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Submission to Taumata Arowai

Questions and answers wastewater standards | Taumata Arowai

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1.0 Submission summary

Fish and Game and Environmental Defence Society Inc (**EDS**) support the idea of creating enforceable conditions, bringing expiring or expired consent up to contemporary treatment standards, and making wastewater consents more standardised. However, we are concerned that the proposed standards are a step away from the sustainable management purpose of the Resource Management Act 1991 (**RMA**) that has been used over the last 20 years. These well-established standards have created a framework for both end of pipe standards and instream standards (at the end of the mixing zone). This approach has created over time a trajectory of planned improvements in the management and treatment of wastewater. The narrowed scope to exclude protections for and monitoring of receiving environments is taking a material step backwards which will not provide for human and ecological health within the New Zealand biophysical context.

The proposed standards are not fit for purpose. Substantial re-work is required to avoid significant adverse effects on aquatic habitats, ecosystem health, human health and the wider environment.

This submission is filed jointly by Fish and Game and EDS. Unless stated otherwise, EDS supports and adopts the position of Fish and Game as outlined in this submission.

The proposed National Wastewater Standards require amendment to include:

1.1 Minimum end of pipe standards (as opposed to maximum) that allow more stringent standards to be set to meet receiving environment outcomes and consider the cumulative effects of all contaminant

sources

1.2 Receiving environment standards that provide for community and environmental outcomes, seasonal/flow related adjustment, allow for integrated catchment management, and drive improvements in treatment technologies

1.3 Incentivisation of partial or full discharges to land over discharges to water

1.4 More flexibility over consent conditions

1.5 More stringent controls on overflows and bypasses

1.1 National Wastewater Standards should be minimum standards

Fish and Game support national standards for end of pipe and receiving water as minimum whilst also allowing decision makers the authority to apply more stringent standards to meet receiving environment outcomes. Regional Councils are required to manage the effects of discharges, in combination with other contributions of contaminants to freshwater. The proposed standard does not facilitate transparent calculations of instream mass loads which are a tool councils need for overall catchment management. The proposed standards will hamper integrated catchment management and set back recent gains in water quality. Allowing wastewater discharges to occur without the need to consider the existing (or upstream) capacity of the receiving environment to assimilate contaminants places a disproportionate and inequitable requirement on commercial and primary industries to make up the needed improvement to freshwater quality.

Maximum standards will not promote improved treatment technologies and overall will result in lower quality discharges. Additionally, technologies will be locked in over the 35-year consent duration.

1.2 Need for receiving environment standards

Wastewater discharge standards are undeniably needed to drive improvements in poorly performing and long expired discharges. End of pipe and receiving environment standards are not mutually exclusive and are commonly applied together for many recent discharge consenting regimes. For example, wastewater treatment plant discharges in the Horizons Region have had combined conditions applied since the mid-2000s and monitoring of end of pipe and upstream/downstream receiving environments has been implemented since 2010, many of these sites are publicly reported through the LAWA web platform.

Many expiring or expired consents do not have useful standards or robust and transparent monitoring in their conditions due to the age of the consents. This is the key problem with standards, monitoring and reporting, and one which the wastewater standards usefully seeks to address.

End of pipe standards are particularly useful to set out the *minimum* treatment standards under 'average' long term conditions. Receiving environment standards set out the maximum degree of acceptable effect and ensure that the quality of the receiving environment and the values people hold for that environment are protected long term, during distinct seasons and under specific conditions.

With respect to the effects of microbial pathogens on human health the supporting technical report notes (page 15) that there is "*minimal international precedent for setting end-of-pipe standards for pathogens in treated wastewater using faecal indicators*" and that "*Most international examples apply receiving environment standards directly to the discharge*". This was considered 'unduly restrictive' for the proposed standards because it does not take into account assimilative capacity and dispersion into the receiving waterbody. This is completely at odds with the approach of the proposed guidelines to use national and international approaches for all other standards and risks significant and potentially widescale adverse effects on public health. The approach does not consider the existing pathogen load in addition to the contribution made by the discharge and any fluctuations in discharge pathogen concentrations of flow conditions in the receiving environment.

The recommended method for determining nutrient criteria based on desired periphyton biomass outcomes (MfE 2022) applies nutrient criteria for the instream receiving environment, which will necessitate consideration of the upstream concentrations on an annual average basis to assign and back-calculate nitrogen and phosphorous end-of pipe concentrations. Where the receiving environment is already overallocated with respect to nutrient concentrations (which is highly likely in many circumstances given the state of nutrient enrichment in New Zealand rivers), we recommend that stronger consent conditions are used to provide improvements and nutrient reduction in the waterbody over time.

Monitoring of receiving environment standards provides feedback to review and make iterative changes to treatment quality to meet ecological, cultural and community outcomes. Receiving environment standards should be commensurate with the sensitivity and/or values of the receiving environment.

In the absence of adoption of relevant receiving environment standards, instream monitoring upstream and downstream of discharges is required to provide certainty that treatment quality is meeting environmental outcomes.

Minimum end of pipe standards alongside receiving environment standards are the most certain way of avoiding adverse effects of wastewater discharges on ecosystem and human health. End of pipe standards set at annual medians will not adequately provide for environmental and human health needs. Variations in discharge quality on a weekly and daily basis will obscure exceedances of receiving environment thresholds. Fish and Game recommend including receiving environment standards (examples provided in Appendix 1) alongside linked end of pipe standards.

1.3 The standards are not designed for ecological health or human health

We consider that the proposed standards are set without provision for assessment of, or inclusion of limits for, ecological health and human health and that this is an unacceptably low standard of environmental management and inconsistent with best practice.

1.4 Land and water discharges

The proposed standards do not appear to have considered mixed land and water discharge solutions. Many contemporary consents for wastewater discharges to hard-bottomed rivers apply a mixed land and water discharge regime to avoid

discharging to water during the highest risk periods for periphyton proliferation and other effects associated with seasonal or flow related conditions. The discussion document does not contemplate these discharge regimes and, because of the more stringent requirements for discharges to land, the standards may disincentivise these mixed discharge solutions or indeed any land-based discharge. This may have the perverse outcome of discouraging Councils from removing discharges to water. Point source discharge removal has been the basis for improvements to water quality in discharge affected receiving environments over recent decades. Providing a permissive discharge to water regime and disincentivising discharges to land or mixed water and land discharges will substantially set back freshwater improvement progress.

1.5 WWTP consent conditions

Fish and Game support providing helpful guidance on WWTP consent conditions. However, dictating a rigid set of conditions will not work with the wide range of variability in WWTP networks and consequent resource consent applications. Bespoke resource consents conditions have arisen to meet the variability in wastewater plants, community aspiration and receiving environments 'at place' for this very reason. Decision makers need the discretion to impose conditions that are tailored to the specifics of an application at hand, the volume treated and treatment method, the discharge quality, and the environment in which it discharges to. Other network and site factors may dictate specific consent conditions including management plans for events such as a botulism outbreak.

1.6 Wastewater activity classes

Some of the proposed activity classes are unsuitable. For example, Bypasses and Overflows as controlled activities. This activity class does not represent the level of risk to ecological health and public health. Therefore, we do not support

the proposed change to activity classes that would force decision makers for regional councils to consent activities that should not be allowed or should be mitigated through consent conditions.

WWTP can be a high risk activity involving risk to ecological and human health. That is why most WWTP are discretionary or higher activity status. Discharge of raw untreated sewage is an unacceptable practice in New Zealand and allowing for this practice would send our system back to a bygone era standard of wastewater disposal.

1.7 The stormwater infiltration problem

An improved discharge management regime would prioritise upline network improvements. For example, providing a stormwater infiltration standard that would focus on ensuring that stormwater does not enter the wastewater system in the first instance. Fish and Game are concerned that stormwater often causes overflows and bypasses by significantly increasing the inflowing volume beyond the capacity of treatment plants. The proposed standard does not adequately or transparently address this issue and the controlled activity proposal for overflows and bypasses disincentivises much needed network improvements. Controlled and uncontrolled overflows and bypasses should not be treated under the same lenient (controlled activity) status.

1.8 Overflows and Bypasses

Every effort must be taken to eliminate overflows and accidental bypasses. Desludging ponds is a priority, as is use of technology for early detection of unexpected overflows. Overflows and bypasses cannot be a controlled activity; they are unacceptable biohazardous pollution events which need to be located and repaired as fast as possible. Automatically granting them a consent, (which

in effect giving them a controlled activity status will do), will not expedite this, and may create delays if such overflows are seen as inevitable and non-urgent.

Fish and Game support non-complying activity status for uncontrolled overflows and bypasses with sunset consent clauses to drive infrastructure improvements over limited time spans. Non-complying activity status is consistent with the levels of environmental and human health risks caused by uncontrolled overflows and bypasses. Consent conditions can then be focussed on improvements to network storage, address infiltration and inflow and the capacity of the plant to avoid future overflows or bypasses. Consenting an activity cannot be seen to be the new norm, as is signalled by a controlled activity status. Dischargers must be encouraged to make every effort to ensure that overflows and bypasses do not occur in the long-term. Controlled activities are only intended for low risk, low environmental effect activities.

This submission leads on from our Local Government (Water Services) Bill submission and they should be read together for context.

2.0 Wastewater treatment and activity class

One of Fish and Game's key concerns is the assumption that national standards and changes to activity standards will fix the current problems with consenting WWTP. We are concerned that making consenting easier and lowering standards will result in water quality degradation or worsening of water quality and set back improvements in recent decades to the receiving environments of discharges.

For Discharge to Water and Discharge to Land resource consent is required and the existing activity class that presides in the regional plan will prevail. However, the proposed standards apply a maximum amount of treatment and this will prevail over Target Attribute States that regional councils are currently required to set under the NPS-FM 2020.

2.1 Proposed activity class

Table 1 in Attachment 2 shows the proposed activity classes for the WWTP as we understand them and recommends the activity class that Fish and Game would support.

Note the following section summarises information from the Quality Planning website relating to activity classes. The activity classes relate to risk, effects and likelihood of notification.

2.2 Permitted Activities

It is important that the conditions (or any end of pipe standards) will adequately manage the effects expected (including cumulative effects). Clearly an end of pipe standard cannot do this, and a receiving environment standard is needed to consider cumulative effects. The discussion document fails to consider the location specific “permitted baseline” to ensure that the water body does not degrade. Note that permitted activities cannot be subject to resource consent type conditions such as lodgement of a management plan or provision of monitoring report or audit, this can only be achieved by a consent.

