



24 October 2023  
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## Feedback on the LWRP consultation – regional and FMU provisions

This submission is provided on behalf of the Otago Fish & Game Council (**Fish and Game**). For additional information please contact Nigel Paragreen using the details below.

### Submitter Details

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1. Fish and Game is the statutory manager of sports fish and game bird resources within Otago. It holds functions and responsibilities set out in the Conservation Act 1987. The organisation's functions include managing, maintaining and enhancing the sports fish and game resources of Otago in the recreational interests of anglers and hunters; representing the interests and aspirations of anglers and hunters in the statutory planning process; and advocating the interests of the Council, including its interests in habitats. This submission has been developed in line with these functions.
2. Due to the popularity of angling in New Zealand, the demographic Fish and Game represents when carrying out its statutory functions is significant; however, this is not always obvious. The 2013/2014 Active NZ Survey conducted by Sport and Recreation New Zealand reported that 19.5% of respondents had been fishing (including both marine and freshwater angling) in the past 12 months<sup>1</sup>. The survey found fishing had a higher rate of participation than rugby, tramping, football, cricket and basketball for men; and that fishing had a higher participation rate than netball, tennis, snow sports and tramping for women. Within Otago, license sales have exceeded 10,000 licenses in the past two decades and in the last decade has increased to over 20,000 licenses across all categories. Participation rates estimated from the National Angling Survey (**NAS**)<sup>2</sup> between 1994 and 2015 show that total freshwater fishing effort in the Otago Fish and Game region ranged from 180,860 to 215,430 angler-days over the fishing season. This total does not include the estimated fishing effort in the fisheries within the Central South Island Fish and Game region that also falls within Otago – the Kakanui, Kauru, Waianakarua and the lower Waitaki.<sup>3</sup>

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<sup>1</sup> Sport and Recreation New Zealand. 2015. *Sport and Active Recreation in the Lives of New Zealand Adults: 2013/14 Active New Zealand Survey Results*. Wellington: Sport New Zealand.

<sup>2</sup> Unwin, M. J. 2016. *Angler Usage of New Zealand Lake and River Fisheries*. Christchurch: National Institute of Water and Atmospheric Research.

<sup>3</sup> Angling effort for these rivers is detailed in Appendix 6.

3. As required by the Conservation Act 1987, both the Otago and Central South Island Fish and Game Councils have developed Sports Fish and Game Management Plans<sup>4,5,6</sup> (**Otago SFGMP** and **CSI SFGMP**). These have guided the development of this submission. These documents describe the sports fish and game bird resources in the region and outline issues, objectives and policies for management over the period.
4. As a management plan prepared under the Conservation Act, the Otago Regional Council (**ORC**) must have regard to the Otago SFGMP and the CSI SFGMP in preparation of the Land and Water Regional Plan (**LWRP**).<sup>7</sup>
5. The following table provides feedback on headings on the LWRP's consultation headings.

Closest heading from consultation page dropdown menus	Feedback
<b>Beds of Lakes and Rivers</b>	
Permitted activity framework: activity criteria	<p>The visual clarity standard needs to have a clear link to deposited sediment. In F&amp;G's experience, sediment is one of the biggest risks to water bodies in Otago. An enormous amount of water bodies are affected by excessive sediment in Otago. The ORC's SOE monitoring shows that a significant proportion of SOE sites fail to meet national bottom lines due to suspended sediment. F&amp;G's experience is that sediment is a significant and growing concern in parts of Otago where intensive agriculture or urban development is occurring.</p> <p>Much of this sediment has been discharged in the last 20 years, when the RPW has been in force. It has failed to manage this issue adequately. F&amp;G recommends adopting more stringent sediment discharge rules and direction in the LWRP, as more of the same will lead to continued failure.</p> <p>The permitted activity approach of discharging sediment under permitted activities in the RPW, using a distance for visual clarity to be restored, must be improved. As stated above, this is a part of a framework that has failed to manage sediment adequately in Otago. I suggest that a key reason for this is that there is no clear link in the mechanism between suspended sediment and deposited sediment.</p> <p>A permitted activity rule with a distance measure to return water to visual clarity, as used in the RPW permitted activity rules, has vastly different outcomes for deposited sediment depending on the water body characteristics at the point of discharge. A discharge of sediment at the top of a riffle will be cautious, as the sediment will quickly be dispersed downstream and remain visible for a long distance in the churning water. However, a</p>

<sup>4</sup> Otago Fish & Game Council. 2015. *Sports Fish and Game Management Plan for Otago Fish and Game Region 2015 - 2025*. Dunedin: Otago Fish and Game Council.

<sup>5</sup> Central South Island Fish and Game Council. *Sports Fish and Game Management Plan for the Central South Island Region 2012-2022*. Temuka: Central South Island Fish and Game Council.

<sup>6</sup> Central South Island Fish and Game Council. *Sports Fish and Game Management Plan for the Central South Island Region 2023-2033*. Currently before the Minister for Approval.

<sup>7</sup> Resource Management Act 1991, section 2(c)(i).

	<p>discharge at the head of a pool will be insensitive because the slow moving water will allow sediment to drop out and settle. In addition, it does not deal well with cumulative effects in practice, as small changes to visual clarity are often not picked up. This means that rivers like the Taieri can be pristine and clear near their headwaters but a brown muck at the bottom – all without any one discharger of sediment along the way thinking they’ve had any meaningful contribution.</p> <p>F&amp;G, F&amp;B and Choose Clean Water have developed a practice note on setting sediment target attribute states, hosted through the Wai Good Policy site.<sup>8</sup> Within this advice, they note that nationally, the length of rivers and streams classified as soft-bottomed are around 20%, where as research indicates it should be around 2%. Targets for deposited sediment are recommended in the practice note:</p> <ul style="list-style-type: none"> <li>- No more than 20% deposited sediment cover for general ecosystem health.</li> <li>- No more than 10% deposited sediment cover in important habitat or spawning areas for native fish and salmonids.</li> <li>- No more than 25% deposited sediment cover for contact recreation.</li> </ul> <p>Ultimately, the direction in the consultation document for sediment discharge doesn’t make it clear how sediment is to be managed. However, F&amp;G recommends that the sediment discharge framework needs to be significantly overhauled from the RPW approach, if it is to be effective. There should be clear links in the mechanisms so that there is certainly that the amount of suspended sediment to be discharged will not cause issue in itself and will allow streams to stay at, or return to, the recommended levels of deposited sediment.</p> <p>It is critical to note that the sediment management framework needs to be suitable to differentiate between tannin stain and sediment derived from soil loss. It would not be acceptable to use tannin stain as a reason to exempt catchments from target attribute states or other regulation relating to the discharge of sediment.</p> <p>In addition to the above, there is no provision for the protection of spawning fish – native or salmonid in the permitted activity list.</p>
<p>Permitted activity framework: use of existing structures</p>	<p>F&amp;G has received advice in the past that ‘lawfully established’ in a permitted activity rule can mean that a structure placed by a deemed permit can remain in place after the deemed permit has ended (Quartz Reef Creek weir). The ‘actively used’ requirement is helpful for this but does not completely resolve the issue. In the Quartz Reef Creek weir case, the weir would need to be removed because it was not going to stay in use but the ‘actively used’ wording creates a perverse incentive to continue using it or else take it out. Any new consent for taking water from the creek wouldn’t be required to consider the impacts of the weir’s ongoing placement, only the taking of water.</p>

<sup>8</sup> <https://www.waigoodpolicy.org.nz/>

Permitted activity framework: bank reshaping paragraph	Should not be allowed as a permitted activity. If it is to be completed for flood repair, it should be controlled so that conditions can be put in place to ensure the bank is not altered. I've seen people use these conditions to dramatically alter banks.
General consenting requirements: stronger policy guidance	<p>Refers to avoiding adverse effects on 'indigenous ecosystems' when providing for activities which enhance ecosystems. This category of ecosystem will be very rare as most water bodies have ecosystems that are a mix of indigenous and introduced species (flora and fauna). Better to refer instead simply to 'ecosystems'.</p> <p>Impacts on fish spawning – native and salmonid – are not considered. Neither is a requirement to salvage stranded fish.</p> <p>There is no consideration of impacts on public recreation.</p>
Flood protection and drainage infrastructure works	<p>Guidance needs to recognise the fundamental conflict between the needs of water bodies and that of humans in this activity. Flood protection and drainage fundamentally is done to benefit humans, at the cost of the river's naturalness. This is a odds with the priorities in the hierarchy of obligations.</p> <p>Given the above, there should be a strong direction to prefer natural solutions to engineered ones – making room for rivers.</p> <p>Managed retreat where property and infrastructure is at risk due to water body proximity should be actively dealt with in the plan, especially in the context of increased extreme events under climate change. This should be a clear theme in direction for extending or expanding flood banks, drainage channels, the management of wetlands and other flood protection schemes.</p>
Gravel extraction	<p>Policy direction needs to enable a proactive approach to identifying gravel deficit, or places where extraction may cause a deficit, and what the rate of recharge can be expected to be in catchments. F&amp;G's experience is that the economic value of gravel is so low that applicants will not be willing to gather this information themselves. It's also a bit rough on them to expect it, because we understand that monitoring payments are provided from gravel extractors to the ORC to undertake catchment scale monitoring. Developing a proactive 'gravel allocation framework' will reduce transaction costs in the long run and allow the ORC to consistently and fairly align gravel extraction activities with river management goals.</p> <p>Policy direction should also aim to maintain natural character of gravel beds (gravel in bed still present for a minimum distance above the water level and sloping upward towards the bank) and reduce or eliminate vehicle crossings for access. Excavation of gravel below the water line should be strongly discouraged.</p> <p>Gravel extraction for the purpose of infrastructure protection should be discouraged, very strongly in catchments where gravel supply close to or already limited. There should be strong policy guidance for the long-term protection of infrastructure and property in a way that prioritises river health, such as favouring natural solutions.</p>

