| | |
|---|---|
| **From:** | Will Nicolson |
| **To:** | Natasha Pritchard |
| **Cc:** | Tony Jack; Ross Dungey |
| **Subject:** | RE: Request for Further Information s92(1) RM18.004 - 25 August 2021 |
| **Date:** | Thursday, 2 September 2021 11:48:15 a.m. |
| **Attachments:** | 20210824_17367_Pioneer Energy Ltd_s92 response_Final.pdf |

Good morning Natasha,

Please find attached our responses to your latest s92 request. Appended to the responses is a draft/interim report prepared by Ross Dungey aimed at providing additional context for recreation at Onslow. Hopefully this all satisfies your further information requirements.

Additionally, with regards to the macroinvertebrate monitoring in the Teviot suggested by Babbage, Ross does not consider this to be necessary or appropriate for the application. Given that the applicant is not modifying the discharge consent or the rate of discharge specifically, there is no real basis for requesting monitoring of the river downstream of the dam as part of the proposal. Ross can think of no instance where the increased drawdown would negatively impact macroinverts in the Teviot, therefore we'd need a bit more justification from Babbage before agreeing to additional monitoring there.

Regards,
Will

Will Nicolson
Scientist/Resource Management Planner

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-----Original Message-----
From: Natasha Pritchard <natasha.pritchard@orc.govt.nz>
Sent: Thursday, 26 August 2021 8:13 AM
To: Will Nicolson <will@landpro.co.nz>
Cc: Tony Jack <tony.jack@pioneerenergy.co.nz>; Ross Dungey <ross.d.consult@gmail.com>
Subject: RE: Request for Further Information s92(1) RM18.004 - 25 August 2021

Hi Will,

Thank you for this update.

I will seek some advice from Babbage on the below and will get back to you shortly.

Kind regards,
Natasha

-----Original Message-----
From: Will Nicolson <will@landpro.co.nz>
Sent: Wednesday, 25 August 2021 12:47 p.m.
To: Natasha Pritchard <natasha.pritchard@orc.govt.nz>
Cc: Tony Jack <tony.jack@pioneerenergy.co.nz>; Ross Dungey <ross.d.consult@gmail.com>
Subject: RE: Request for Further Information s92(1) RM18.004 - 25 August 2021

Hi Natasha,

Thanks for turning the s92 request around so quickly.

I've talked to Ross and we'd appreciate if you could liaise with Babbage to get a bit more justification/reasoning around why macroinvert monitoring in the Teviot downstream of the dam would be necessary. We don't foresee any effects to downstream ecology, therefore would need a bit more justification to ensure monitoring was appropriate. Routine monitoring of macroinvertebrates doesn't take place presently, so it would be a reasonably significant additional undertaking, depending on the required methodology (if any).

I will aim to have s92 responses back to you by Monday next week at the latest.

Regards,
Will

-----Original Message-----
From: Natasha Pritchard <natasha.pritchard@orc.govt.nz>
Sent: Wednesday, 25 August 2021 9:42 AM
To: Will Nicolson <will@landpro.co.nz>
Cc: Tony Jack <tony.jack@pioneerenergy.co.nz>
Subject: Request for Further Information s92(1) RM18.004 - 25 August 2021

Mōrena Will,

Thank you for promptly confirming the applicant's preference. I have attached the formal s92(1) letter. There are no significant changes from the below but please let me know if you have any questions. I have kept this in an accessible word format so that you can access the document to prepare your response.

I note the applicant's likely proposal to include the Teviot River monitoring in the LOMP. Please let me know if you would like to confirm this prior to a s95 decision being made.

When you have had a chance to scope the further information work, if you are able to advise a likely timeframe for a response that will assist with our planning. I can confirm that we will have Dr Kay Booth audit the further information and update her report based on it (we will need to set up a separate purchase order for this which has a 24 hr turnaround typically and it will depend on Dr Booths availability on how promptly she can complete the audit). However, I will seek for a prompt confirmation regarding the completeness of the further information request. Once I have an updated audit (if there is no need for further information/clarification), I will update the draft s95, have this peer reviewed and then with you for comment. I will keep you updated on these likely timeframes and can confirm that we are making continual progress on the processing of this application.

I hope you and your families are doing ok in this challenging time.

Kind regards,
Natasha

Natasha Pritchard
PRINCIPAL CONSENTS PLANNER

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From: Will Nicolson <will@landpro.co.nz>

Sent: Tuesday, 24 August 2021 8:59 p.m.
To: Natasha Pritchard <natasha.pritchard@orc.govt.nz>
Cc: Tony Jack <tony.jack@pioneerenergy.co.nz>
Subject: RE: Ecological and Amenity Audit Reports - Pioneer - RM18.004

Good evening Natasha,

With regards to macroinvertebrate monitoring in the Teviot River downstream of the dam, I am yet to be convinced such considerations would be within the scope of proposed drawdown amendment to the water permits (and not the discharge permit). However, my limited understanding is that Ross already conducts routine monitoring of the Teviot River for macros, so if this can easily be integrated into the LOMP then we would consider doing so as a show of good faith.

As I understand it, the only party who could undertake a suitable cultural assessment would be iwi themselves, and I doubt it would be acceptable to allow a potentially affected party to conduct their own assessment! We can, however, provide further comment on these elements from a non-expert perspective. With regards to amenity, we should be able to address most of your additional questions.

On this basis, can you please formalise the draft further information questions below and we will seek to address those within our means. Time is really starting to drag on this one, so I'll assume that your formal s92 questions aren't going to differ too much from what you've outlined below – please let me know ASAP if it's looking likely they'll deviate somewhat. I'd also appreciate if you could indicate when we might expect to receive the latest round of formalised questions.

Thanks,
Will

Will Nicolson
Scientist/Resource Management Planner

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From: Natasha Pritchard <natasha.pritchard@orc.govt.nz>
Sent: Monday, 23 August 2021 11:36 AM
To: Will Nicolson <will@landpro.co.nz>
Cc: Tony Jack <tony.jack@pioneerenergy.co.nz>
Subject: Ecological and Amenity Audit Reports - Pioneer - RM18.004

Kia ora Will,

As part of the processing and assessment of Application RM18.004 it was audited by technical experts. We let you know about this on 11 August 2021. A copy of the audit reports prepared by Babbage Consulting Limited and Dr Kay Booth contracting to R and R Consulting (NZ) Limited are attached for your reference. I note the following:

- The Ecological audit report supports the ecological effects conclusions in the Application related to the effects on Lake Onslow and its tributaries, the Teviot River and the Regionally Significant Wetlands.
- The Ecological audit report recommends that monitoring of macroinvertebrates downstream of the dam in the Teviot River occurs. This may form part of a s42A recommendation. At this point, it would be helpful to know if the applicant seeks to amend their Application to include this requirement. This may be an update to the LOMP if it were to be incorporated.

- The Amenity Values audit report identifies that the Application has a lack of information to understand the specifics of the recreational, visual amenity and cultural values at the site and effects on them from the proposal. The following options are proposed:
  - Further information is provided. Draft questions are provided below (I am currently having these reviewed).
  - F and G had suggested previously that rather than a comprehensive assessment now a recreational and visual amenity monitoring proposal could be added to the Application. I understand that a cultural effects monitoring proposal has also been suggested by Aukaha in your discussions with them. If comprehensive amenity and cultural monitoring regimes are proposed now this may be enough for a decision maker to be satisfied that overall environmental effects are no more than minor and/or you may also obtain written approvals from some of the interested parties. However, without prejudicing the notification decision, without the clarity of the below questions being answered before a notification decision is made it is likely that effects on some parties will be minor (due to the uncertainty on key amenity/cultural locations). Let us know if you would like to proceed on that basis.
- Draft further information questions are included below to assist with your decision making. I can formalise these if you seek to progress with that option.