2.3 Controlled Activities

A consent for a controlled activity cannot be declined. The effects of a proposal need to be adequately controlled through the matters of control and conditions proposed, which will identify the total cumulative effects that may occur from the resource use and development. Controlled activity consent applications may be notified, but it is more common for them to be non-notified. Council must be sure that the matters over which they have reserved control will adequately deal with the likely adverse effects of the activity at the maximum limits of any requirements. Ideally, plans should detail when activities are to be notified and are not to be notified or limited notified.

The proposed activity status for overflows and bypasses is a controlled activity. We discuss the problem with the activity class further in section 6 below.

2.4 Restricted Discretionary Activities

Restricted Discretionary activities can be declined or granted, with or without conditions and requirements and matters of discretion must be named and addressed in the application. The application can be notified or non-notified. Restricted Discretionary activities are intended to have a named scope and not a wide unrestricted scope that discretionary activities have.

2.5 Discretionary Activities

Discretionary activities can be declined or granted with conditions. Often by failing to be a Controlled or Restricted Discretionary activity they automatically become a Discretionary activity (s87b (1) (a) and (b) or where a prohibited rule is not operative. Discretionary activities can be notified or non-notified. Discretionary activities are suitable when the effects of an activity are so variable that it is not possible to prescribe standards to control them in advance – this is the case with WWTP rules. Discretionary activity is also the default for activities not explicitly mentioned in the plan (RMA s87B(1)(a).

2.6 Non-Complying Activities

Non-Complying activity status is reserved for those activities where potential adverse effects are great but do not warrant prohibition. Applications can be declined or granted with conditions. A gateway test is used to decide applications requiring either the adverse effects on the environment to be minor or the application is not contrary to the objectives and policies of the plan.

2.7 Prohibited Activities

Prohibited activities must expressly prohibit an activity without exceptions. A resource consent application cannot be made for a prohibited activity, and a consent cannot be granted. A plan change process would be required to allow

prohibited activities to take place. The plan change process should not be used as an alternative resource consent process.

Regional plans generally prohibit the discharge of untreated sewage to waterways (overflows and bypasses). The discussion document proposes that this should be changed to a controlled activity. We urge you to understand first the reasons for overflows and bypasses. We note that the majority of them will be related to stormwater infiltration issues or fundamental overloading of the system when peak flows overwhelm the capacity at the WWTP. Therefore, it is paramount that a controlled activity is not used for overflows and bypasses. A Non-Complying activity class could be possible (although objectives and policies should not be supporting this, and often effects will be more than minor).

Alternatively, if the problem is stormwater infiltration, that system needs to be sorted out so that stormwater doesn't mix with the sewer and overwhelm the WWTP. Doing nothing (which a Controlled Activity status would allow) is not an option that will result in good ecological health and human health outcomes.

2.8 Catch All Rules

Sections 68(5)(e) require a resource consent to be obtained for an activity causing, or likely to cause, adverse effects not covered by the regional plan. This effectively limits the range of activities that can be covered by a catch-all rule.

3. Discharge to Water

3.1 Cumulative effects of discharge to water and mass loads

It has been claimed that the proposed standards will provide higher treatment than any existing resource consent, and that receiving water standards are not enforceable as non-compliance is often caused by farming or non-point source discharges. These assumptions are incorrect. Receiving water standards can identify treatment failures by accounting for the upstream inputs. This is the very purpose of upstream and downstream monitoring of discharges to rivers and the key reason why current consents and the proposed standards are not directly comparable.

Councils frequently use mass loads to manage cumulative and proportional contributions of contaminants from various sources in a catchment and to assess the effects of contaminants on sensitive downstream receiving environment such as lakes, estuaries and near-coastal waters. There are considerable benefits in requiring both types of standards in discharge to water consent conditions for the purposes of enabling accurate calculation of catchment mass loads to apportion contaminants to contributing sources.

Many of the recommendations of the technical document on considerations for nutrients are not carried through to the discussion document and it is unclear whether the final standard will follow the technical report recommendations. For example, '*It is proposed that the TN and TP mass loads discharged from a WWTP are considered in the context of the wider catchment through a periodic review process by the relevant regional council and that a staged approach to asset upgrades can be undertaken to manage changes in load over the term of the consent*.'

Fish and Game have included recommended receiving water standards in Attachment 1 and submit that they be incorporated into the standards.

Attachment 1 contains an example for the Palmerston North City wastewater discharge to the Manawatū River. This case-study shows by using the end of pipe wastewater standards, even with dilution ratios applied, greater degradation in already compromised ecosystems will result for some parameters (Table 1: TSS, pathogens and nutrients) and for nutrient criteria to manage periphyton (Table 2). Application of the wastewater standards as proposed will simply authorise a discharge to water that further degrades ecosystem and human health in a highly degraded waterbody. This is an inequitable outcome for a catchment where controls on farming and industrial discharges are already required to reduce contaminants and improve water quality. Essentially this is allocating free pollution rights to the PNCC in an already overallocated catchment, at the expense of the other contaminant contributors.

Fish and Game disagrees with the use solely of end of pipe standards for discharges to water and recommends the inclusion of receiving environment standards, alongside changes to the end of pipe standards to be minimum treatment standards to allow for the management of cumulative catchment effects.

Fish and Game argue that concentration and load limits play a vital role in wastewater management and environmental protection.

3.2 Variation of existing consent to lower treatment standards

Fish and Game is concerned that existing wastewater consent holders could apply for a variation of consent conditions under s108 so that they can adhere to the proposed lower performance standards, potentially through manipulation of discharge volume and thereby dilution ratios (see Attachment 1). If this were to occur in a waterbody that is already deemed degraded, then it would be in breach of the function of regional councils to improve water quality in degraded waterbodies.

3.3 Dilution ratios

Dilution ratios play a critical role in the implementation of the proposed wastewater discharge standards, and discharge volumes have a significant influence on the calculation of the dilution factor. The future volume specified by an applicant for a discharge to water consent becomes a key issue in determining the category of the receiving environment. Attachment 1 provides a worked example of this in relation to a wastewater discharge to the Manawatū River.

3.4 Seasonality and Consent Conditions

The dilution ratio is less likely to occur in the summer season when salmonids could already be stressed by low flow conditions in lakes and rivers. There is also a greater probability of eutrophication effects in the warmer temperatures in summer months. Therefore, we support the use of 7-day annual low flow to establish the proposed dilution categories, however, note that these do not provide for variability between rivers. We oppose the use of median design flow for the discharge volume and recommend that peak flow should be consented and designed for. If peak flow is not consented for, then half the time there will not be capacity to treat all the wastewater that is coming into the plant.

3.5 Precedence over other legislation including Settlement Acts

Another example alongside the Horizons case-study for the Manawatū River is the Waikato Region's Healthy Rivers Plan Change 1 which sets water quality targets which must be achieved in certain timeframes for the Waikato River. It is unclear how these targets are to be met in the context of the proposed wastewater standards which would essentially enable increases in contaminants to the Waikato catchments. It appears that the WWTP standards will authorise discharges as the priority contaminant sources over the above examples, which will thereby enable further degradation. As noted above, existing consented WWTP could also apply to remove consent conditions that would result in a better treatment than the proposed standards provide for.

3.6 Fish and Game does not support a default 35-year term

Fish and Game consider that the default 35-year term should be reduced significantly for underperforming WWTP. Review conditions do not work as well as re-consenting a treatment plant that is not performing to the standards. Technology is rapidly improving, and this will provide new treatment options within the 35-year term.

Fish and Game understands that long-term investment certainty is the main reason for proposing the 35-year term in the standards. However, the standards themselves do not guarantee that a WWTP will in itself be a significant infrastructural asset, or that any investment is even required as part of the resource consenting process for a WWTP. The standards themselves propose compliance limits which, as we have highlighted above, may in fact result in a downgrade of treatment in water quality for a WWTP consent, rather than an upgrade.

It is the nature of a wastewater discharge that fluctuations are likely to occur and that the discharge will not be in a steady state throughout the duration of consent. Population growth will result in increased volume discharged over time.

A significant portion of the current loads processed may be from major trade waste discharges and these may fluctuate significantly through time and at any time throughout a consent period. While an application may have projections on population growth and development, these are not known or predicted with any certainty (see also Attachment 1 for discussion of dilution ratios). If consent is granted for a WWTP, at any moment an applicant might begin discharging at their maximum consented limits. In the face of such uncertainty around actual effects of the discharge it is essential that a precautionary approach is applied and that a shorter term is more appropriate.

3.7 Sensitive receiving environments

The definition of sensitive receiving environments should be expanded to ensure other high-value water bodies are protected from further degradation. These should include:

1. Areas with increased contaminant residence time, such as lakes, ponds, estuaries, and wetlands, where pollutants accumulate and persist.
2. Water bodies supporting significant at-risk or threatened populations of indigenous species, where any further contamination could have severe or irreversible ecological consequences.
3. Environments highly sensitive to further contamination, including pristine or natural-state water bodies, degraded water bodies requiring improvement, and areas where additional contamination would exceed established bottom lines or compromise freshwater values.

4. Water bodies with outstanding natural character, features, or landscapes, where discharges would impact an outstanding freshwater body or a Water Conservation Order.

3.8 Protecting sensitive receiving environments and provision for cumulative effects

Contaminants from WWTP's can have significant adverse effects on sensitive downstream receiving environments, including wetlands, lakes, and estuaries, contributing to further water quality degradation.

Fish and Game emphasise the critical importance of retaining and strengthening provisions within the proposed standards that address the cumulative effects of contaminants from multiple sources on the broader catchment. We strongly recommend the inclusion of a dedicated section on the impacts of total contaminant loads on the environment, particularly concerning non-toxicants such as nutrients and sediment.

3.9 Importance of the inclusion of total loads

Concentration limits ensure that treated wastewater complies with water quality standards at the discharge point, while total load represents the total mass of a pollutant discharge from a WWTP over a specific period and helps assess the overall impact on the receiving water body over time.

WWTP's frequently discharge into heavily degraded receiving environments, which in turn flow into sensitive downstream ecosystems that are already under significant stress. A notable example is the Firth of Thames, where at least 13

different WWTP's currently discharge into its catchment. The Firth of Thames is a RAMSAR wetland of international significance that provides critical habitat for shore birds and game birds.

To ensure that the life-supporting capacity of the freshwater receiving environment is safeguarded, and that the effects of the discharge are avoided, remedied and mitigated, it is imperative that the cumulative effects of contaminants, with the inclusion of total contaminant loads, are retained and strengthened within the wastewater environmental performance standards.

