunstan is also excluded due to the sensitivity of the vegetation and ecology.
9. I consider that these exclusions areas are appropriate and, in some respects, highly precautionary. Particularly in relation to Galaxiid spawning. Whilst there is potential for these species to be present in

the mainstem of the Clutha as they are present in sections of upstream tributaries, they are unlikely to persist within the mainstem for long periods due to the high density of Trout and the limited availability of preferred habitat in the mainstem.

### Guidelines

10. The guidelines I referred to in my summary of evidence were the ANZ guidelines 2018, the British Columbia Turbidity Document and the ORC Regional Plan, schedule 15.

ANZ Guidelines 2018 - <https://www.waterquality.gov.au/anz-guidelines/your-location/new-zealand/search-results?region=CDM&stressor=Turbidity>

British Columbia Turbidity Document link here: see table 45.

[https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg\\_summary\\_aquaticlife\\_wildlife\\_agri.pdf](https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf)

ORC Plan i.e. Tables 15.2.2 and 15.2.3 (page 20-110) link here - [https://www.orc.govt.nz/media/12844/regional-plan\\_water-for-otago-updated-to-3-september-2022-schedules-etc.pdf](https://www.orc.govt.nz/media/12844/regional-plan_water-for-otago-updated-to-3-september-2022-schedules-etc.pdf)

11. The ANZG turbidity guidelines and those in the ORC plan have undergone a rigorous process when being developed and applied. Both suggest turbidity levels be maintained below certain levels i.e. 2.9 NTU (ANZG 2018), 3 NTU upstream of Luggate and 5 NTU downstream of Luggate (ORC plan) 80% of the time.
12. I suggest it is most appropriate to measure a change in turbidity due to the nature of the proposed activity. This would involve measuring the turbidity immediately upstream of the dredge activity and then at 100m and 200 m downstream. As such I have suggested the British Columbia Water quality guidelines for turbidity be used as a measure of change. The document provides a standard “change from background level” of 2 NTU to use in clear water (< 8 NTU) and a separate change from background value of 5 NTU for more turbid waters (8 - 50 NTU). In line with the ANZG and ORC Plan, I

recommend that these standards be met 80% of the time at 100m and that if the standards are not met then a measurement is required at 200m to confirm a return to baseline by this point. This would mean that up to 20% of the time the plume may extend beyond 100m, but not 200m.

13. Given Mr Youngs comments about turbidity I have suggested to the Applicant that a review is done shortly after the dredge commences operating to assess whether the standards are meeting the required narrative standards. This would involve an independent expert reviewing the monitoring data and contemporaneous video footage and assessing that. The review could recommend amendments to the monitoring procedure, or improved standards.
14. Please note in paragraph 19e of my brief of evidence I refer to table 44 of the British Columbia Water Quality - Turbidity guidelines. I should have referred to table 45, as I have done in paragraph 10 above.

#### **Bird conditions**

15. The 250m mining exclusion area for bird nesting colonies proposed in my brief of evidence has been criticised by Babbage Consulting as being arbitrary. The purpose of the proposed 250 m exclusion area in condition 13 was as a protective measure of any potential nesting areas.
16. As the consent conditions have been refined and the beach nesting locations have been identified with a trapping regime if listed birds are found to be nesting. I do not believe the 250 m buffer is necessary anymore and the 100 m exclusion area would suffice.
17. Bird condition comments from Barnett
  - a. Why the species list? – The species list was added to improve the clarity of the condition and target ground nesting birds or those most likely to be affected by the proposed activity. In the absence of a specific list there is uncertainty as to the species that need to be looked for. For example, it might mean smaller

tree nesting birds that are unlikely to be bothered by the dredge are included. I agree that the crested Grebe could be removed as the habitat it is likely to use is now within the exclusion zone below Lindis Crossing. Having considered this further the species list is not strictly necessary if the survey is carried out by an ecologist.

- b. The Shags could be added, but I note that their nesting is clearly concentrated upstream of the proposed consent area (particularly around the Lake an upper section of the Clutha), or clustered around the 'Nook' which is already excluded. So I think there is adequate protection of known Shag nesting habitat already.
- c. Threat rankings of the species - the threat classifications (Robertson, et al., 2021) for the birds identified are:

Common name	Threat classification
Black-billed gull	At Risk - Declining
Black fronted tern	Nationally Endangered
Australasian crested grebe	Nationally Vulnerable
South Island pied oystercatcher	At Risk - Declining
Pied stilt	Not Threatened
Banded dotterel	At Risk - Declining
Southern black-backed gull	Not Threatened
Caspian tern	Nationally Vulnerable
Little pied shag	Data Poor - Relict
Black shag	Data poor - Relict

- d. Setback – 250 m was originally proposed as a precautionary approach. But I accept the input from Ms Barnett and consider that this could be reduced to 100m and it would still be precautionary.