Further information

1. The Lake Onslow lakeshore is variable in substrate composition and gradient meaning that substrate and lake bed exposure will differ in extent around the lake edges with changes in water levels (Dungey, R 2017 – Lake Onslow Lake Bed Profile and Invertebrate Study). Access and use of the lakeshore is also understood to be variable with limited access in some locations. Please provide plans or diagrams that clearly illustrate and reflect this variability around the Lake Onslow lakeshore.
2. Identify and illustrate via plans or other means the locations around Lake Onslow that have key amenity and cultural values (e.g. public access locations, walking locations, key angling locations including identification of the specific type of angling (foot, boat)). It would be helpful to have a recognised gradient of use e.g. different colours or shading for high use, moderate use, low use areas and the point source identification of sites (e.g. waahi taoka sites), if that is relevant
3. Clearly describe and quantify (where possible) how the change in the rate of drawdown may affect the lakeshore at different locations around Lake Onslow focusing, but not limited to, the locations identified as moderate-high value for amenity and cultural reasons. The assessment should consider, but is not limited to, the horizonal distance of lakeshore that may be exposed, the nature of the substrate, the extent of mudflats at different lake levels and the changes in deep water passage.
4. Provide a recreational assessment of the effect the changes will have on key amenity values being fishing/angling, boating and use of the lakeshore for camping/walking. The recreational assessment should address the following:
   a. Identifies the key fishing, boating, walking, camping locations in and around Lake Onslow and the Teviot River including access points.
   b. Effects to recreation values from the proposed change on access to the lake (by foot and boat).
   c. Effect to lake channels for boating including safety implications from stranding from the proposed change.
   d. Identification of the proportion of the Lake Onslow shoreline that is mudflats that is in a moderate-high recreational use area. Identification of the proposed change to the mudflat extent at different lake levels and what effects this has on access and aesthetics. Consideration of how this relates to key walking and angling locations. Assessment of changes in effects from the proposal.
   e. In terms of mudflats, any supporting advice on the duration between lake level drop and the mudflat being safely accessible for public access.
   f. The potential for increased erosion and land instability of the lakeshore, the location of these potential effects and relationship to identified key amenity value locations.
5. Provide a cultural impact assessment that addresses the following:
   a. The presence, extent and importance of mahika kai gathering historically and currently at or near Lake Onslow and within the Teviot River.
   b. The presence, extent, location and importance of waahi taoka at Lake Onslow and within or near the Teviot River.
   c. Assesses the effect of the proposed change on these identified values including the activity of mahika kai gathering.
   d. Assesses whether the proposal protects important sites and values of cultural significance.
6. Provide a visual amenity assessment that assesses the effect of the proposal on landscape values.

Once you have had an opportunity to discuss with the applicant, please let me know how you wish to proceed.

The costs to date for the processing of your application are $16,726. This excludes the deposit. These costs may not yet include all work completed on your application, including external audit work.

The work still to be completed on your application includes finalising the draft notification report, conditions and decision report. I will continue to monitor the costs of your application and I will update you on the costs of your application at the next processing stage for your consent. If you would like another update on costs before then please let me know. Further information on consent costs can also be found on our website: https://www.orc.govt.nz/consents-and-compliance/ready-to-apply-for-a-consent/fees-and-charges/fees-and-charges-faqs
Please contact me if you have any questions regarding the above.

Kā mihi,
Natasha

Natasha Pritchard
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2 September 2021

Landpro Reference: 17367
Council Reference: RM18.004 / A1518841

Otago Regional Council
70 Stafford Street
**Dunedin, 9054**

Dear Natasha,

**Re: Request for further information under Section 92(1) of the Resource Management Act 1991 – application to amend water permits 2001.475 & 2001.476.**

Prior to directly addressing your further information requests, there is a need to clarify the operational realities of the increased drawdown rate being sought. While 0.4 m/week is being sought (up from 0.2 m/week), it is unlikely that this drawdown rate would ever be fully achieved. It is more likely that an increased drawdown rate of around 0.25 m/week (0.05 m above what is currently consented) would be utilised, in order to respond to electricity market demand. This corresponds to how the applicant currently operates under their consent conditions at Onslow, with a tendency to curtail lake drawdown/discharge from the dam when the drawdown rates reach 0.18 m/week.

Drawdown of Lake Onslow due to the dam operation is also unlikely to exceed 0.2 m/week every year, with the applicant indicating that this would likely only occur an estimated 2 in every 5 years.

In a worst-case scenario, there may be up to 8 weeks of drawdown at 0.25 m/week, with up to 2 weeks at a drawdown of 0.3 m/week. Thus in any given year, total drawdown above the currently consented 0.2 m/week would be unlikely to exceed 0.6 m. Comparing this to another (much larger) hydro scheme with a managed artificial lake, Contact Energy is authorised to vary the level of Lake Dunstan by up to 1 metre (193.5-194.5 m above sea level) at any point in time. This implies a potential drawdown of up to **1 metre** in **less than one week** (dependent on operational constraints) – significantly more than what the applicant is proposing at Onslow and at a significantly greater scale.

In reference to your request for further information dated August 25, 2021, please find outlined below our responses to this request.

*1. The Lake Onslow lakeshore is variable in substrate composition and gradient meaning that substrate and lakebed exposure will differ in extent around the lake edges with changes in water levels (Dungey, R 2017 – Lake Onslow Lake Bed Profile and Invertebrate Study). Access and use of the lakeshore by recreational users are also understood to be variable with limited access in some locations. The potential for increased erosion and land instability of the lakeshore is also variable. Please provide plans, diagrams and/or maps (overlain maps) that clearly illustrate and reflect this variability around the Lake Onslow lakeshore and that highlight the locations of high use and high erosion/land instability potential.*

Ross Dungey, who has considerable experience as an angler at Lake Onslow over the past ~4 decades, indicates that angler access to Lake Onslow is primarily via boats launched at the boat ramp to the southeast of the dam (see Figure 1 below). This is largely due to a lack of public access to the lake over an estimated 75-80% of the lake shore. Mr Dungey states that boating is the only way to reach fishing locations on all but a small proportion of the west, northwest and north areas of the lake.

