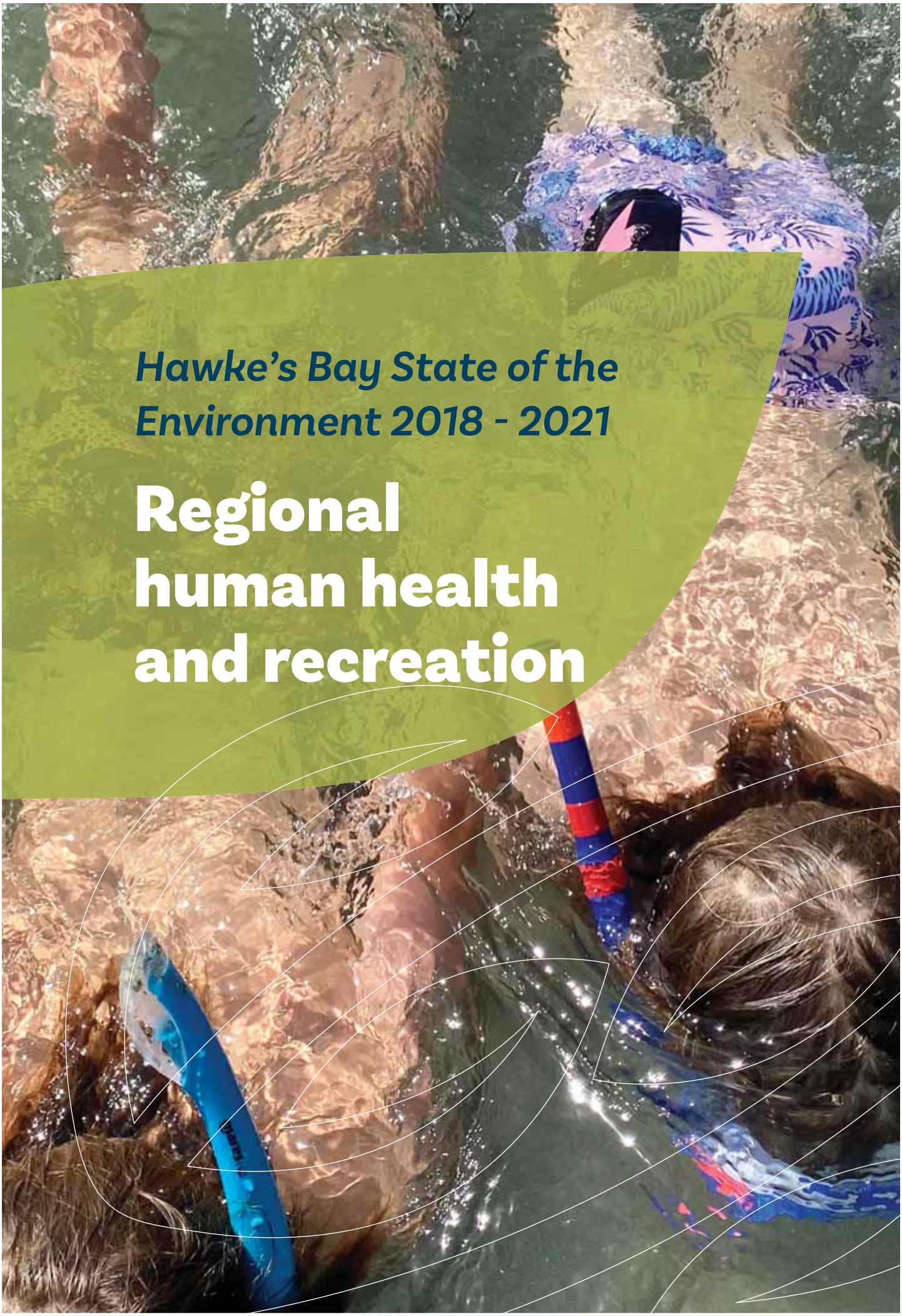

Hawke's Bay State of the Environment 2018 - 2021

Regional human health and recreation

13. Human health and recreation

Hawke's Bay's coastal waters, freshwater lakes, and rivers provide for a range of recreational activities, improving our physical health, enhancing wellbeing, and connecting us with the natural environment (Figure 13-1). The suitability of these areas for contact recreation such as swimming or collecting food can be compromised by the input of human or animal faecal matter, which may indicate the presence of harmful, illness-causing pathogens.

