

**BEFORE A COMMISSIONER APPOINTED
BY THE SOUTHLAND REGIONAL COUNCIL**

IN THE MATTER the Resource Management Act 1991

AND

IN THE MATTER of resource consents to occupy the Coastal Marine
Area with a tide gate and weir and to dam and divert
water

AND

IN THE MATTER of an application by **SOUTHLAND REGIONAL
COUNCIL**

JOINT WITNESS STATEMENT ON ECOLOGY

1&4 November 2024

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MAY IT PLEASE THE COMMISSIONER

1. This is a joint witness statement made in accordance with the Environment Court Practice Note 2023. This joint witness statement has been made after joint witness conferencing on ecology.
2. Joint witness conferencing took place on 1 & 4 November 2024, by way of video call.
3. The attendees were:
 - Laura Drummond (LD) – Instream Consulting, on behalf of Environment Southland
 - Jane Bowen (JB) - Department of Conservation
 - Stevie-Rae Blair (SB) - Te Ao Marama
4. In preparing this statement, the participants have read and understood the Code of Conduct for Expert Witnesses as included in the Environment Court of New Zealand Practice Note 2023.
5. The participants have considered and discussed the key agenda items provided in Minute 3. These items are set out in the attached table, along with a record of the matters agreed between the experts and the issues upon which the experts cannot agree (including the reasons for disagreement).

Agenda item	Comments	Matters Agreed	Matters Disagreed
<p>1. What is the optimal design of the 'letterbox' proposed to enhance fish passage, and what monitoring conditions should be put in place to establish its effectiveness?</p>	<p>Letterbox design: LD - The centre gate was chosen for the letterbox as this location will enable the most straightforward flow path. The behaviour of different fish species means smaller, or weaker swimming species may use the sides of the channel, not the thalweg/centre.</p> <p>Monitoring: LD&JB - Targeted monitoring of the letterbox structure is required to assess its effectiveness and improve current knowledge. Options for this include trapping either side of the letterbox (as proposed) and mark and recapture. This type of monitoring would be limited to the diversion channel reach to directly measure success of the letterbox.</p>	<p>Letterbox design: LD&JB - The optimal design should be as large as possible and extend vertically as far as possible. This is to enable large fish to move through and avoid fish impingement. The current letterbox design vertical extent covers the full tide cycle (this is what is indicated in the design provided). The height of the concrete sill (0.5 m) could impact benthic species movement. Boulders or similar placed along edges of the sill would reduce the gradient.</p> <p>JB,SB&LD agree that is a positive ecologically that the letterbox does not have a closure mechanism.</p> <p>LD&JB - One letterbox has been proposed, multiple would provide increased passage opportunities.</p> <p>JB,SB& LD agree that the letterbox approach is relatively new, novel approach and has not been tested widely. This means that there is uncertainty in the design and its effectiveness. Monitoring data on this approach would be beneficial to inform future decision making on</p>	<p>Letterbox design: JB considers the combined use of stiffeners/counterweights and a letterbox could be a better outcome to provide improved passage dependant on design and operating regime. This is because of an increase in opening time when some fish species preferentially migrate.</p> <p>LD considers that based on the hydrology at this site, the delay in gate closure time from the use of stiffeners/counterweights would be short. LD considers that a letterbox is a better option, that provides passage for the full time that the gates are shut and that this would provide a better outcome for fish passage.</p> <p>Monitoring: JB would like monitoring to be consistent with the recent 'Guidelines for monitoring fish passage success at instream structure and fishways'.</p>