3.10 Fish and Game oppose default standard for small wastewater treatment plants

The criteria for small WWTPs is proposed so that if an existing plant receives a mean annual influent cBOD5 load of 85kg / day or less, it will qualify for the small plant exclusion in the standard. The small plant standard would only apply to existing plants with a mean annual influent load at or less than this standard. It is difficult to tell from the discussion document whether this means small plants meeting the criteria will be consented using the traditional resource consent process or not. Notwithstanding the comments below, Fish and Game would support the exclusion if it results in a resource consent process that adequately examines the effects of the discharge on the environment, as is the traditional process.

Most small treatment plants rely on pond and lagoon systems, which generally produce lower-quality effluent compared to more advanced treatment methods. The primary challenge is the high cost of investment required for upgrading these systems (outlined in the consultation document), making it difficult to meet compliance standards. As a result, implementing lower default standards for small WWTPs allows the continuation of subpar operation performance,

contributing to further water quality degradation of already compromised water quality.

Fish and Game oppose a default standard for small WWTP's. We disagree with the statement that "*small plants generally have a low impact on the receiving environment, particularly in relation to nutrients, compared to other sources in the surrounding catchment*." As noted above, many small plants are currently operating in non-compliance, thus these plants are contributing to the cumulative effects on sensitive receiving environments and therefore require new technology to improve treatment and compliance.

Eliminating these parameters also removes appropriate monitoring, transparency, and water protection, further threatening ecological and human health.

3.11 Periphyton

The Authority proposes that, where a wastewater treatment plant discharges to a hard bottomed or rocky stream or river, the nitrogen and phosphorous limits in the standard would not apply, and the treatment requirements will be set on the basis of a site-specific risk assessment.

Fish and Game agrees with the Waikato River Authority's concerns regarding periphyton. Excessive periphyton growth can negatively impact food availability for trout and reduce the fishing amenity value. Similarly, as with the importance for an Assessment of Environmental Effects, we support site-specific assessments to determine appropriate requirements.

The example in Attachment 1 shows a worked example of the difficulties of this approach, including how hard-bottomed receiving environments will be classified

and how to address management of periphyton when nutrient criteria are already exceeded upstream.

3.12 Oppose Bathing Water Standards as WWTP Standards

The Ministry for the Environment (MfE) released a report in June 2003 “Microbial Water Quality Guidelines for Marine and Freshwater Recreational Areas”
The guidelines cover the monitoring and interpretation of results from surveys for bacteriological indicators of faecal contamination in recreational waters. They do not cover other impacts on the above water uses, such as water clarity, chemical pollution, or marine biotoxins from algal blooms. The guidelines should not be used as the basis for establishing conditions for discharge consents, although they may be used as a component for decision making.

Further on page 15 it states:
“Applying the guidelines to water impacted by wastewater discharges: these guidelines should not be directly applied to assess the microbiological quality of water that is impacted by a nearby point source discharge of treated effluent without first confirming that they are appropriate. This is particularly important for disinfected effluent (Disinfection Review Group 2002) and for waste stabilisation pond effluent (Sinton et al 2002). It is important when planning the location and degree of treatment for wastewater treatment plants to recognise that the guideline values are not necessarily a guarantee of safety.

While it is correct to infer that water exceeding the guideline values poses an unacceptable health risk, the converse is not necessarily true. This is because effluent may be treated to a level where the indicator bacteria concentrations are very low, but pathogens such as viruses and protozoa may still be present at

substantial concentrations, effectively changing the indicator/pathogen ratio. To assess the microbiological quality of water that is impacted by a discharge of treated effluent, the relationship between indicator bacteria and key pathogens (such as viruses and protozoa) must be established for that treatment. This would require the generation of statistically robust data to establish that the treatment process produces an effluent that meets the guideline indicator bacteria values and is capable of destroying pathogenic micro-organisms. Treatment plants also require ongoing auditing and monitoring. Wastewater plants may not operate 100% of the time (e.g. during high water flows) and the health status of the population at any given time affects the pathogens likely in wastewater."

3.13 F&G Support Exceptions to Proposed Standards

Fish and Game support the proposed exceptions to the proposed standards including discharge to TAS band A receiving waters, rivers and streams with low dilution ratio, discharge to natural wetlands, discharges to aquifers, and discharges within certain distances of drinking water abstraction.

Fish and Game note an error in the following paragraph on page 22 of the discussion document. We understand that the degraded water bodies that have unnaturally high levels of Nitrogen and Phosphorus is caused by run off from intensive farming, due to the high level of application of fertiliser and runoff from dairy cow urine. Does this mean that in these degraded catchments (that have not yet been specifically mapped) that the proposed WWTP regulations will not apply?

*"discharges to a waterbody that has **naturally high** levels of a particular parameter. This is not intended to capture waterbodies that have existing high levels of a particular parameter due to **diffuse discharges** that occur through land use such as farming".*

4.0 Discharge to Land Environmental Performance Standard

4.1 Support Low Rate Infiltration

Fish and Game support this standard only applying to low-rate infiltration arrangements and not rapid infiltration basins. We support requiring resource consent for all discharge to land activities, and that the activity classification in the regional plan shall prevail.

4.2 Support Discharge to Land in Preference to Water

Fish and Game support discharge to land, or a hybrid discharge to land and water approach in preference to only discharging to water where the land is suitable. We note that your standards provide for a more stringent methodology for discharge to land and this may encourage the status quo of discharge to water. The standards do not provide scope for that analysis and consents should continue to do this options appraisal with the goal of getting the best water quality outcomes. We are concerned however that the discharge to water standards are set lower, and therefore it is unlikely that the option of discharge to land will be explored.

4.3 Support Risk Management Assessment for Specific Types of Land

Fish and Game support risk management assessment for site and its suitability to apply the standards to. We also note that this is already part of a standard pre-application assessment so note that it isn't a new idea or new practice. Site suitability assessment should be a standard practice prior to applying for resource consent when a team of engineers, consultants, and planners work to put together an application for resource consent.

Sites will be deemed unsuitable where it is necessary to protect public health, preserve soil health and prevent contamination of crops (for example, irrigation to human food crops).

Fish and Game support risk screening to identify pathways for contaminants such as total nitrogen, total phosphorus and *E. coli* to reach a receptor because of the discharge to properly consider the environmental, public health and social risks.

4.4 Oppose Loading Rates and Concentration with Each Class

Fish and Game are concerned about the high loading rates shown in the following table:

Class	Total Nitrogen (kg/ha/year)	Total Phosphorous (kg/ha/year)	*E. coli* (public health) (cfu/100mL)
1	500	75	No limit
2	250	50	< 2,000
3	150	20	< 1,000

4.5 Support Hydraulic Loading Rate for Discharges to Land

Fish and Game support the hydraulic loading rate of 5mm / hour or 15mm per application event.

4.6 Support Scope of Standard Excluding Total Suspended Solids and Heavy Metals

Fish and Game support the above exclusions from the proposed standard.

4.7 Support Management and Operational Plans

Fish and Game support the proposed use of Management and Operational plans as this is a standard part of a WWTP consent.

4.8 Support Monitoring and Reporting Requirements

Fish and Game Support the proposed monitoring and reporting requirements generally.

5. Beneficial Reuse of Biosolids Environmental Performance Standard

5.1 Consenting Activity Class for Biosolids

Fish and Game support the stabilisation grade approach to biosolids but recommend that grade A should be used as the minimum standard rather than grade B for permitted activities. The use of Restricted Discretionary activities for higher risk activities is also supported. We include a Permitted activity and Controlled activity rule from the Waikato Regional Plan to show the range of criteria they use that may be included as matters of control / discretion. We recommend that you expand your list of criteria for Controlled and Restricted Discretionary activities accordingly.

5.2 Fish and Game support the reuse of biosolids in principle.

However, Fish and Game is concerned that many small-scale wastewater treatment plants are not de-sludged regularly which does not accord with operating and maintenance requirements of these plants. This can also lead to overflows.

Fish and Game only support the beneficial re-use of biosolids as a Permitted activity in exceptional instances where heavy metals are removed first. As many treatment plants cannot provide this level of treatment it is likely that most proposals will still require a consent as a Controlled or Restricted Discretionary activity.

The following Permitted activity rule provides examples of conditions that could be useful to include.

3.5.6.1 Good Practice

Waikato Regional Council will, in conjunction with organisations, industry groups and individuals, provide guidance on good practice techniques for the reuse of biosolids and nonhazardous byproducts from industrial and trade premises as soil conditioners or fertiliser substitutes.

3.5.6.2

Permitted Activity Rule – Discharge of Sludges and Liquids from Activated Sludge Treatment Processes to Land

*The discharge of sludges and liquids from activated sludge treatment processes onto or into land outside the Lake Taupo Catchment and any consequent discharge of contaminants to air is a **permitted activity** subject to the following conditions:*

a. *There shall be no direct discharge to water.*
b. *The material shall not enter surface water by overland flow.*
c. *The material shall not contain any human/animal pathogens or hazardous substances.*
d. *The total nitrogen loading onto grazed pasture shall not exceed the limits as specified in Table 3-7, including any loading made under Rules 3.5.5.1, 3.5.5.2, 3.5.5.3 and 3.5.6.3.*
e. *The discharger shall maintain daily records of the volume discharged to each paddock or relevant area and the concentration of nitrogen in the discharge in, as a minimum, monthly samples.*
f. *The records required under condition e) shall be made available to the Waikato Regional Council upon request.*
g. *The maximum loading rate of effluent onto any part of the irrigated land shall not exceed 25 millimetres depth per application.*
h. *The material shall either*
    i. *not be stored for longer than eight hours prior to application, or*

ii. *have been stabilised by storage and dewatering for a period of at least 6 months.*

i. *The discharge location should provide for the following buffer zones between the discharge area and neighbouring land uses or sensitive environments:*

i. *300 metres from any school, residential zone or rural residential zone as identified by the relevant district plan*

ii. *150 metres from any residence or building of regular occupation such as community halls, marae and public or community facilities*

iii. *50 metres from any property boundary*

iv. *10 metres from any surface water body*

v. *20 metres from a Significant Geothermal Feature*.*

j. *Any discharge to air arising from this activity shall comply with the permitted activity conditions in Section 6.1.8 of this Plan.*

k. *Where fertiliser is applied onto the same land on which activated biosolids have been disposed of in the preceding 12 months, the application must be in accordance with Rule 3.9.4.11.*

l. *The soil pH where the biosolids are discharged is not less than pH 5.5.*

Advisory Notes:

- *Discharges of contaminants into or onto land within 20 metres of a Significant Geothermal Feature are addressed by Rules 7.6.6.1 to 7.6.6.3 of this Plan. Significant Geothermal Features are defined in the Glossary, and in Development and Limited Development Geothermal Systems, identified on maps in Section 7.10 of this Plan.*

3.5.6.3

Controlled Activity Rule – Discharge of Biosolids and Sludges and Liquids from Activated Sludge Treatment Processes