Faecal material can enter waterways through a number of pathways, including through direct sources such as from animals and birds. During summer, when animals need more water, they may make their way to streams or rivers to drink. This increases the likelihood of direct deposition of faeces into the waterway. Rain may also wash contaminants off the land and into waterways as it travels across the landscape, and aged or malfunctioning septic tanks may leak into nearby streams. In urban areas, stormwater pipes may carry faecal material from illegal cross connections, or our sewer systems may be inundated during periods of heavy rain. Each of these transport mechanisms can lead to high levels of bacteria that make waterways unsuitable for swimming and other recreational activities.

Figure 13-1 Swimmers at Pandora Pond, Napier.

Bacteria across the region

A number of HBRC monitoring programmes measure bacteria levels at freshwater, estuarine, beach, and coastal sites. Each site is graded according to the National Objectives Framework (freshwater and estuarine), or the recreational water quality guidelines for freshwater and coastal recreational areas and nearshore coastal sites (Figure 13-2).

For 20 weeks over summer, when most people head to the water, HBRC monitors the water quality at 36 popular sites weekly. Marine beaches in Hawke's Bay tend to have excellent water quality and any instances of high bacterial levels tend to be short-lived. Marine beaches were suitable for swimming 97% of the time over the last five years (Figure 13-3).

Our rivers, lakes, and streams can be more affected by rain, which washes animal waste into waterways. However, these waterways were still suitable for swimming 91% of the time over the last five years (Figure 13-3). Lagoons and coastal streams can have poorer water quality as they are at the end of the catchment and generally have warm, slower moving waters with abundant birdlife that also produce waste. These areas were suitable for swimming 88% of the time they were monitored over the past five years.

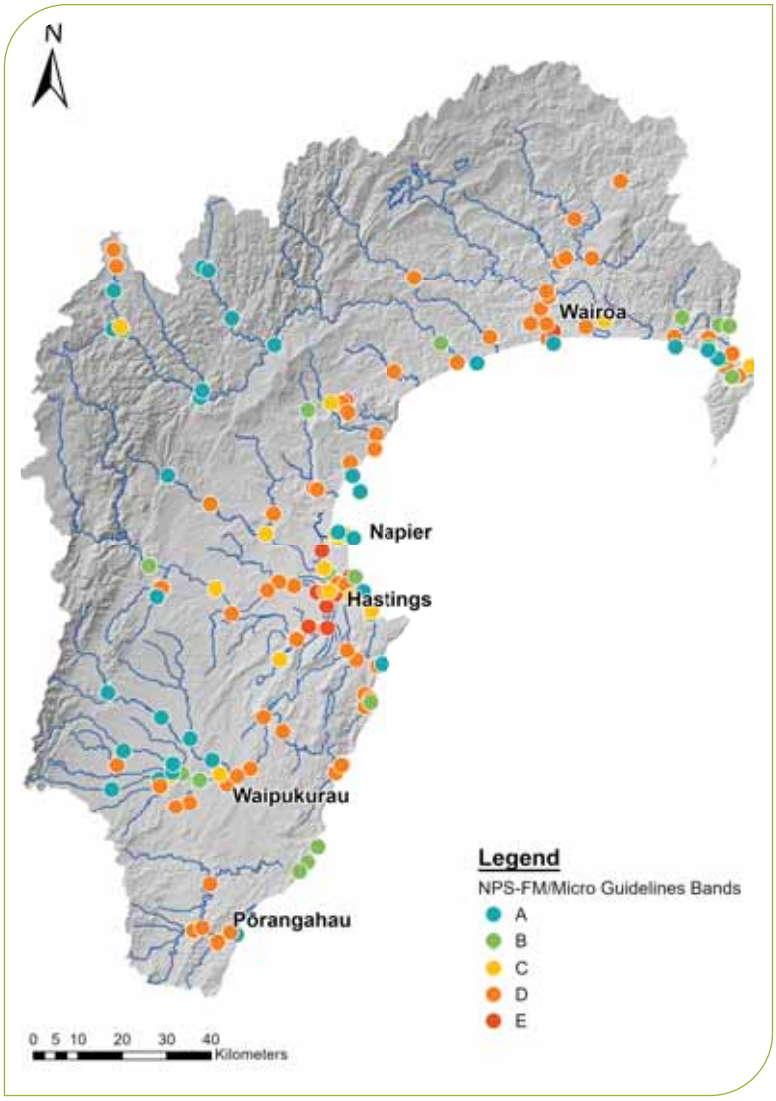

Figure 13-2. All freshwater, estuarine water, recreational, and nearshore water quality sites graded according to the National Policy Statement for Freshwater Management (NPS-FM) Escherichia coli and Primary Recreation grades, and Microbiological Water Quality Guidelines for marine waters (Enterococci).