<b>Damming and Diversion</b>	
Damming: New temporary in-stream dams and weirs permitted activity list	<p>The list should deal with the temporary nature of changes to flows by limiting the scale and amount of time that flow can be restricted or stopped completely – eg 5 hours worth of dewatering or restricted flow.</p> <p>Impacts on fish spawning – native and salmonid – are not considered. Neither is a requirement to salvage stranded fish.</p>
Damming: Use of in-stream dams and weirs that existed on 1 July 2024	<p>See comments above about ‘lawfully existing’. A dam or weir that exists due to a consent or other mechanism with a limited timeframe should be required to be removed upon the expiry of that mechanism.</p>
Damming: Removal of in-stream dams and weirs	<p>Impacts on fish spawning – native and salmonid – are not considered. Neither is a requirement to salvage stranded fish.</p>
Diversion: outside the bed of a lake or river are permitted	<p>There should not be a carte blanche permitted activity status for land drainage or alleviating flooding. This is inconsistent with Policy 6 of the NPS-FM which directs that there is no further loss of extent of natural inland wetlands. Not all natural inland wetlands will be mapped and therefore will not be monitored by the ORC. As a result, diversions of water for land drainage under a permitted activity are likely to include the drainage of natural inland wetlands in the long term.</p> <p>Additionally, the scale of sub-surface drainage for agricultural land is extensive in Otago and the placement of those drains is unknown. Many are placed in ephemeral water bodies such as gullies. While each individual diversion may have relatively minor adverse effects, cumulatively the impact of all this sub-surface drainage alters catchment hydrology and water quality and has allowed for the draining of ephemeral wetland ecosystems. The LWRP should not enable further sub-surface drainage as a permitted activity and should provide direction on a process to understand and map where drainage has been laid. Farm plans may be a helpful tool to gather the latter information.</p> <p>A simple system to manage sub-surface drainage could be:</p> <ol style="list-style-type: none"> <li>1. Identify discharge points for sub-surface drainage – GPS and report the ORC – perhaps using farm plans.</li> <li>2. Test discharge for contaminants (point source) and provide notes on hydrological alteration and erosion.</li> <li>3. If there are identified issues, the LWRP policy direction should require action. For example, smashing part of the drain to create a wetland, digging it up / filling it in along the length, excluding stock around the path of the drain.</li> </ol>

<p>Diversion: inside the bed of a lake or river are permitted</p>	<p>Impacts on fish spawning – native and salmonid – are not considered. Neither is a requirement to salvage stranded fish.</p>
<p><b>Earthworks and Drilling</b></p>	
<p>Earthworks: permitted activity list</p>	<p>The list currently suggests no soil or debris should be able to enter a waterway at all, which is similar to what is suggested for the RPW. I note that the RPW approach has not been successful, as the discharge of sediment from unconsented work is a longstanding issue. Clear guidance about the scale of discharge allowed – preferably none for a permitted activity – is made clear and is easily enforceable.</p> <p>Receiving water standards must be expressed in a way which will enable compliance action to be taken in terms of a contribution by an individual party. In F&amp;G’s experience, being unable to determine an individual’s contribution to the cumulative effects of sedimentation in water bodies has been a reason for inaction in the compliance space.</p> <p>The setback distances suggested seem reasonable. It would be helpful to ensure that these types of setback distances are applied to any activity where large tracts of bare soil are likely to result, such as agriculture and forestry. The relationship between sediment runoff and slope is similar for <i>any</i> patch of bare soil.</p> <p>For clarity, there is strong evidence that setbacks of at least 10 meters on slopes less than 10 degrees and at least 20 meters for slopes above that (increasing with slope) are required between activities that result in large tracts of bare soil and water bodies. F&amp;G is comfortable for limits in the LWRP to exceed these minimum requirements.</p>
<p><b>Environmental Flows and Limits (Water Quantity)</b></p>	
<p>River catchments: environmental flows and take limits set for all rivers</p> <p>&amp;</p> <p>Lakes</p>	<p>Presumptive standards (default minimum flows and take limits) are helpful and supported by F&amp;G. The standards proposed are consistent with the advice F&amp;G has been provided with for suitable limits that would generally contribute to ecosystem health.</p> <p>Presumptive standards are particularly helpful because they are at low risk of bias in study or interpretation, unlike other methods of identifying limits (eg. IFIM). In F&amp;G’s experience, it is common for bespoke study into water quantity limits to be influenced by such scientific bias, as well as political bias, resulting in far lower recommended limits than if a presumptive standard had been applied.</p> <p>Abandoning presumptive standards in rivers with higher hydrological modification, presumably in preference for alternative methods where are easily biased, creates risk that outcomes which prioritise ecosystem health and the health of water bodies will be compromised by bias. It seems inconsistent with the concept of Te Mana o te Wai that water bodies which are most heavily altered should be placed at risk in this way.</p> <p>A trend where rivers with high abstraction demand are consistently recommended dramatically lower limits than those without high demand</p>

would show a breakdown in the limit setting system. It would demonstrate that limits are strongly influenced by water demand, not the needs of water bodies and freshwater ecosystems. This outcome has been the experience of F&G to date.

The preferential way to resolve this is to use presumptive standards for all rivers in Otago. This is the most equitable outcome, when prioritising the health needs of water bodies.

An alternative is to use presumptive standards as a 'sanity check' for bespoke solutions. To implement this, policy direction could require a dramatically higher degree of confidence the further away bespoke recommendations for limits are from those set by presumptive standards. For example, an IFIM study might be appropriate to set a river's allocation limit and minimum flows at 35% and 65% respectively, but for a 100% allocation and 50% minimum flow a bioenergetic model (which is both more holistic as a study method) may be employed.

This approach should be applied consistently in plan changes and consenting processes. In F&G's experience, it is often the case that smaller water bodies, like tributaries, are often host to some of the largest relative allocations and smallest flows, as measured via the percentage of MALF. These allocations and flows are often determined through consenting processes, where decision makers have less ability to ensure an equitable distribution of allocation across the catchment. It is not consistent under the NPS-FM for a small number of small water bodies to bear the brunt of a catchment wide allocation limit, nor have the responsibility for a small sub-set of other water bodies to provide the bulk of input for the catchment's minimum flow. Applying presumptive standards, including applying a 'sanity check' if bespoke solutions are employed, will help ensure equitable outcomes for water bodies across the catchment.

The same equitable approach should be applied to water harvesting.

As a general rule, presumptive standards should also be applied in places where there is uncertainty. This will assist with the above as the information on hand for many consent process, especially ones dealing with smaller tributaries, is sparse in F&G's experience.

In addition to the comments above on consenting, policy direction should generally be made strong and directive so that the required outcomes are clear. In the deemed permit process in the lead up to 2021 and prior to PC7, applicants and affected parties were faced with an enormous workload because key points needed to be relitigated each time. I've provided examples of common questions below, with F&G positions.

1. How do we deal with hydrological and ecological uncertainty? Use a precautionary principle, the more uncertainty you have the less we should be departing from presumptive standards. This holds true for ephemeral and intermittent streams also, where ground-surface water interactions are often unknown or guesstimated.
2. What baseline should be used when assessing adverse effects? A *ngāti rangi* approach.

