Southland Fish & Game Council submission on ‘Action for healthy waterways package’

To: Ministry for the Environment
PO Box 10362
Wellington 6143

Attention: Freshwater Team

Via e-mail to: consultation.freshwater@mfe.govt.nz

Name of stakeholder: Southland Fish & Game Council

Physical address: Personal details removed
Postal address: Personal details removed
Phone: Personal
Fax: Personal
Contact person: Personal details
E-mail: Personal details removed
Phone: Personal details removed

Signature: Personal details removed

Manager

Date: Thursday, 31 October 2019

Preliminary

Southland Fish & Game’s submission is structured as follows:

1. Introduction – Role of Southland Fish & Game and statutory mandate;
2. The importance of the sports fishery and game bird resource in the Southland Region;
3. General submissions; and
4. Specific submissions.
1. Introduction

The following submission by Southland Fish & Game Council on the action for healthy waterways package supplements the submission by the New Zealand Fish & Game Council. The intent of this submission is not to repeat verbatim the submission by the New Zealand Fish & Game Council, which is supported by Southland Fish & Game Council, but to focus on issues of particular relevance to the Southland region.

Role of Southland Fish & Game and statutory mandate

Southland Fish & Game Council (‘Southland Fish & Game’) is the statutory manager of sports fish and game birds within the Southland Fish & Game Region under Parts 5A and 5B of the Conservation Act 1987 and Part II of the Wildlife Act 1953 and their associated regulations and notices. The Southland Fish and Game Council is comprised of 12 members elected from licence holders in the Southland Fish and Game Region.

Fish & Game Councils are statutory bodies with functions, pursuant to s 26Q of the Conservation Act 1987, to manage, maintain and enhance the sportfish and game bird resources in the recreational interests of anglers and hunters.

2. Importance of sports fishery and game bird resources in the Southland region

The sports fish and game bird resources of the Southland region are highly valued. Southland Fish & Game represents holders of 16,500 angling and hunting licences in the Southland region.¹

Sports fishery

The Southland region is one of the key regions in the South Island for sport fishing and includes a large number of sports fisheries which have locally, regionally and nationally significant values. During the 2014 / 2015 angling season, 122,660 ± 6,010 angler days, distributed over 57 river fisheries and 14 lake fisheries in 14 catchments were undertaken in Southland.²

The value of the sports fish resource in the Southland region is encapsulated by the two operative Water Conservation Orders in the Region, Water Conservation (Mataura River) Order 1997 and Water Conservation (Oreti River) Order 2008, which recognise nationally significant brown trout fisheries / habitat and angling amenity features associated with the Mataura and Oreti rivers. Excluding fisheries wholly or partly dependent on sea-run Chinook salmon, the Mataura and Oreti Rivers are the two most heavily fished trout rivers in the South Island and New Zealand if the Tongariro River, which is manged by the Department of Conservation and lies within the Taupo Conservancy, is excluded. In short, the Mataura and Oreti rivers have national and international status.

Domestic and international anglers from outside the Southland region provide a substantial portion of angling effort expended in Southland. Licence holders from outside the Southland region fished for 24,360 ± 1,830 angler-days on Southland waters during the 2014 / 2015 season, contributing 20% of the regional total.

Southland has a wide selection of waterbodies that offer regionally significant fishing opportunities, for example: Lakes Manapouri and Te Anau, Waituna Lagoon and the Upper and Lower Waiau and Aparima rivers. In addition, Southland has many locally significant fisheries, such as the Makarewa River, which provide close to home angler opportunity, and a comprehensive network of significant spawning rivers and streams, such as the Waikaka Stream and tributaries, which are essential to the health and sustainability of the regions’ fisheries.

All river and still water fisheries in Southland are wild and self-sustaining through natural spawning, rearing and recruitment of juvenile trout into the adult population. It is the standing of adult trout that provide the recreational trout fishing amenity, and fishery productivity is related to habitat quality and ecosystem health.

**Game bird resource**

The Southland Region provides for significant wildlife habitat and game bird hunting opportunities, with key wetlands such as the Waituna / Awarua complex, numerous other wetlands on private and public land and its extensive network of rivers and lakes.

Game birds are recognised and defined in the First Schedule of the Wildlife Act 1953. The current statutory basis and regime for game bird management by Fish and Game Councils is provided for under Part II of the Wildlife Act, together with annual Game Notices promulgated under that legislation. Several of the principle game bird species (grey duck, paradise shelduck, shoveler duck, black swan and pukeko) in the Southland region are native species.

**3. General submissions**

Southland Fish & Game welcomes the action for healthy waterways discussion document, which sets out an important step in the right direction if freshwater degradation issues are to be addressed in a substantive and timely fashion, including in the Southland region.

Southland Fish & Game considers that Central Government should hold firm on imposing regulation and should not fall back to industry self-regulation and / or educative approach, which have failed to control and stop degradation of Southland’s waterways. In short, more oversight and regulation, as proposed, is required and supported by Southland Fish & Game.

**Specific recognition of trout and salmon**

As discussed, trout and salmon are species valued by many thousands of Southland residents and domestic and international visitors to the region. Accordingly, the draft National Policy Statement for Freshwater Management should include more specific recognition of trout and salmon to ensure that the valuable recreational resource is properly provided for. For example, salmon and trout should be recognised as a valued introduced species in the description of
healthy freshwater ecosystem in Appendix 1A(1) of the draft National Policy Statement for Freshwater Management.

Water quality

Southland Fish & Game supports:

1. The removal of the concept of ‘overall’ water quality, which is currently set out in the operative National Policy Statement for Freshwater Management (2017) and the ability to change water quality within a ‘band’ in the accompanying National Objectives Framework; and

2. The concept of maintaining water quality for each water quality attribute. However, the requirement to maintain water quality should not be deferred to some date in the future when the draft National Policy Statement for Freshwater Management becomes operative. To do so risks embedding degraded water quality. Instead, the definitions of ‘current water quality’, ‘existing water quality’ and ‘maintain water quality’ should refer to water quality as it existed in 1991, i.e. the date from which regional councils, including Southland Regional Council (commonly known as ‘Environment Southland’), have had the statutory obligation under the Resource Management Act to monitor and maintain water quality.

Implementation

Southland Fish & Game submits that there is an urgent need for a Freshwater Commission to be established as a stand-alone entity focused on assisting regional councils, including Environment Southland, to implement the freshwater reforms by providing scientific advice, support funding, plan-making advice, compliance / enforcement advice and (where required) direct Ministerial interventions.

In addition, Southland Fish & Game submits that robust monitoring, including randomised monitoring of both permitted and consented activities, and associated enforcement action by regional councils is critical if the benefits of more oversight and regulation to address water quality and habitat degradation are to be realised.

4. Specific submissions

The following specific submissions are set out using the topic headings and sequence of numbering set out in the discussion document on national direction for our essential freshwater.

Section 4 – Setting and clarifying policy direction

Proposals to require a holistic view of managing land water resources and enable faster planning

3 See clause 3.9 – Setting target attribute states of the draft National Policy Statement for Freshwater Management.
4 See regional council functions set out in s 30(1)(c) and s 35 of the Resource Management Act 1991.
Section 4.2 – Te Mana o te Wai

Southland Fish & Game supports:

1. The proposals that strengthen Te Mana o te Wai or ‘the mana of the water’, including a three tiered hierarchy of obligations whereby the health of the waterway comes first, followed by the essential needs of humans, followed by all other uses; and

2. The proposal to elevate status of Mahinga Kai as a compulsory value, as recommended by Kahui Wai Maori.

Section 4.5 – Directing more integrated management of freshwater

Southland Fish & Game supports new policies in the draft National Policy Statement for Freshwater Management directing territorial authorities to manage the effects of urban development on water, so they are supporting integrated management across freshwater management units.