National Objectives Framework note: The grading system in the National Objectives Framework uses a combination of statistical measures to define the grade. One of these measures is the highest 5% of values the results. In Hawke's Bay periodic rainfall can lead to large flood flows in our rivers and streams. This may mean that risk from swimming at these times may be overestimated as contact recreation is rare and can be dangerous when rivers or streams are in peak flow.

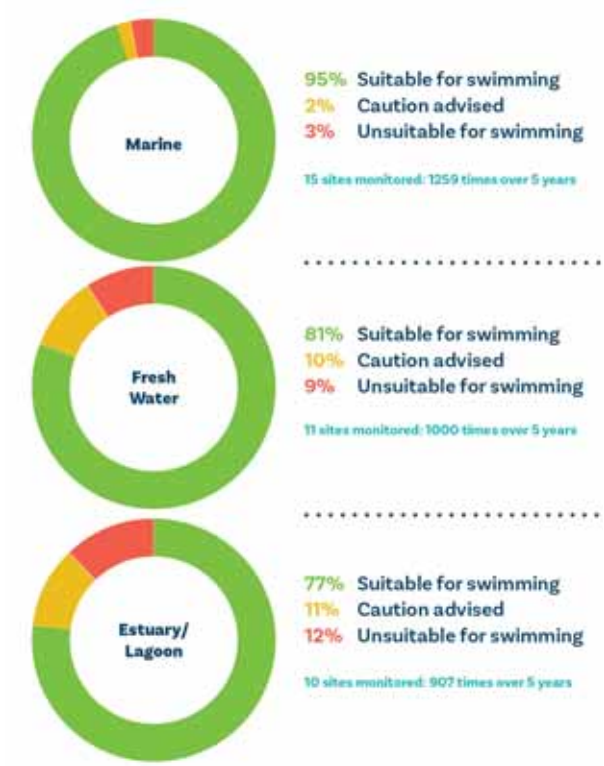

Figure 13-3. Proportion of time that marine, freshwater, and estuarine/lagoon monitoring sites have been suitable for swimming during the summer recreational water quality period over the last five years. (Swimmable = green and amber).

Faecal source tracking

When bacteria levels are high, we need to understand the source of contaminants to better target management and reduce bacterial loads. When sites tend to exceed the guidelines frequently, or at sites where the current state is lower than desired, HBRC conducts faecal source tracking to identify the types of animals responsible. (Figure 13-4).

What can we do?

Because there are a number of ways that contaminants can enter our waterways, we need different approaches to help reduce bacteria depending on the source. Birds are a common source of faecal material in water, and in many instances, this is a natural and healthy part of the environment. However, in some areas large flocks of geese or swans can result in poor water quality. Planting can be used to detract nuisance birds from settling when this occurs.

In areas dominated by ruminants (cows, sheep, deer, goats, and horses), keeping stock out of waterways is the most efficient way to reduce bacterial levels. The Resource Management (Stock Exclusion) Regulations [1] 2020 require farmers to keep cattle, deer, and pigs out of waterways in low-slope areas by July 2025. In some flatter catchments such as the Tukituki, Karamū, and Ahuriri, this exclusion will apply to large tracts of waterways and should reduce faecal contamination. Where water flow over land may be contributing, fencing and planting may help to filter out bacteria before it enters waterways.

In urban areas, improvements to stormwater and sewer networks will help to reduce cross-over and inundation of the networks, which can lead to bacterial discharges into local waterways.