The discharge of biosolids or sludges and liquids from activated sludge treatment processes onto or into land outside the Lake Taupo Catchment, and any subsequent discharge to air, that is not permitted by Rule 3.5.6.2 is a ***controlled activity*** *(requiring resource consent) subject to the following standards and terms:*

a. *Concentrations of pathogens or hazardous substances in the material shall not exceed the values given in Table 3-9.*
b. *The discharge shall not:*
    i. *result in ponding where the contaminant remains on an area of more than 10 square metres 24 hours after being irrigated.*
    ii. *cause a direct discharge to surface water or ground water.*
c. *The discharge shall not occur within 20 metres of a Significant Geothermal Feature*.*
d. *Any discharge to air arising from this activity shall comply with the permitted activity conditions in Section 6.1.8 of this Plan.*
e. *The soil pH where the biosolids are discharged is not less than pH5.5.*

Waikato Regional Council reserves control over the following matters:

i. *The season during which the discharge can occur.*
ii. *The frequency at which the discharge can occur at the same location.*
iii. *The maximum annual nitrogen loading rate for the discharge site given the proposed land use.*
iv. *Measures to manage the effects of contaminants such as heavy metals, mineral salts or hazardous substances on the long-term health of the soil resource and on the existing and range of foreseeable uses of the soil resource.*

v. *The means of controlling objectionable odour.*

vi. *Measures to avoid significant adverse effects of the activity on tangata whenua values of the site.*

vii. *Measures for managing effects of the discharge upon the soil's hydraulic loading capacity and compaction.*

viii. *Measures to ensure that adverse effects on nearby land uses, water bodies or areas of significant indigenous vegetation, significant habitats of indigenous fauna[21] and significant natural features such as cave and karst systems are avoided, remedied or mitigated.*

ix. *The maximum level of soil contamination that is acceptable at the application site.*

x. *The method of application.*

xi. *Separation distances from sensitive areas.*

xii. *Record keeping and nutrient budgeting.*

6. Management of Overflows and Bypasses

6.1 Overflows as a Controlled Activity

Overflows set as a Controlled activity is far too permissive for such a potentially environmentally damaging event, with attendant public health risks. Considering overflows as a Non-Complying activity will allow consenting authorities to decide whether to grant a consent, and if so, to impose meaningful conditions that require work to prevent further overflow events.

Bypasses also should not be controlled activities, for the same reason.

Having a Controlled activity plan does not compensate for being unable to impose meaningful conditions on a consent. For example, stating that a programme must be in place to reduce network overflows to an average of no more than 2 events per discharge location per annum by 2040 does not give any pathway to achieving this, or meaningful disincentives if there are more events per annum. Alongside this, both matters of control and the assessment criteria limit controlled activity plans to urban areas, excluding the wastewater treatment plants themselves. Does this wording exclude semi-rural and industrial areas, and any overflows or bypasses that might occur at the treatment plant? Those also need to be covered by appropriate standards and conditions.

6.2 Risk Frameworks for Overflows

Fish and Game do not support establishing a framework that determines how overflows are managed based on risk. Such a framework would be time-consuming and cumbersome to set up and implement, as overflows are predominantly unexpected, so the risk would have to capture the entire

wastewater system. It may be more effective to establish a system with response templates dependant on variables such as proximity to water, to housing, to important cultural places and so on. These templates could set out appropriate responses and communications to iwi partners, stakeholders, and communities. This could allow for faster communication and potentially reduce exposure and health hazards. However, all overflows and bypasses should be reacted to immediately and repaired as fast as practicable.

6.3 Uncontrolled Overflows and Early Detection

The onus of discovering overflows should not be on mana whenua and communities. Although their input is vital, it is the duty of the wastewater treatment operators to proactively seek out and repair overflows, regardless of the reason the overflows occur. Technology (such as Heedhq) exists already which can give councils and wastewater treatment plant operators real time alerts from sensors located on manhole covers enabling quick response and repair. It is important to promote such technology rather than leaving it to public reporting.

6.4 Bypasses and Old WWTP

It is imperative that wastewater treatment plants be upgraded as population and discharge volume and pollutant inputs increase. Old plants and infrastructure are widespread across the country, some which still combine wastewater and stormwater, and this contributes to overflows and bypasses.

6.5 LAWA and Safe Swim Information

It must be a requirement to inform the public of the location and duration of overflow and bypass pollution events. This should be on the Land and Water

Aoteoroa (LAWA) website and should also be in the form of signage at the site of a large enough size to be easily seen and read.

6.6 Recommend Variation to Definition of Overflow

The definition of overflow should delineate between uncontrolled overflows and those which are engineered/controlled so that different standards can be applied to each and improvements to uncontrolled discharges driven at pace.

Proposed Definition of Overflow:

Instances where untreated or partially treated wastewater (or stormwater contaminated with wastewater) spills, surcharges, discharges or otherwise escapes from a wastewater network to the external environment. This may be due to different causes and may be released via either constructed (engineered) or unconstructed overflow points. Engineered overflow points are designed and intended to act as an emergency relief valve during instances of capacity overload in the network, whereas unconstructed overflow points are not (but inadvertently perform this function).12

6.7 Support Definition of Bypass

Bypasses are discharges where the wastewater is not fully treated due to inlet flow rates exceeding the design capacity of a wastewater treatment plant, and then discharged into a receiving environment.

6.8 Wastewater Network Risk Management Plans

The Water Services Act 2021 required wastewater network operators to prepare and implement wastewater network risk management plans. As such, seeking feedback while stating that these management plans are “already required in

some regions" seems disingenuous – they are required in all regions. However, this is new legislation, and some network operators may have a draft risk management plan in the process of becoming operative, therefore it is difficult to know which approaches will work well and where there is room for improvement.

Wastewater Risk Management Plans need to relate to and integrate with existing risk management planning tools, stormwater risk management plans, as stormwater and groundwater infiltration are large contributors to wastewater overflows.

Such plans need to have enforceable and actionable plans to remediate overflows and bypasses embedded within them, not merely reports and monitoring.

Fish and Game would want to be notified as an affected party of such plans, to carry out our regional and national statutory responsibilities.

6.9 Monitoring and Reporting Overflows

Fish and Game agrees with the importance of reporting overflows – both for repair, and to the relevant regional authorities, stakeholders, and communities. Existing and new pump stations and engineered overflows should have overflow alarms and duration monitoring. If there are high or medium frequency overflows in uncontrolled discharge points, there should be a priority remediation of those sites to prevent any future overflows. Network operators should be actively seeking new or innovative technologies and skills to allow improved monitoring which is fit-for-purpose for that network.

It is imperative that overflows and bypasses are reported in timely fashion and allow for complete transparency about the extent and duration of wastewater flows into the environment. The onus of reporting should be on the wastewater treatment network operators, to the relevant regional and territorial authorities, and to appropriate websites (such as LAWA) as well as large signage at the site to ensure communities are informed.

7. Arrangements for WWTP Operating on Expired Consents under Section 124 of the RMA 1991

There is discussion around how long should wastewater treatment plants be able to operate under section 124 of the RMA once wastewater standards have been set. We understand that the authority wishes to get existing expired consents consented. Fish and Game support ensuring that all wastewater treatment plants have current and meaningful consents. To this end we suggest the following:

7.1 Prioritise standards that minimises incursion limits of stormwater into wastewater. This will better prepare the industry for the improvements required.
7.2 Develop new standards that are receiving water standards including concentration loads.
7.3 We suggest that minimum standards are set using an NPS-FM 2020 receiving water as the benchmark, as this is what was committed to with the NPS-FM 2020 back in 2021.
7.4 Standards should be set as National Bottom Lines with an expectation that water quality in any given location will not deteriorate, and at a minimum it will be maintained. This philosophy is embedded in the NPS-FM 2020, and has been set in national policy since 2021.

7.5 Timeframe for Granting Consent

To this end, Fish and Game agrees that consents should be granted within a 2-year period of application. However, we don't agree that commencement of this arrangement should be delayed 5 years to allow Territorial Authorities with plants

on expired consents time to plan for and fund necessary upgrades. This 5-year window can be provided for within the conditions of the resource consent; this is normal practice in staged upgrades commonly described in consent conditions.

7.6 One-year delay could be provided for an amended assessment of environmental effects to be provided showing the state of the receiving water (in 2020), and suitable upgrades that can achieve the necessary level of treatment.

8. Botulism and Management Plans

Many of our Fish and Game regions have submitted on problematic WWTP and stormwater discharges that have resulted in botulism and algal blooms which can kill the species that we manage (waterfowl are frequently impacted by botulism blooms) and game hunting dogs (which can be killed after ingesting cyanobacteria). Some examples in recent years include botulism in Otago and Northland and Waikato. These outbreaks involve significant impacts and deaths on both game birds and rare and endangered species.

The following photo from March 2023:

Thousands of wetland birds have been killed by the recent outbreak of botulism. Photo / Fish and Game NZ

Botulism is often viewed as a naturally occurring problem that is outside the control or obligations of local authorities. Fish and Game note that many of the ponds that have frequent botulism outbreaks are poorly aerated, with high

sludge levels. Outbreaks often occur at sites where the ponds no longer provide any facultative treatment function and are largely used for storage when upgraded plants have winter capacity issues. These ponds often have no summer flows, exhibit high (> 25°C) temperatures that persist for days/weeks and have prolonged anoxic events that lead to fish or invertebrate kills. Other factors may include negative redox potential, high salinity and pH between 7.5 and 9.

Unfortunately, many WWTPs provide the perfect microclimate for outbreaks and blooms to occur and can spread to adjacent areas through the carcass-maggot cycle. Outbreaks can be managed, dramatically decreasing their impacts, by adhering to some relatively simple protocols.

Fish and Game suggest that a Botulism Management Plan should be a requirement for at risk WWTP's, although ideally upgrading the WWTP to eliminate botulism would be our preference. As a minimum the operational management plan shall include:

- *An Avian Management Plan (AMP), taking into account any feedback provided by (applicable region) Fish and Game. The objective of the AMP shall be to provide a framework to be adopted to remedy or mitigate any adverse effects associated with an outbreak of avian botulism at the WWTP. The AMP shall include (as a minimum) the monitoring methods and response actions that will be adopted in the event of an outbreak of avian botulism at the WWTP site.*

The four key parts of a Botulism Management Plan are:

• *Monitoring, including environmental and avian triggers levels that will require management interventions.*

• *Environmental manipulation and proactive dispersals prior to the moult.*

• *Early detection of a botulism outbreak, reporting, and escalation.*

• *Recovery of sick birds for rehabilitation and immediate carcass removal.*

A copy of an avian Botulism Management Plan is attached for reference in Attachment 3 of this submission.