		<p>fish passage options for tide gates in New Zealand.</p> <p>Monitoring:</p> <p>LD,JB&SB agree that a catchment-based fish surveys/stocktake would be helpful to understand fish passage effects of the gates. However, the Titiroa cut-off (based on LD description and site visit) would confound the results, which would limit how the data is interpreted.</p> <p>LD,JB&SB agree that monitoring should investigate different species and life stage's ability to move through the structure, quantify delays in movement through the structure and quantify the proportion of fish arriving at the structure, that ultimately successfully pass (this text is taken from the NZ Fish Passage Guidelines). Mark and recapture would do this for whitebait. There are Department of Conservation and MPI authorisations that would be required to undertake this type of work.</p> <p>LD,JB&SB agree a fish passage monitoring plan would provide more transparency and detail on the proposed monitoring and should be a condition of consent.</p>	<p>LD has not reviewed these guidelines therefore cannot comment. LD considers targeted monitoring of the letterbox structure will provide transparent approach.</p> <p>LD notes that mark and recapture can be difficult. Challenges can include authorisations/permitting and keeping the target species alive. However, if this method was used, it would provide a good case study for the fish passage using letterbox designs.</p>
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		<p>Species to be targeted – inanga and longfin eel, in addition to general summer baseline conditions to capture all species (kanakana discussed in agenda topic 5).</p> <p>LD,JB&SB agree that the fish monitoring plan should include collaborative input from DOC, TAMI and ES. LD&JB agree that robust monitoring of the letterbox structure would increase the scientific knowledge base nationally for these novel fish passage solutions.</p>	
<p>2. Having regard to the effects management hierarchy set out in clause 3.24(3), what is the appropriate level of habitat enhancement that should be provided if consent is granted?</p>		<p>LD&JB agree that despite the letterbox proposed, offsetting for lost inanga spawning habitat is still required.</p> <p>LD,JB&SB agree that while not the optimum solution (like for like offsetting of inanga spawning), there would still be ecological benefit in general habitat enhancement, such as riparian planting, other fish passage opportunities, or further research into the ecological values of the catchment (increased knowledge base).</p> <p>LD&JB agree that assigning an offsetting area can be subjective and that there is a difference in what would be the 'optimum' level of</p>	<p>LD notes that there are limitations with available land for inanga spawning enhancement within the immediate location.</p>

		<p>offsetting/enhancement and what is feasibly possible (i.e. land availability).</p> <p>JB,LD&SB agree that where inanga spawning habitat can be successfully recreated, a 1:1 ratio is a minimum (i.e. tributary enhancement).</p> <p>JB,LD&SB agree that where like for like offsetting cannot be achieved, the offsetting ratio should be higher.</p>	
<p>3. If consent is granted for a short period of time, what would be the effect on any areas enhanced for habitat purposes if the gates are eventually removed? If this enhancement work would become redundant under that scenario, is there a practical alternative that would avoid this outcome, along with the costs of providing such work for a short-term consent only?</p>		<p>LD&JB agree that the proposed habitat enhancement would still be of ecological value if the gates were removed (see discussion to left). The exception to this is the area around the weir/embankments. However, it is noted that this area had inanga spawning recorded and therefore should be retained as is. This area could be removed from the Habitat Enhancement Plan (HEP) and replaced with additional riparian planting along the mainstem. If considering the boulder clusters. These would be redundant if the gates and diversion channel is removed.</p> <p>LD&JB agree that the inundation regime upstream, if the gates are removed in the future needs to be confirmed, in order to plan the planting along the banks. This is required to</p>	

		<p>ensure the right plant species are in the right locations along the bank slope.</p> <p>LD&JB agree that the tributary enhancement works would not be affected if designed with the potential future hydrological changes in mind (if gates are removed), as the downstream water level change has been modelled to be minor.</p>	
<p>4. Consideration of the proposed conditions and their adequacy, along with any recommended changes, should I consider consent should be granted.</p>	<p>Condition 19(b) – Review clause. How are we defining ‘any adverse effect’ this is considered problematic as the letterbox has been designed to improve passage, however, there will always be an ‘effect’ from the structures. We recognise this is a planning question.</p>	<p>Habitat Enhancement Plan (HEP) conditions (4-7).</p> <p>LD,JB&SB agree that clarity and transparency of the plan contents is needed, and that the plan needs to be developed by suitably qualified freshwater ecologists. LD,JB&SB agree that the HEP should include collaborative input from DOC, TAMI and ES.</p> <p>LD&JB agree that inanga spawning habitat enhancement should follow the guidance of Richardson & Taylor (2002) and resources by the ‘whitebait connection’. LD,JB&SB agree that plants should be eco-sourced and provide overhanging vegetation. Enhanced areas should be fenced from stock and the tributary fish passage barrier be remediated.</p> <p>Condition 8 – Inanga spawning surveys: JB&LD agree that to account for monthly</p>	<p>JB&SB agree that the 5-year term is preferable to 10-year, but still consider the gates should be removed.</p> <p>LD considers that a 5-year term is acceptable to trial the letterbox design to determine if successful in improving fish passage.</p> <p>Condition 3 – JB considers 2 years is too long for enhancement to be commenced. LD considers that 2 years provides time for the HEP to be developed and agreed upon.</p> <p>Condition 8 – JB&LD consider that inanga spawning enhancement won’t be able to be successfully monitored for by the end of consent term (5 years). To avoid unsuccessful</p>

