



Regional  
targets  
for  
swimmable  
rivers and lakes  
for the  
Taranaki region



# Regional targets for swimmable rivers and lakes for the Taranaki region

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# Introduction

## Purpose

The purpose of this report entitled *Regional targets for swimmable rivers and lakes for the Taranaki region* is to set regional targets to improve the quality of fresh water in specified rivers and lakes and contribute to achieving the national target to increase proportions of specified rivers and lakes that are suitable for primary contact to at least 80% by 2030, and 90% no later than 2040.

This report gives effect to Policy A6(b) requirements of the *National Policy Statement for Freshwater Management* (NPS-FM).

## Background

Taranaki has over 500 named rivers and streams, many of which contain spots or places valued for swimming. However, water quality in the region, as in other parts of New Zealand, varies dramatically with the weather. Taranaki's high rainfall means that even our cleanest waterways may exceed recognised guidelines of contaminants during cold and wet weather, and indeed even during flood flows in summer. The overland flow of rainwater across agricultural land and urban landscapes may easily pick up high levels of the bacteria that are then deposited into our nearest waterways.

The NPS-FM directs all regional councils (including unitary authorities) to set regional targets to improve the quality of fresh water so rivers and lakes are suitable for primary contact more often. Furthermore, under Policy A6(b) of the NPS-FM the Taranaki Regional Council (the Council) is required to develop regional targets and make these

targets available to the public by 31 December 2018. This report has been prepared to meet these requirements.<sup>1</sup>

"Primary contact" includes swimming, and means people's contact with fresh water that involves immersion in the water. Being suitable for primary contact more often includes improvements in water quality from one nationally defined state to another (for example, orange to yellow, yellow to green, or green to blue as set out in the NPS-FM). The NPS-FM does not specify a 'bottom line', or minimum standard, for 'swimmability', but the government's targets are based on only the top 3 (yellow, green, blue) of the 5 categories being acceptable.

A joint taskforce of central and local government representatives sought to use the best information available to model on a regional and national scale:

- The improvements that will be made to water quality in rivers and lakes under programmes that are planned or underway, on a region-by-region basis;
- When the anticipated water quality improvements will be achieved; and
- The likely costs of all interventions, and where these costs will fall.

The assumptions and limitations of the modelling approaches that have been taken are raised in the Taskforce's report<sup>2</sup>, e.g:

*"While there are areas where the science can be improved, for example, the ability to model all four criteria for E. coli results in rivers, it is unlikely these matters will be resolved over the next six months. The Taskforce felt that these uncertainties should not prevent councils making the best estimations possible with the tools and knowledge available to meet the deadline set in the NPS-FM.... changes between scenarios of the proportion of rivers in a given swimming grade can be considered more reliable than estimates of the absolute values of load..."*

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<sup>1</sup> Of note, draft swimmability targets were published and made available to the public by 31 March 2018.

<sup>2</sup> Ministry for the Environment (March 2018). *Regional information for setting draft targets for swimmable lakes and rivers, ME1349.*

The report<sup>3</sup> on these theoretical improvements and costs, presented region-by-region was published in a finalised form by the Ministry for the Environment in March 2018.

The NPS-FM has set a national target of swimmability that by 2030, 80% of all specified rivers and lakes shall be swimmable and by 2040, 90% of specified rivers and lakes shall be swimmable.

The NPS-FM defines “*specified rivers and lakes*” as meaning rivers that are fourth order or above and lakes with a perimeter of 1.5 kilometres or more. Each regional council is required to develop targets to demonstrate a regional contribution towards the national target. The NPS-FM further defines ‘swimmable’ rivers and lakes based on the bacterial concentrations of *Escherichia coli* (*E. coli*) and cyanobacteria as outlined in Table 2 below.

Table 1: *Swimmable criteria for rivers and lakes*

Bacteria	Concentration	Rivers or lakes affected	Swimmable
<i>E. coli</i>	In regular sampling of <i>E. coli</i> , for at least half the time, the estimated risk* is less than 1 in 1000 (0.1% risk).	Rivers and lakes	Yes
<i>Cyanobacteria</i>	Less than or equal to 1.8 cubic millimetres per litre of toxic cyanobacteria OR less than or equal to 10 cubic millimetres per litre of all cyanobacteria.	Lakes	Yes

\* The estimated risk refers to the predicated risk of *Campylobacter* infection to swimmers. Actual risk will generally be less if a person does not swim during times when a river is obviously turbulent or discoloured, e.g. during and after rainfall.



<sup>3</sup> Ministry for the Environment (March 2018). *Regional information for setting draft targets for swimmable lakes and rivers*, ME1349.