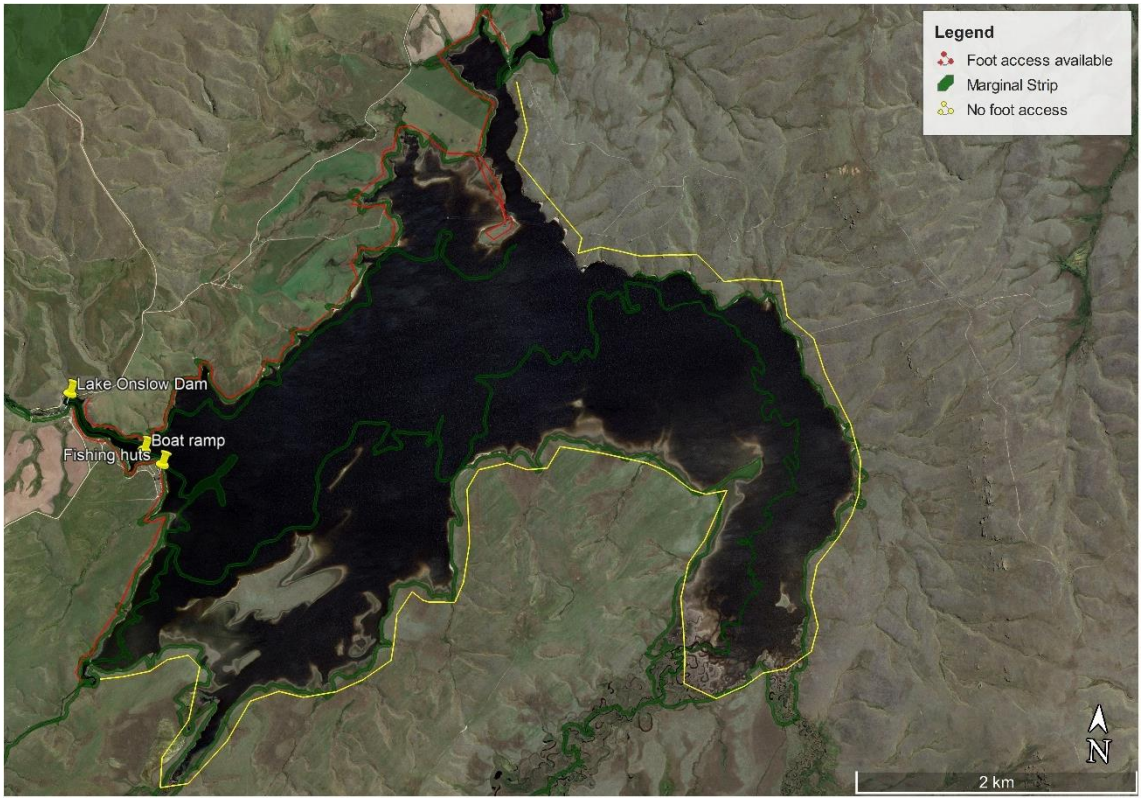



**Figure 1: Fishing access at Lake Onslow, as indicated by Ross Dungey.**

Note that while the above figure indicates a large proportion of the northwest and west of the lake would technically be accessible by foot for angling, in practice most of this zone would either require

consent from the private landowner for the angler to cross that land from the road, or walking along the shoreline (public land via marginal strip) for several kilometres, which is relatively unfeasible. It is more likely that these areas would still be accessed via boat as the most efficient means.

According to Mr Dungey, anglers typically use boats to either fish from (primarily trolling) or get access to a section of shoreline from which they would fish on foot. The change in drawdown rate is unlikely to restrict use of the boat ramp because the overall operating regime will not change, and the boat ramp is operable within the consented drawdown range (upper and lower lake level limits). Anglers using boats to access the rest of the shoreline will not be restricted either, as they can follow the retreating shoreline from the boat. Those anglers accessing the west, northwest or north shoreline by foot will still be able to do so, but this group will have some muddy shorelines to traverse as the lake falls. This is no different to the current arrangement.

Illustrating the variability in erosion or land instability around the lake due to the proposal would be a very difficult process, and is considered well outside the scope of the application. Additionally, as Mr Dungey has indicated in previous correspondence, it is not expected that erosion or land instability (such as from increased wave action on exposed shoreline) would increase due to the proposal, therefore there would be little to show on a map. That being said, the 2018 application did provide a representative snapshot of how the lake shoreline responds to different lake levels in varying locations, thereby giving a good idea of how shallow or steep, rocky shoreline, for example, would respond to the drawdown – noting that these areas would be exposed regardless of the drawdown rate. A table ("Table 3") and figures ("Figure 1" & "Figure 2") from that report (appended to the AEE) are provided below.

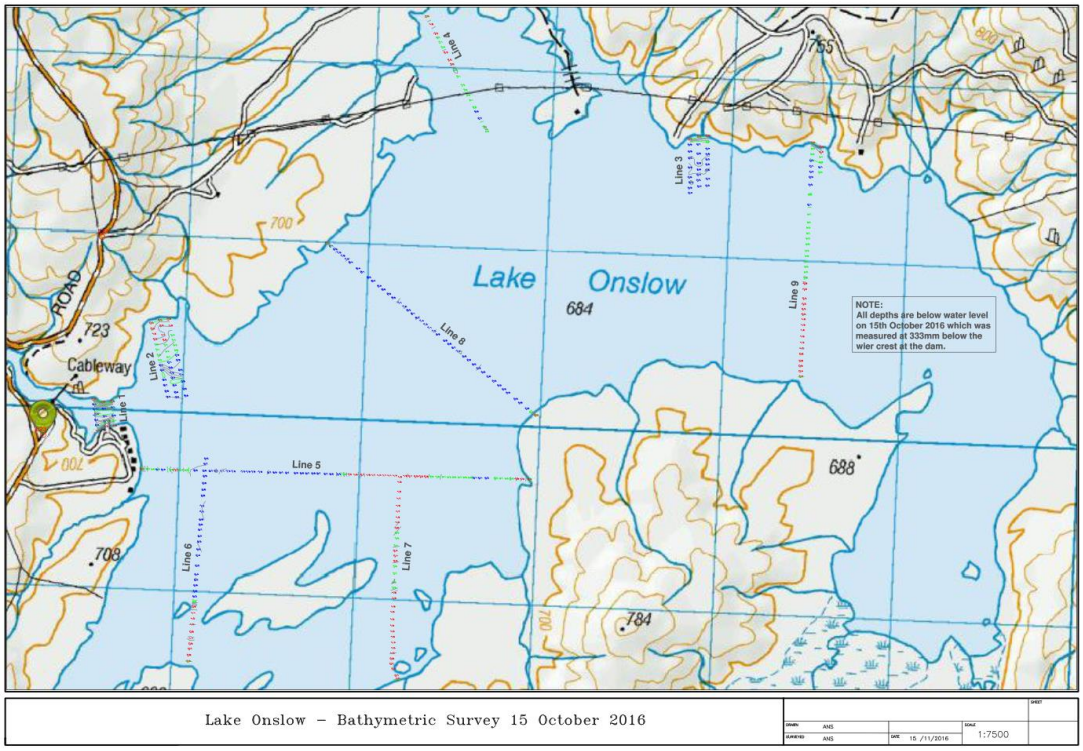



Figure 1, lines 1, 2, and 3 are invertebrate survey sites, others lines are water depths only, see appendix 1 for large scale map.