- e. Update to avifauna beaches – I used the Google Earth Pro tool to interrogate historical satellite imagery. The 11 beaches outlined in the brief of evidence were all present in their current locations in 2005 when the earliest usable satellite images were available. Further to this “retrolens” was used to assess historical aerial photos. Visually assessing the presence of gravel beaches at the 11 locations showed that the beaches were present in their current locations in aerial photographs from 1955 to 1976. Therefore, I suggest these beaches are stable and there is no need to update the location of the 11 beaches outlined in my evidence during the consent term.
- f. With respect to the pest trapping – I remain of the view that this is a positive contribution. I agree with Ms Barnett that it is not necessary in order offset or compensate for an adverse effect due to the proposed approach, but it will assist any nesting birds that are found which I consider helpful.

#### **Trap and transfer status**

- 18. Contact Energy have advised of the status of the trap and transfer project and where they release the fish. Elver’s are transferred throughout the catchment into different suitable habitats, the examples given were the Manuherekia River and above the Clyde and Hāwea Dams. For Lamprey, Contact Energy advised that they have only ever been released above the Roxburgh Dam due to sporadic catch rates. Contact Energy aims to develop a more efficient system and distribute Lamprey into a variety of suitable habitats. This goal has not yet come into effect, therefore Lamprey would not be found in the upper Clutha River. I have attached a copy of their email as **Appendix 1**.
- 19. I note that Mr Parata discussed mana whenua’s plans and indicated that transfers were likely to occur within the Manuherekia and Hāwea to start with.

### **Clutha Flathead Galaxias in the Mainstem**

20. The New Zealand Freshwater Fish Database (NZFFDB) records show that the Clutha Flathead Galaxias have only been found in tributary streams and not in the Clutha River mainstem. Therefore, there is very little risk that the Clutha Flathead Galaxias would be affected by the suction dredge as they are not found in the mainstem of the Clutha River, and if they were, the most likely areas are within the proposed exclusion zones. Therefore, they are protected if the Galaxias were to find themselves in the mainstem. Attached at **Appendix 2** is a copy of the NZFFDB records for the Clutha flathead galaxias, these are also outlined in Figure 2 of the e3s report Jager & Doheny (2022) included in the application.

### **Further explanation of evidence**

21. The purpose of figure 5 in my brief of evidence was to demonstrate that intermediate levels of disturbance can be ecologically beneficial. The suction dredge only interacts with the river floor once in each location. Therefore, one disturbance is not going to be ecologically harmful, but could be ecologically beneficial.
22. The New Zealand based study by Townsend et al., (1997) found evidence to support the intermediate disturbance hypothesis with maximum taxa richness found at stream sites with an intermediate frequency and intensity of flood related disturbance. In addition to this, Death (1996) found that in more stable waterways the invertebrate communities recovered more quickly after disturbance. With Tonkin & Death (2013) finding that benthic invertebrate communities become more similar to those found in the surrounding stream bed with time since disturbance.
23. Therefore, I believe that the disturbance of the benthos will be followed by a rapid recovery in the invertebrate community and to potentially have greater benthic macroinvertebrate taxa richness in the areas where suction dredging occurs initially before it trends back to baseline. There are ample undisturbed patches to provide a source of macroinvertebrate colonists to the disturbed areas. This



will occur because the dredge will not be operating in at least the shallow (less than 1m) areas of the river and there will be large areas of upstream habitat to supply macroinvertebrate colonists from.

### **Issues raised by Ka rūnaka**

24. During the Ka rūnaka presentation Mr Parata identified the key areas of concern arising from the proposal and that there is inadequate information regarding these matters to understand effects. I understood those to be:
- a. Effects on species migration,
  - b. Effects on spawning habitat,
  - c. Connectivity, such as the ability of species to move up and down stream freely without risk of harm (e.g. entrainment or noise)
  - d. Effects on rehabilitation of species,
25. I make the following comments with respect to these matters.