## Regional context

The joint Taskforce has advised the Council that currently, overall swimmability for the Taranaki region is estimated (as at 2017) as:

- **39% of rivers,** and
- **97% of lakes.**

This figure has been generated by the computer modelling undertaken on behalf of the Taskforce. The Council was not involved in this modelling.

From the Council's perspective, the regional priorities for the Taranaki region are to focus on interventions that will improve freshwater quality in the region. Good freshwater quality is one of the most important issues for the Council and has been since it was formed almost 30 years ago. The Council's policy position is clear: it is to maintain and enhance water quality in Taranaki's rivers and lakes.

Management interventions (whether regulatory or non-regulatory) over the last 30 years have become increasingly stringent, as each step of progress is made and as expectations rise. The Council has pursued this policy vigorously over the decades in the face of increasing demands and pressures being placed on our freshwater resources, even though indicators of stream health are showing significant gains in the Taranaki region.<sup>4</sup>

The Council has an operative *Regional Fresh Water Plan for Taranaki* which is currently undergoing review. The Plan has a full suite of regulations to ensure discharges to water achieve the Plan's objectives. The Council has recently released its *Requirements for good farm management practices in Taranaki*, which are based on existing policy but which represent a tightening of the requirements to meet modern standards and changing community expectations. One of the initiatives being pursued by the Council is to have discharges of farm dairy effluent to water gradually phased out where it is practicable to do so, and replaced by discharge to land. This will be done as resource

consents come up for renewal. The policy will see further improvements to water quality in Taranaki (including bacteriological quality) and will also be of benefit to farmers in the long run. Further extension and refinement of these requirements through the plan review process will ensure all sectors impacting on water quality adopt good management practices in relation to freshwater resources.

One of the major non-regulatory programmes being run by the Council is the Taranaki Riparian Management Programme. This is a wholly voluntary programme designed to address the effects on water quality of our agricultural sector, primarily dairy farming which is focused on the ring plain and coastal terraces. This programme has been highly successful since it was first introduced in the early 1990s and has transformed the Taranaki landscape. It exceeds national regulatory requirements on a number of fronts, in both spatial scope and in the degree of stream-bank management interventions along each stretch.

Under the Taranaki Riparian Management Programme, 99.5% of dairy farms have a riparian plan in place. The programme covers 15,409 kilometres of stream bank. As at 30 June 2018, 86% of plan holders have fenced their streams and over 72% have their streamside margins in suitable vegetative cover. Over 5.1 million plants have been supplied to plan holders.

Completion of fencing and planting is set for around the end of the decade, when it is intended that a compliance regime will be put in place via the Fresh Water Plan review process to ensure completion of the programme and to ensure its security into the future. It should be noted that the success of the Taranaki Riparian Management Programme has come about as a result of a substantial amount of collaborative work with stakeholders and the wider regional community to determine an appropriate and achievable completion and compliance regime suited to Taranaki conditions. The benefits for water quality of riparian management are universally recognised.

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<sup>4</sup> Ministry for the Environment (March 2018). *Regional information for setting draft targets for swimmable lakes and rivers*, ME1349.

The Council released a draft *Freshwater and Land Management Plan for Taranaki* for pre-notification for comment in 2015. The draft plan builds on the Council's extensive experience in freshwater management and puts in place a management regime that takes account of national policy direction as expressed in the NPS-FM. It would establish freshwater management units and would set objectives and maximum in-stream concentrations for key water quality attributes.

The draft plan also contains rules requiring stock exclusion and riparian planting on land used for intensive pastoral farming, effluent discharge to land, wetland protection and forestry setback distances from waterways. It also contains schedules of outstanding freshwater bodies in the region and regionally significant freshwater and wetland species.

Following comments received on the draft Plan, the Council is now carrying out further consultation and investigations, with the intention of notifying a proposed plan before 2020 which will include provisions that will look to give effect to recent (and proposed) amendments to national policy in the NPS-FM.

The Council has a comprehensive state of the environment monitoring programme which has been running since the mid-1990s. There are several freshwater quality monitoring programmes which form part of the region-wide state of the environment monitoring programme. The results from the programme are regularly reported to the Council. Every few years a more accessible public document written with a broader audience in mind, is produced and given wide public and media attention.

The results of all of our state of the environment monitoring show good to excellent water quality across most parameters measured compared with national guidelines, and generally positive trends. Statistically robust trend analysis show improvements continue to be made over time. In Taranaki, 'swimmability' in our rivers is generally already good to very good where and when it matters – i.e. at recognised community swimming spots during summer (noting that the NPS-FM requires and measures swimmability all-year-round, under all flows and all river conditions).