Section 4.6 – Exceptions for major hydro schemes to support renewable energy targets

Southland Fish & Game does not support allowing regional councils to set objectives below the bottom line for rivers impacted by major hydro schemes, including the Manapouri Power Scheme, to support renewable energy targets. This runs the risk of undermining all the work being done to improve rivers, including flow levels and variability, and risks creating ‘sacrifice catchments’ whereby greater degradation is permitted than elsewhere.

Background to Southland Fish & Game submission on exception for the Manapouri Power Scheme to support renewable energy targets

The Manapouri Power Scheme began generation in 1969 and currently diverts approximately 450m$^3$/s (approximately 90%) of water, that would have flowed down the Lower Waiau River and discharged into Foveaux Strait, through the Manapouri Power Station and into the coastal marine area at Doubtful Sound. As such, the take is consumptive in nature insofar as water passing through the Manapouri Power Station is not returned to the Waiau catchment, including the Lower Waiau River. Minimum flows are currently set for the Lower Waiau River at 12 – 16m$^3$/s depending on the time of year. The current suite of consents for operation of the Manapouri Power Station, including the diversion, take and use of surface water, were granted for 35 years duration in 1996 and expire in 2031.

Southland Fish & Game acknowledges that the operation of the Manapouri Power Scheme is of national importance, however the resultant modified flow and level regime has resulted in significant adverse effects on the environment, including (among other things) algal blooms, periphyton accumulation during extended periods of low flow, sedimentation of Te Wae Lagoon, disruption of fish passage (including migratory fish passage), diminished cultural and recreational values, de-watering of riparian wetlands, diminished amenity and the magnitude, duration, variability and frequency of flushing flows.

That said, opportunities exist for ongoing mitigation and remediation, such as the provision of flushing flows in summer and autumn to mitigate the effects of didymo colonisation, which will
result in the restoration of ecological values associated with the modified environmental flow and level regimes of the Waiau catchment.

Southland Fish & Game submission on exceptions for major hydro schemes to support renewable energy targets

Southland Fish & Game opposes the proposed exception for the Manapouri Power Scheme for the following reasons:

1. The adverse environmental effects on the Lower Waiau River ecosystem from operation of the Manapouri Power Scheme are nationally significant and ongoing. Exempting the Manapouri Power Scheme in its entirety risks perpetuating the adverse environmental effects not only of the structures, but also the water take itself. Effectively, it incentivises retaining the status quo, notwithstanding the scale and nature of its adverse effects on the environment.

2. The operation of the Manapouri Power station and the significant adverse effects on the Lower Waiau River ecosystem are complex and their management is continually evolving.

3. There is opportunity to improve the flow regime, including flow levels and variability, of the Lower Waiau River and hence the health of the associated ecosystem. These opportunities need to continue to be explored and changes implemented to ensure the ongoing improvement of the degraded Lower Waiau River ecosystem. There are many unresolved issues that are attributable to the ongoing effects of the Manapouri Power Scheme and more recently, intensification of land use in the Waiau Catchment.

4. The exception will make future improvements to the river ecosystem through the National Policy Statement for Freshwater Management and the re-consenting process for the Manapouri Power Scheme in 2031, very difficult. It is important that the adverse economic, social, cultural and environmental consequences of the Manapouri Power Scheme are adequately considered through future resource consenting processes.

Section 5 – Raising the bar on ecosystem health

Proposals to strengthen the focus on ecosystem health, set more stringent bottom lines, and stop further loss of wetlands and streams

Section 5.2 – Focus on holistic ecosystem health – te hauora o te wai

Southland Fish & Game supports broadening of the focus of those making decisions on waterways to consider and manage all five components that contribute to the health of freshwater ecosystem, namely: aquatic life, habitat, water quality, water quantity and ecological processes. In addition, Southland Fish & Game submits that ecosystem health should be designed to protect both indigenous and salmonid aquatic life for the following reasons:

1. In recognition of the national importance of trout and salmon. Salmonid (trout and salmon) fisheries are of high socio economic and socio cultural importance, both domestically and internationally; and
2. Recognition of salmonids provides de facto protection for other freshwater species.

Salmonids are among the most studied fish species in the world. Salmonid habitat requirements (water quality and quantity and physical habitats) are well established and documented in literature. Regrettably, the habitat requirements of most fresh water native fish species are comparatively less well known. Given the sensitivity of salmonids to habitat degradation, it is recognised that the provision of salmonid habitat requirements provides protection for the health of most other species in aquatic ecosystems, and for life supporting capacity generally. There is a good correlation between the habitat requirements of salmonids and suitability for other species and purposes.

In light of the above comments, the following changes are sought by Southland Fish & Game:

1. Amend the definition of ‘ecosystem health’ in Appendix 1A: Compulsory Values of the draft National Policy Statement for Freshwater Management to recognise that salmonids are accepted as a key component of ecosystems as follows:

   “. . .
   
   In a healthy freshwater ecosystem, water quality, quantity, habitat and processes are suitable to sustain appropriate indigenous and salmonid aquatic life, as would be found in a minimally disturbed condition (before providing for other values).”

   The above change is consistent with s 7(h) of the Resource management Act, which requires that particular regard is given to the protection of the habitat of trout and salmon.

2. Amend Table 15 – Fish (rivers) in Appendix 2B of the draft National Policy Statement for Freshwater Management to recognise salmonids as positive indicator in all cases in the Fish Index of Biotic Integrity as follows:
Table 15 - Fish (rivers)

<table>
<thead>
<tr>
<th>Value (and component)</th>
<th>Ecosystem health (aquatic life)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshwater Body Type</td>
<td>Wadeable</td>
</tr>
<tr>
<td>Attribute Unit</td>
<td>Fish Index of Biotic Integrity (F-IBI)</td>
</tr>
<tr>
<td>Attribute band and description</td>
<td>Numeric Attribute State</td>
</tr>
</tbody>
</table>

| A | High integrity of fish community. Habitat and migratory access have minimal degradation. | ≥34 ≥36 |
| B | Moderate integrity of fish community. Habitat and/or migratory access are reduced and show some signs of stress. | <34 and ≥28 <36 and ≥28 |
| C | Low integrity of fish community. Habitat and/or migratory access is considerably impairing and stressing the community. | <28 and ≥18 <28 and ≥20 |

| National Bottom Line | 18 20 |

| D | Severe loss of fish community integrity. There is substantial loss of habitat and/or migratory access, causing a high level of stress on the community. | <18 <20 |

Sampling is to occur at least annually between December and March (inclusive) following the protocols for at least one of the backpack electrofishing method, spotlighting method, or trapping method in Joy M, David B, and Lake M. 2013. *New Zealand Freshwater Fish Sampling Protocols (Part 1): Wadeable rivers and streams*. Palmerston North, New Zealand: Massey University.

The F-IBI score is to be calculated using the general method defined by Joy, M. K., & Death, R. G. (2004). Application of the Index of Biotic Integrity Methodology to New Zealand Freshwater Fish Communities. *Environmental Management*, 34(3), 415-428. However, salmonids are to be considered as ‘honorary natives’.

A three year rolling average is to be used.

Section 5.3 – Ecosystem health – new attributes and new management approach

Southland Fish & Game support:

1. Clear direction in the draft National Policy Statement for Freshwater Management that all attributes for ecosystem health are compulsory and have specified bottom lines. That said, clear direction is required as to when national bottom lines should be achieved. As drafted, the draft National Policy Statement for Freshwater Management allows each regional council to decide how long improvement in water quality will take.
2. The new requirements to measure, monitor and report on a broader range of ecosystem health attributes. In addition, Southland Fish & Game submits that there should be strong measuring, monitoring and reporting on key drivers of ecosystem health, such as numbers of stock (including dairy cows), fertiliser application and vegetated land cover.