Conclusion

9.1 Fish and Game is prepared to work collaboratively with the Government on these environmental performance standards. We are mindful that to be sustainable, development needs to be carried out within environmental limits. Fish and Game do not agree that the proposed standards and will result in acceptable outcomes for the environment and therefore the species that we manage. This is our main concern.

9.2 We thank you for your consideration of this submission. The proposed National Wastewater Standards require amendment to include:

- Minimum end of pipe standards (as opposed to maximum) that allow more stringent standards to be set to meet receiving environment outcomes and consider the cumulative effects of all contaminant sources
- Receiving environment standards that provide for community and environmental outcomes, seasonal/flow related adjustment, allow for integrated catchment management, and drive improvements in treatment technologies
- Incentivisation of partial or full discharges to land over discharges to water
- More flexibility over consent conditions
- More stringent controls on overflows and bypasses

9.3 Fish and Game wish to be heard in support of this submission. The following attachments are included to give you more detail of specific receiving water standards, proposed activity classes, habitat standards that our species require, and overview of our waigoodpolicy web page about the specific standards that our species require, the work we have

done in our waigoodpolicy web page and more general information about Fish and Game.

Attachment 1: Recommendations and examples from Kate McArthur
Attachment 2: Proposed Activity Classes table
Attachment 3: Avian Botulism Management Plan example
Attachment 4: Table Environmental Standards for providing salmonid fishery values
Attachment 5: Waigoodpolicy overview
Attachment 6: About Fish and Game poster
Attachment 7: The species that we manage

Appendix 1. Recommended water quality standards for WWTP discharges to water

Dilution ratio example

Dilution ratios play a critical role in the implementation of the proposed wastewater discharge standards, and discharge volumes have a significant influence on the calculation of the dilution factor. The future volume specified by an applicant for a discharge to water consent becomes a key issue in determining the category of the receiving environment.

As an example, the Palmerston North City sewage discharge, currently undergoing a reconsenting process,[1] has an existing reported dry weather flow of 24,000 m^3/day. For the Manawatū River 7-day MALF of 15.735 m^3/s, this discharge volume results in a dilution ratio of **58**, making it a moderate dilution discharge. The peak consented dry weather discharge is reported as 42,000 m^3/day, this results in a dilution ratio of **33**, which would make it a low dilution discharge. If the smaller discharge volume (24,000 m^3/day) is applied for the purposes of the wastewater discharge standards, most of the allowable contaminant concentrations will be double or triple those which apply if the higher discharge volume (42,000 m^3/day) and associated lower concentration standards were applied.

Table 1. Instream contaminant concentrations from the proposed wastewater discharge standards for two receiving environment dilution scenarios for the Palmerston North City wastewater discharge to the Manawatū River at 7-day MALF flow at Teachers College[2] compared with current upstream medians and management zones targets in the Horizons One Plan.

Parameter	Low dilution ratio	Moderate dilution ratio	Upstream concentration (5-year median LAWA[3]	Current regional plan management zone target
cBOD5 and TSS	0.31 g/m^3	0.46 g/m^3	Not reported[4]	2 g/m^3
Total nitrogen	0.15 g/m^3	0.31 g/m^3	0.61 g/m^3	DIN 0.444 g/m^3
Total phosphorous	0.031 g/m^3	0.093 g/m^3	0.039 g/m^3	DRP 0.015 g/m^3
Ammoniacal nitrogen	0.031 g/m^3	0.093 g/m^3	0.01 g/m^3	0.4 g/m^3
E. coli/100 ml	4.02	20	270/100 ml[5]	260/100 ml

Hard-bottomed receiving environments example – periphyton.

Total nitrogen and total phosphorous standards will not apply to wastewater discharges to hard-bottomed rivers. It is not clear what criteria will be used to determine what constitutes a 'hard-bottomed' receiving environment. Many discharges to rivers are likely to fall into the 'hard-bottomed' category. Notwithstanding this, nuisance periphyton growth and macrophyte

[1] The proposed discharge volume for Palmerston North City WWTP, estimated using the 'largest predicted annual median for discharge volume, across the duration of a consent (m^3/day)', is not currently known.
[2] Henderson R, Diettrich J 2007. Statistical analysis of river flow data in the Horizons Region. NIWA Client Report No. CHC2006-154 prepared for Horizons Regional Council. Pp 349.
[3] Where relevant parameters are reported and directly comparable.
[4] Although visual clarity and turbidity are poor and in the worst 25% of sites in the country, therefore TSS can be presumed to be also poor upstream.
[5] 90th percentile of *E. coli* not reported on LAWA site so not directly comparable to the 5-year median or the target which is an average concentration.

(aquatic weed) proliferation can occur at sites which are not 'hard-bottomed' and epiphytic periphyton growth (growth of periphyton on macrophytes) can also be a significant issue causing low dissolved oxygen at night and poor ecosystem health outcomes where nutrient-rich discharges contribute to soft-bottomed rivers.

Treatment requirements for discharges to hard-bottomed receiving environments are proposed to be set based on using a site-specific risk assessment and the guidance on lookup tables for setting nutrient targets for periphyton (MfE 2022). It is not clear what the 'site-specific risk assessment' entails as this is not documented in the periphyton guidelines (MfE 2022), referenced in the technical report supporting the standards or the discussion document. Using MfE (2022) requires first finding out the River Environment Classification (REC) class to determine the nutrient criteria. Then the desired periphyton state (A, B or C band) must be selected. It is not clear what the process is for deciding the desired periphyton state, or whether this involves a traditional consenting process with potential for community and iwi/hapū involvement.

Section 4 of the periphyton guidance (MfE 2022), 'How to use the lookup tables', specifies the limitations of the approach, including: being clear that the lookup tables are a starting point and not intended as a mandated method for setting nutrient criteria because they are uncertain, they apply to a population of sites and cannot be interpreted for individual sites in isolation and they have a risk of under-protection[6] even when the criteria are adhered to.

The supporting technical document suggests the nutrient criteria for unshaded sites to achieve 95% protection (5% under-protection) – this must be specified within the standards themselves, rather than left to an ad hoc and unclear process. It is unclear whether the consenting of nutrient criteria for periphyton biomass is excluded from a consent under the standards and is, therefore, covered by the traditional resource consent process.

Two forms of nutrient criteria are available to apply from the lookup tables in MfE (2022). Total nitrogen (TN) and total phosphorous (TP) are important nutrient parameters when managing mass loads and any effects on nutrient sensitive downstream receiving environments. However, to manage the effects of periphyton specifically at the discharge site it is strongly recommended that dissolved nutrient fractions are applied. Dissolved nitrogen (DIN) and phosphorous (DRP) contribute directly to periphyton in the immediate vicinity of the discharge because they are instantly bioavailable for periphyton and plant cell uptake.

Dissolved oxygen

The importance of managing nutrient outputs from discharges cannot be understated with respect to ecosystem health and human recreational and aesthetic values. Nuisance periphyton and macrophytes can have a significant influence on other critical instream parameters. Dissolved oxygen is critical to all aquatic life. Concentration and saturation of dissolved oxygen fluctuates diurnally, along with pH, in response to photosynthesis and respiration cycles of periphyton and plants growing within the waterbody. Hypoxia or anoxia can occur overnight as a result of periphyton cellular respiration in the absence of photosynthetic oxygen production and can result in mortality or avoidance effects on aquatic life. Biochemical oxygen demand end of pipe standards will not adequately control dissolved

[6] Under-protection risk is the probability that a randomly chosen site will exceed the designated maximum periphyton biomass threshold even when it is compliant with the specified nutrient concentration criterion.

oxygen in receiving environments that are nutrient enriched and subject to periphyton or plant proliferation.

Table 2. Nutrient criteria for the Palmerston North City discharge to the Manawatū River as per the nutrient criteria lookup tables (MfE 2022) for unshaded rivers at 95% protection to meet the national bottom line for periphyton biomass in the NPS FM (2020). Upstream five-year median concentrations from LAWA.org.nz site 'Manawatū at u/s PNCC STP'.

Parameter	Nutrient criteria	Upstream 5-year median
Total nitrogen (TN)	0.625 mg/L	0.61 mg/L
Dissolved inorganic nitrogen (DIN)	0.543 mg/L[7]	0.374 mg/L
Total phosphorous (TP)	0.058 mg/L	0.039 mg/L
Dissolved reactive phosphorous (DRP)	0.015 mg/L[8]	0.011 mg/L

Exceptions for naturally elevated contaminants

Receiving environments with naturally elevated contaminants are likely to be those affected by geology. Examples of this include soft-sedimentary geology which results in elevated TSS and, in some cases, phosphorous, and volcanic acidic geology which characteristically have elevated concentrations of phosphorous. The process is unclear as to which parameters and what degree of elevation will be considered to exempt a discharge.

Recommended additional standards

In addition to end of pipe minimum treatment standards, the following instream standards are recommended to manage and avoid degradation of water quality and significant adverse effects on the ecosystem and human health of freshwater receiving environments (Table 3).

[7] This exceeds the current Horizons One Plan target for dissolved inorganic nitrogen annual median of 0.444 mg/L.
[8] This is the same as the current Horizons One Plan annual median target for DRP (0.015 mg/L).

Table 3. Recommended receiving environment standards for wastewater discharges to water to provide for the water quality and aquatic life components of freshwater ecosystem health.

Contaminant/parameter	High value ecosystems	All other ecosystems (bottom lines)	Effects on values and further information
Dissolved inorganic nitrogen (DIN) annual median	DIN ≤0.5 mg/L	DIN ≤1.0 mg/L	Ecosystem health STAG (2019) Matheson et al. (2012) – periphyton[9]
Dissolved reactive phosphorous (DRP) annual median	DRP <0.011 mg/L	DRP <0.018 mg/L	
DIN (low risk of macrophyte growth)	DIN ≤0.1 mg/L	<1.0 mg/L	Matheson et al. (2012)
DRP (low risk of macrophyte growth)	DRP ≤0.01 mg/L	<0.1 mg/L	
Lakes: Total nitrogen (TN) annual median	Seasonally stratified and brackish lakes: TN ≤0.35 mg/L (350 mg/m^3) Polymictic lakes: TN ≤0.5 mg/L (500 mg/m^3) NPS FM B Band	Seasonally stratified and brackish lakes: TN ≤0.75 mg/L (750 mg/m^3) Polymictic lakes: TN ≤0.8 mg/L (800 mg/m^3) NPS FM bottom line	Ecosystem health NPS FM (2017)
Lakes: Total phosphorous (TP) annual median	Lakes: TP ≤0.02 mg/L (20 mg/m^3) NPS FM B band	Lakes: TP ≤0.05 mg/l (50 mg/m^3) NPS FM bottom line	
E. coli	NPS FM A-C band (blue - yellow) Must meet all four attributes	NPS FM C band (yellow) Must meet all four attributes	Human health NPS FM (2017)
Dissolved oxygen (DO) continuous monitoring	Rivers: 7-day mean minimum ≥7 mg/L and a 1-day minimum of ≥5 mg/L NPS FM B band	Rivers: 7-day mean minimum ≥5 mg/L and a 1-day minimum of ≥4 mg/L NPS FM bottom line	Ecosystem health NPS FM (2017) Davies-Colley et al. (2013)
	Lakes: Bottom water ≥2 mg/L Mid-hypolimnion ≥5 mg/L Draft NPS FM (2019) B band	Lakes: Bottom water ≥0.5 mg/L Mid-hypolimnion ≥4 mg/L Draft NPS FM (2019) bottom line	Ecosystem health STAG (2019)
pH continuous monitoring	>6.5 – <8.5	>6 – <9	

[9] Alternatively apply site specific MfE (2022) nutrient criteria from lookup tables to match desired periphyton biomass outcomes (A, B or C bands).