#### *Migration*

26. In my view the operation of the dredge is not likely to affect the migration of species. The dredge (and associated plume) is localised, and there will be areas either side available for fish to pass by if they wish. Observations of fish surrounding dredging activities indicate that they will continue to move in the vicinity. Many native fish species migrate after dark (e.g. lamprey and eels) so will be able to continue to do so unaffected because the dredge will not be operating 8pm-8am. If fish did not want to pass the dredge there is ample space within the Upper Clutha for migrating species to 'wait' until the dredge stops operating each day at which time they can move unimpeded. This phenomenon is often seen when migrating species are observed waiting for conditions to be appropriate to complete migration such as after rain events have elevated flow.

27. These points have been covered previously in Section 4.1.1 of the e3s Jager and Doheny (2022) Ecological Impact Assessment included in the application and covers that dams downstream will impact on fish passage. Section 6.1.3 then covers how migration of the various species present will not be impacted.

*Effects on spawning habitat*

28. In my view the exclusion areas proposed (including the depth requirement) adequately address the potential effects on trout spawning habitat. I note Ms Barnett agrees with my evidence with regard to this and I concur with the response (paragraph 6) of Ms Barnett in this respect.
29. In relation to native species, due to their more limited locations and tendency to be located in tributaries the exclusions around tributaries address this potential effect. Specifically, longfin eels spawn at sea, Koaro spawn at stream edges during 'freshes', and Clutha Flathead galaxias will only be found in tributaries not the mainstem. Therefore, any potential impact on threatened native fish is likely to be very minimal. I note Ms Barnett considers there will be "no significant adverse effects on native fauna".<sup>1</sup>
30. With respect to Lamprey in particular, as set out in paragraph 9 of my brief of evidence I consider that they are not present in the Clutha River upstream of the Clyde dam. This means the activity is very unlikely to have an adverse effect on lamprey spawning. If they were to be present their only known spawning locations are under boulders in small headwater streams which is not equivalent to this large river mainstem.
31. Section 6.1.3 of the e3s Jager and Doheny (2022) Ecological Impact Assessment (included in the application) covers the potential impacts on spawning. Why lamprey would not be impacted is covered again in matter 4 of the s92 final response to cultural impact assessment document (Hamer & Miller, 2023). More reasons as to why spawning

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<sup>1</sup> Response to questions from panel Treffery Barnett 16/11/23 at page 7.

is unlikely to be affected for the various species present is outlined in paragraphs 9, 11 and 12 of my brief of evidence.

32. To summarise spawning aspects - The effects of the dredging operations are localised so would not affect all available spawning habitat within the dredge footprint in the same spawning season. The activity, with the conditions around exclusion areas, water depths, and plume is very unlikely to affect the predominant spawning habitat of relevant threatened species. The spawning habitat of species of key interest to mana whenua (longfin eel and kanakana/lamprey) are not available in the dredging area as the species either spawn at sea or spawn in smaller tributary streams.

#### *Connectivity*

33. Similar to the discussion regarding migration I believe there is unlikely to be any meaningful effect on connectivity. The two dams downstream with only a manual trap and transfer system in place will have a much greater effect on connectivity to the sea than the proposed activity. In addition to this, stream confluences will be avoided to aid in connectivity to smaller tributaries.
34. There is a very low chance of fish entrainment. As outlined in Section 6.1.4 of the e3s report (Jager and Doheny 2022) covering the Ecological Impact Assessment which demonstrates low risk of the potential for entrainment of trout by the suction dredge. Why eels, adults and elvers, are unlikely to be entrained is covered in Matter 5 of Hamer & Miller (2023) and again more thoroughly in paragraph 15 in my brief of evidence.

#### *Rehabilitation*

35. I do not believe that the proposal will affect the ability to restore Taonga species over time. There are no Lamprey within the mainstem of the Clutha River upstream of Clyde currently. Based on the information I have from Contact and the evidence of Mr Parata even if relocations commence in the short term, they are likely to take place in the Manuherehia catchment (downstream of Clyde still) and Hawea, where there is more suitable habitat. Neither of these areas

are going to be affected by the operation of the dredge. Lamprey macrophthalmia would need to pass downstream through this reach of the Clutha River to migrate to the sea if released near Hawea, However, macrophthalmia travel at night and are known to handle water and speed pressures better than most other fish (Moser, et al., 2015), so are likely to avoid daytime suction dredging and are likely to survive if entrained in the future (which is unlikely). Therefore, I consider it very unlikely that the proposed activity would adversely impact on fish rehabilitation activities.