3. The introduction of the ecosystem metabolism attribute (Table 22), however, Southland Fish & Game submits that this should be the same as recommended in the Freshwater Science and Technical Advisory Group report to the Minister for the Environment⁶, including both numeric and narrative attribute states.

Section 5.4 – Aquatic life – improving protection for threatened indigenous species

Southland Fish & Game support the new compulsory national value for threatened species, as defined in the draft National Policy Statement for Freshwater Management, to ensure that regional planning identifies and manages threatened species.

Section 5.5 – Aquatic life – providing for fish passage

Southland Fish & Game support the fish passage improvement proposals; however, the term ‘undesirable species’ in Clause 3.17(c) of the draft National Policy Statement for Freshwater Management should be replaced with the term “pest” as defined in the Biosecurity Act 1993 for the following reasons:

1. The term ‘undesirable species’ is currently undefined and uncertain; and

2. Regional councils should not be tasked with making decisions on species interactions, including freshwater fish species that they have no statutory mandate to manage. Regional councils are habitat managers and should not replace the function of the Director-General of Conservation under the Freshwater Fisheries Regulations 1983.

Section 5.6 – Habitat – no further loss of wetlands

Southland Fish & Game support controls on wetlands and recommend that these are extended to include whitebait spawning habitat. In addition, Southland Fish & Game submits that:

1. The definition of ‘wetland’ set out in the draft National Policy Statement for Freshwater Management and draft National Environmental Standards for Freshwater require amendment to be consistent with the definition in the Resource Management Act 1991, namely:

   “wetland includes permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions.”

Southland Fish & Game supports use of the Wetland Delineation Tool developed by Landcare to identify and define wetlands on the ground. Having a national assessment tool to delineate wetlands will provide greater certainty for stakeholders, plans and policies, resource consents, council hearings, and in the Environment Court.

---

⁶ STAG Report to the Minister for the Environment (June 2019) at page 23 – Section 3.3 – Ecosystem metabolism.
2. The Freshwater Science and Technical Advisory Group recommended introducing a Wetland Condition Index, including numeric and narrative attribute states and a national bottom-line, which has not been included in the draft National Policy Statement for Freshwater Management. Southland Fish & Game submits the Wetland Condition Index, including numeric and narrative attribute states and a national bottom-line, should be included as an attribute in the draft National Policy Statement for Freshwater Management. This would ensure that wetlands are improved to a minimum standard rather than maintained in poor health.

3. Southland Fish & Game support policies in relation to increase in wetland extent, though this should be done with a goal to achieve 10% pre-human extent as per the Freshwater Science and Technical Advisory recommended attribute table, which has not been included in the draft National Policy Statement for Freshwater Management.

4. Regular monitoring of compliance with wetland requirements and enforcement are absolutely critical if the benefits of further regulation are to be realised, particularly in the Southland region. Unfortunately, history shows that:

   a. Estimates are that the original (c. 1840) extent of wetlands in Southland was 450,00ha, of which 90% have been lost.  

![Figure 1 - Historic (c. 1840) and present (c. 2011) extent of Southland wetlands](image)

---


9 Clarkson (2011).
b. Wetland loss and development continues in Southland despite abundant national and regional policy designed to protect wetlands.\textsuperscript{10} \textsuperscript{11} For example, recent research in Southland\textsuperscript{12} found that:

i. Wetland loss continues, particularly in lowland areas. Specifically, between 2007 and 2014/15, i.e. over 7 years, there was a total loss of 1,165ha of wetland extent in lowland Southland equating to a rate of around 1.5% per year or 10% in total, mainly through drainage and conversion to pasture;

ii. Although many wetlands that have been lost or reduced in extent appeared of poor or moderate quality, some good quality wetland areas that were highly likely to meet significance criteria were still modified or lost, and even poor-quality wetlands were still likely to be providing some level of ecosystem service; and

iii. The conversion of even poor or moderate quality wetlands to pasture was likely to amplify nutrient losses to receiving waters by both reducing nutrient interception properties and by increasing the land area upon which agricultural nutrients are applied.

In addition, many of Southland’s wetlands are under 5 ha and are often in a severely degraded condition. It is not just active land development that is threatening wetlands. Weed invasions, altered hydrological inputs and animal incursions all threaten the integrity of Southland’s wetland ecosystems.\textsuperscript{13}

c. Despite the scale of wetland loss in Southland, including recent lowland wetland loss through drainage and land development, very little, if any, meaningful compliance and enforcement activity has been undertaken by Environment Southland to address the issue.

Section 5.7 – Habitat – no further loss of streams

Southland Fish & Game support the no further loss of streams policy. Again, regular monitoring of compliance with stream habitat requirements and enforcement are absolutely critical if the benefits of regulating it are to be realised. This is an important point because Southland has a history of small stream modification with streams and wet areas being realigned or piped and infilled to improve the drainage and hence the economic productivity of agricultural land.


\textsuperscript{12} Ewans (2016).

Section 5.8 – Water quality – new bottom line for nutrient pollution

Southland Fish & Game support inclusion in the draft National Policy Statement for Freshwater Management of the following (in line with the recommendations of the Freshwater Science and Technical Advisory Group):

1. An attribute state for riverine periphyton (Table 2), including numeric values and a national bottom line.

2. Attribute states for both riverine dissolved inorganic nitrogen (Table 5) and dissolved reactive phosphorus (Table 6), including numeric values and national bottom lines, to support ecosystem health. This represents an efficient approach to planning and avoids bottom lines for ecosystem health, particularly in relation to dissolved inorganic nitrogen and dissolved reactive phosphorus, being argued on a region-by-region basis.

3. Inclusion of attributes for macroinvertebrates (Tables 13 – 14), fish (Table 15), submerged plants (Tables 16 – 17), deposited fined sediment (Table 18), dissolved oxygen (Tables 19 - 21), ecosystem metabolism (Table 22) and E. coli for primary contact sites (Table 23), including numeric values and national bottom lines. However, Southland Fish & Game submits that they should all be moved from Appendix 2B and into Appendix 2A to be attributes requiring limits rather than just ‘action plans’ for the following reasons:

   a. Action plans are an undefined, uncertain and untested tool with no opportunity for public participation or oversight by the Courts; and

   b. It is not clear what, if any, influence an action plan would have over resource consents and permitted activities. This is particularly relevant in Southland where water quality degradation issues have been apparent for some years, but Environment Southland has not taken meaningful steps to address these issues in a timely manner, including reviewing operative resource consents for intensive land use.

4. The introduction of the ecosystem metabolism attribute, however Southland Fish & Game submits that this should be the same as that set out in the Freshwater Science and Technical Advisory Group report to the Minister for the Environment14, including both numeric and narrative attribute states.

Section 5.9 – Water quality – reducing sediment

Southland Fish & Game supports recognition of the fact that excessive sediment, including suspended fine sediment and deposited fine sediment, are severe stressors on freshwater and coastal ecosystems. As such, Southland Fish & Game supports the introduction of attribute states for fine suspended sediment (as measured by turbidity) and fine deposited sediment (as measured by percentage of fine sediment cover), including numeric values and national bottom lines. Southland Fish & Game does, however, submit that:

14 STAG Report to the Minister for the Environment (June 2019) at page 23 – Section 3.3 – Ecosystem metabolism.
1. Table 18 – ‘Deposited fine sediment’ in the draft National Policy Statement for Freshwater Management should be amended in line with the Freshwater Science and Technical Advisory recommendation to include a footnote recognising that more stringent attribute states may be required in specific locations, such as salmonid spawning reaches, as follows:

“Limit-setting needs to account for impacts on downstream receiving environments. Bottom-line thresholds are anticipated to provide a sufficient level of protection at an overall macroinvertebrate community level (i.e. will cause <20% decrease in macroinvertebrate community deviation metric), however, they may not be sufficient for the protection of specific life-stages or habitat requirements in specific locations (for example, salmonid spawning habitats may require sediment cover of <10%). Fine sediments with high organic enrichment may also result in higher levels of impacts on macroinvertebrate communities or sensitive fish life-stages.”