	<p>3. If we are returning water to the river, to what degree should the flows be restored – after all, we can't go back to natural condition? It is often impossible to go back to natural conditions; although, the direction in the NPS-FM is clear. We should be aiming for the health and well-being of water bodies and freshwater ecosystems. Water should be restored to the point where they are in a state of good health and well-being. I have provided additional comment on what this means in response to the Ecosystem Health environmental outcomes, later in this submission.</p> <p>4. How much water will provide for life supporting capacity, terminology which has now been replaced with the health and well-being of water bodies and freshwater ecosystems? In F&amp;G's experience, there is always significant disagreement between parties and experts about what flows are necessary to achieve these types of goals. This is because environmental science is fuzzy and, as discussed above, even well-established tools (like IFIM) are subject to bias when undertaking study and interpretation. Strong policy direction on how to answer this question will be extremely helpful in resolving conflict and ensuring that outcomes are consistent across Otago. As above, a heavy weighting on presumptive standards, including through a 'sanity check', would be helpful. To be clear, when thinking about this question, we should be considering both residual flows and allocation. The latter is arguably <i>more</i> important for ensuring waterbody and ecosystem health outcomes.</p> <p>5. Is there an adverse effect at all from abstraction when a river would go dry naturally at one point along its reach and, if so, how do we deal with the increased size and timeframe of disconnection caused by the abstraction? Absolutely there's an impact! Habitat is reduced in perennial reaches above and below the dry reach and where it goes dry, the size and timeframe of the disconnection will be increased.</p> <p>6. Can the health of one part of a river be 'traded off' against another? In other words, if we restore flows for one river reach, does that cancel out a significant loss of flow elsewhere in the river? For F&amp;G, we should be aiming for good health and well-being in each river reach, which will contribute to the good health of the water body overall. If we allow an 'overs and unders' approach to safeguarding the life supporting capacity of water bodies, then we'll be left with in a position where some parts of water bodies have their life supporting capacity safeguarded whereas others do not.</p> <p>7. Should we retain no or low flow barriers? Abstraction is not a helpful long-term solution to separating populations of predators (including salmonids) and non-migratory galaxiids because the barrier isn't in place for most of the year, it significantly reduces the habitat available for the populations and does not contribute to the mauri of the rest of the river. Proactive solutions should be identified by statutory parties managing the species involved (DoC, F&amp;G, Iwi, ORC) prior to consenting processes, so that there is clarity about the outcomes to be sought. F&amp;G has proposed an approach in the PORPS</p>
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	<p>and is generally supported by experts from every one of those parties.</p> <p>8. Should we protect salmonids and their habitat at all? Absolutely, this is a consideration in the RMA and there is now clear direction in the NPS-FM requiring the protection of habitat and consideration of salmonid populations as per values. Where the risk of detrimental population level impacts due to species interaction is low, protecting the habitat of trout and salmon will contribute to achieving ecosystem health as water can be returned to the water body without much risk of aggravating species interaction issues. F&amp;G has undertaken research on this point and can provide mapping for low, medium and high-risk areas for brown trout. Nationally, around 90% of areas where there are interactions are identified as low risk in this research. You can find summaries on this work in the PORPS evidence of Ms Coughlan and F&amp;G can share her thesis on the work if required. Because of the clear link to species interaction, the process proposed in the PORPS would allow the parties to proactively identify places where they think it is appropriate to protect the habitat of salmonids, as well as provide for this fish passage. Developing a process to identify this information up-front will significantly reduce conflict within consenting processes.</p> <p>9. When is a fish screen appropriate? The default direction should be that fish screens are required, with fish being returned from any diversions unharmed, and the only exemption for not installing a fish screen being for truly exceptional circumstances. For example, fish screens are all too often not installed because the intake is placed in an inaccessible location because of a desire to gravity feed water. In such cases, economic considerations have trumped that of the water body and freshwater ecosystem.</p>
<p>Phasing out over-allocation</p>	<p>It's unclear to me whether the two stages in the approaches, for both default and bespoke circumstances, will be implemented as part of the same consenting process or whether the ORC will wait until stage 1 fails to undertake stage 2. In F&amp;G's experience, if the levels required to be achieved are identified prior, for example through presumptive standards, it will be simple to see whether the stage 1 actions will achieve those targets. Where they will not, a plan for phasing out over-allocation should be made and being implementation without delay.</p> <p>For the bespoke circumstance, it's success will rely almost entirely on setting clear goals and direction for the consent holders to work towards. If the goals are vague, for example: 'provide for the health and well-being of water bodies', then there will be significant debate about what flows are required for the direction to be achieved. Look at the Manuherekia for example, where the irrigators have long maintained that a minimum flow of 1,100l/s is sufficient to achieve the direction of the NPS-FM, including te mana o te wai, but the ORC's recommendation for the same is 2,500l/s. F&amp;G's expectation is that the goals and direction would be numerical, coming from catchment-wide limit setting. As with the discussion above on surface water abstraction consenting processes, there will need to be direction within those limits that</p>

	<p>all water bodies in the catchment need to be sufficiently protected and provide equitably towards a catchment-wide minimum flow and allocation limit.</p> <p>In addition, it isn't just the maximum instantaneous amount of water to be taken that determines the adverse effects on water bodies and communities. In F&amp;G's experience, the maximum rate of abstraction figure hides a lot of crucial information that is crucial to understand the nature and scale of impacts. These include:</p> <ol style="list-style-type: none"> <li>1. How often the maximum rate of take is reached;</li> <li>2. What rate of take the abstraction normally operates at; and</li> <li>3. When and for how long abstraction takes place.</li> </ol> <p>The LWRP should include consideration of these factors when setting allocation and phasing out over-allocation.</p> <p>Finally, it is clear to F&amp;G that some abstractors have been acting in bad faith, intentionally increasing the use of water to secure a history of use and retain water that would otherwise have been deemed 'paper' water. This may include investing in irrigation infrastructure to expand the area under irrigation in the years proceeding the 2021 deemed permit process deadline, or simply abstracting and dumping water. The LWRP should include consideration of historical use records, so that deliberate over-use in the reference period can be identified.</p>
<p>Different types of freshwater takes</p>	<p>The policies and rules for taking water at higher flows need to be carefully constructed. In catchments which are at or above allocation limits, there should be restrictions in place to ensure that water harvesting is used to replace low flow water abstraction. In F&amp;G's experience, applicants have often sought to retain all low flow abstraction and use water harvesting to <i>increase</i> the amount of water that can be abstracted. This creates more, not less, pressure on the water body.</p> <p>As discussed above, there needs to be strong policy direction for water harvesting on tributaries needs so that the water harvested is proportional to the size of the water body. F&amp;G has experienced applicants who have been able to significantly drag down small tributaries through supplementary flows from large flows to MALF conditions. This has been enabled because the impact on the tributary is lost in the scale of catchment-wide limits.</p>
<p>Efficiency considerations</p>	<p>There are multiple types of efficiency. Three key types are:</p> <ul style="list-style-type: none"> <li>- Technical/productive efficiency: that the most output is generated per input. Ie. There is little waste.</li> <li>- Allocative efficiency: that resources are allocated between the best use/s of the resource.</li> <li>- Dynamic efficiency: that resources are allocated between the best use/s of the resource over a period of time.</li> </ul> <p>This plan should include direction on all three, so that water is allocated in the long term to uses which provide the outcomes most suited to achieving</p>

	<p>environmental outcomes and visions. We should not assume that the current land use is the most appropriate one to be undertaken in the long run.</p> <p>Critically, the direction must be written in such a way to internalise externalities in that decision. When thinking about efficiency, consideration shouldn't be restricted to maximising profit per litre of water abstracted. It should be inclusive of economic, environmental, social and cultural outcomes.</p> <p>Fundamentally, the LWRP should guide people to undertake the most appropriate activities, including land use, not entrench existing practices.</p>
Consideration of applications	<p>See discussion under the river catchments &amp; lakes heading.</p> <p>Maximum consent durations are strongly supported by F&amp;G. The devil will be in the detail though. For example, it would be appropriate to use a precautionary approach and ensure that there is a very high degree of confidence that consents exempt from maximum durations will achieve the environmental outcomes and visions because if they do not, there will be limited ability to alter them.</p>
<b>Other discharges</b>	
<p>Discharges of water and contaminants used for holding live organisms</p> <p>&amp;</p> <p>Discharges not managed elsewhere</p>	<p>Points 1 and 2 on the list are simply duplicates of the Conservation Act and pest plan. Given this, a guidance note would be more appropriate as embedding duplicate rules in the LWRP will not add anything themselves and will create an unnecessary rigidity, in that they'd need to be changed if the legislation or pest plan changes.</p> <p>The desirable/undesirable fish species categories in the NPS-FM are developed for fish passage only. If this is to be expanded more generally, then the ORC begins working into the Conservation act space, where decisions are more appropriately made by F&amp;G and DoC (and iwi as per section 4). It is not for the ORC to decide by itself whether a particular species is generally desirable or not, outside the pest plan. There are other statutory agencies tasked with work in this area. In the PORPS, F&amp;G has proposed a process which might be similar to identifying desirable/undesirable species in dealing to species interaction, fish passage and the protection of trout and salmon habitat but it does so using the appropriate direction of the NPS-FM. When using the appropriate direction, it does not go as far as designating species as generally desirable or undesirable.</p> <p>There are good reasons why it is helpful to retain the desirable or undesirable classification to fish passage. For example, the hatchery reared trout released into dams provide a fishery for communities that otherwise may not have one close to home. Examples include Sullivans Dam or the Southern Reservoir. Often, fish passage from these fisheries is removed completely or restricted to prevent hatchery fish escaping. Ensuring fish passage is restricted with an undesirable designation might be helpful to lock in that management regime; however, if the release of fish were therefore also restricted it would eliminate the fishery for no good reason.</p> <p>A more simple reason to avoid doing this is to ensure that decision are determined by outcome, rather than emotion. The 'desirable' and</p>