Contaminant/parameter	High value ecosystems	All other ecosystems (bottom lines)	Effects on values and further information
Particulate organic matter (POM) / volatile suspended solids (VSS) annual average	All rivers at median or lower flows: POM/VSS ≤5 g/m^3		Quinn and Hickey (1993)
Biochemical oxygen demand ($CBOD_5$) – soluble carbonaceous annual average	All rivers at flows less than flood flows: ≤2 g/m^3		Quinn (1988)
Ammonia toxicity – although see DIN/TN	Rivers and lakes: ≤0.03 mg/L (annual median) and ≤0.05 mg/L (annual maximum) NPS FM (2017) A band - 99% species protection	Rivers and lakes: ≤0.03 mg/L (annual median) and ≤0.05 mg/L (annual maximum) NPS FM (2017) B band – 95% species protection	Ecosystem health NPS FM (2017)
Nitrate toxicity – although see DIN	Rivers and lakes: ≤1.0 mg/L (annual median) and ≤1.5 mg/L (annual 95th%ile) NPS FM (2017) A band - 99% species protection	Rivers: ≤2.4 mg/L (annual median) and ≤3.5 mg/L (annual 95th %ile) NPS FM (2017) B band – 95% species protection	
Toxicants, metals and metalloids	99% species protection level	95% species protection level	ANZG (2018) and updates
Periphyton biomass (chlorophyll *a*)	≤50 mg/m^3 Exceeded no more than 8% of 3 years of monthly samples NPS FM (2017) A band	≤120 mg/m^3 Exceeded no more than 8% of 3 years of monthly samples NPS FM (2017) B band	Ecosystem health NPS FM (2017)
Periphyton % cover (weighted composite cover – mat and filamentous algae combined)	≤20%	≤40%	Ecosystem health Matheson et al. (2012)
Benthic cyanobacteria % cover (annual maximum of transect means)	All rivers: ≤20% cover for human health		Benthic cyanobacteria % cover (annual maximum of transect means)
Lakes: Phytoplankton biomass (chlorophyll *a*)	≤5 mg/m^3 annual median ≤25 mg/m^3 annual maximum NPS FM (2017) B band	≤12 mg/m3 annual median ≤60 mg/m3 annual maximum NPS FM (2017) bottom line	Ecosystem health NPS FM (2017)
Lakes: Planktonic cyanobacteria	All lakes: 80th %ile ≤1.0 mm^3/L biovolume equivalent total cyanobacteria NPS FM (2017) B band (green)		Human health NPS FM (2017)

Contaminant/parameter	High value ecosystems	All other ecosystems (bottom lines)	Effects on values and further information
Quantitative macroinvertebrate community index reduction (QMCI) (paired equivalence test)	All rivers: ≤20% reduction between upstream and downstream		Ecosystem health Stark and Maxted (2007)

Attachment 2 - Activity Status for Wastewater Activities

What You Are Doing	Criteria Resource Consent Required?	Proposed Activity	Fish and Game Recommendation
Discharge to ocean, estuary, lake and river.	Resource consent required	Regional Plan dictate activity status	Discretionary Activity*
Discharge to water.	Proximity to drinking water abstraction 1000m upstream / 100m downstream; 500m radius for lakes; 1000, upstream of any tributaries 500m radius.	Resource Consent required. Activity status dependent on regional plan (DW NES standard).	Discretionary Activity*
*Discharge to water in degraded catchments			Discharges in already degraded catchments should be a Non-Complying Activity
Discharge to water Class A water bodies	Excluded from standards. Resource consent required.	Regional plan dictates activity status.	To keep the water body in pristine condition at least a Discretionary Activity, but preferably a Non-Complying Activity status should apply
Discharge to water. Includes heavy metals	Resource consent required.	Regional plan dictates activity status.	Discretionary Activity or Non-Complying Activity.
Discharge to land.	Resource consent required and site-specific risk assessment.	Activity status set by regional plan.	Discretionary Activity to deal with new contaminants of concern although land discharge is still our preference over discharge to water.
Mixed discharge to land and water.	Resource consent required.	Activity status set by regional plan.	Discretionary Activity.

Discharge to land of Biosolids.	Grade 1/A Permitted Activity.	Grade 1 / B Controlled Grade 2 – Restricted Discretionary (can be refused).	How do we deal with micro plastics / PCBs/ PFAS? We recommend 1A Controlled; 1B Restricted Discretionary and Grade 2 Discretionary .
Overflows.	Resource consent required.	Proposed Controlled Activity.	Non-Complying Activity with conditions to avoid overflows.
Bypasses.	Resource consent required.	Proposed Controlled Activity.	If sufficient storage is provided Controlled Activity could be okay, but Non-Complying Activity would be preferred so that as growth occurs the storage capacity can be increased.
Stormwater inundation.	Appears to be a Permitted Activity.	This is the critical issue to sort out before setting WWTP standards. Preventing stormwater infiltration into the wastewater system will minimise overload to the WWTP. Early detection technology is needed to rapidly notify WWTP of any network overflows.	Non-Complying status where there is a history of inflow and infiltration, Discretionary Activity elsewhere.

Thames Coromandel District Council

Avian Botulism Management Plan

Thames Coromandel District Council Wastewater Treatment Plants

AUGUST 2020

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APPENDICES

Appendix 1	Thames Wastewater Treatment Plant

1.0 OVERVIEW

This Avian Botulism Management Plan (ABMP) provides an overview of what the disease is and the primary receptors. It identifies conditions which may increase the risk of avian botulism at the District's wastewater treatment plants and sets out actions to reduce the likelihood and the severity of an outbreak.

2.0 AVIAN BOTULISM

Avian botulism is a paralytic disease in birds. It affects nerves and paralyses muscles. Infected birds struggle to open eyelids, hold necks up or use limbs. Death may occur within 24 hours or birds may be paralysed for several days first. At Wastewater treatment plants (WWTP) the primary cause of death is drowning.

An avian botulism outbreak can kill significant numbers of avifauna including gulls, black shags, grey teal, mallard, grey ducks, pied stilts, white-faced herons, swan, geese, royal spoonbills and bittern. Commercially raised poultry can also be affected. The most common wildfowl to visit the Thames Coromandel District Council (TCDC) WWTPs are gulls, ducks and swans.

There are no reported human health threats with the strain of bacteria causing bird deaths in New Zealand, although standard personal protective equipment (PPE) should be worn if handling sick or dead birds.

Avian botulism is caused by eating the toxin produced by the bacteria *Clostridium botulinum*. *C. botulinum* spores occur in rotting material and sediments. Spores can lie dormant for years in soil and are released under certain environmental conditions, which often occur in summer.

3.0 ENVIRONMENTAL CONDITIONS THAT SIGNAL AN OUTBREAK

C. botulinum in soil needs a protein source, warm temperature and a low oxygen environment to produce toxins. Decomposing matter (insects, sludge or vegetation) in warm water with reduced oxygen poses high risk.

Environmental management and wastewater engineering are the most effective ways to prevent these conditions, and thus an avian botulism outbreak. Outbreaks can last for several months and may recur. Once botulism is found in a water body it can be difficult to eradicate.

4.0
RISK FACTORS

- As avian botulism outbreaks often occur on oxidation ponds during periods of hot, dry weather, a combination of the following conditions could signal an outbreak:
- A food source (suitable organic substrate)
- Warm water (25-40 ºC)
- Low or declining water levels
- Alkaline conditions (pH 7.5-9.0)
- Reduced oxygen levels (especially in the lower layers of the water column)
- Negative redox potential.

Wastewater treatment plants are high risk environments for avian botulism outbreaks but they can be managed to reduce the risk. Preventative actions in the ponds reduce the likelihood of an outbreak and proactive measures to disperse healthy birds away from sites when environmental monitoring suggests an outbreak is likely and cannot be prevented. The main aim is to keep water levels high and silt low. It is important to look out for sick birds showing the onset of paralysis (e.g. slow to move and flightless) and precursor environmental conditions.

5.0
MONITORING CONDITIONS

Standard monitoring results can indicate high risk conditions. This can trigger actions to alert plant managers to manipulate conditions, e.g. to increase pond aeration. Water levels may be able to be increased but consideration must be given to maintaining a buffer/additional capacity for high intensity rainfall events and increased inflows/infiltration.

As conditions become ideal for an avian botulism outbreak, and bird numbers are high, proactive intervention through dispersal is the best preventative measure to mitigate the number of mortalities.

When total bird numbers reach 100 or greater from the months of Dec-April inclusive active dispersal will be undertaken to reduce numbers below that threshold.

This permit authorises standard waterfowl dispersal techniques, such as;

- Daily human disturbance around the circumference of affected ponds.
- Netting, visual deterrents, electronic audio disturbers, or fireworks.
- Zon guns – i.e. 1 gun per 2 hectares of open water.
- Shooting with shotguns, rifles and bird fright cartridges.

6.0
ACTIONS TO PREVENT AN OUTBREAK

If an avian botulism outbreak is suspected, the following actions may reduce severity of effects:

- Maintain maximum water levels; avoid large water drawdowns.
- Avoid any exposure of putrefying material.