2. The above footnote is consistent with research regarding the effects of fine deposited sediment, including on salmonid spawning habitat. For example, research has found that the survival of brown trout embryo decreased from 90% to 28% when 20% (volume) of sand was added to redds in coarse gravel.

Section 5.10 – Water quality – a higher standard for swimming

Southland Fish & Game support inclusion of the new E.coli attribute state for human health in relation to primary contact (Table 23), including numeric values. Southland Fish & Game does, however, submit that Table 23 should be amended to:

1. Apply everywhere and not just to primary contact sites in lakes and rivers during the bathing season, which have been left to regional councils to determine and monitor, and during summer. In reality, people do more than just swim in lakes and rivers during the bathing season, as such the table needs to provide for all primary contact, such as fishing, gathering mahinga kai and kayaking/boating, including outside the bathing season; and

2. Include a national bottom line.

Section 5.11 – Water quantity – clarifying requirements for minimum flows

Southland Fish & Game support requiring regional councils to set flows that provide for all life-stages of aquatic life, both indigenous and salmonid, provide for meeting the attribute standards, and provide for flow variability. However, Southland Fish & Game submits that water takes should not reduce the available habitat of aquatic life (all life-stages) by more than 20%.

---

15 STAG Report to the Minister for the Environment (June 2019) at page 37 – Table - ‘Deposited fine sediment’ – foot note 3.
Section 5.12 – Water quantity – real-time reporting of water use

Southland Fish & Game support the proposed amendments to water take monitoring requirements to help regional councils maintain health flows in waterways.

Creation of exclusions in relation to ecosystem health

Southland Fish & Game is opposed to the following exclusions / exemptions to bottom lines for ecosystem health:

1. Clause 3.22 of the Draft National Policy Statement for Freshwater Management, which creates exemptions for the six nominated major hydroelectricity schemes;

2. Clause 3.24 of the Draft National Policy Statement for Freshwater Management, which allows any waterbody in Appendix 4 (Temporary exception for specified freshwater management units) to be excluded from national bottom lines; and

3. The exclusion of forestry from complying with regulations relating to wetlands in the draft National Environmental Standards for Freshwater. Instead it relies on the National Environmental Standard for Plantation Forestry, which ignores small wetlands (less than 0.25has) and permits forest activities, such as afforestation and harvest, to damage them.

Southland Fish & Game submits that:

1. Clause 3.22 should be deleted;

2. Clause 3.24 and Appendix 4 should be deleted; and

3. The draft National Policy Statement for Freshwater Management and draft National Environmental Standards for Freshwater should take precedence over the National Environmental Standards for Plantation Forestry. In short, the health of the water should come first in accordance with Te Mana of te Wai.

Section 6 – Supporting the delivery of safe drinking water

Proposals to amend the National Environmental Standard for sources of human drinking water

Southland Fish & Game support the proposed amendments to the National Environmental Standards for Drinking Water to ensure that councils are placing appropriate controls on activities located within source water risk management areas.

Section 7 – Better managing stormwater and wastewater

Proposals to require wastewater and stormwater operators to meet new standards and improve practices
Southland Fish & Game support the new wastewater and stormwater discharge standards. In addition, Southland Fish & Game submits that monitoring of emerging contaminants and antimicrobial resistant bacteria should also be carried out.

Section 8 - Improving farming practices

Proposals to restrict further intensification, set new standards for high-risk activities, and introduce freshwater modules in farm plans

Background to Southland Fish & Game submission on improving farm practices

The Southland region has a land area of 3,203,297 hectares.\(^{17}\) The total agricultural land area of Southland is 1,145,383 hectares, including both the effective pastoral and ineffective (i.e. non-grazing areas such as forestry, native bush, wetlands etc) areas.\(^{18}\)

Monitoring and research conducted by Environment Southland shows that:

1. Water quality objectives are not met in some locations in Southland; and
2. Diffuse (non-point) sources from agricultural land are the most significant contribution to nutrient contamination at the regional scale.\(^{19}\)

To date, Environment Southland has not set out a pathway by way of either rules or proposed rules in the Operative Regional Water Plan for Southland or the Proposed Southland Water and Land Plan to reduce nutrient leaching in Southland. As such, Southland Fish & Game support proposals to reduce pollution from intensive land use, including:

1. Restricting further intensification of rural land use;
2. Improving farm practices through farm planning;
3. Immediate action to reduce nitrogen loss;
4. Stock exclusion from waterways;
5. Controlling intensive winter grazing;
6. Restricting feedlots; and
7. Reducing pollution from stock holding areas.

Specific comments in relation on the above topics are provided below.


\(^{18}\) Pearson (2016).

Section 8.2 – Restricting further intensification of land use

Southland Fish & Game support the proposal to restrict intensification of land use, particularly in Southland, and submit that any application for consent to do so should be a non-complying activity.

A non-complying activity status is appropriate in light of the prevalence and well documented potential adverse environmental effects of intensification of land use, including cumulative adverse effects on water quality. As such, applicants for consent should be required to demonstrate under s 104D of the Resource Management Act that the adverse effects of the proposed activity on the environment are minor or that it will not be contrary to the objectives and policies of the relevant plan.

Section 8.3 – Improving farm practices through farm planning

Southland Fish & Game submits that Environment Plans or Farm Environment Plans are important support tools for farmers, but should not be used to set limits for environmental performance in their own right. Instead, they should only be used as a tool to help farmers comply with limits set by central government and / or regional councils.

Section 8.4 - Immediate action to reduce nitrogen loss

Southland Fish & Game support both Option 1 (setting a cap in catchments with high nitrate-nitrogen levels, so farms with excessive losses have to reduce to come under the cap) and Option 2 (setting a national nitrogen fertiliser cap) in combination

Southland Fish & Game submits that:

1. Options 1 and 2 both have merit and should be considered in combination rather than separately as an ‘either or’ option;

2. Option 1 should apply to all catchments that breach the nitrate-nitrogen bottom-line in Table 5 of the draft National Policy Statement for Freshwater Management, not just those catchments that are specifically listed; and

3. A maximum cap of 150kgN/ha/year from all sources, including nitrogen fertilisers, should be applied pursuant to Option 2.

Southland Fish & Game does not support Option 3 (farm plan-based reductions) for the following reasons:

1. Whilst land and environmental plans or farm environmental plans are an important tool for farmers to help farmers comply, they should not be used to set compliance limits and regulations; and

2. Compliance limits and regulation should be set by Central Government to achieve specific environmental outcomes, including compliance with national bottom lines set out in the draft National Policy Statement for Freshwater Management. Industry self-regulation and the associated ‘educative’ / non-regulatory approach taken by Environment Southland have failed to control and stop degradation of Southland’s waterways.
Identification of high nitrate-nitrogen catchments in Southland

The Mataura, Oreti, Waimatuku, Aparima and Waihopai catchments in the Southland region have been identified as having excessive nitrogen levels derived from intensive farms and are therefore subject to the proposal to require immediate action to reduce nitrogen response. In response, Southland Fish & Game support the inclusion of the above high nitrate-nitrogen catchments in the Southland Region and submit that the Waituna Lagoon catchment should also be included in the list for the following reasons:

1. **Waituna Lagoon** lies at the bottom of a small, intensively farmed catchment.