Table 3, cumulative distance (m) of lakebed exposed for each 0.5m drop in lake level. L1S =Line 1 south end of transect, L8NW=line 8 northwest end of transect.

| Site | 0.5 drop | 1m | 1.5m | 2m | 2.5m | 3m | 3.5m |
|---|---|---|---|---|---|---|---|
| L1N | 1 | 2 | 4 | 4 | 7 | 8 | 8.5 |
| L1S | 4 | 6 | 10 | 17 | 20 | 22 | 25 |
| L2N | .5 | 5 | 7 | 10 | 20 | 40 | 55 |
| L3N | 2 | 3 | 4 | 8 | 10 | 12 | 15 |
| L4N | 20 | 50 | 65 | 70 | 90 | 140 | 215 |
| L5E | 20 | 40 | 50 | 50 | 75 | 80 | 130 |
| L5W | 10 | 15 | 20 | 20 | 27 | 30 | 50 |
| L6S | 25 | 50 | 325 | 330 | 340 | 345 | 350 |
| L7S | 20 | 125 | 240 | 500 | 510 | 530 | 560 |
| L8SE | 10 | 15 | 25 | 30 | 40 | 50 | 50 |
| L8NW | 1 | 1.5 | 5 | 10 | 15 | 20 | 25 |
| L9N | 1 | 2 | 5 | 10 | 15 | 25 | 30 |
| L9S | 20 | 115 | 250 | 350 | 500 | 540 | 550 |

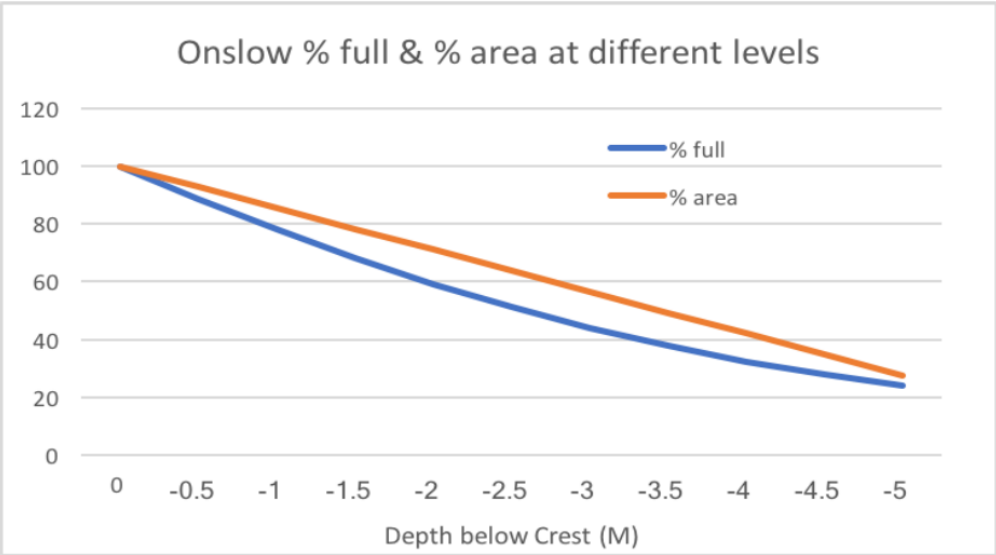



Figure 2: relationship between lake area, percent full and the water level below the weir crest. (-2 equals 2m from the weir crest down to the water level).

*2. Please identify and illustrate via plans or other means the locations around Lake Onslow that have key amenity and cultural values. This may include public access locations, walking locations, key angling locations including identification of the specific type of angling (foot, boat), mahika kai locations. It would be helpful to have a recognised gradient of use e.g., different colours or shading for high use, moderate use, low use areas and the point source identification of sites (e.g., waahi taoka sites), if that is relevant.*

As a long-time recreational user of Lake Onslow, Mr Dungey has provided the following response to this question:

*Lake Onslow is a highly valued resource providing angling opportunity in particular for anglers of all ages and levels of skill. International anglers travel there and NZ families camp and fish there. The huts present are owned by locals and fishing clubs and used by individual anglers and angling families and their associates who simply enjoy the view and ambiance of the Central Otago landscape. Angler access to the lake is mostly by boat as about 75% of the shoreline does not have public vehicle access by land. So anglers use boats to reach that shoreline. Part of the western and north-western shoreline does have foot access across private land with permission. There are a few roads/tracks in this zone from which access to the lake may be gained. The boat ramp near the huts is the only launching site available.*

*Anglers fish from the whole Onslow shoreline and all of the lake trolling. As summer warms the deeper water is preferred as fish move to cooler temperatures. There are fish everywhere!* ***All of the lake is "high use"*** *moderated by fish activity according to insect activity/life history. It is an anglers Eldorado if your visit*

*coincides with a cicada hatch and this event is watched for closely by keen anglers. Fishing success is also moderated by skill and weather. In the winter use is low with few anglers and a few game bird hunters. In winter Onslow can be very bleak and very cold and snow can block the access road from Millers Flat*

*As previously mentioned there is a small recreational lobster* [Paranephrops zealandicus] *fishery. People fish for lobster using a baited trap. Lobsters are more common around the rocky shorelines.*

*There are a few anglers huts on the western shoreline and some anglers camp/caravan/motorhomes at this location. It is private land and therefore courtesy of the landowner.*

*Mountain bikers have appeared in recent years but this use is confined to tracks and public roads to the west and north. The tussock dominated landscape does not make for suitable biking terrain and is difficult to walk through even when one is motivated by trout rising to cicadas.*

*The tracks (4WD) roads past the north end of Onslow and over into the headwaters of the Taieri River are also popular for 4WD and trail bike outings, none of which can be affected by the proposal.*

Mr Dungey has prepared a figure that builds on the information presented in Figure 1, with other known recreational activities at Onslow also shown.

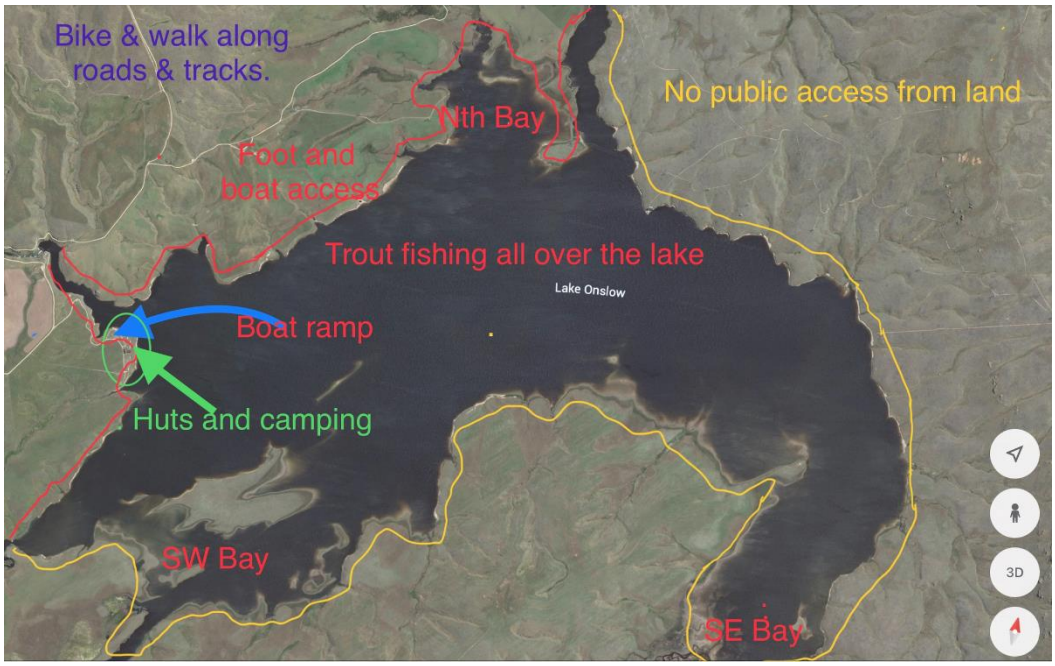



**Figure 2: Recreational activties in and around Lake Onslow (Source: R. Dungey, 2021)**

The below table indicates popularity/use for each recreational activity shown on the map, with waterfowl hunting (typically taking place during the duck shooting season) also shown. This table has also been provided by Mr Dungey.