36. The proposed consent is relatively short term to align with the mining permits, due to expire in 2031. The rehabilitation of species will be a much longer-term project, particularly given the limited locations where translocation of eels and lamprey are likely to occur over life of the consents. Further, the ability to rehabilitate galaxiid species within the mainstem Clutha is likely to be virtually impossible due to the presence of trout which predate on these species. The downstream migration of lamprey is unlikely to be successful past the two dams however I note they are known to survive turbine exposure more than other fish tested (Moser, et al., 2015).

#### **Turbidity condition**

37. I note Ms Barnett's agreement that a turbidity meter is the most appropriate tool for monitoring in this context. This will simplify the consent condition and enable real time feedback to staff operating the suction dredge.

#### **Permitted activity use**

38. If the consent was to be declined the applicant has suggested they may utilise smaller dredges along the edge, in shallower, slower flowing locations along this section of river covered by their mining permit. This would result in suction dredge activities occurring in the more sensitive areas that are largely excluded from this application.
39. For instance, areas of potential Koaro (river and stream edge) and Trout (gravels less than 1 m deep) spawning and juvenile development (gravelly shallows and slow flowing stream edges

respectively) areas could be disturbed along with areas near beaches where indigenous birds may nest.

40. Dredging activity, under the permitted activity rules, while likely to be more limited in scale, could actually have a greater impact on the more sensitive areas that are to be avoided as outlined in this consent application.

Date: 19 December 2023

Mark Peter Hamer

### REFERENCES

- Death, R. G. (1996). The effect of patch disturbance on stream invertebrate community structure: the influence of disturbance history. *Oecologia*, 108: 567-576.
- Hamer, M., & Miller, B. (2023). *s92 response final response to cultural impact assessment*. Arrowtown: e3s.
- Harding, J. S. (1994). Variations in benthic fauna between differing lake outlet types in New Zealand. *New Zealand Journal of Marine and Freshwater Research*, 28(4): 417-427.
- Jager, M., & Doheny, B. (2022). *Suction Dredge Mining Upper Clutha River, Prepared for Cold Gold Clutha LTD*. Arrowtown: e3 scientific.
- Moser, M. L., Jackson, A. D., Lucas, M. C., & Mueller, R. P. (2015). Behavior and potential threats to survival of migrating lamprey ammocoetes and macrophthalmia. *RevFishBiolFisheries*, 25:103-116.
- Robertson, H. A., Baird, K. A., Elliot, G. P., Hitchmough, R. A., McArthur, N. J., Makan, T. D., . . . Michel, P. (2021). *NEW ZEALAND THREAT CLASSIFICATION SERIES 36: Conservation status of birds in Aotearoa New Zealand, 2021*. Wellington: Department of Conservation.
- Tonkin, J. D., & Death, R. G. (2013). Scale dependent effects of productivity and disturbance on diversity in streams. *Fundam. Appl. Limnol.*, 182(4): 283-295.
- Townsend, C. R., Scarsbrook, M. R., & Doledec, S. (1997). The intermediate disturbance hypothesis, refugia, and biodiversity in streams. *Limnology and Oceanography*, 42(5): 938-949.

## Appendix 1: Email correspondence with Contact Energy

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**From:** Jenny Bullock <Jenny.Bullock@contactenergy.co.nz>  
**Sent:** Wednesday, 19 April 2023 9:03 am  
**To:** Mark Hamer  
**Subject:** RE: trap and transfer data

Morning Mark,

No problem, these things happen with deadlines!

Good question – So for the elver and lamprey trap and transfer like you said we have the ramps and traps based at the Roxburgh dam. The elver are transferred all throughout the catchment into suitable habitats such as the Manuherikia river and above the Clyde and Hāwea dams not just directly above the Roxburgh dam. The intention here is to distribute the elver where possible to avoid releasing elver above Roxburgh only to come across further barriers upstream.

The lamprey have only ever been released above the Roxburgh dam. The main reason for this has been due to the sporadic catch rates in the past. Our goal is to develop a more effective system which successfully traps lamprey each season and from there we hope to investigate release sites throughout the catchment similar to the process we have with the elver.

Cheers,  
Jenny

**Jenny Bullock**  
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**From:** Mark Hamer <mark.hamer@e3scientific.co.nz>  
**Sent:** Tuesday, April 18, 2023 3:32 PM  
**To:** Jenny Bullock <Jenny.Bullock@contactenergy.co.nz>  
**Subject:** RE: trap and transfer data

Awesome, Thanks Jenny!

Sorry to make my timeline your issue I didn't mean to.

1 last question. These numbers are for Roxburgh dam. Is there also a trap and transfer up into the other lakes or is there some sort of elver fishway at those lakes?