2. **Waituna Lagoon** covers an area of 1,350ha and is Southland’s largest coastal lake. The lagoon is one of the best remaining examples of a natural coastal lagoon in New Zealand and is unique in Southland and New Zealand. The significance of the Waituna catchment is recognised insofar as:
   
   a. The Waituna Wetland was designated in 1976 as a Ramsar Wetland of International Importance with respect to its waterfowl and wading bird habitat. The wider wetland complex was subsequently included in 2008. Great diversity of wildlife is associated with the Waituna wetland complex;
   
   b. In 1983 Waituna Lagoon and the immediately surrounding wetland (an area of 3,500ha) was designated as the Waituna Wetland Scientific Reserve;
   
   c. Waituna Wetland has a statutory acknowledgement under the Ngāi Tahu Claims Settlement Act 1998 which recognises Ngāi Tahu’s cultural, spiritual, historic and traditional association to Waituna; and
   
   d. Waituna Scientific Reserve is identified as a regionally significant wetland in Southland in the Operative Regional Water Plan for Southland and Proposed Southland Water and Land Plan.

3. Monitoring of Waituna Lagoon over the last 10 years has shown a rapid decline in lagoon condition to the point that it has deteriorated to a degraded condition. Recommendations from the Waituna Lagoon Technical Group (LTG), convened by the Council to provide advice and guidance on management of the Waituna Lagoon, are that:

   a. **Waituna Lagoon** is in an unstable ecological state and requires active management to improve its ecological condition and reduce the risk of further degradation. Specifically, Waituna lagoon currently exhibits symptoms of eutrophication that are consistent with a high risk of the highly valued system shifting to an algal-dominated state; and
   
   b. It is necessary to significantly reduce current nutrient and sediment inputs from the catchment to ensure the long-term viability of the Waituna Lagoon, which equates to a 50% catchment load reduction for both nitrogen and phosphorus.\(^{20}\)

4. To date, Environment Southland has not set out a pathway by way of either rules or proposed rules in the Operative Regional Water Plan for Southland or the Proposed Southland Water and Land Plan to:

a. Regulate nutrient leaching, including reductions, in the Waituna Lagoon catchment through either an allocation regime or a good management practice-based cap; or

b. Regulate high intensity land use practices in the Waituna catchment, including dairy farming and intensive winter grazing. Photographic evidence of the lack of regulation of intensive winter grazing practices in the Waituna Lagoon catchment is depicted in Figure 12 of this submission.

This complete lack of regulatory action by Environment Southland has occurred notwithstanding that:

a. Waituna is in an unstable ecological state; and

b. Waituna Lagoon requires active management to improve its ecological condition and reduce the risk of further degradation.

In summary, there is an urgent need to significantly reduce contaminant loss in the Waituna Lagoon catchment, including nitrogen and phosphorus, to improve its degraded ecological condition and reduce the risk of further deterioration. As such, it is important that the regulatory response to address adverse environmental effects in the Waituna Lagoon catchment is prioritized.

In addition, Southland Fish & Game submits that the use of nitrate-nitrogen concentrations as the basis for prioritising actions for stopping excessive nitrogen leaching has some limitations. For example, it works in physiographic zones in Southland that are Oxidising or Old Mataura, but not in areas such as the Waituna Lagoon catchment, which is largely Gleyed, Peat Wetlands, Oxidising and Lignite-Marine Terraces physiographic zones. In these areas, a large proportion of the nitrogen export occurs as organic nitrogen with some ammoniacal nitrogen. Organic and ammoniacal forms of nitrogen are precursors to nitrate-nitrogen and are key drivers of internal eutrophication in stream beds, lakes and lagoons and also drive sediment anoxic and low dissolved oxygen.

**Section 8.5 – Excluding stock from waterways**

Southland Fish & Game support proposed new national standards for when stock must be excluded from wetlands, lakes and rivers, including the proposed setback of 5 metres on average across a farm. Southland Fish & Game submit that:

1. The proposed 5 metre fencing buffer is consistent with research finding that a 5 metre wide riparian segment (vegetated buffer) with effective stock exclusion is the minimum required to achieve an in stream deposited fine sediment cover below 20%. At greater

---

than 20% fine deposited sediment cover, research shows a marked decline in the number of pollution sensitive invertebrate species as a result of decreased habitat availability.\textsuperscript{22}

2. The proposed 5 metre setback should be measured horizontally from the outer edge of the bed of any waterbody.

3. Monitoring of compliance with stock exclusion requirements and enforcement are critical if the benefits of it are to be realised. Further, fences that do not satisfy the proposed 5 metre buffer should not be permitted to remain in-situ in perpetuity, particularly when the property is utilised for high intensity pastoral grazing. Instead a time frame should be imposed for remediation of stock exclusion to comply with the 5 metre buffer.

Southland Fish & Game is, however, concerned that stock exclusion is limited to waterways more than one meter wide. Research shows that contaminant yields increase with increasing stream order in catchments dominated by agriculture, however loads from low order small streams (<1m wide, 30cm deep, and in flat catchments dominated by pasture) potentially exempt from fencing regulations accounted for an average of 77% of the national load (varying from 73% for total N to 84% for dissolved reactive P).\textsuperscript{23} As such, stock exclusion from high-order streams potentially misses 77% of national contaminant load from small order streams. As drafted, the stock exclusion standards provide little, if any, clarity as to what mitigations are required to reduce contaminant loss to small streams in the absence of stock exclusion and the timeframe(s) for implementation. This detail is critical if contaminant loss to small order streams is to be realised.

**Section 8.7 – Restricting feedlots**

Southland Fish & Game support the proposal to require all feedlots to meet conditions, as set out in a resource consent, and submits that any application for such consent should be a non-complying activity.

A non-complying activity status is appropriate in light of the potential adverse environmental effects of feedlots, including on water quality. As such, applicants for consent should be required to demonstrate under s 104D of the Resource Management Act that the adverse effects of the proposed activity on the environment are minor or that it will not be contrary to the objectives and policies of the relevant plan.

**Section 8.8 – Reducing pollution from stock holding areas**

Southland Fish & Game support the proposal to require holding of stock in concentrated areas, such as sacrifice paddocks, to meet national standards. Southland Fish & Game does, however, consider that the proposed nationally set standards for stock holding areas require amendment to:


\textsuperscript{23} McDowell, R., Cox, N., and Snelder, T. (September 2017). *Assessing the yield and load of contaminants with stream order: would policy requiring livestock to be fenced out of high-order streams decrease catchment contaminant loads.* Journal of Environmental Quality – Published online September 21, 2017.
1. Strengthen the permitted activity standards, including identification of objective methods for identifying critical source areas and consideration of contaminant transport to water via artificial subsurface drainage; and

2. Provide that where the use of stock holding areas cannot meet permitted activity standards consent is required by way of a non-complying activity.

A non-complying activity status is appropriate in light of the potential adverse environmental effects of holding stock in concentrated areas, including on water quality. As such, applicants for consent should be required to demonstrate under s 104D of the Resource Management Act that the adverse effects of the proposed activity on the environment are minor or that it will not be contrary to the objectives and policies of the relevant plan.

Southland Fish & Game submits that national standards for ‘permitted’ use of stock holding areas, including sacrifice paddocks, should:

1. Require the use of LiDAR and / or NASA survey data to objectively identify and exclude critical source areas. The rationale for the use of LiDAR and / or NASA survey data is discussed in more detail in relation to intensive winter grazing.