**Table 1: Assumed popularity of recreational activities at Onslow - to be read in conjunction with Figure 2**

| Angling | Waterfowl Hunting | Camping | Biking |
|---|---|---|---|
| High | Low | Moderate | Low |

Documented sites of cultural significance were shown in the previous s92 request, dated 29 July 2021. These would not be affected by the proposal, as any sites within the impounded area would remain within the impounded area, while sites above the lake shoreline would also not be impacted as the fullest extent of the lake would not change due to the proposal. As no erosion or land instability is expected due to the increased drawdown, there is little likelihood that there would be any risk to cultural sites in close proximity to the shoreline.

While it is once again noted that we are not cultural experts and have an only limited capacity to determine cultural values in the area, with no proposed change to the minimum and maximum extent of the lake, no adverse effects on any unidentified values are unlikely. Based on Mr Dungey's prior assessments, it is not expected that any significant adverse effects on any mahika kai species present will result due to the proposal.

*3. Please clearly describe and quantify (where possible) how the change in the rate of drawdown may affect the lakeshore at different locations around Lake Onslow focusing, but not limited to, the locations identified as moderate-high value for amenity and cultural reasons. The assessment should consider, but is not limited to, the horizonal distance of lakeshore that may be exposed, the nature of the substrate, the extent of mudflats at different lake levels, the potential for increased erosion or land instability, the changes in deep water passage, dust generation and changes in visual amenity. Consideration should also be given to the time of year when the drawdown is likely to occur and the likely recreational uses/weather conditions at this time. Overlain maps may help to illustrate some of the changes.*

This question has already been addressed to some extent by the responses above. Furthermore, Mr Dungey (with some additions/alterations) indicates that:

1. Exposed shoreline is a function of water level, which varies based on rainfall (input) and water use (output), the latter of which is capped at a consented maximum of 6 $m^3/s$.
2. No more lake shore will be exposed due to the proposal than can be exposed under the current operating regime.

3. As discussed earlier, while the drawdown rate of 400 mm/week sought is unlikely to ever be reached, theoretically this would equate to 2.38 mm/hour which would be undetectable to the human eye. Over the course of a fishing day – say 14 hours – that would be 33.33 mm, which may be noticeable on a really calm day, but not significantly so. Overall, the aesthetics of the lake would remain unchanged due to the proposal, as the minimum and maximum extent of the lake would not be altered.
4. The above rate of drawdown would not strand anglers or fish. The boat ramp has historically provided angler access at all lake levels since the raising of the lake in 1984.
5. At present, over the course of the summer as more water is discharged from the lake, water level falls and more lake bed is exposed, with this effect being more pronounced in a drought year, which seems to occur approximately once in seven years.

There are 3 main bays with relatively shallow water; Pylon Bay in the north, and the southwestern and south-eastern bays. These gradually expose more mudflats as the lake level drops and in a drought year where the lake could potentially drop to 5m below the weir crest as allowed for in the consent, that would expose approximately 72% of the full lake bed. This has occurred twice since 1984, and the applicant is not likely to reduce lake levels beyond what is typical (~2.5 m below dam crest) as a result of the increased drawdown rate sought.

The figures provided in response to Question 1, which were taken from Mr Dungey's 2017 Lake Onslow assessment, show the amount of lakebed that would be exposed based on 0.5 m reductions in lake levels across a series of transects. While these exposures would occur regardless of the drawdown *rate*, they provide the best means of assessing what the lake and corresponding shoreline would look like at different levels.

Reductions in lake levels are obviously going to be most pronounced in those areas of shallower shoreline, such as the bays discussed above and as shown in Table 3 of Mr Dungey's 2017 report. However, the applicant has indicated that the increased drawdown sought is most likely to be exercised in late summer/early autumn – at a time when lake water temperatures tend to be warmest and anglers tend to target the deeper zones of the lake as that is where trout tend to congregate (see Mr Dungey's explanation of this earlier). As such, most of the fishing at this time of the year would be away from the shallower areas of the lake, meaning the areas where the "effects" may be most pronounced would tend to be low-use from a recreational perspective.

With regards to dust generation, the implication is that by increasing the rate of drawdown, increased lakebed exposure could lead to increased generation of dust in windy conditions. However, the worst that could happen is an additional 0.2 metres per week would be exposed, which is relatively minor, and it is not likely that this would technically represent a 100% increase in potential dust generation as the exposed shoreline would dry at varying rates, depending on substrate. Additionally, the *total*

exposed shoreline should not change due to the proposal, therefore the total dust generation potential is also unlikely to significantly increase.

*4. Provide a recreational assessment of the effect the changes will have on key amenity values being fishing/angling, boating and use of the lakeshore for camping/walking and any other recreational activities pursued at Lake Onslow or on/near the Teviot River. The recreational assessment should address the following:*

*a. Identifies the key recreational activity locations including fishing, boating, walking and camping in and around Lake Onslow and the Teviot River including access points.*

Key fishing locations are discussed earlier in this document. In short, fishing occurs throughout the lake and is dependent primarily on trout movements. Boating is the primary means of fishing (either trolling or accessing shore locations for fishing on foot), however some terrestrially-accessed shore fishing is possible towards the western and northwestern end of the lake, generally pending private land access agreement. The boat ramp at the huts towards the western end of the lake is the only location for launching boats.

To our knowledge, there are no formal hiking trails in close proximity to the lake, however any walking in the area would occur well above the high water mark and is therefore unaffected by the lake level. Camping occurs primarily in the vicinity of the huts (shown in earlier figure), and also is not directly affected by lake levels.

Further information regarding recreation at Lake Onslow is provided in an interim report prepared by Mr Dungey, attached to this document as Appendix A. As indicated in that report, it is not finalised due to COVID lockdown restrictions, however it has nonetheless been provided to help fill in perceived information gaps in the application.

*b. Assesses the effects to recreation values from the proposed change on access to the lake (by foot and boat).*

As has been alluded to throughout our responses, effects on recreation values due to the proposal to increase the lake drawdown rate by 0.2 m over a week are not expected to be significant. Mud is present around the Lake Onslow shoreline regardless of drawdown rate, and Mr Dungey has indicated that most anglers at Onslow access fishing locations by boat and then jump out into the shallows as needed. Otherwise, those seeking to fish the shoreline by foot would be largely unaffected by the increased drawdown rate, as trout tend to avoid the shallower parts of the lake during the late summer, and this is when Pioneer have indicated they would most likely seek to utilise the increased drawdown rate. As is shown in the table provided in the response to Question 1, steeper/rocky shoreline areas would not be significantly impacted by the increased drawdown.