I don't need numbers for those today though. Just trying to understand how it works.

Ngā mihi,

**Mark Hamer**  
Senior Freshwater Ecologist

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**From:** Jenny Bullock <[Jenny.Bullock@contactenergy.co.nz](mailto:Jenny.Bullock@contactenergy.co.nz)>  
**Sent:** Tuesday, April 18, 2023 2:35 PM  
**To:** Mark Hamer <[mark.hamer@e3scientific.co.nz](mailto:mark.hamer@e3scientific.co.nz)>  
**Subject:** RE: trap and transfer data

Hi Mark,

Thank you for your email. I'll be struggling with my current workload to get you any further information before the end of today. I've pulled out what I can quickly as a summary and hopefully this is some help!

Please let me know if you have any questions.

**Elver Trap & Transfer:**

The elver trap and transfer takes place at the Roxburgh dam and the bulk weight is recorded. We carry out species ID and this is predominantly long-fin eel with a very small portion identified as short-fin.

Year	Weight (Kg)
2012	18
2013	36
2014	2
2015	4
2016	4
2017	0
2018	25
2019	81
2020	7
2021	52
2022	198
2023	180

**Migrant Eel Transfers:**

Contact hires an eel fisherman who fishes on the upper lakes such as Lake Wakatipu, Wānaka, Hāwea, Dunstan, Roxburgh. Any large eel (over 4kg) or showing migratory signs are released below the Roxburgh dam. Below is a table of the total eels relocated from 2019-2023. Prior to 2019 monitoring and surveys took place with no transfers of eel.

2019	137
2020	489
2021	330

2022	227
2023	197

**Lamprey Transfers:**

Lamprey catches have been sporadic at the Roxburgh dam as you can see below. We are currently working through developing a lamprey dedicated system to allow for the effective upstream passage of lamprey through a dedicated lamprey ladder.

Year	No of Lamprey
2012	67
2013	1
2014	25
2015	0
2016	148
2017	0
2018	0
2019	0
2020	352
2021	0
2022	0
2023	0

Cheers,  
Jenny

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**From:** Mark Hamer <[mark.hamer@e3scientific.co.nz](mailto:mark.hamer@e3scientific.co.nz)>  
**Sent:** Tuesday, April 18, 2023 1:21 PM  
**To:** Jenny Bullock <[Jenny.Bullock@contactenergy.co.nz](mailto:Jenny.Bullock@contactenergy.co.nz)>  
**Subject:** trap and transfer data

Hi Jenny,  
My deadline has been brought forward. Any info you could get me today would be appreciated.

Thanks  
Mark

**Mark Hamer**  
Senior Freshwater Ecologist



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## Appendix 2: New Zealand Freshwater Fish Database records

nzffdRecor	eventDate	eventTime	institution	waterBody	waterBody site	catchment	catchment	eastingNZI	northingNZ	minimumE	distanceOc	samplingM	samplingPr	taxonName	taxonComr	totalCount	notCounte	notDetecte	minLength	maxLength	dataVersion
14758	10/12/1995	13:00	Private Ind	Clutha River tributary	Not Entered	752	Clutha R	1327908	4904922	70	64	Other net - Unknown	Galaxias spec Clutha flat	13	FALSE	FALSE					V1
25376	13/04/2002	day	Departmer	Clutha River tributary	Not Entered	752	Clutha R	1325672	4926131	100	94.4	Electric fish	Unknown	Galaxias spec Clutha flat	1	FALSE	FALSE	71			V1
25380	13/04/2002	day	Departmer	Clutha River tributary	Not Entered	752	Clutha R	1324267	4929231	80	96	Electric fish	Unknown	Galaxias spec Clutha flathead galaxias	1	FALSE	FALSE	56	78		V1
101781	6/08/2013		Departmer	Clutha River tributary	Stream	752	Clutha R	1325440	4923661	133	96.64	Electric fish	Unknown	Galaxias spec Clutha flat	10	FALSE	FALSE				V1
101782	6/08/2013		Departmer	Clutha River tributary	Stream	752	Clutha R	1325374	4923652	135	96.64	Electric fish	Unknown	Galaxias spec Clutha flat	1	FALSE	FALSE				V1
112866	20/10/2017	13:46	Departmer	Clutha River tributary	Stream	752.31	Clutha R	1325302	4923607	150	97.39	Electric fish	Unknown	Galaxias spec Clutha flat	7	FALSE	FALSE	52	62		V1