2. Exclude the use of land for holding of stock in concentrated areas that is underlain by artificial sub-surface drainage for the following reasons:

   a. Artificial subsurface drainage, along with overland flow (surface runoff) and deep drainage (leaching) are the three main pathways for the transport of contaminants from land to water. Where artificial subsurface drainage systems exist, there is potential for contaminants to bypass the soil matrix allowing less time for absorption and retention of contaminants in the soil, especially nitrogen and phosphorus, sediment and faecal organisms.  

   b. Research shows that contaminant loss from agricultural systems increase when artificial subsurface drains are active, most significantly over the wetter months of autumn, winter and early spring, which is likely to coincide with the seasonality of sacrifice paddock use and intensive winter grazing.

   c. A vast network of artificial subsurface drainage, typically tile drain, is found throughout the Southland Region. Research commissioned by Environment Southland suggests that artificial subsurface drainage systems cover

---


approximately three quarters of agricultural land in Southland, which overlaps reasonably well with historical mapping of wetland areas in Southland.\textsuperscript{26}

\textbf{Figure 2 – Approximate subsurface drainage densities across the Southland region}\textsuperscript{27}


\textsuperscript{27} Pearson (September 2015).
Section 8.6 – Controlling intensive winter grazing

Background to Southland Fish & Game submission regarding controlling intensive winter grazing

The cultivation and growth of winter forage crops over summer and autumn and subsequent use to fill the winter ‘feed gap’ for stock when pasture growth is slow is very common in Southland. Crops such as kale, swede, turnip (leaf and bulb varieties) and fodder beet are commonly grown along with other brassica varieties, cereal species and rape.

During winter months, areas of forage crops are intensively grazed by livestock. Break or block feeding behind temporary electric fencing allows stock to access the crop in stages. Feeding in this way usually results in complete crop removal, i.e. de-vegetation, and significant soil disturbance by animal treading.

Research highlights that on-paddock grazing of stock on forage crops over the months of May – September inclusive contributes a disproportionately large proportion of nutrient (nitrogen and phosphorus), faecal bacteria and sediment loss from the total farm system. In addition to nutrient, faecal bacteria and sediment losses, significant structural damage to the soil can occur through pugging and compaction. The issue is significant because of the prevalence of the activity in the Southland region. For example, Environment Southland mapping conservatively identified 68,155ha of winter forage crop (excluding cereal crops) in Southland in 2014.

The above environmental issues are compounded by the fact that there is no ‘ideal’ soil type, physiographic zone and / or topography to intensively winter graze animals on in the Southland region. For example:

1. All soils are vulnerable to compaction and soil damage under winter forage crop due to the intensity of the activity. However, some soils are more vulnerable to damage due to their inherent properties. In 2014, approximately 9,636ha of winter forage crop in the Southland region was grown on soils that are severely vulnerable to structural compaction and waterlogging.

2. The Oxidising, Old Mataura and Peat Wetlands physiographic zones in Southland have been identified as the most susceptible to nutrient (nitrogen and phosphorus), sediment and faecal bacteria loss and water quality degradation from intensive winter grazing. In agricultural areas, the shallow groundwater below the Old Mataura and Oxidising Zones have elevated concentrations of nitrogen compared to other area, while the Peat Wetlands have elevated risk for phosphorus loss. In 2014, approximately 20,263ha of forage crops were grown in the Oxidising (16,190ha), Old Mataura (2,185ha) and Peat Wetlands (1,888ha) physiographic zones.

3. The Riverine physiographic zone in Southland is also susceptible to nutrient loss, especially nitrogen leaching, however contaminants do not accumulate to high

---

concentrations in groundwater due to the large flushing potential provided from alpine and bedrock river recharge. In 2014, approximately 6,788ha of forage crops were grown in the Riverine physiographic zone.

4. The Bedrock / Hill Country physiographic zone in Southland is also high risk due to the large amount of winter forage crop grown in the zone, especially on sloping land, which increases the potential for sediment, phosphorus and faecal bacteria loss, principally due to overland flow. In 2014, approximately 24,858ha of forage crops were grown in the Bedrock / Hill Country physiographic zone. The potential for contaminant dilution by the Riverine and Bedrock / Hill Country physiographic zones are reduced with increased contaminant concentrations and total load increases from those zones.

Southland Fish & Game consider it timely that the Government is considering the environmental effects of intensive winter grazing for the following reasons:

1. The spatial distribution of winter forage crops across Southland is widespread, as most properties with livestock grow forage crops to sustain animals over the winter period when grass growth is minimal. Further, the area of winter forage crop grown has increased significantly throughout Southland since 2008, primarily to support the growing dairy sector.

2. In 2014, approximately 65% of winter crop area in Southland was grown on sheep and beef properties. In comparison, 22% was found on dairy and dairy support properties, 4.5% on deer, 3.4% on arable properties and the remainder on other agricultural land use. The properties with the largest amount of winter forage crops are those typically in the sheep and beef industry, providing dairy grazing or a combination of both.

3. Dry stock land use dominates the Bedrock / Hill Country physiographic zone, which:
   a. Represents the largest area of winter forage crop grown in Southland (34.7%); and
   b. Contains approximately 87% of winter forage crop grown on slopes above 16°.

Southland Fish & Game submission regarding controlling intensive winter grazing

Southland Fish & Game support Option 1: Nationally set standards for intensive winter grazing, i.e. regulation, in light of well documented adverse environmental effects associated with the activity. For the avoidance of doubt, Southland Fish & Game opposes Option 2 – Industry set standards.

The experience of Southland Fish & Game in Southland is that:

1. The largely non-regulatory / voluntary or educative approach taken by Environment intensive winter grazing has been unsuccessful in terms of maintaining water quality, notwithstanding that the Operative Regional Water Plan laudably sought to improve water quality in relation to faecal bacteria, nitrogen, phosphorus and sediment by 10% by 2020 for hill, spring and lowland waterbodies; and

30 See Objective 4 – Gradual improvement in surface water quality parameters of the Operative Regional Water Plan for Southland
2. Industry has a proven track record of failure to date in this area, despite the prevalence and history of intensive winter grazing in Southland.

Southland Fish & Game does, however, consider that the proposed nationally set standards for intensive winter grazing require amendment to:

1. Strengthen the permitted activity standards; and

2. Provide that where the intensive winter grazing activity cannot meet the permitted standard consent is required by way of a non-complying activity.

A non-complying activity status is appropriate in light of the prevalence and well documented potential adverse environmental effects of intensive winter grazing. As such, applicants for consent should be required to demonstrate under s 104D of the Resource Management Act that the adverse effects of the proposed intensive winter grazing on the environment are minor or that it will not be contrary to the objectives and policies of the relevant plan.

Further, monitoring of compliance with intensive winter grazing requirements, including randomised aerial surveys, and enforcement are critical if the benefits of regulating the activity are to be realised.

Southland Fish & Game submits that as a minimum, nationally set standards for ‘permitted’ intensive winter grazing should:

1. Include all intensive winter grazing activities that result in significant de-vegetation. As drafted, Clause 30 only refers to “annual forage crops”, which are described by the Lincoln University Farm Technical Manual as annual or biennial crops that are grown for utilisation by grazing or harvesting as a whole crop, i.e. the definition excludes cereal crops and potentially wintering activities involving the feeding of pasture.

Explicitly excluding cereal crops and pasture from the definition of intensive winter grazing would mean that sheep being break fed on cereal crops and / or supplementary feed and pasture over winter (between May and September inclusive) would be allowed access to waterways, as would cattle, deer and other stock until specified dates for mandatory stock exclusion are reached. Activities that involve feeding pasture and supplementary feed (typically hay, straw, silage and baleage) that result in significant de-vegetation should fall within the definition of intensive winter grazing.

2. Require the use of robust topographic and hydrological methods to objectively identify areas, including critical source areas, that represent a high risk to water quality from intensive winter grazing.