*c. Assesses the effects to lake channels for boating from the proposed change including safety implications from boat stranding.*

Mr Dungey has indicated the following:

> *As discussed above an hourly maximum drawdown rate of 2.38mm/hour isn't going to strand anybody. There are known shallow spots in the lake where care has to be taken at any lake level to avoid running aground on a mud flat. Local knowledge is required to safely navigate the lake at all lake levels. Its not like a big hydro scheme where water level may change by metres/day. Even at maximum drawdown rate applied for its about 33mm over a long angling day.*

*d. Identifies the effects of the proposed change to the mudflat extent at different lake levels on recreational access and use. Considers how this relates to key walking and angling locations.*

Mr Dungey estimates that approximately 60% of the Lake Onslow shoreline is soft, deep mud at lake levels of approximately 3 m below dam crest. By their very nature, these areas are shallow and warm in the late summer, and therefore have limited capacity to support trout. It is not the drawdown rate but the lake level itself that influences the formation/exposure of the mud flats – meaning any increase in drawdown rate would not impact the existence of these features, given the minimum operating levels should not change.

*e. Assesses the effects of the proposed changes on public access to Lake Onslow including any supporting evidence on the duration between lake level drop and the mudflats being safely accessible for public access.*

Mud flats at Lake Onslow can be an inconvenience to those seeking to access the shoreline (mostly anglers), however this is a function of the lake level rather than the drawdown per se. Generally speaking, lower lake levels coincide with creation of muddy zones on previously flooded shoreline, therefore those on foot may have greater difficulty accessing the lake when levels are low.

However, as discussed earlier, mud flats occur where the lakebed margins have the lowest gradient, which tend to be the least favoured locations for anglers during the summer months – which is when Pioneer has indicated they would be most likely to utilise the higher drawdown rate.

Overall, the proposal is not expected to significantly increase safety concerns regarding public access, particularly considering most anglers tend to utilise boats for fishing at Onslow when lake levels are low – regardless of the drawdown rate (R Dungey 2021, pers. comm., 31 August).

*f. Assesses the implications for recreational access and use from the information provided on the potential for increased erosion and land instability of the lakeshore.*

Shoreline erosion is most prevalent at high water levels, particularly during stormy weather when wind drives waves against the shoreline. Were the lake to be *raised*, increased adverse effects from erosion would be a legitimate concern, however the proposal is simply to draw the lake *down* at a slightly increased rate but within the existing authorised operating levels. As such, increased lakeshore erosion due to the proposal is not expected.

*g. Assesses the effects on recreational users from any increased potential for dust generation from the proposed change.*

As indicated earlier, it is not expected that there will be a significant increase in dust generation due to the proposal.

*5. Provide a cultural impact assessment or evidence of consultation that identifies and addresses the following:*
*a. The presence, extent and importance of mahika kai (flora and fauna) gathering historically and currently at or near Lake Onslow and within the Teviot River.*

An analysis of historic mahika kai gathering records was provided in our previous s92 response, dated 29 July 2021. We are not clear on current mahika kai gathering at Lake Onslow and the Teviot River, however Mr Dungey has indicated the following:

> *Food gathering is presently based primarily around fishing for trout. Pre-European times when the area was an upland swamp complex it is likely only lobsters and galaxiids were present in the open water of the swamp and its tributary streams. Any evidence of these resources being harvested is likely to have been flooded when the first dam was built in 1890. The construction of the dams has greatly increased habitat available for lobster and trout to provide the highly valued resource currently available.*

*b. The presence, extent, location and importance of waahi taoka at Lake Onslow and within or near the Teviot River.*

Again, an analysis of waahi taoka is provided in our previous s92 response. Ultimately, Lake Onslow is an artificial lake created by the historic damming of the Teviot River, which flooded much of the upstream reach of that river and various tributaries, and Dismal Swamp. This means that any sites or resources of significance that are location-specific to those flooded areas will remain unaffected by the proposal, as the minimum and maximum extent of impounded will not be changed. Any sites or

resources outside the impounded area would be assumed to be unaffected by the proposal, as no adverse effects to the shoreline or lake margins are anticipated due to the increased drawdown.

*c. Assesses the effect of the proposed change on these identified values including the activity of mahika kai gathering. This includes the practical effects the change may have on this practice and the experiential effects including visual amenity, if this is relevant.*

From a non-expert perspective, there is no indication that the proposal will have any adverse effect on possible cultural values in and around Lake Onslow and the Teviot River. As has been indicated in previous s92 responses to this application and earlier in this document, an increased drawdown rate is unlikely to significantly adversely impact assumed mahika kai species in Lake Onslow (trout and koura) or in the Teviot River downstream of the dam.

With regards to waahi taoka, as has been discussed above, as the consented minimum and maximum lake levels will not change and no significant shoreline erosion is anticipated, it is not expected that any effects to sites of significance will result due to the proposal.

Similarly, the proposed increased drawdown rate will not alter the surrounding landscape or the aesthetics of the lake or Teviot River. In this respect, no experiential or visual effects due to the proposal are expected.

*d. Assesses whether the proposal protects important sites and values of cultural significance.*

As I am not a cultural expert, I can only comment on the effects on publicly-documented sites and values of cultural significance. I have done so in the previous s92 response, indicating that I do not foresee any significant negative effects on these parameters, insofar as I am able to determine this.

I trust that the information set out above satisfies the request for further information. However, if you have any further queries, please do not hesitate to contact me.

Kind Regards,

Will Nicolson
Scientist/Resource Management Planner

## Appendix A: Draft/Interim Lake Onslow amenity report

# Lake Onslow Recreation Values.



## Interim Report

This is an interim report, because of the covid lockdown, which restricted the opportunity to consult with interested and affected parties and agencies with an interest in, and knowledge of, the amenity values of Lake Onslow.

## Background

Lake Onslow is an irrigation dam operated by Pioneer Energy for hydro generation and water supply to irrigators of the Teviot/Ettrick/Roxburgh river flats. The dam to create Lake Onslow was originally constructed in 1888 by damming the Teviot River and Dismal Swamp to provide water for mining operations, a new dam was built in 1984 that increased lake area from 367 ha to approximately 830 ha, an increase of 2.25 times. There is single access road to the lake from the south side which is limited in the winter time because of snow drifts and road conditions. The Lake Onslow Road continues over to the Taieri River to the north east but this is not the usual route to access the lake because of its cross country/dirt track nature.

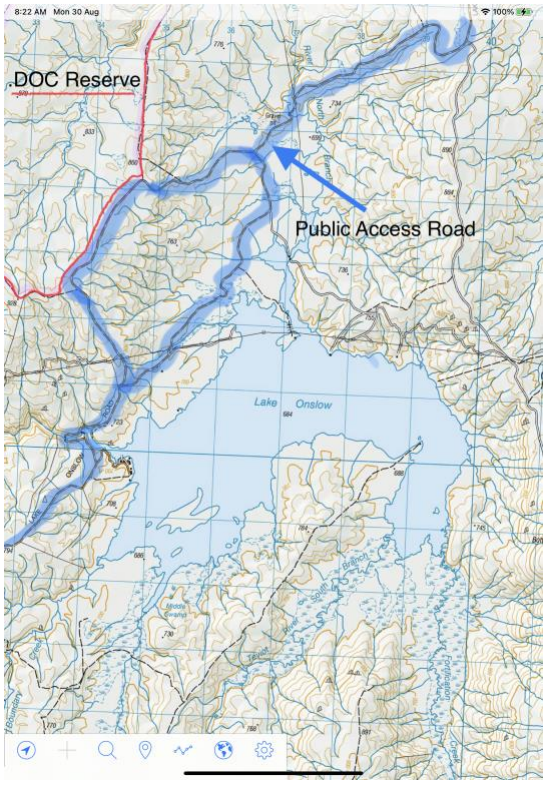


Figure 1, Lake Onslow, public access road, and DoC Reserve.