	<p>‘undesirable’ language is emotionally charged in this context and is likely to lead to considerable conflict if used lazily. To reduce conflict, it would be better to use the terminology exactly as required in the NPS-FM, for the exact purpose it was intended. For example, rather than labelling species desirable or undesirable generally, stating that their passage will fall into those categories in defined reaches for the purpose of implementing the NPS-FM.</p> <p>I assume the reason for including the undesirable category in this permitted activity list is to ensure that there are controls over where predatory fish are released because of fears of species interaction. Rather than creating a blanket rule, it would be more helpful to instead refer back to the proactive approach F&amp;G is seeking in the PORPS. Embedding that process into the LRWP would enable the statutory parties to ID places where species interaction is problematic and limit the release of predatory species in those specific water body reaches, rather than mixing it up with fish passage.</p>
<b>Primary Production</b>	
Different tools for different places	<p>In workshop documents the ORC has indicated that they do not think land use in some catchments will achieve the expected target attributes set, and therefore land use change may need to be required. Through discussions with ORC staff, I understand that they are concerned there is not enough information to demonstrate this yet, despite the results of current study. Given this, it is imperative that landholders and Otago residents have a clear idea about:</p> <ol style="list-style-type: none"> <li>1. Where the risk areas are currently thought to be.</li> <li>2. What the ORC’s plan is to robustly inform whether GMP, GMP+ or GMP++ options will be required to achieve the target attribute states. Such a plan should be clear in the actions it will take and when it will achieve them by.</li> <li>3. How the ORC will take action to change land use, should that be necessary.</li> <li>4. How the ORC will ensure that, in the short term, there is no further degradation across Otago.</li> </ol> <p>Ultimately, when notifying the plan the ORC must either have a high degree of confidence that the target attribute states will be achieved the by direction of the plan or have a robust plan in place to ensure that this outcome will be achieved. Crucially, the public must be made aware of whichever path is chosen.</p>
Freshwater farm plans	<p>It is critical that freshwater farm plans are integrated into the LWRP in such a way that they cannot avoid meeting the outcomes set by the plan. The situation that occurred in the Ōtūwharekai / Ashburton Lakes where lake quality continued to degrade while farm plans were in place, cannot be allowed to happen in Otago.</p> <p>F&amp;G is particularly concerned with the language in the freshwater farm plan regulations, where each farm plan must only ‘have regard to’ the catchment context. This creates ample opportunity for farm plans to cumulatively fail to contribute adequately to the LWRP’s direction. The LWRP should go further</p>

	<p>than this language, creating a framework which requires farm plans to contribute towards the cumulative achievement of the objectives of the LWRP.</p> <p>Furthermore, F&amp;G anticipates that the scale of work required to audit the farm plans means that it will be easy for poor outcomes to slip through simply because there is not enough resource to keep on top of the workload. The LWRP's freshwater farm plan framework must address this risk if it is to be effective.</p>
<p>Permitted activity framework: sacrifice paddocks</p>	<p>Any activity which is likely to result in large tracts of bare earth – for example earthworks, forestry, cultivation, sacrifice paddocks and intensive winter grazing – should be subject to similar conditions around slope and setback from waterways.</p> <p>For clarity, there is strong evidence that setbacks of at least 10 meters on slopes less than 10 degrees and at least 20 meters for slopes above that (increasing with slope) are required between activities that result in large tracts of bare soil and water bodies. F&amp;G is comfortable for limits in the LWRP to exceed these minimum requirements.</p> <p>It would be helpful also to know how a sensitive water body will be defined. F&amp;G seeks that salmonid spawning areas be identified as sensitive, as occurs in other regions across New Zealand.</p>
<p>Permitted activity framework: paddocks used for pasture-based wintering</p>	<p>Any activity which is likely to result in large tracts of bare earth – for example earthworks, forestry, cultivation, sacrifice paddocks and intensive winter grazing – should be subject to similar conditions around slope and setback from waterways. I have provided F&amp;G's interpretation of evidence on minimum distances for setbacks above.</p> <p>It would be helpful also to know how a sensitive water body will be defined. F&amp;G seeks that salmonid spawning areas be identified as sensitive, as occurs in other regions across New Zealand.</p> <p>I assume that the conditions here are not a full set that would be expected because this permitted activity rule is to work in with, and not duplicate, the NES-FW. It is helpful to avoid duplication. It would also be helpful for a plan user to include a practice note alongside this rule explaining that the user also needs to refer to the NES-FW.</p>
<p>Permitted activity framework: restrict intensification of land use</p>	<p>This rule should include high intensity beef land use and feedlots. I am aware of businesses in Central Otago which operate irrigated, high stocking rate beef cattle operations which are likely to have significantly greater discharges and input requirements to that of lower stocking rate operations.</p> <p>Policy direction for resource consenting should include a consideration of how any intensification in catchments which have not met target attributes will help or hinder the achievement of those target states. Prior to the deemed permit process, F&amp;G saw an uptake of spray irrigation which ultimately made it more difficult to return allocation to the river, as the economic costs of doing so are much higher than under other irrigation methods. Where intensification will make necessary, future transition more difficult, it should be strongly discouraged.</p>

General consenting requirements	Aside from farm effluent ponds, PC8 provisions were well understood by all parties to be <u>interim</u> . As a result, many parties – including F&G – did not seek a higher standard that would have achieved the direction required in the NPS-FM. Most of the PC8 provisions should not be moved directly into the LWRP as they are not appropriate to be used for the longer term.
General consenting requirements: freshwater farm plans	See comments on Freshwater farm plans above.
General consenting requirements: planting of plantation and permanent forestry	Strongly support the slope and setback requirements. These are above the minimum setback distances unless slopes are very steep. F&G is supportive of a risk adverse approach to setbacks.  To be clear, the proposed setbacks should apply to new plantations <i>and</i> replanting of existing plantations after harvest.
<b>Stormwater management</b>	
Network discharges	A progressive upgrade system with short term consents seems useful. It would be assisted by policy guidance so that parties and communities understand what type of actions are anticipated.
Non-network discharges	Do the discharges captured from roads include rural and gravel roads? I hear often that they are a large source of sediment but I've never had that verified by more than anecdote.  It would be helpful to include heavy metals in the considerations for discharges from the road network.
<b>Threatened Species</b>	
General comment	F&G is actively seeking a collaborative approach on species interaction between ORC, DoC, F&G and iwi. This will involve management of some threatened species, such as non-migratory galaxiids.
General comment	The NPS-IB is relevant to the LWRP and requires that there be no overall reduction in indigenous biodiversity. I note that this is restricted to terrestrial biodiversity in most cases. That this is a Land and Water Regional Plan makes it a key issue.  To be clear, the NPS-IB direction includes species that F&G manages, such as paradise shelduck.  In the region-wide provisions within this consultation, there does not appear to be any direction that will give effect to the NPS-IB direction. This is more substantive than simply relying upon SNAs and is particularly important for flora. The LWRP should have strong direction on protecting native vegetation and restoring it where the local extent is limited.  ORC must not allow an overall reduction in extent or quality of indigenous vegetation. There needs to be a framework in the LWRP to ensure this will occur. NPS-IB requires the monitoring of vegetation and sets targets for

	<p>improvement in urban and non-urban settings (section 3.22). This is critical for tussock communities in dry catchments, as there is a direct relationship to catchment yield.</p> <p>F&amp;G is more comfortable with the policy direction not delving too deeply into fauna, as these species will be generally provided for through the protection of habitat and the regulation of human activities. The clear exceptions being threatened species, which are already provided for in their own chapter.</p>
<b>Solid Waste Management</b>	
Landfill	<p>Policy direction should be provided for closed, existing and new landfills which requires that they be placed away from rivers and the ocean, to avoid erosion risks from climate change. I see this is partly provided for in the key changes for closed landfills. The direction should go further than identification of risk, by requiring that the risk is avoided.</p>
Clean fill	<p>The permitted activity rules still should:</p> <ol style="list-style-type: none"> <li>1. Have a requirement that clean fill cannot slump if it is being piled or stockpiled.</li> <li>2. Retain the requirement that no sediment enters water.</li> </ol>
<b>Wastewater Management</b>	
Reticulated wastewater: existing systems	<p>The 2045 prohibition should be supported by strong policy guidance for consent holders to achieving this goal. For example, by encouraging the early adherence when consents come up for renewal prior to 2045.</p>
<b>Wetlands</b>	
General comment	<p>Wetlands are significantly reduced in range compared to pre-European extent, with many continuing to have been drained in recent times. There should be a specific focus in policy direction on restoring drained wetlands.</p> <p>In addition, there should be strong policy direction around considering wetlands as part of catchment hydrology, and as part of climate mitigation. Please refer to my comments on the 'beds of rivers' and 'key drivers for proposed changes' sections about making room for rivers.</p>
<b>General comment for regional provisions – what's missing from consultation material</b>	
Cumulative effects	<p>In F&amp;G's experience, cumulative effects are often poorly managed. Most of the poor environmental outcomes in Otago's water bodies are the result of cumulative effects, despite provisions addressing the point (eg. RMA s3). The existence, and worsening, of environmental issues caused by cumulative effects while the RPW has been in force is evidence that it has failed to manage the associated activities adequately.</p> <p>If the LWRP is to achieve the proposed environmental outcomes, it must find a way to resolve cumulative effects by effectively managing the associated</p>