LiDAR (light detection and ranging) survey data enables fine-scale topographical information to objectively and robustly identify what constitutes a critical source area at a paddock scale. This information can then be mapped and overlaid on aerial photography / maps, identifying locations where cultivation and intensive winter grazing is prohibited, as well as the locations of appropriate vegetated buffers. The same system can also be used to identify gradient of paddock too. Once mapped, the information can be made available for farmers at a paddock scale, to inform their
management. In this case, Environment Southland has received money from the Provincial Growth Fund to obtain LiDAR for whole of the Southland region.

Where Li-DAR is lacking, a similar albeit slightly less resolved assessment can be undertaken utilising NASA’s Shuttle Radar Topography which has national scale coverage. Significantly, the widely used River Environment Classification (REC), a landscape based classification of surface waterways, does not identify ephemeral waterways nor associated drainage areas.

Li-DAR survey data, at a resolution of 1 m x 1 m, has been used to objectively identify and rank areas of high risk of contaminant transfer across the entire Waituna Lagoon Catchment in Southland as part of a project for Living Water (DOC-Fonterra Partnership). Zones of highest risk of contaminant transfer are associated with ephemeral drainage pathways that are directly connected to waterways – see Figures 3 and 4 below.

---

Figure 3 – Identification of critical source area’s using LiDAR that drain to surface water – Southland region
When soils are saturated or rainfall intensity exceeds the infiltration capacity of the soil, ephemeral drainage pathways are activated. The episodic channelisation of overland flow via the ephemeral drainage network is the key mechanism by which nutrients, sediment, and microbes are transported directly to waterways. Identifying these ‘critical transfer zones’ and excluding them from wintering provides a topographically guided basis for mitigating runoff.

Leaving the transfer zone as a vegetated buffer aids in the reduction of contaminant export via physical filtering, the reduction of the velocity of runoff and as a result its capacity to transport contaminants. In Figure 4, buffer zones of 5, 10 and 30 m around the ephemeral drainage network are provided as an example of how Li-DAR derived mapping can be used to objectively identify these high risk areas. Buffer widths can be further refined using soil hydrological properties and slope to allow a variable width buffer along the length of the critical transfer pathway.
Identification of critical source areas can also be used to support other mitigation efforts on farm, such as the placement and scaling of peak runoff control structures (detainment structures) within the downstream catchment.

Indications are that for the Southland region, it would take approximately 6 months (working fulltime) to map all critical transfer zones and rank them in terms of risk using a combination of NASA Radar Topography and existing Li-DAR coverage. Scaling this work nationally would require additional time but could be undertaken in collaboration with other specialists.

Despite this work having been undertaken in the Waituna Lagoon catchment, Southland Fish & Game is concerned that it is not being applied on the ground as illustrated in Figure 12 of this submission, which shows an example of cultivation and intensive winter grazing occurring within critical source areas in the Waituna Lagoon catchment.

3. Prohibit cultivation of land underlain by artificial subsurface drainage for the purpose of establishing forage crops used for intensive winter grazing. As discussed, research shows contaminants transported from agricultural systems increase when artificial subsurface drains are active, most significantly over the wetter months of autumn, winter and early spring, i.e. when intensive winter grazing is typically undertaken.

4. Prohibit cultivation of critical source areas (including gullies, swales, intermittent and ephemeral waterways) that accumulate run-off from adjacent flats and slopes for the purpose of establishing forage crops used for intensive winter grazing.

The key point is that critical source areas can occur in all parts of a farm, even if the proposed winter grazing area is relatively flat. Whilst exclusion of critical source areas from cultivation and subsequent stock grazing may result in some lost productive area, depending on the landscape, critical source areas typically comprise a relatively small area, often 2 – 3% of the paddock as depicted in the following sequence of photograph taken in Southland in 2017.

Figure 6 – Critical source area without vegetated buffer – Southland region
The above approach accords with that endorsed by Dairy NZ\textsuperscript{33}, which recommends:

a. Identification of critical source area’s;

b. Implementation of variable width vegetated buffer strips in and around critical source areas and adjoining surface waterbodies, which are left uncultivated and from which stock are excluded.

**Figure 9 - Dairy NZ advice regarding vegetated buffer strips in and around critical source areas and surface waterbodies**

Southland Fish & Game submits that:

a. Critical source areas should be objectively identified at a paddock scale using LiDAR and / or NASA Radar Topography, i.e. be specific to the paddock in question rather than generically identified and / or narratively described;

b. Any loss of productivity associated with exclusion of critical source areas from cultivation is associated with significant reductions (80-90%) in fine sediment loss associated with overland flow; and

c. A vegetated buffer of at least 5m that does not include any annual forage crop should be required to be maintained between the grazed area and critical source area, and all stock excluded from it during the grazing and subsequent recultivation.

Issues with cultivation and subsequent grazing of critical source areas on sloping land are illustrated in the following 2017 photographs, which depict significant overland flow associated with sheep grazing on fodder crop in Southland.
Similarly, issues with cultivation and grazing of critical source areas on flat land are illustrated in the following 2019 photograph of dairy cows grazing on fodder crop in the Waituna Lagoon catchment, Southland.
Figure 12 – Grazed critical source areas on flat land discharging overland flow to farm drainage channel – Southland region

5. Require vegetated buffers of at least 20m to be maintained between the grazed area and any water body or drainage ditch, and all stock excluded from this strip during grazing. Such buffers should be measured horizontally from the outer edge of the bed of the surface waterbody.

It is well recognised that riparian buffers are the ‘last line of defence’ before contaminants enter waterways and can have a significant positive influence on water quality. Issues with inadequate riparian vegetated buffers and no stock exclusion are illustrated in the following 2018 photographs, which depict sheep grazing on fodder crop in Southland.

Figure 13 – Surface waterbody without vegetated buffers and stock exclusion - Southland region
There are a number of studies that consider the efficiency and effectiveness of vegetated buffers to reduce non-point source pollution, including sediment. While specific results vary between studies, climatic regimes, geographical areas etc, studies consistently identify that wider buffers traps more sediment. Zhang et al (2010), reviewed the relationship between sediment removal and set back distance on differing slope angles up to 10 degrees from 63 published studies. Key findings were that:

a. In every case for slopes between 1 – 10 degrees a buffer width of 20m delivered a greater predicted sediment removal efficiency for sediment compared to alternative buffer widths of less than 20m, i.e. buffer widths of less than 20m represent a worse environmental outcome in terms of diminished sediment removal and should not be contemplated. In addition, buffer widths of 20m delivered greater predicted removal efficiency for nutrients (nitrogen and phosphorus) compared to alternative buffer widths of less than 20m; and

b. There were insufficient empirical studies to derive the sediment removal efficacy for slopes beyond 10 degrees.

To provide context of the proportion of winter fodder crop impact by vegetated set back distances on different slope classes the 2014 winter crop survey in Southland found that over 80% of winter crop occurred in the 0 - 7 degree landscape, 12% in the 8 – 16 degree landscape and 4% in the over 16 degree landscape.

6. Prohibit the use of land for intensive winter grazing that is more than 10 degree slope, i.e. steep, including small areas within a paddock that is otherwise less than 10 degree, such as a knoll or pinch at the top of a terrace that exceed 10 degrees.

7. Require grazing to occur toward waterways / critical source areas and downhill rather than from the bottom up.

8. Require consideration of additional sediment mitigation, including sediment traps, detention and decanting bunds.

Horticulture New Zealand provide a structured framework for the implementation of good management practices to address erosion and sediment control for vegetable production with rainfall intensity and desired treatment efficiency to define the nature, size and location of additional sediment mitigation (sediment traps, detention and decanting bunds).  

9. Require that soil treading damage and pugging shall not exceed a depth of 10cm. For the avoidance of doubt, soil treading damage and pugging should be measured vertically and subject to a maximum depth.

Pugging and heavy treading damage reduces soil infiltration rates, resulting in more water moving across the soil via overland flow, which increases the loss of sediment and nutrients.