		<p>variation, three spawning surveys (March, April, May) would be better than two (as proposed) to determine current rates of spawning success.</p> <p>Condition 9 – JB&LD agree this condition could be removed. It would be beneficial to follow up inanga spawning surveys with egg success surveys/checks. JB proposes weekly checks associated with one month of spawning surveys (i.e., site visits weekly post spawning survey). JB&LD agree that water level loggers placed upstream of the gates would provide information on how inundation levels changed with the letterbox installation and if this altered available inanga spawning habitat.</p> <p>Condition 10 – LD,JB&SB agree that further velocity information in the diversion channel is needed to determine boulder cluster placement for optimum results. Velocity measures should also be taken through the letterbox structure. Methodology for this could be within the HEP. SB comment on boulder source, would prefer more local supply. LD&JB agree boulder placement upstream/downstream of the sill could be added to condition 10, if needed after site surveys to improve passage of benthic species. LD site observations are that the bed is</p>	<p>monitoring post enhancement, JB suggests the effort is directed to more intensive baseline census surveys. This would include monthly monitoring for 5 months. The updated data on current spawning conditions and success would help inform where enhancement is directed and provide information for future consents.</p> <p>LD considers monitoring for 5 months to be the gold standard for monitoring and would recommend monitoring for three consecutive months to cover monthly spawning variation.</p>
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		<p>filled in at this location with substrate but can confirm as part of the HEP. The practicality of this would operationally need to be checked with the catchments team.</p> <p>Condition 11 – JB,LD&SB agree that a date for letterbox installation should be included in the conditions of consent. This should be installed as soon as practical after the first round of inanga spawning surveys. We note that the wording of ‘unimpeded native fish passage’ may need to be adjusted to ‘improved’ or ‘enhanced’ native fish passage’</p> <p>Condition 12 – fish passage monitoring discussion provided in response to agenda item 1.</p> <p>Condition 14 - LD&JB agree that the dissolved oxygen and temperature monitoring should be done using a continuous logging probe.</p>	
<p>5. Such other matters as the experts see fit to consider.</p>	<p>Kanakana/cultural monitoring SB – a consent condition would be required to enable the undertaking of the cultural monitoring. Kanakana monitoring would be a component of the cultural monitoring. This should be resourced by the applicant.</p>	<p>Kanakana SB,JB&LD agree that targeted monitoring/observations of kanakana movement at the gates would increase the current understanding of how the gates impact kanakana migration. If observed, targeted monitoring could occur as per the fish monitoring</p>	<p>Kanakana LD considers that the letterbox will increase the ability for kanakana to migrate past the gates when closed. SB&JB would like a more comprehensive investigation into the</p>

	<p>SB – TAMI have their own cultural monitoring methodology that could be used, this is similar to the Cultural Health Index. This would assist with informing future decision making and improving engagement.</p> <p>Fish bypass JB - A technical fish bypass could be an option to improve fish passage at the site. This should be investigated.</p> <p>Refugia habitat in downstream ponded area The ponded channel downstream of the weir could be a congregation area for fish as a result of the structure. The open habitat area could make them vulnerable to predation.</p>	<p>plan discussed in agenda item 1. Kanakana has not been included in agenda item 1, as the difficulty in targeting this species is known.</p> <p>SB, JB&LD agree that the presence of the Titiroa cut-off is a confounding variable if catchment scale fish surveys were undertaken to confirm the success of fish passage at the gates.</p> <p>Fish bypass LD&JB agree that a fish bypass may or may not be a solution at this site, and that further investigation into this option would be needed as there is a high level of uncertainty around the gradient and velocity that would occur in a bypass at this location. JB considers further investigation should be done to reduce this uncertainty.</p> <p>Refugia habitat in downstream ponded area JB&LD agree that fish refugia habitat (i.e., logs, boulders) in the ponded area downstream of the weir/dam could provide an ecological improvement for fish with delayed migration (when gates area closed).</p>	<p>presence of kanakana within the Titiroa catchment.</p> <p>JB&SB consider there is not enough evidence to know if the letterbox will increase the ability for kanakana to migrate past the gates when closed.</p> <p>LD considers a comprehensive investigation into the presence of kanakana within the Titiroa catchment would improve the knowledge base. However, that this level of investigation is more suited to a multiyear research project, not a short duration consent.</p>
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Laura Drummond
4 November 2024



Jane Bowen
4 November 2024



Stevie-Rae Blair
4 November 2024