	<p>activities. Taking an approach similar to the RPW is unlikely to work given it has not worked in the past.</p> <p>Above in the submission, I reference the <i>Aratiatia</i><sup>9</sup> interim decision and I think this deserves specific mention as a different approach to managing cumulative effects. This decision considered te mana o te wai in the context of the proposed Southland Water and Land Plan. The Court’s comments in this decision show that the plan gives all water users a positive obligation to support the health and well-being of water bodies.</p> <p>This is a fundamentally different approach to considering adverse effects, in that activities consistent with the plan must support the health and well-being of water bodies, rather than being within an envelope of acceptable damage to the water body.</p> <p>Harnessing this type of positive obligation within the LWRP will have a better chance of being successful in addressing the environmental issues that we face.</p>
<p>Protection of spring-fed streams</p>	<p>It would be helpful for the LWRP to provide specific direction on the management of spring-fed streams. These water bodies are unique, in that their nature is one of stable flows and often very high water quality. Because of this, it does not take much to degrade their health. In addition, once sediment has been discharged to spring-fed streams, it can be more difficult to flush it out because of their stable flows. Spring-fed streams require a higher degree of protection against the discharge of contaminants and hydrologic alteration – both in terms of abstraction and the addition of water (for example via stormwater discharges).</p> <p>A prominent example of a spring-fed creek’s fundamental nature being changed through the addition of water and sediment is Bullock Creek in Wanaka. With surrounding urban development, the creek has become flashier because stormwater is discharged directly to the creek rather than infiltrating into ground and being released via springs over time. The failure of developers to contain sediment from earthworks has also enabled significant amounts of sediment to be discharged to the creek, causing an excess of deposited sediment.</p>
<p>Sediment traps and bunds</p>	<p>Sediment traps can be a helpful tool to capture sediment as it moves down a waterbody. However, they are not a perfect solution. They require the water body to be mechanically altered and periodically cleared out, causing adverse effects on the water body and the biota living within.</p> <p>In terms of being a solution to sedimentation, sediment traps are akin to the ambulance at the bottom of the cliff. It would be a very poor outcome if sediment traps became an alternative to reducing sediment discharge at the source.</p> <p>Provisions in the LWRP will need to create a fine balance for sediment traps. Enabling them to be easily installed in appropriate circumstances but not being so easy that they can be relied upon in lieu of managing sediment discharge on land.</p>

<sup>9</sup> *Aratiatia Livestock Limited vs Southland Regional Council* [2019] NZEnvC 208



	<p>I note also that the current permitted activity for sediment traps in the RPW does not have size or frequency limits. This creates a loophole where a person could use the rule to categorise very large reaches of a water body as a sediment trap and clear the stream with no consequence.</p> <p>In addition, small bunds on ephemeral streams (eg. gullies with no formed water course, in which water runs along the surface only during rain) have shown promise in Southland to settle sediment and other contaminants out of water before it enters a formed water body. This could be a helpful practice to incentivise instead of in-stream sediment traps, as they are likely to have fewer adverse effects. They may have a helpful secondary benefit in holding water from rainfall and releasing it slowly over time – a hydrological function which would have been performed by wetlands that have now been largely drained across Otago.</p>
<p>Definition of perennial, intermittent and ephemeral rivers</p>	<p>It would be helpful for the LWRP to include a definition of perennial, intermittent and ephemeral rivers. F&amp;G’s experience in the deemed permit process was that this categorisation influenced planners’ opinions of adverse effects, yet there were often differences of opinion about what category a river, or river reach, fell into.</p> <p>In addition to this, it would be helpful to provide direction on how plan users should consider discrete reaches which are intermittent or ephemeral in a river which is otherwise perennial in nature.</p>
<p>Spatial mapping of degraded areas</p>	<p>The water policy framework is complicated and boring, so it is often viewed as inaccessible or incomprehensible to the general public. Because of this, it is critical that we find ways to communicate key information to the public in a way that is easy to digest. Mapping provides one way to do this.</p> <p>The LWRP’s environmental outcomes and target attributes will inform the definition of ‘degraded’ in the NPS-FM sense and allow the identification of degraded water bodies and catchments in Otago. It would be helpful for these degraded areas under the proposed environmental outcomes and target attributes to be mapped, so that the public can get a sense of the level of degradation in Otago. This will help the public (and Commissioners) to understand the scale of action required to address the issues.</p> <p>An example of such mapping was undertaken in the Southland Water and Land Plan, which has been reported on in news publications.<sup>10</sup></p> <p>In doing so, it will be important to ensure that setting the extent of degradation does not become the key concern for setting environmental outcomes and target attributes.</p>
<p>Principles for making room for rivers</p>	<p>I have discussed briefly the benefits of striving for a system of hands-off river management including a consistent approach with te mana o te wai. Below, I have detailed some general principles that would be helpful to be implemented to assist with this.</p> <ol style="list-style-type: none"> <li>1. Give rivers room to move by setting or moving infrastructure away from a river corridor.</li> </ol>

<sup>10</sup> <https://www.newsroom.co.nz/finally-waters-health-is-being-put-first>

	<ol style="list-style-type: none"> <li>2. Require a preference for nature-based solutions to erosion and river management – strongly discourage engineered solutions.</li> <li>3. Avoid spraying or clearing of instream weed by creating a strong preference for planting areas that do not host foot traffic. Small order streams in particular, as this is where the majority of sediment comes from (77%!)<sup>11</sup></li> <li>4. Requiring gravel extraction to consider the whole catchment – when gravel resources are low it will build up in some areas but not others</li> <li>5. Actively discourage stream clearing! The RPW helpfully discourages it by making it a discretionary activity; however, it is not well enforced and illegal stream clearing happens regularly. This practice has been a crutch that has allowed businesses to avoid reducing sediment discharge at the source and it must be addressed.</li> <li>6. Encouraging the use of two-stage channel design where hard flood protection measures cannot be avoided, to avoid long stretches of low, laminar flow. Examples of river reaches which would benefit from this approach include the Leith under SH1.</li> </ol>
<b>Key Drivers for Proposed Changes</b>	
The increasing impacts of climate change	<p>F&amp;G strongly supports the consideration of climate change in the LWRP. Combating climate change and mitigating its impacts are one of the most significant challenges facing Otago, and the world, this century. Policy 4 of the NPS-FM requires that freshwater in managed as part of New Zealand’s integrated response to climate change. For F&amp;G, this clearly directs that this LWRP should manage water in a way that contributes to:</p> <ol style="list-style-type: none"> <li>1. Achieving New Zealand’s emission reduction targets. This includes considering the emissions of land use and activities that are enabled through the plan, such as agricultural intensification through irrigation.</li> <li>2. Mitigating the impacts of climate change on communities, including making room for rivers, wetlands and floodplains through the managed retreat of infrastructure.</li> </ol>
<b>FMU’s and Rohe – feedback shared amongst all rohe and FMU’s</b>	
Environmental outcome: Ecosystem health	<p>The following changes are recommended:</p> <p><i>Freshwater bodies support <u>healthy</u> freshwater ecosystems <u>where the five biophysical components enable with thriving habitats for a range of indigenous aquatic species, and the life stages of those species, that would be expected to occur naturally.</u> <u>Freshwater bodies support introduced species and other values where they contribute to, or are not inconsistent with, the achievement of environmental outcomes for habitats and indigenous species.</u></i></p> <p>The Ecosystem Health compulsory value wording shines through in the outcome as proposed. It can be improved by:</p>