10. Require back fencing of stock (excluding sheep and deer) with temporary electric fences to reduce treading / pugging of exposed / saturate soil within the footprint of intensive winter grazing. Similarly, transportable troughs should be provided in the area being grazed to prevent stock accessing a waterbody or critical source area for drinking water or alternatively causing heavy trading damage by stock repeatedly walking between the source of water and grazed area.

11. Prohibit intensive winter grazing within the alpine area, i.e. altitude greater than 700m above mean sea level.

12. Require an intensively grazed paddock to be re-sown within 1 month after the end of grazing by stock. The words "or as soon as practicable" or similar variations of the same are unlikely to be able to be objectively determined for the purposes of enforcement nor do they add certainty, and as such they should be deleted. The key point is that the adverse environmental effects of intensive winter grazing, particularly overland flow of contaminants (such as fine sediment), extends well beyond the period of grazing by stock and includes the period between cessation of grazing by stock and subsequent re-establishment of vegetation, which in some years in Southland can extend to late November / early December due to wet and saturated soil conditions preventing mechanical cultivation and re-sowing.

The following picture of the Hollyburn Stream in Southland following rainfall, which was taken in mid-October 2019, shows the effects of high suspended fine sediment originating from overland flow from 'bare' paddocks previously used for intensive winter grazing in the upstream catchment.

---

Proposed nationally set standards for intensive winter grazing

Southland Fish & Game submits that the nationally set standards for intensive winter grazing should be re-drafted to provide as follows (set out in Calibri (Body) font):

Permitted activity

1. Intensive winter grazing is a permitted activity if it complies with the following conditions:

Farm Environmental Management Plan (FEMP)

a. The owner of land where intensive winter grazing occurs must hold a Farm Environmental Management Plan that:

i. Includes a map or aerial photo identifying the location of the intensive winter grazing;

ii. Includes a map or aerial photo identifying:

   • Using LiDAR and / or NASA Survey Data the location of all waterbodies and critical source areas within 50m of the intensive winter grazing area; and

Figure 14 – Hollyburn Stream showing evidence of high suspended fine sediment from intensive winter grazing following rainfall and overland flow in mid-October 2019, i.e. following grazing by stock – Southland region
• The location of all subsurface drains within the intensive grazing area.

iii. Identifies methods of grazing management to avoid or minimise the risk of contaminates entering waterbodies and / or critical source areas, including:

• Progressive grazing downhill from the top of any slope to the bottom;

• Progressive grazing toward any waterbody and critical source areas and adjacent vegetated buffers;

• Back-fencing of stock (excluding sheep and deer) to prevent stock entering previously grazed areas;

• Prevention of stock accessing any waterbody and critical source area;

• Methods for prevention of significant pugging; and

• Provision of stock drinking water.

iv. Can be made available upon request of the Regional Council.

Threshold

b. The area of intensive winter grazing does not exceed more than 30ha or 5% (whichever is lesser) cumulatively or one contiguous area of the ‘effective’ pastoral area of the landholding.

Exclusion Areas

c. The use of land for intensive winter grazing does not occur:

i. Within any waterbody, including its bed and margins;

ii. Within any critical source area;

iii. On land directly overlying any subsurface drain;

iv. On land with a slope greater than 10 degrees; and
v. Within the Alpine environment.

**Vegetated Buffer Areas**

**Waterbodies**

d. The use of land for intensive winter grazing does not occur unless a vegetated strip of at least the following widths that does not include any annual forage crops is maintained between the grazed area and any waterbody and all stock are excluded from this strip during the grazing:

i. Within 20m on land with a slope between 0 – 10 degrees; and

ii. Within 30m from any tidally influenced river waters, lake, wetland, estuary or the Coastal Marine Area

**Critical source areas**

e. The use of land for intensive winter grazing does not occur unless a vegetated strip of at least 5m that does not include any annual forage crops is maintained between the grazed area and any critical source area and all stock are excluded from this strip during the grazing:

**Methods of grazing management**

f. All of the following grazing management practices are implemented:

i. If the area to be grazed is located on sloping ground, stock are progressively grazed (break-fed or block-fed) from the top of any slope to the bottom;

ii. Stock are progressive grazed (break-fed or block-fed) toward any waterbody and / or critical source areas and adjacent vegetated buffer areas;

iii. Stock (excluding sheep and deer) are back fenced to prevent them entering previously grazed areas; and

iv. Transportable troughs are provided in the area being grazed to prevent stock accessing a waterbody and / or critical source area for drinking water.
**Pugging**

g. Pugging or soil treading damage does not exceed a depth of 10cm measured vertically.

**Re-sowing**

h. The grazed area of land is cultivated and re-sown within 1 month after the end of grazing.

**Non-complying activity**

2. Intensive winter grazing is a non-complying activity if:

   a. The grazing does not meet the requirements of sub-clause 1 set out above; and

   b. In a freshwater management unit to which clause 31 applies, the total area in annual forage crop does not exceed the highest total area in annual forage crop in any farm year between 2013/14 and 2018/19.

3. Any application for the non-complying activity must address the following matters:

   a. The ‘effective’ pastoral area of the landholding;

   b. The location(s) and cumulative area of intensive winter grazing on the landholding;

   c. Methods for identification of slope;

   d. Methods for identification of critical source areas;

   e. The slope of land where intensive winter grazing is to occur and the location of any waterbodies, subsurface drain(s) and critical source areas;

   f. Provision for vegetated strips that do not include any annual forage crop species between the grazed area any waterbodies and critical source areas from which stock are excluded during the grazing;

   g. Methods of grazing management to avoid or minimise the risk of contaminates entering waterbodies, artificial subsurface drains and critical source areas;

   h. Additional methods for sediment mitigation, including sediment traps, detention and decanting bunds.
i. Methods for preventing pugging or soil treading damage; and

j. Provisions, including time, for cultivation and re-sowing after the end of grazing.

4. Any resource consent for the non-complying activity that is granted before the date that is 2 years after the commencement date must include at least the condition that, by that date, the applicant will have a certified FW-FP for the farm.

5. An resource consent for the non-complying activity that is granted after the date that is 2 years after the commencement date must include a certified FW-FP for the farm to which the information relates.

Prohibited activity

6. Intensive winter grazing that is not a permitted or non-complying activity is a prohibited activity.

Definitions

1. *Alpine environment:* Being defined as an altitude greater than 700m above mean sea level.

2. *Critical source area:* An area of land where topography causes overland flow of water following rainfall events, particularly when soils are saturated, that are identified in regional LiDAR mapping and / or NASA Radar Topography.

3. *Intensive winter grazing:* Grazing of stock on annual forage crops, supplementary feed or pasture (between 1st May and 1st October) to the extent that the grazing results in significant de-vegetation and / or significant pugging. This is often associated with break feeding behind temporary electric fencing, particularly over the winter.

4. *Margin:* The outer edge of the bed of any waterbody.

5. *Significant de-vegetation:* Removal of, or damage to, vegetation caused by stock access or grazing that results in the exposure of bare ground and / or significant pugging of the soil.

6. *Significant pugging:* Pugging or soil-treading damage exceeding a vertical depth of 5cm.
7. *Sloping land:*  
Land with a slope between 3 – 10 degrees.

8. *Subsurface drain:*  
An artificial permeable subsurface conduit constructed for the purposes of draining agricultural soil water / moisture. An installed subsurface drain includes tile, mole, concrete and clay drains, wooden box drains and plastic subsurface drainage pipes. Stormwater systems, drainage by use of sumps, and on-site wastewater systems are not included in this definition.

9. *Water body:*  
Means fresh water or geothermal water in a river, lake, stream, pond, farm drainage canal, wetland, or aquifer, or any part thereof, that is not located within the coastal marine area.

Submission by Southland Fish & Game ends.