These results reflect a serious level of financial commitment and prioritised engagement by resource users and the regional community at large.

# Regional targets

## Taskforce modelling projections

The primary contact regional target for the Taranaki region based on the Taskforce modelling of Council programmes and interventions already underway are for:

- **67.4%** of rivers that are fourth order or larger to be in the blue, green or yellow category in terms of *E.coli* by 2030 (see Figure 1); and
- **97%** of lakes with a perimeter of 1.5 kilometres or more to be in the blue, green or yellow category in terms of *E.coli* by 2030.

The change in the percentage of swimmable rivers in Taranaki as currently modelled by Ministry for the Environment (MfE) is the greatest change that would occur in any region in New Zealand (an improvement of over 28% in absolute terms, to 67.4% from the 39% of rivers swimmable as currently modelled). In particular, the percentage of rivers in Taranaki currently assessed as rarely or never swimmable (16.8%) is modelled to reduce to just 2.5%, a relative reduction of 85%.

## Taranaki Regional Council projections

The primary contact regional target for the Taranaki region based on the Council's own assessments of the swimmability benefits from programmes already underway are more conservative (refer to discussion overleaf) and are for:

- **50%-55%** of rivers that are fourth order or larger to be in the blue, green or yellow category in terms of *E.coli* by 2030
- **97%** of lakes with a perimeter of 1.5 kilometres or more to be in the blue, green or yellow category in terms of *E.coli* by 2030.

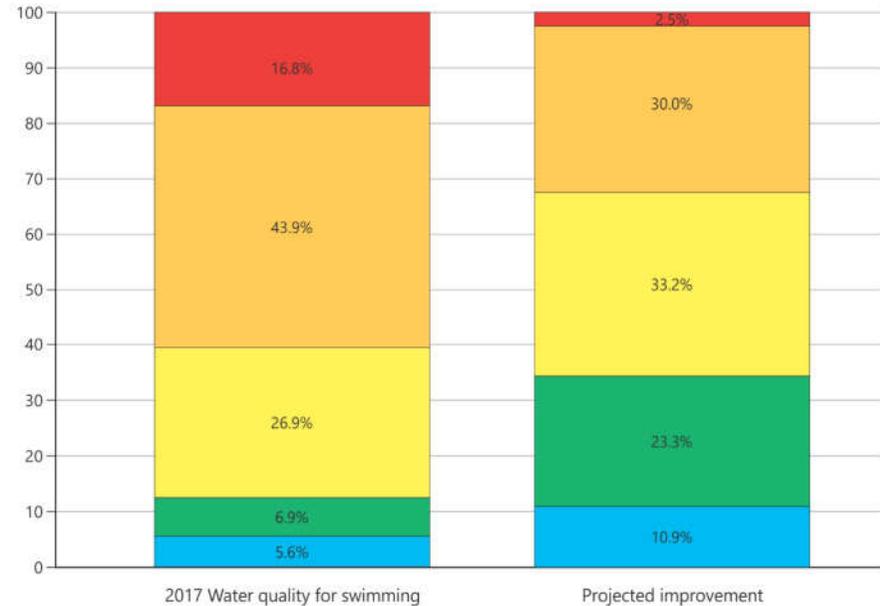


Figure 1: Projected improvement in water quality for swimming for Taranaki rivers by 2030

## Discussion of assumptions and limitations of modelling and the setting of targets

The Council has expressed concerns that the Taskforce's report has critical flaws in methodology and quality. In particular, that the modelling that has been undertaken has not accurately represented and assessed the application of the NPS-FM 95th<sup>th</sup>ile *E coli* criterion to above-median flow conditions, that the modelled costs of riparian planting in the Taranaki region underestimate the investment that Taranaki farmers are making in riparian management, that the reductions in annual *E. coli* loadings from diverting farm dairy effluent from rivers are over-stated, and that the costs of completing farm dairy effluent conversion to land irrigation are under-stated. MfE had indicated that the economic model for costs may be re-run prior to councils setting their final regional targets later in 2018 but at the time of writing this has not occurred.

The Council's view is that the MfE assumptions and inputs to the modelling are overly optimistic, especially around the anticipated water quality benefits of spreading dairy shed effluent on land instead of into treatment ponds which discharge to waterways. For example, the Council's data show that *E. coli* levels in rivers are actually higher in winter (when effluent ponds are not discharging fresh effluent with high *E. coli* counts) than under identical flow and weather conditions in summer (when ponds are discharging for some periods on most days). Two of the seven mid to low catchment monitoring sites are in catchments with minimal or no remaining pond discharges to water (Maketawa and Mangaehu), yet both these sites drop into the lowest (worst) category of swimmability grades under mid to higher flow conditions, whether in winter or summer. The Maketawa Stream carries a considerably higher bacterial concentration in winter under low flow conditions than it does in summer under the same conditions; under winter high flow conditions it drops to the lowest grade. Likewise, the Mangaehu River drops from the best category during winter low flow conditions, to the worst category under winter high flow conditions.