<sup>11</sup> <https://pubmed.ncbi.nlm.nih.gov/28991968/>

	<ol style="list-style-type: none"> <li>1. Explicitly acknowledging the 5 biophysical components, so that it is clear a healthy ecosystem concerns itself with more than habitat and aquatic life.</li> <li>2. Avoiding the use of 'healthy' within the outcome, as it makes the interpretation circular. You don't use a word in it's own definition.</li> <li>3. Referring to 'indigenous aquatic species' as in the compulsory value.</li> <li>4. Being clear that ecosystem health can encompass other values than native species, where they contribute to the achievement of ecosystem health. This is a key part of the compulsory value wording in the NPS-FM, in that the aquatic life biophysical component isn't restricted to indigenous species and the final paragraph specifically refers to providing for other values in bracketed text. Including reference to other values emphasises that humans can and should be a part of healthy ecosystems. By including humans and their actions, the outcome provides strong guidance on cumulative effects.</li> </ol>
Environmental outcome: human contact	<p>F&amp;G strongly supports the text proposed, particularly because it recognises the health links involved with connections between people and water bodies.</p> <p>It is critical that this connection is recognised in this outcome because there is no other environmental outcome which recognises the value. Across Otago, people connect with water for recreation; food or resource harvesting; spiritual fulfillment; or general appreciation and relaxation. Because it is such a significant act for the public, this connection <i>must</i> be supported somewhere within the environmental outcomes for all FMU and Rohe.</p> <p>When such an environmental outcome is achieved, the quality, quantity and ecological productivity of water will be sufficient to support the public's desired connections.</p> <p>F&amp;G recommends the theme connecting human health needs and people's connections to water bodies be carried through the provisions of the LWRP as a second order priority within the hierarchy of obligations.</p>
Environmental outcome: natural form and character	F&G supports the proposed wording, particularly the references to connected receiving environments.
Environmental outcome: drinking water supply	F&G supports retaining the reference for this value to 'drinking water supply' rather than 'community supply' as it is now clear that much of the water in community supplies go to uses other than drinking water. Water used for those uses are better characterised under other values. This is critical in water short catchments, where difficult choices may need to be made about prioritising water for certain uses above others.
Environmental outcome: fishing	<p>F&amp;G notes that this value is relevant to both sports and native fisheries in freshwater, where they are targeted by people not of māori descent. The latter includes whitebait, tuna and kahawai.</p> <p>The proposed wording does not provide adequate direction in managing the fishing value. For example, it only provides for juvenile and rearing waters – not the adults which are often caught – and it's not clear what 'providing for'</p>

	<p>refers to in the sentence. F&amp;G recommends wording in the outcome which speaks to the species themselves and the habitat. Wording is proposed below, which is based on the mahika kai because the practice is broadly similar, though the specific methods and content of cultural expression or teaching may differ.</p> <p>For clarity, when referring to ‘resources’ I take this to mean both the populations and the habitat which supports them. Alternatively, this could be separated out into the components of fishing: fish populations, habitat, access and factors contributing to recreation amenity (landscape, natural character ect.).</p> <p>I have also removed reference to threatened species, as they are by definition indigenous.</p> <p><u>Fish are safe to eat, and fishing resources are protected and restored to a condition, insofar as it is consistent with the protection of indigenous species, in which populations of valued fishery species are self-sustaining and plentiful enough to support harvest for recreation and food by the public.</u></p> <p><u>The public are able to safely access, harvest and use these resources now and in the future.</u></p> <p>For the sake of clarity, I note that F&amp;G seeks this wording in conjunction with the collaborative species interaction process sought as part of the PORPS. This is critical, as it will allow the statutory parties involved in the management of the species involved consider how and where to manage species interaction. By using such a process, the public can have confidence that the protection and restoration aim of the outcome will be undertaken where it is appropriate, given the species present. Without such a process, any fishing value focusing on species will be subject to constant conflict, as different parts of the community fight over what is valued and whether there is consistency with the protection of indigenous species.</p>
<p>Environmental outcome: wetlands</p>	<p>F&amp;G strongly supports the outcome to protect and restore wetlands and their values. The outcome would be aided with wording that:</p> <ol style="list-style-type: none"> <li>1. Requires an improvement the extent of wetlands in the region. This is justified by the dramatic historical loss of wetlands in the region.</li> <li>2. Will develop an understanding of drainage schemes where it is not currently well known, including rural sub-surface drainage</li> </ol>
<p>Environmental outcome: hydro-electric power generation</p>	<p>It is not appropriate to have a carve out for hydro-electric power generation from meeting the environmental outcomes. The relationship between the NPS-FM and the NPS-REG is such that hydro-electric generation must also fall within the direction for te mana o te wai. I am aware in the PORPS process that some parties believe specific hydro-electric generation projects will not meet that bar and should be given an explicit carve out. If the ORC agrees that such projects exist, then it is helpful to be specific about where this will be and how it will be dealt with within the LWRP framework. Applying a generic carve out with vague wording (“to the greatest extent practicable”) will only push the problem onto consenting processes, causing additional cost and complexity for parties. Dealing with exemptions in the LWRP framework</p>

	<p>will enable an open and transparent discussion of the issues with large hydro-generation activities and the merits of a carveout.</p> <p>F&amp;G strongly recommends the outcome language be structured using the “provided the health and wellbeing ...” phrase, identifying specific exceptions where they are relevant.</p>
Recommended environmental outcome: climate change response	<p>F&amp;G recommends that an environmental outcome is added which speaks to how land and water use will be integrated into New Zealand’s climate change adaptation and mitigation responses. The outcome would be applied to all FMUs and Rohe, as it affects all areas.</p> <p>This outcome is warranted because of the significant impacts climate change will have in Otago,<sup>12</sup> the strong public concern about climate change<sup>13</sup> and the strong policy direction via Policy 4 of the NPS-FM.</p> <p>Recommended wording, which could be applied to all FMUs and Rohe, is provided below:</p> <p><u><a href="#">Water and land is used in a manner that is consistent with New Zealand’s response to climate change. Nature-based solutions are preferentially adopted when adapting to the impacts of climate change.</a></u></p>
<b>FMU and rohe specific provisions</b>	
Increased setbacks for high-risk activities near water ways: Catlins,	<p>The setback requirements for all high-risk activities that leave large tracts of bare soil - forestry, earthworks, cultivation, intensive winter grazing – should have similar setbacks across Otago rather than different setbacks for different FMUs or rohe. Because the risk from these activities is so great, a</p>

<sup>12</sup> MfE predicts that:

1. “Less winter snowfall and an earlier spring melt may cause marked changes in the annual cycle of river flow in the region’ and that ‘for rivers where the water precipitation currently falls mainly as snow ... there is the possibility for larger winter floods”. This is likely to impact communities around Lakes Wakatipu and Wanaka and those downstream alongside the Clutha.
2. “By 2090, the time spent in drought ranges from minimal change through to more than double depending on the climate model and emissions scenario considered. More frequent droughts are likely to lead to water shortages, increased demand for irrigation and increased risk of wild fires. Reduced snowfalls may affect water availability since snow acts as a storage mechanism until the water is required in summer”
3. “Rising sea levels and storm surge will increase the risk of salt-water intrusion in low-lying coastal areas such as Douth Dunedin (much of which is at or below sea level)”
4. “Warmer water temperatures could lead to more algal blooms, a reduced range of trout species and the spread of pest species like carp.”
5. “Warmer temperatures, particularly with milder winters, could increase the spread of pests and weeds”.
6. “With frost reduction and temperature increase, climate change could benefit cherries and apricots both in yield and quality. Farmers might benefit from faster growth of pasture and better crop growing conditions. However, these benefits may be limited by negative effects of climate change such as prolonged drought, increased flood risk and greater frequency and intensity of storms.”

<https://environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-otago-region/>

<sup>13</sup> The September 2023 Ipsos Issue Monitor found climate change to be the 6th most concerning issue for Kiwis. <https://www.ipsos.com/sites/default/files/ct/news/documents/2023-09/21st%20Ipsos%20New%20Zealand%20Issues%20Monitor%20%2819%20September%202023%29.pdf>

*Statutory managers of freshwater sports fish, game birds and their habitat*

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<p>Dunedin &amp; coast, Lower Clutha, Taiari/Taiari</p> <p>Cultivation permitted, subject to setbacks: Dunedin &amp; coast, Dunstan, Manuherekia, Roxburgh, Taiari/Taiari</p>	<p>small number of paddocks or areas that are poorly managed can cause significant damage to any catchment.</p> <p>For clarity, there is strong evidence that setbacks of at least 10 meters on slopes less than 10 degrees and at least 20 meters for slopes above that (increasing with slope) are required between activities that result in large tracts of bare soil and water bodies. F&amp;G is comfortable for limits in the LWRP to exceed these minimum requirements. F&amp;G supports more stringent setbacks for stock in FMU's and rohe where stock are more intensely grazed.</p> <p>In addition to this, the North Otago FMU should be subject to more stringent setbacks.</p> <p>It is important to note that Otago F&amp;G is not necessarily opposed to sheep and other light-footed stock grazing along rivers. The key is that it is not done intensively. When this is achieved, the water quality impacts are minimal. With lightly stocked, light-footed animals, there are benefits for grazing along water bodies – such as weed control and keeping vegetation suitably low for public access. Allowing for appropriate grazing will also provide opportunities for economic return on the land, meaning that the social and economic consequences of the more stringent grazing approach is reduced.</p>
<p>More stringent management of harvest of plantation forestry: Catlins, Dunedin &amp; coast</p>	<p>F&amp;G supports more stringent management of harvesting plantation forestry across the region. This is justified because the activity is extremely high-risk for water bodies, wherever they are located. Because of the high risk of the activity, consideration should be given to making these more stringent approaches the default in the regional provisions.</p>
<p>Controlled activity status for dairy farming and dairy support: Dunedin &amp; coast, Lower Clutha, Manuherekia, North Otago, Taiari/Taiari</p>	<p>F&amp;G support a consenting regime to ensure that the environmental outcomes and vision statements will be achieved. However, a controlled activity will not enable the ORC to decline the application where the activity is inappropriate. A more rigorous activity status will enable the ORC to properly manage land use. Refer to comments on the 'different tools for different places' heading for more information on this point.</p> <p>Ultimately, the ORC should have provisions in place which it can be confident will achieve the environmental outcomes and vision statements. The more uncertainty on this point, the more precautionary the provisions should be.</p>
<p><b>Environmental flows and levels and limits on take, diversion and the damming of water</b></p>	
<p>General comment</p>	<p>As discussed in the Environmental Flows and Limits (Water Quantity) section, F&amp;G strongly supports using the default limit approach for rivers.</p> <p>F&amp;G is supportive of using the default limits as an interim approach. However, it is critical that bespoke limits go through a plan change process if this is to be altered, otherwise there will be no public input to what those levels should be.</p> <p>It I note that some of the bespoke limits are new, while others have been taken directly from Schedule 2A of the RPW.</p>