- Reduce addition of new organic materials to the water, where practicable.
- Maintain good water circulation, aeration and mixing of the water column
- Desludge to reduce build up.
- Ensure WWTP have adequate facilities to conduct removals (access to boats and trained staff, OSH compliance).
- Remove and dispose of dead birds / animals
- Remove sick birds (permit may be required)

Where avian botulism outbreaks regularly occur, the following measures should be adopted:

- Identify stagnant areas where toxin may be concentrated. Target these areas for improved water circulation.
- De-sludge every 5 to 7 years; however intervene when necessary

7.0 MONITORING BIRDS

Fly larvae are botulism carriers but are not affected by the toxin. In an avian botulism outbreak, fly larvae feed on contaminated animal carcasses and ingest the toxin. Birds then develop the disease by eating as few as 2- 4 toxin-laden maggots. A dead bird may hold 9,000-10,000 larvae, continuing the botulism cycle.

Prompt removal of dead birds to reduce the spread of bacteria is an important action to reduce the risk of a large outbreak of avian botulism. Site walkovers and surveillance to record waterfowl numbers and any signs of an avian botulism outbreak should be conducted:

- Daily in summer/early autumn - 1 December to 30 March, or during high risk.
- Weekly thereafter - 1st April to 30th November.

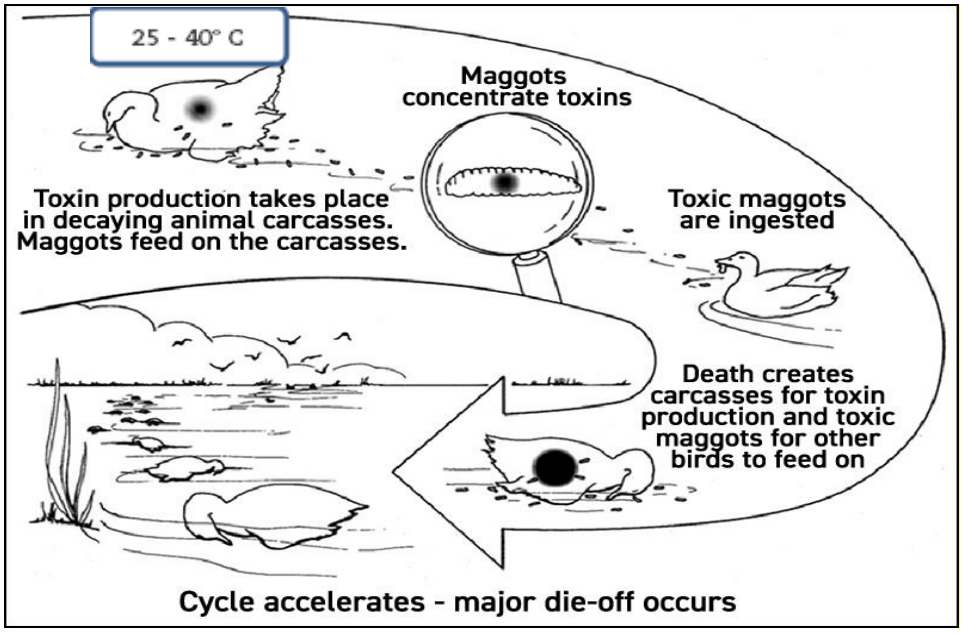


Figure 1. Avian Botulism cycle.
Source: *www.aquaticsystems.com/blog/avian-botulism-whats-wrong-with-the-ducks*

8.0
ACTIONS TAKEN IN AN OUTBREAK

The immediate removal and correct disposal of carcasses is the most effective technique for containing or reducing the spread of avian botulism.

The following actions should be taken if an outbreak of botulism occurs:

- Daily carcass removal and appropriate disposal ie. burned (permit may be required) or made no longer bio-available.
- DoC, TCDC and Fish and Game notified.
- Sick birds captured and removed (permit may be required)
- Decision made by plant managers about dispersal of healthy birds from the site.

9.0
MONITORING AN OUTBREAK

During an outbreak the following information should be collected daily:

- The number and species of birds that have died.
- The number and species of any sick or dead birds unable to be removed.
- The number and species of sick birds removed.
- Any actions taken by the plant operators to manage the outbreak

During an outbreak weekly reports should be submitted to the appropriate TCDC supervisor.

10.0
AVIAN BOTULISM MANAGEMENT PLAN REVIEW & AMENDMENTS

A plan review will be undertaken ten years from the final date of approval of this Plan. Each WWTP will have site specific measures, summarised in the relevant Appendix.

The provisions under this plan and/or the site-specific plan may be amended based on mutual agreement between Thames Coromandel District Council and Fish & Game.

APPENDICES

APPENDIX 1
THAMES WASTEWATER TREATMENT PLANT

WWTP ALARMS

Alarm	Alarm Test Procedure	Likely Cause	Likely Consequences if left	Typical Alarm Response
Sewer Low Float Alarm	Lift Float during routine wet well entry	High well level in the Airport Pump Station. There may be significant inflow, or the level transducer has failed	Risk of Airport Pump Station overflow. Could increase risk of Avian botulism	Check the trends on SCADA. Look for change in wet well level. If the level transducer appears to have failed, contact the telemetry contractor and escalate to supervisor. Escalate the situation if there is no apparent cause for the alarm. Adjust levels
Sewer Low Well Level Alarm	Change low level alarm SP on SCADA to less than duty start level	Pump failure, Power Failure, or low inflow	Could increase risk of Avian botulism	Check the trends on SCADA. Check pump operation and flow rates. Low levels are sometimes experienced in dry weather conditions. If the site power has failed, the generator should start. Consider addition of inflow/oxygenated water to decrease risk
Aerator Fault	Turn off aerator at pond side isolation switch	Aerator has overloaded and tripped its breaker. Pond side isolation switch turned off. Impellor dropped and motor is running at low amps	Damage to aerator if cavitating. Drop in DO level in pond. Anoxic conditions may result which could increase risk of Avian botulism	Check aerator current trend on SCADA. A gradual increase indicates ragging (especially vertical shaft aerators), and eventual overload trip. A sudden drop in current indicates either a motor fault, loss of impellor, or pond side isolation. The aerator should be locked out on site if it is still running and drawing low amps. Arrange for the aerator to be pulled to the side of the pond for inspection/repair

Alarm	Alarm Test Procedure	Likely Cause	Likely Consequences if left	Typical Alarm Response
Triton Aerator Fault	Turn off aerator at pond side isolation switch	Aerator has overloaded and tripped its breaker. Pond side isolation switch turned off. Impellor dropped and motor is running at low amps. Aerator pulled loose from mooring	Damage to aerator or cable if pulled loose from mooring. Drop in DO level in pond. Anoxic conditions may result which could increase risk of Avian botulism	Check aerator current trend on SCADA. A gradual increase indicates ragging, and eventual overload trip. A sudden drop in current indicates either a motor fault, loss of impellor, broken mooring or pond side isolation. The aerator should be locked out on site if it is still running and drawing low amps. Arrange for the aerator to be pulled to the side of the pond for inspection/repair
Blower Fault	Turn off blower at pond side isolation switch	Cable or motor fault. Pond side isolation switch turned off	Drop in DO level in pond. Anoxic conditions may result which could increase risk of Avian botulism	Visit site and inspect cable for damage. Check pond side isolation switch. Run aerator in manual from main switchboard. If unable to determine cause of fault, engage electrician to check blower motor

OPERATIONS & MAINTENANCE PROCEDURES

1. CLEANING THE AIRPORT PUMP STATION WET WELL

The Pump Station Wet Well should be cleaned on a monthly basis.

2. SITE ODOUR CONTROL

Oxygenated wastewater has a distinctive odour, which is less objectionable than wastewater that has undergone oxygen-deficient decomposition (odour of rotten eggs). Dissolved oxygen needs to be in the order of 2 mg/l to reduce the formation of unpleasant odours and related Avian botulism risk conditions. It is therefore critical to keep aerators in a good operational state, and any repairs made before peak summer and periods.

- The SCADA Trends for Dissolved Oxygen Analysers should be checked daily, and the trend for the last day, week and fortnight reviewed. DO levels will likely drop during a hot summers day but should recover overnight.
- *Escalation of sustained low DO levels* to the Operations Engineer or on-call supervisor to remedy.

3. REMOVING AERATORS FROM / RETURNING AERATORS TO THE AERATION POND

From time to time it will be necessary to remove an aerator for maintenance. This will require unfastening one of the mooring lines and guiding the aerator to the shore where it can be lifted out with a crane truck. When re-connecting the aerator power cable, ensure that the mooring cables are taking up the strain and that there is sufficient slack in the power cables. Untwist the cables if they have become twisted. Test each aerator in manual (from the main switchboard) to check for correct operation.

Image: Aeration Pond DO meter

Source: WWTP Operations manual, TCDC.

The two online DO meters should be checked and calibrated monthly to ensure accurate and meaningful results. The operator should be familiar with the measuring principles of the DO sensor.

Cleaning the sensor - Inspect the end of the probe. It should be clear of slime or sludge. Wipe the lens with a soft paper towel and rinse with clean water.

Review the DO trends after 24 hours to ensure the instruments are still operating correctly.

4. ANNUAL AIRPORT PUMP STATION PUMP INSPECTION AND MAINTENANCE

Airport Pump Station Pumps 1 to 4 are lifted and inspected on an annual basis by a Contractor.

5. AERATOR MAINTENANCE

The Aqualators have autogreasers which must be checked annually.

The Cage rotors require 3 monthly bearing grease, and replacement of autogrease units. The gearbox oil requires changing annually.

Grease motor bearings 6 monthly, check for mechanical wear and any defects / noise. Replace auto grease units. Grease the universal joint on the mixer shaft annually.

Aerator pontoons should also be inspected for signs of corrosion.

6. Nuisance Insect Control

The Thames and Coromandel WWTPs' close proximity to the wetlands along the Waihou river makes the site susceptible to insects. Past experience shows nuisance insect populations are transient. A monitoring and minimization approach has been selected as the most cost effective and environmentally sound approach. Routine spraying of chemicals is highly undesirable.

- The operator should note in the plant diary any change in insect populations noted while inspecting the boundary of the plant.
- Grass should be kept short to minimize insect habitat.
- If fly larvae of insect populations increase, the operator should escalate to the supervisor and Operations Engineer.
- If the problem persists, then it may be necessary to engage an Entomologist to first determine which species is the predominant problem, and then advise on suitable methods of deterrence or eradication.

Any complaints by members of the public in close proximity to the WWTP regarding insect populations should be investigated promptly, and a work order raised so that complaints can be tracked to comply with Resource Consent conditions.

7. MONITORING SLUDGE LEVELS

Sludge will slowly accumulate over time. The level and location of the sludge needs to be monitored so that de-sludging can be scheduled.

It is recommended that sludge levels are monitored and recorded regularly.