Council staff assessments of swimmability as determined by the NPS-FW, put the likely level of compliance on completion of proposed interventions at **50-55%** of rivers rather than **67%**. The Council believes that the 50-55% figure is a more realistic outcome to be

expected, and is an appropriate target to be pursued. However, it should be noted that even with MfE's overly optimistic analysis, we will fall well short of what is required as a national average under the NPS-FM. This is despite the fact that through the Taranaki Riparian Management Programme the region is investing and doing far more than the NPS-FM requires and doing more than many other regions in New Zealand.

Since 1995, the percentage of Taranaki's ring plain streams fenced has risen from 50% to 85%, and the percentage planted has risen from 42% to above 70%. Notwithstanding that while NIWA confirms a definite reduction in *E coli* levels, the rate of compliance with NPS-FM targets has not changed over the same period<sup>5</sup> due at least in part to the reality that peak concentrations of *E. coli* at peak flows are not reduced by such riparian interventions. Taking the above into account, regional gains in swimmability of some 20-25% in relative terms, from a current 39% (as modelled) to about 50%, is considered more credible than a relative gain of about 75% as is projected

Taking the national perspective, the Taskforce report makes it clear that councils are spending far more than had been proposed as necessary by MfE when the swimmability provisions of the NPS-FM were promulgated, but with far less improvement in swimmability than MfE had proposed would be the case. The report suggests that nationally, swimmability will increase from the current 68.6% of rivers, to only 76.5% - delivering barely one-third of the increase needed to meet the national target.

The Council has commented on the modelling assumptions and parameters used by MfE which raise issues of concern with the value and applicability of the modelling across a number of inputs and assumptions. For example, the input data reflected baseline rather than peak flow conditions, but from observation it is the latter that give rise to the highest concentrations of *E. coli*, the indicator bacteria that establishes 'swimmability'. Similarly, MfE's projection indicate Taranaki has already exceeded national targets for swimmability in lakes (and therefore no problem). However, Council monitoring shows that algal blooms can regularly occur at Lake Rotokare

The Council has received a revised report from the Taskforce charged with gathering regional information for setting draft targets for swimmable rivers and lakes but that report has not addressed the issues raised by the Council (and summarised in this

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<sup>5</sup> NIWA *Analysis of stream responses to riparian management on the Taranaki ring plain*, March 2018, prepared for Taranaki Regional Council.

discussion). The Council believes a fundamental review of the modelling work is required.

The Council has commissioned its own studies, utilising actual water quality and riparian management monitoring data from the last two decades. The report from NIWA was presented to the Council on 24 April 2018. It found a strong correlation between the implementation of riparian management and reductions in *E coli* levels in the waterways of Taranaki, but on the other hand it found a lack of correlation between increasing riparian interventions and any evidence of a change in attainment of the NPS-FM swimmability criteria.



## Summary

Table 2 below shows the proportion of Taranaki rivers and lakes that were classified as swimmable in 2017, along with the projected Taranaki attainment to be met by 2030 (based upon the Taskforce modelling). As noted, at 67%, Taranaki is not going to achieve the national target of 80% for rivers set by the Government. Although, at 97%, Taranaki has already exceeded the national target of 80% set for lakes.

The Council is committed to notifying a proposed Freshwater and Land Management Plan for Taranaki before 2020. The Council intends that the proposed plan will fully implement the NPS-FM. The NPS-FM however, provides for regional councils to fully implement the policy by 31 December 2025, or by 31 December 2030 if certain circumstances apply.

In the meantime the Council will continue to take positive action towards improving water quality for primary contact through the riparian management programme, the diversion of farm dairy effluent discharges to land and the adoption of good management practices to improve water quality across all sectors. The Council will continue to monitor water quality and report trends to the community. The Council will also continue to improve the suitability of fresh water for primary contact through attention to other contaminants (not just *E. coli*), for example water clarity and periphyton growths, and monitor and report flow rates and levels.

Table 2: *Proposed and current proportion of Taranaki rivers and lakes that are swimmable*

Year	Rivers	Lakes
2017 (current)	39%	97%
2030 (regional target - projected)	67%	97%
2030 (national target)	80%	80%