	<p>Given that the NPS-FM has changed dramatically since all of the Schedule 2A limits were set, it is inappropriate to assume they can be carried across to the LWRP and be consistent with the local expression of te mana o te wai. For example:</p> <ol style="list-style-type: none"> <li>1. The Lindis summer minimum flow of 550l/s leaves just 8% of MALF in the river at the confluence. It seems very difficult to believe this is consistent with a te mana o te wai led approach.</li> <li>2. The water levels on lowland lakes currently impacted by hydrological alteration are extremely low – Lake tuakitoto and the Clutha Lagoon being prominent examples. Both are clearly subjected to a management regime which prioritises the economic return and value of surrounding land, rather than the health of the water bodies. Both are subjected to reduced flushing/inflows, very low levels and the input of contaminants from surrounding intensive farmland. The result is extremely poor water quality and common algal blooms. It is wildly inappropriate for the RPW levels for these water bodies, and others in situations like them, to be simply copied into the LWRP. They need water levels set with consideration of te mana o te wai. For the Clutha Lagoon, there should also be a direction in the LWRP to move the minimum levels out of the consenting regime and into levels within the plan.</li> </ol> <p>Where bespoke limits are newly defined, F&amp;G is unable to provide specific comment until supporting information is provided. As with the comments in region wide provisions, it would be helpful for the ORC to use presumptive standards to ‘sanity check’ the bespoke limits.</p> <p>It is difficult for me to see how the ORC could rely on consultation results when none of the respondents will be aware of the justification for choosing these bespoke limits.</p> <p>Supporting information should be made available to the public well in advance of notification. It would be unhelpful for this to be held off until evidence exchange, as it will create a significant burden on parties to read, understand and respond to the information for so many catchments.</p>
<p>River catchment limits: Manuherekia at campground</p>	<p>F&amp;G supports the minimum flow of 2,500l/s but the 17 year delay is well too long. It is extremely disappointing that the ORC has relied on species interaction for this delay without ever reaching out to F&amp;G to inform the relationship between minimum flows and species interaction, and collaborate on resolutions as necessary. F&amp;G has extensive knowledge in this area and is supportive of finding resolutions to species interaction.</p> <p>It is not clear to F&amp;G:</p> <ol style="list-style-type: none"> <li>1. Whether fish passage barriers are necessary, or whether other management tools are more warranted either instead of or in addition to barriers.</li> <li>2. Where fish passage barriers are to be installed if they are necessary, and in what number.</li> <li>3. The basis of fact for setting interim flows at 1,200l/s.</li> </ol>

	<ol style="list-style-type: none"> <li>4. Who will pay for the fish passage barriers.</li> <li>5. Whether a 17-year delay is appropriate amount of time to resolve species interaction issues.</li> </ol> <p>As it stands, F&amp;G sees little to no evidence for such a long delay in restoring meaningful flow to the Manuherekia, nor how the ORC intends to resolve species interaction on its own.</p> <p>F&amp;G has been clear that it would like statutory agencies to collaborate proactively on resolving species interaction. The ORC would have found itself in a much stronger position had it come to DoC, Iwi and F&amp;G prior to develop an agreed approach to species interaction in the catchment.</p> <p>In addition to this. The proposed take limit is ridiculously high – well above even the current abstraction. In public ORC meetings, staff have told Councillors the intention for such a high limit is to ensure that new consents can be issued as old ones run out. This is inconsistent with the hierarchy of obligations in that it explicitly prioritises irrigation over the health and well-being of water bodies and freshwater ecosystems. A more realistic take limit should be identified, which will prioritise the health and well-being of the Manuherekia and it’s tributaries.</p>
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**Outstanding water bodies**

	<p>It appears that outstanding water bodies for habitat and recreation have been identified using the Otago SFGMP and CSI SFGMP and other recreation studies. F&amp;G broadly agrees with the categorisation, with the following additions:</p> <ol style="list-style-type: none"> <li>1. The Lake Wakatipu entry should identify it as a nationally significant sports fishery in the Otago SFGMP.</li> <li>2. The Hunter River, both up an downstream of the branches should also be identified as outstanding as it is a nationally significant sports fishery in the Otago SFGMP.</li> <li>3. The three significant Otago fisheries on hydro-electric generation lakes should be identified as outstanding: Lakes Onslow, Dunstan and Hawea. Of these, Dunstan and Hawea are nationally significant fisheries. Lake Onslow is regionally significant but widely viewed by the angling community as outstanding for its high catch rate.</li> <li>4. Since the development of the Otago SFGMP, the Dingle Burn, Wilkin River, Young River and upper Pomahaka (upstream of the Hukarere Station Bridge on Hukarere Station Road) have been formally recognised for their backcountry characteristics and have become designated waters. This designation comes with specific rules designed to protect their outstanding characteristics. While they are not listed as nationally significant in the Otago SFGMP, they should be categorised as outstanding.</li> <li>5. The upper Manuherekia (above Falls Dam) and Dunstan Creek (above Loop Road) should be recognised as outstanding fisheries for the backcountry characteristics.</li> <li>6. Lake Tuakitoto entry should recognise the categorisation in the Otago SFGMP as being regionally significant waterfowl habitat.</li> </ol>
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	<p>7. The Waihola/Waipori wetland/lake complexes entry should recognise their categorisation in the Otago SFGMP as being nationally important waterfowl habitat.</p> <p>8. Based on F&amp;G staff experience, a small number of water bodies should be identified as outstanding on the grounds of game bird hunting opportunities: Lake Tuakitoto, Waihola/Waipori, the Lower Clutha and Lake Dunstan.</p>
<b>Primary contact sites</b>	
General comment	<p>F&amp;G considers that the NPS-FM definition for 'primary contact site' is inclusive of fishing and game bird hunting. These activities are not listed explicitly; however, I note that the activities listed are <i>examples</i> of relevant recreational activities, as denoted by the use of the phrase 'such as'.</p> <p>Fishing and hunting are both recreational activities undertaken in and around water, which in and of itself would satisfy the definition in terms of being a relevant activity.</p> <p>In addition to this, there are practical human health connections between the act of fishing and hunting and water quality:</p> <ol style="list-style-type: none"> <li>1. Fishing is often undertaken when wading in, or boating on, water. This puts the angler directly in or on the water. Though the intention of wading is to stay dry, at least from the chest up, there is a genuine and constant risk of slipping and falling into the water body. This comes with a high likelihood of ingesting or inhaling water. Regardless of the method used, anglers come into contact with water on their gear and catch. When the quality of the water at the site is poor, washing caught fish in the water body can cause a heightened risk of sickness, through infected meat.</li> <li>2. Game bird hunting is generally undertaken from a dry position out of the water. This can be in a maimai on the bank, an island or on stilts above the water; in a boat; or when walking along a bank. Boating is not uncommon as a platform to hunt from, a method of transport to the maimai or a vehicle to collect game birds which have been shot. Given that boating is a specific example in the definition, game hunting from a boat is by definition also included. Where dogs are used, they usually bring direct contact with water to their owners. Hunters also come into direct contact with water via the game itself. Whether boating is involved, game bird hunting is a contact recreation activity.</li> </ol>
General comment: fishing primary contact sites	<p>As an activity, fishing does not occur at one site. Most anglers travel along the water body, by foot or boat, to cover new water and find fish. The one exception being fishing with bait, where it is sometimes assumed that fish will come to you. Depending on the fishing method employed, the fitness of the angler and the characteristics of the fishery, distance of tens of meters to tens of kilometres can be traversed in a fishing session. In addition to this, it is more difficult (and sometimes near impossible) to catch fish in places that were recently disturbed by another angler. So, anglers tend to naturally</p>

disperse along the length of water bodies, wherever there is access and availability of fish.

As a result of this, angling doesn't lend itself well to identifying specific points on a map where the activity takes place. It is more aptly represented by reaches or whole water bodies. It is helpful that the definition for 'primary contact site' is inclusive in this sense because it doesn't require a site to be limited in size. A site could be a river reach, whole lake or swimming hole.