## Activities

Angling is the most popular recreational activity based on Lake Onslow and environs and probably accounts for about 90% of the activity, but in approximate order of use activities are;

1. angling,
2. pig and deer hunting,
3. waterfowl hunting,
4. mountain biking,
5. sightseeing,
6. birdwatching.

## User Groups and Management Agencies

Fish and Game Otago are the statutory managers of the sports-fish and game bird resources found at Lake Onslow and the anglers and hunters that utilize them. The Otago Regional Council are the statutory managers of the water resource. User groups are listed below.

1. general public,
2. angling clubs and anglers,
3. Sightseers & photographers
4. Fish and Game, angler and hunter management.
5. Otago Regional Council, water resource management.

## Literature Search for Information from

1. National Angler Survey 2007-08

2. records of previous creel surveys (angling effort and catch),
3. angling diaries,
4. LAWA water quality information,
5. Otago Regional Council water quality surveys.
6. Promotional Literature

## Overview.

Lake Onslow and environs are a spectacular high country predominantly tussock range landscape with the lake in the middle of the basin. In recent years agriculture and forestry have begun to significantly alter the appearance of this landscape.

Lake Onslow is one of 8 reservoirs created initially for mining in some cases but now all operating to provide irrigation water to downstream agriculture and horticultural land-use. Some have combined hydro electricity generation (Fraser, Falls and Onslow) as water is moved to irrigation schemes.

The majority of the recreation is based around angling for brown trout and Onslow is one of Otago's premier high-country fisheries.

Other observed uses are mountain biking along the various tracks and trails, bird watching as there are a range of aquatic habitats for ducks and wading birds, game bird hunting, lobster trapping, and boating although most the boating is related to angling use. Figure 2 shows general amenity distribution and access to the lake.

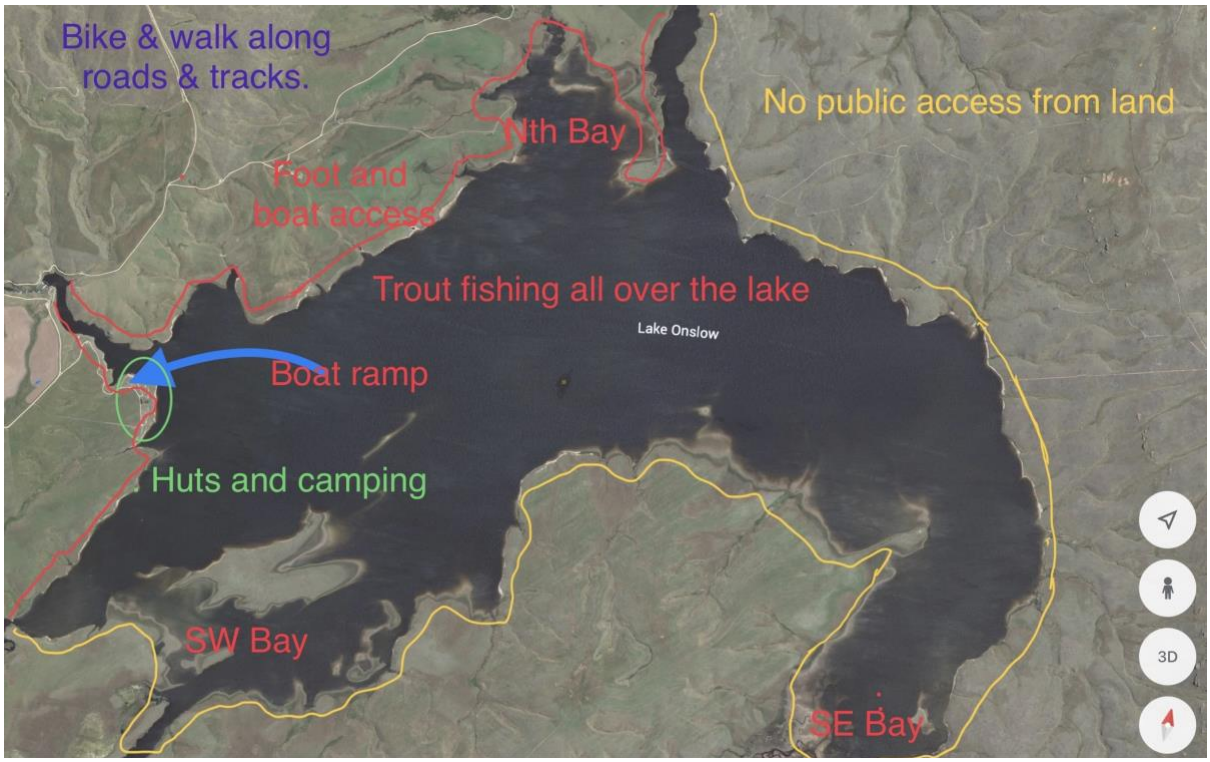



Figure 2, amenity distribution, access available to the lake mostly used by anglers (boat and foot), location of the boat ramp, and location of huts and camp sites.

# Describing the Recreational Values of Lake Onslow.

## Mountain Biking and 4WD.

4WD/MTB, tracks and trails along the western edge and the Lake Onslow Road to the north that leads over to the Taieri River, figure 1. Many of the marked trails are on private land and not available for general public use. The west and NW shorelines are accessed by foot (as well as boat) courtesy of the landowner and the shallow areas of the NTh (Pylon) Bay are ideal for bird watching as they provide an abundance of wading bird habitat.

## Game Bird Hunting

Game bird hunting on the Lake follows the distribution of waterfowl species that varies according to season and disturbance but is usually located around shallow margins and proximity to feeding opportunities. In the case of Canada goose hunting they are often targeted where they feed which is on adjacent pasture and therefore requires landowner permission for access.

## Big Game Hunting

Pig and deer hunting is generally on private land in the immediate vicinity of the lake but also occurs in the nearby Manor Burn Reserve to the NW.

## Lake Onslow Lobster Fishery.

There has been a long-standing low level recreational Lobster (*paranephrops zealandicus*) harvest on the Otago High Country Lakes including Lake Onslow. Fishers trap lobsters in a baited trap. In recent years some commercial harvest has anecdotally reduced lobster numbers substantially.

In a lobster survey conducted in 2008, they were recorded as ranging in size from 79-196mm with a mean length of 137mm. Rocky shorelines are favoured with 87% of the catch being recorded from this habitat and only 13% in shallow and muddy lake bed areas.

## Trout Fishing

Angling occurs throughout the whole of the lake for brown trout (*salmo trutta*) the only species of trout present. There is a boat ramp on the outlet arm of the lake at the end of the road near the huts. Most anglers access the lake from this point and fish from the boat and /or use the boat to access a section of shoreline that is then fished on foot. There is some foot access along the western and NW shoreline across private land courtesy of the landowners for those anglers without a boat. There are no specific areas of high use but the effort is spread over the whole lake according to season, fish activity, water temperature, and preferred angling method. There are specific times of increased activity according insect life cycles. Onslow is particularly renowned for angling opportunity based around the cicada hatch at which time expert anglers may catch up to 40 trout per day. In a season when the cicadas hatch, perhaps prime number years, there is a major increase in the level of angling activity.