Attachment 4 - Environmental Standards for Providing Salmonid Fishery Values

Standard	Detail
E. coli	If a single sample from a monitoring site is greater than 540 E. coli per 100 mL, the regional council must, as soon as practicable, take all practicable steps to notify the public and keep the public informed that the site is unsuitable for primary contact, until further sampling shows a result of 540 E. coli per 100 mL or less.
Phytoplankton (trophic state)	<2 annual median attribute band A <10 annual maximum Unit: milligrams chlorophyll-a per cubic metre
Periphyton	Use only the 17% exceedance threshold in Table 2 NPS-FM if that level of exceedance would have occurred under natural occurring processes. The term “conspicuous” has been removed from the NPS-FM 2020 (previously in the 2017 version). Conspicuous periphyton had been interpreted to mean “growing on rocks”. Because of this, approximately 25% of the nation’s rivers (naturally soft-bottom reaches) were excluded from consideration for nutrient outcomes to control periphyton in the NPS-FM 2017. Changes in periphyton abundance and frequency of blooms can be expected to increase as a result of climate change impacts. Warmer weather, longer periods of low flow, and less frequent ‘flushing flows’ to remove periphyton can be expected in many parts of the country. As such, you can expect increased periphyton growth during these conditions. This means controls on nutrients to limit periphyton growth will become even more important in the future.
Nitrogen concentrations	Nutrients impact the water quality and induce algae blooms that can decrease water clarity and dissolved oxygen, causing death to sensitive aquatic species. Nutrients also impact macroinvertebrate species composition, reducing food availability for trout, salmon and indigenous fish species. These effects start to occur at nitrogen concentrations above 0.8 mg/l.

Sediment	Deposited sediment cover in most places should be no higher than 20% and below 10% in important habitat/spawning areas for both native fish and trout and salmon. Suspended sediment should provide for water clarity of at least 0.61 - 2.22m, with this varying depending on the waterbody and needing to be much higher where threatened species, trout fishing and spawning, or swimming are identified values.
Temperature	for water bodies during spawning season cool water below 11 degrees for trout. Salmon require water below 14.5 degrees to successfully spawn and 16 degrees for egg maturation.
Dissolved Oxygen	If fish cannot take up enough oxygen to meet their energy demand for essential functions, ultimately they will suffocate and die. We expect dissolved oxygen target attribute states to be set above the national bottom line outlined in Table 7 of the NPS-FM, and applied throughout the catchment, not just downstream of point source discharges. In salmon spawning reaches during spawning season, dissolved oxygen must not be allowed to fall below 7 mg/l at any time.
Habitat Extent	Natural form and extent as well as river habitat and shading can be measured by the Habitat Quality Index and the Natural Character Index, Rapid Habitat Assessment and Stream Ecological Valuation.
Nutrient standards	DIN limits should be < 1.0 mg/L to protect salmonid fishery values. Outcomes for DIN concentrations should be set at around 0.3 - 0.6mg/L and median DRP concentrations should be set at around 0.01 - 0.03mg/L, where these nutrient limits are already met, or are achievable. Where nutrient concentrations exceed these values, reductions overtime should be considered. Changes may be intergenerational.
Hydrological Variability	Hydrological variability should be within 10% of natural flows for small streams and 20% for larger rivers. This does not include permitted activity takes which is largely an unknown quantity.

Attachment 5 – Wai Good Policy

Pooling resources to protect our wai

Our communities have very strong connections to their rivers, lakes, wetlands, and estuaries and want them to be healthy now and in the future. To help navigate policy and rules a group of organisations has worked together on guidance to make it easier.

There has been a significant public push in recent years for stronger policy and stronger national direction to protect and restore the health of waterways. In some parts of the country water degradation means communities are losing swimming spots, the ability to gather kai and having poor drinking water quality. We are increasingly experiencing the amplified effects of this degradation as climate change impacts intensify.

The guidance was formulated under the Resource Management Act and to work with the new National Policy Statement on Fresh Water. The guidance offers useful ways of managing freshwater health that are science based and which are founded on an integrated catchment management approach. We will review this guidance as the Government makes its changes, but the fundamentals are likely to be enduring under new policy settings.

Regional planning processes can put regions and catchments on the right path to responding to these issues, and to restore the health of our waterways to support the health of our communities.

The waigoodpolicy practice notes will be of interest to regional council policy and science teams, regional council councilors, iwi and hapu groups, Department of Conservation scientists, policy staff, environmental and community groups. This work will also be useful to others who are looking for information, resources and evidence.

The web site was created by Fish &Game, Forest and Bird and Choose Clean Water. Fish & Game is a statutory organisation mandated to manage sports fish and game bird species in New Zealand.

Pulling together the most relevant research and case studies, we have developed best practice notes for freshwater policy development and implementation. We hope that these resources can support your work creating regional plans that meet the needs of your communities while safeguarding freshwater health for current and future generations.

Eighteen topics are covered and include; protecting the habitat of trout and salmon, indigenous fish species, natural form and character and river extent, protecting drinking water supplies, and environmental flows and take limits.

What does Fish & Game do?

Fish & Game NEW ZEALAND

Who are we? **Fish & Game New Zealand manages, maintains and enhances sports fish and game birds and their freshwater habitats in the best long-term interests of anglers, hunters and all New Zealanders.**

Our vision

A New Zealand where freshwater habitats and species flourish, where game bird hunting and fishing traditions thrive and all New Zealanders enjoy access to sustainable wild fish and game resources.

Together, let's ensure a thriving future for fishing and game bird hunting!

What we do

- Manage fishing and hunting regulations
- Conduct research to monitor fish and game bird populations
- Collaborate with communities to protect natural habitats
- Provide educational programmes and resources
- Advocate for valued habitats and species
- Negotiate and maintain access for anglers, hunters and all New Zealanders

fishandgame.org.nz

#ReWild

What does Fish & Game do?

Species management: We monitor and survey species populations; set season regulations; and sustainably manage pressure on the resource.

Habitat protection: Advocate and take action to protect and enhance lakes, rivers, streams and wetlands; and secure 'national park' status to important rivers through Water Conservation Orders.

Access and participation: Negotiate and advocate so all New Zealanders can access our natural places; maintain access signage, information and brochures; organise fishing and hunting events and classes.

Public awareness: Maintain public advocacy; schools programmes; website and newsletters; community liaison; promote the right of licensed anglers and game bird hunters to pursue their chosen pastime.

Compliance: Recruit, train, equip and coordinate warranted rangers, to educate and enforce regulations to ensure the fish and game resource is sustained.

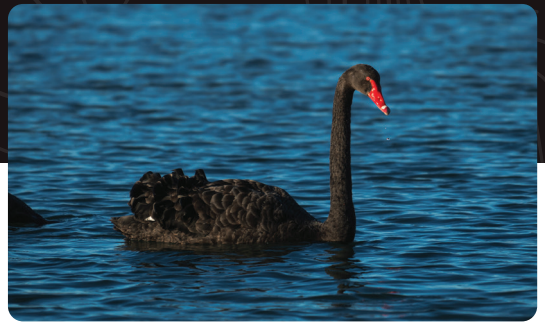
Licensing: Provide a nationwide licensing system with a range of licence categories and sales channels that makes it easy to buy a licence. We are solely funded by licence holders.

Council: Hold public meetings of elected licence holders to approve regulations and budgets, set policies and provide governance for the Fish & Game system.

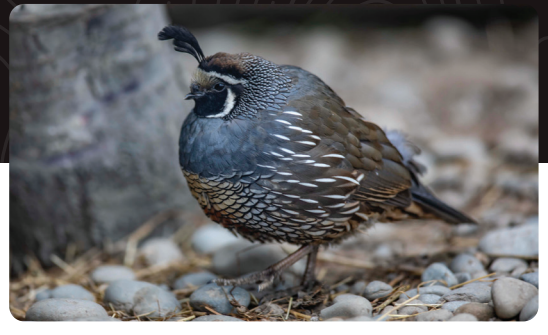
Coordination and planning: Provide research, planning and reporting; financial management and general coordination across Fish & Game New Zealand.

fishandgame.org.nz **#ReWild**

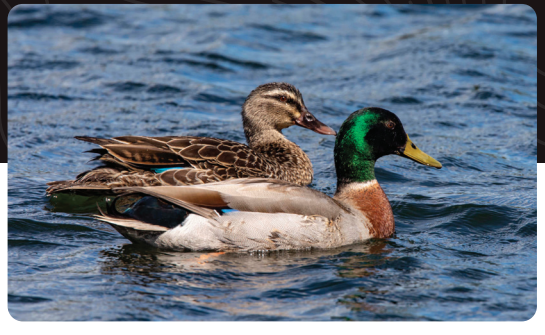
Species we manage



Black Swan Kakianau

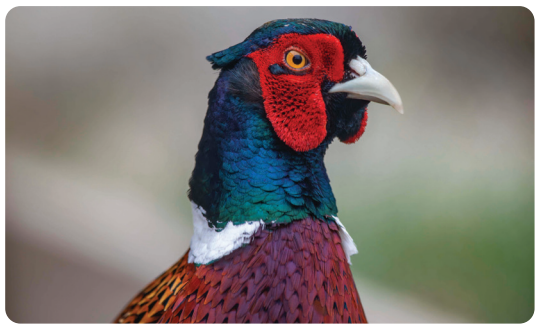


Californian Quail Koitareke



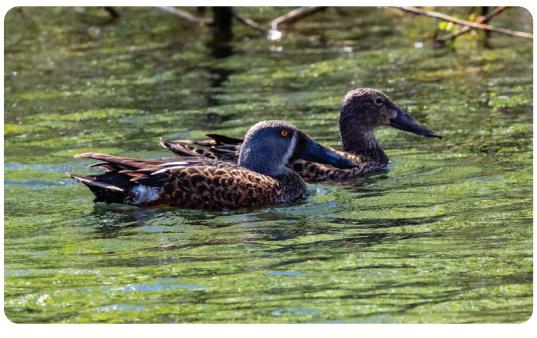
Mallard Rakiraki

Paradise Shelduck Pūtakitaki



Pheasant Peihana

Pūkeko



Shoveler Kuruwhengi

Chukar

Grey Duck Pārera

Brown Trout

Rainbow Trout

Chinook Salmon

Sockeye Salmon

Brook Trout

Tiger Trout

Perch

Tench

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Species we manage

Fish & Game NEW ZEALAND

GAME BIRD SPECIES

Black Swan
Kakianau

Californian Quail
Koitareke

Mallard
Rakiraki

Paradise Shelduck
Pūtakitaki

Pheasant
Peihana

Pūkeko

Shoveler
Kuruwhengi

Chukar

Grey Duck
Pārera

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Species we manage

Fish & Game NEW ZEALAND

FISH SPECIES

Brown Trout

Rainbow Trout

Chinook Salmon

Sockeye Salmon

Brook Trout

Tiger Trout

Perch

Tench

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