The most effective way to identify water bodies and reaches used for angling would be to consider named fisheries in the Otago section of the Fishing Regulations, which can be found in the South Island Sports Fishing Regulations for a given year.<sup>14</sup> Generally, the list of named fisheries remains stable across the years.

Within the definition for primary contact site, the site needs to be identified as being "...regularly used, or would be regularly used but not for existing freshwater quality". The National Angler Survey<sup>15</sup> (NAS) can assist with this task. The NAS estimates angler use of named fisheries in a given year across the country. The latest publicly available survey was conducted in the 2014/2015 season, though one is being undertaken this year. The NAS shows that between 1994/1995 and 2014/2015, there were between ~180,000 and ~218,000 angler-days worth of effort on Otago water bodies. That equates to an average of ~493 to ~597 anglers on Otago water bodies each day of the year.

What is considered 'regularly used' is ultimately subjective. I'd suggest that if a fishery had an average of one or more user per day within the year then it'd be used regularly. Using the NAS, I'd recommend including the full range of error for each estimate, because sampling error is unavoidable in this study. I'd also recommend using the full range of NAS results across the years, as sampling error occurs through the years and the definition includes sites that would have been used if not for water quality. Anecdotally, some sites in Otago have declined in use over time for this reason. The Waipahi is a prominent example.

Finally, it's important to note the difference between a fishery and a contact recreation site. The former encompasses angling, habitat for adult fish, habitat for spawning fish and habitat for juveniles and therefore includes all tributaries of the water body from which it gets its name. The latter would only include parts of a fishery which get regular use by anglers. I'd recommend identifying the water body which bears the name of the named fishery, usually a river main stem, whole lake or whole wetland, for the purpose of identifying primary contact sites.

Using this metric, the mainstem or whole water body bearing the name of a named fishery with 365 angler-days of effort in the NAS surveys would be identified as a primary contact site. The sites which meet these criteria are:

1. Shag River

<sup>14</sup> The 2023/2024 regulations can be found here: <https://fishandgame.org.nz/assets/Uploads/90103-FG-202324-Sportsfishing-Reg-South-Island-V5-WEB.pdf>

<sup>15</sup> <https://fishandgame.org.nz/assets/Uploads/National-Anglers-Survey-2015-16.pdf>

	<ol style="list-style-type: none"> <li>2. Waikouaiti River</li> <li>3. Waitati River</li> <li>4. Sullivans Dam (dammed at the top of the Leith Stream)</li> <li>5. Water of Leith</li> <li>6. Tomahawk Lagoon (NAS includes Tomahawk creek separately, with 320±190 angler-days, though they are combined in the regulations)</li> <li>7. Kaikorai Stream</li> <li>8. Taieri River</li> <li>9. Lake Mahinerangi</li> <li>10. Lake Waiholo</li> <li>11. Lake Waipori</li> <li>12. Waipori River</li> <li>13. Silver Stream</li> <li>14. Deep Stream</li> <li>15. Kye Burn</li> <li>16. Logan Burn</li> <li>17. Logan Burn Reservoir</li> <li>18. Tokomairiro River</li> <li>19. Clutha River / Mata-au</li> <li>20. Puerua River (Puerua Stream in the regulations)</li> <li>21. Lake Tuakitoto</li> <li>22. Waitahuna River</li> <li>23. Waiwera River</li> <li>24. Pomahaka River</li> <li>25. Waipahi River</li> <li>26. Lake Onslow</li> <li>27. Teviot River</li> <li>28. Lake Roxburgh</li> <li>29. Butchers Dam</li> <li>30. Manuherikia River</li> <li>31. Manor Burn (not included specifically within the regulations but as a part of the Manuherikia regulations)</li> <li>32. Manorburn Reservoir</li> <li>33. Poolburn Reservoir</li> <li>34. Pool Burn (not included specifically within the regulations but as a part of the Manuherikia regulations)</li> </ol>
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*Statutory managers of freshwater sports fish, game birds and their habitat*

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35. Dunstan Creek
36. Conroys Dam
37. Fraser Dam
38. Fraser River
39. Kawarau River
40. Bannock Burn
41. Nevis River
42. Arrow River
43. Lake Hayes
44. Lake Johnson
45. Moke Lake
46. Shotover River
47. Diamond Lake
48. Lake Wakatipu
49. Lochy River
50. Von River
51. Greenstone River
52. Caples River
53. Rees River
54. Diamond Creek
55. Route Burn
56. Lake Dunstan
57. Lindis River
58. Cardrona River
59. Hawea River
60. Lake Hawea
61. Hunter River
62. Timaru River
63. Dingle Burn
64. Lake Wanaka
65. Matukituki River
66. Mototapu River
67. Makarora River
68. Wilkin River
69. Young River

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- 70. Catlins River
- 71. Owaka River
- 72. Tahakopa River
- 73. Tautuku River
- 74. Kākaunui river
- 75. Waianakarua River

I recommend that these named water bodies should be identified as primary contact sites for angling.

Each of these sites has a defined fishing season from the regulations, which should be used for defining the sites. Use for some sites will be restricted to part of the year and others will be all year.

The following water bodies are identified in the NAS and fit the criterion but are not listed in the fishing regulations. I include them here for completeness:

- 76. West Eweburn Dam
- 77. Kaiwera Stream
- 78. Waikoikoi Creek
- 79. Leithen Burn
- 80. Malones Dam
- 81. Lake Kirkpatrick
- 82. Wye Creek
- 83. Fast Burn

The following water bodies are identified in the fishing regulations and NAS and fit the criterion but are off stream or are fed predominantly by irrigation races. It does not seem appropriate to me that the ORC should be controlling water quality in these places, especially where it is an irrigation dam on private land with negotiated access for fishing. I include them for completeness.

- 84. Hamiltons Dam
- 85. Coal Pit Dam
- 86. Hoffmans Dam
- 87. Mathias Dam
- 88. Blakleys Dam (this is spelt incorrectly in the NAS)
- 89. Hore's Pond
- 90. McAtamneys Head Pond

F&G is also developing two other resources which may be helpful to support the above analysis:

	<p>91. An online portal<sup>16</sup> of fishery access points has recently gone live. It is critical to note that this only currently shows signposted access points, so misses general access points – for example where road bridges cut over rivers. The site will be updated in time.</p> <p>92. Mapping of the extent of named freshwater fisheries. I note that this will extend further than the regularly used sites, as it is likely to include named fisheries with less than 365 angler-days worth of effort. They also include tributaries as part of the fishery because this is how it is structured in the regulations and a fishery includes the fish that are targeted, the water source and the spawning areas that supports the population. This map is in the early stages of development, with a target completion date of early 2024. Once complete, a copy can be provided to the ORC.</p>
<p>General comment: hunting primary contact sites</p>	<p>It is much more difficult to identify contact sites for game bird hunting. Most often, these are found on private property. However, there are a small number of popular game bird hunting sites on publicly accessible land that are regularly used.</p> <p>All of these sites will only be used for hunting during the hunting season, as defined by the regulations.</p> <p>I have attached an excerpt from the book SpotX which provides information and locations for these sites. While the book is dated, the information is still relevant today and these pages are used by F&amp;G today to guide people to hunting areas. I'd recommend considering these sites as a primary contact site. For clarity, here is a list of the sites:</p> <ol style="list-style-type: none"> <li>1. Hunter River Mouth Wetland</li> <li>2. Makarora Wetlands</li> <li>3. Big Boggy Conservation Area</li> <li>4. Matukituki Wetlands</li> <li>5. Paddock Bay</li> <li>6. Falls Dam Boat Ramp</li> <li>7. Bendigo Conservation Area</li> <li>8. Bendigo Wildlife Reserve</li> <li>9. Cogans Bridge Drift</li> <li>10. Serpentine Wildlife Management Reserve</li> <li>11. Merton Arm</li> <li>12. Little Hoopers Wildlife Reserve</li> <li>13. Lower Taieri Drift</li> <li>14. McKays Triangle</li> <li>15. Otokai Wetlands</li> </ol>

<sup>16</sup> <https://fishandgameaccess.org/fg-otago-region-full-width-map/>

16. Contour Channel Backwater

17. Lake Waipori

18. Takitakitoa Wetlands

19. The Boot

In addition to this, the following locations have been anecdotally identified by the Otago Sports Fish and Game Management Plan and staff as popular hunting areas available to the public. For the latter, this is based off of years of experience as F&G staff, where regular compliance actions are undertaken, and personal hunting experience.

1. Lake Tuakitoto

2. Waipori / Waihola wetland and lake complexes

3. Lower Clutha River / Mata-au

4. Lower Taieri River

5. Pomahaka River, from Dusky Forest down

6. Kaikorai Estuary

7. Upper Taieri Scroll Plain Wetlands

8. Daimond Lake, Reid Lake and Diamond Creek

F&G recommends that these sites are identified in the SpotX pages and the above list are identified as primary contact sites for hunting, during the gamebird hunting season.