Angling Diaries provide valuable information on catch and catch rates. For example,
In October 2020 two lake Onslow anglers used trolling, bait, and fly to catch 17 trout in a 10 hour day, table 1. These are high catch rates. Trolling accounted for most of these fish.

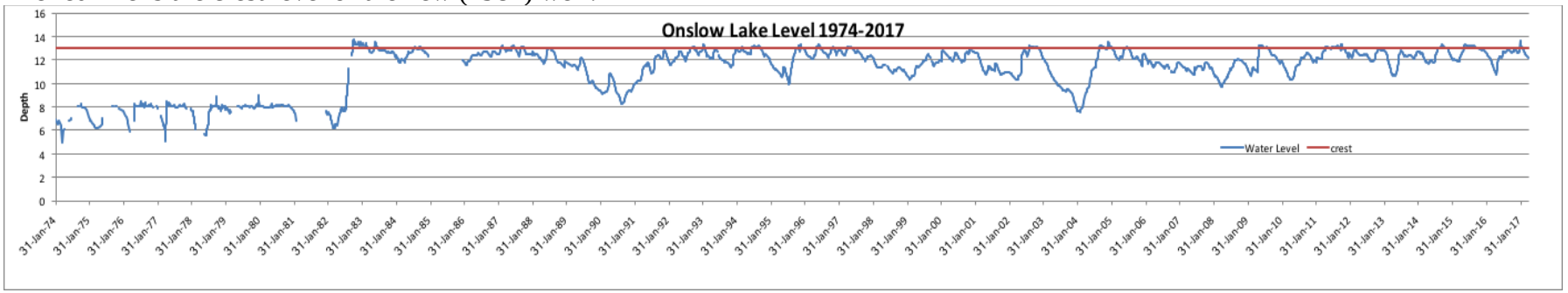
Table 1, summary of 3 angler diary entries for the 2020-21 angling season at lake Onslow with size of brown trout caught by various methods.

| Entry | Hours | Troll | Bait | Fly | Total fish caught | Catch Rate, fish/hr | Mean Length (mm) | Size Range (mm) |
|---|---|---|---|---|---|---|---|---|
| 1 | 20 | 7 | 8 | 2 | 17 | 0.85 | 439 | 360-500 |
| 2 | 9 | 10 | | | 10 | 0.9 | 411 | 350-480 |
| 3 | 9 | | | | 9 | 1.0 | 436 | 300-500 |

A recent sample of 191 angler caught trout had an average size of 422.5mm and a size range of 200-650mm. These were caught over the 2020—21 angling season by a variety of angling methods, troll, bait, fly and by an estimated 40 anglers.

Because the lake is a storage reservoir its level fluctuates annually. Lake Onslow usually operates within approximately a 2.5m range, figure 3 but occasionally (twice since 1982) drops to 5m in a drought year. As the lake level drops over the summer large areas of shallow shoreline especially on the southern shore become exposed and dry out. These are reflooded when the lake refills as rain allows. The variable lake level characteristic of Otago storage reservoirs, means that local knowledge of navigation hazards is important. Anglers new to any of these lakes (Poolburn, Manorburn, Loganburn, and Onslow) need to proceed with caution. In Lake Onslow however hazards to navigation are soft mud bars as opposed to the schist thors of Poolburn and Manorburn.

Figure 3, Lake Onslow lake level record. The old lake was full at approximately 8m but with the new dam built in 1984 level was raised to 13m. The red line is the crest level of the new (1982) weir.



## Levels of Use.

Mountain bike, 4WD and trail bike; activities have a low level of use restricted to occasional passers-by but sometimes holiday based group excursions over what are generally dry weather tracks through the spectacular Central Otago landscape.

Game bird hunting activity is occasional and based on mallard, paradise shelduck, black swan, and Canada Goose.

While there is an abundance of anecdotal information about Lake Onslow based recreation there is very limited formal literature. Fish and Game Otago have conducted some surveys in the past and their general knowledge of Otago based sports fishery and game bird use and management, rates Onslow as an important Otago recreational resource. Lake Onslow is of major significance to the angling community and is ranked as regionally significant by F&G. According to the National Angler Survey conducted in 2007/08, Onslow ranks as 2$^{nd}$ in terms of use for Otago reservoirs, table 3. This survey is now 13 years old but the only formal survey available.

Poolburn receives a much higher level of use perhaps because access is easier than for Onslow, proximity to a population centre, Alexandra, and a greater proportion of the shoreline readily accessible to foot anglers. Manorburn, while close to Alexandra ranks 3$^{rd}$ and it is probably an angler access issue there as well as much of the reservoir is only easily accessed by boat.

Table 3, Otago Reservoirs with area, species, and angler days based on the National Angler Survey of 2007/08

| | **Area (ha)** | **Angler Days** | **Fish Species** |
|---|---|---|---|
| Poolburn Reservior | 300 (4km$^2$) | 5150 ± 1280 | Brown trout |
| Lake Onslow | 830 | 1420 ± 410 | Brown trout |
| Manorburn Reservior | 700 (1.6km$^2$) | 1240 ± 650 | Brown and Rainbow trout |
| Conroys | 17.5 | 660 ± 590 | Brown trout |
| Butchers Dam | Na | 540 ± 390 | Brown trout |
| Falls Dam | Na | 50 ± 30 | Brown trout |
| Fraser Dam | na | 30 ± 20 | Brown trout |

The lobster fishery is small and occasional and frequently utilised in a family group as an additional activity for younger members.

## Water Quality.

Otago Regional Council (ORC) ranks it as eutrophic because of phosphate levels. This is unusual for Otago water ways where elevated nitrate levels usually indicate water quality status and algal growths are limited by phosphate levels. This perhaps raises a warning flag for Onslow where with already elevated phosphate (DRP) levels it may-be particularly susceptible to enrichment and algal blooms if nitrate levels become only moderately elevated. Onslow exceeds the limits for DRP and turbidity. Given the small proportion of the lake catchment that does not have native vegetation and the low intensity of land-use these elevated levels are likely to have a natural rather than an anthropomorphic cause. Local geology can influence the availability fine particles that can be put into suspension by floods in tributaries and wave action along the shorelines. These measurements are an annual event and if they coincide with stormy or calm conditions prior to the measurement considerable variation can occur.

Table 3, Lake Onslow water quality as assessed by ORC, and compared to the ORC Water Plan limits and two other high-country lake fisheries.

| | **NNN** | **$NH_4$-N** | **DRP** | **Ecoli** | **Turbidity** |
|---|---|---|---|---|---|
| Std | 0.55 | 0.10 | 0.033 | 126 | 5.0 |
| Onslow | 0.290 | 0.009 | 0.036 | 4.36 | 5.024 |
| Poolburn | na | na | na | na | na |
| Manorburn | na | na | na | na | na |

## Evaluation and Conclusions.

Angling for brown trout is the main recreational activity on Lake Onslow. The resource ranks highly in the lower South Island with anglers visiting from Otago, Southland and Canterbury in particular for the cicada season. The lake support anglers of all ages and provides opportunity for all angling methods.

## References

Dungey RG, 2008, Lobster Survey at Lake Onslow. Report prepared for Pioneer Energy Ltd.

Dungey RG, 2017, Lake Onslow Bathymetry and invertebrate survey. Report prepared for Pioneer Energy Ltd.

Unwin M, 2008, National Angler Survey 2007-08 for NZ fish and Game Council.

Ross Dungey Consulting Ltd.
August 2021