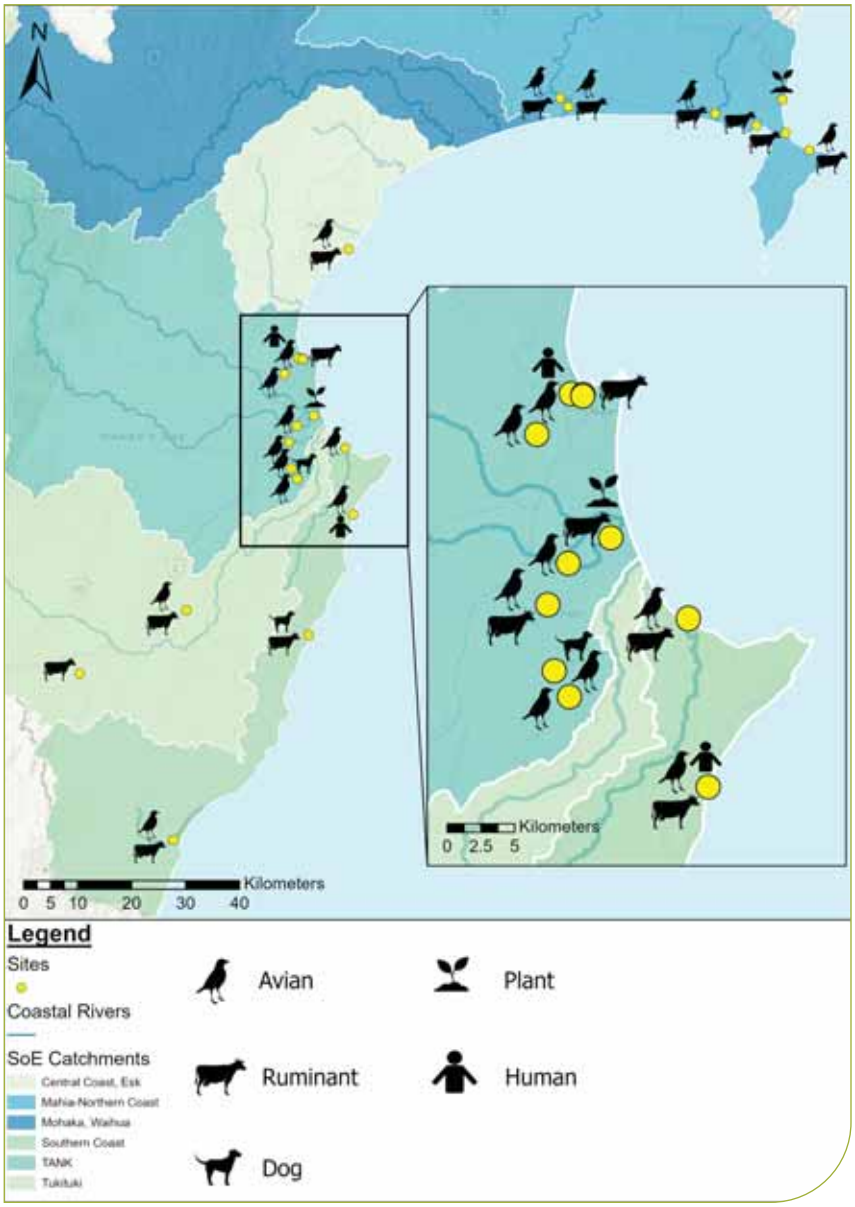

Figure 13-4. Sources of faecal contamination in regional waterways.

[1] https://www.legislation.govt.nz/regulation/public/2020/0175/latest/LMS379869.html

Toxic algae

The presence of potentially toxic algae can also reduce the amount of time a waterway is considered suitable for swimming, irrespective of the overall water quality. In lakes, planktonic algae floating in the water can make the water look brown, red, or bright green. These algae are a natural part of lake dynamics, but nutrient inputs from the surrounding catchment can increase algae to dangerous levels.

In rivers, *Phormidium* is a naturally occurring potentially toxic cyanobacteria (often mistaken for algae) that grows on the surface of rocks and can be a health risk to humans and dogs (Figure 13-5). It can be found in rivers all year round but grows faster in summer. The risk of contact is therefore higher during the hotter months of the year, when people spend more time in the water.

Figure 13-5. Different shades of Phormidium, *including a brown mat growing underwater (left) and an exposed grey mat (right).*

In both lakes and rivers, these particular types of algae can contain toxins in their cells, which can be released into the waterway when the cells degrade. It is difficult to tell whether the algae contain toxins just by looking at them, so we recommend avoiding any potentially toxic algae.

HBRC has monitored 46 river sites for *Phormidium* since 2016 (Figure 13-6). The sites are typically stony riverbeds and can be visually assessed. If over 50% of the riverbed is covered by *Phormidium*, there is a higher risk of accidental contact. This was the case for 12 sites on at least one occasion from July 2016 to June 2021. Most (8) of these were located in the Tukituki catchment.

There is no simple cause and effect relationship between nuisance levels of *Phormidium* and water quality. However, there may be a link to elevated levels of nitrogen in some areas, or when bed sediment is phosphorus rich. A number of regulatory mechanisms may help reduce nutrient and sediment levels and tackle other factors that may exacerbate *Phormidium* growth. National research is being conducted into the risks and drivers of *Phormidium* toxicity.

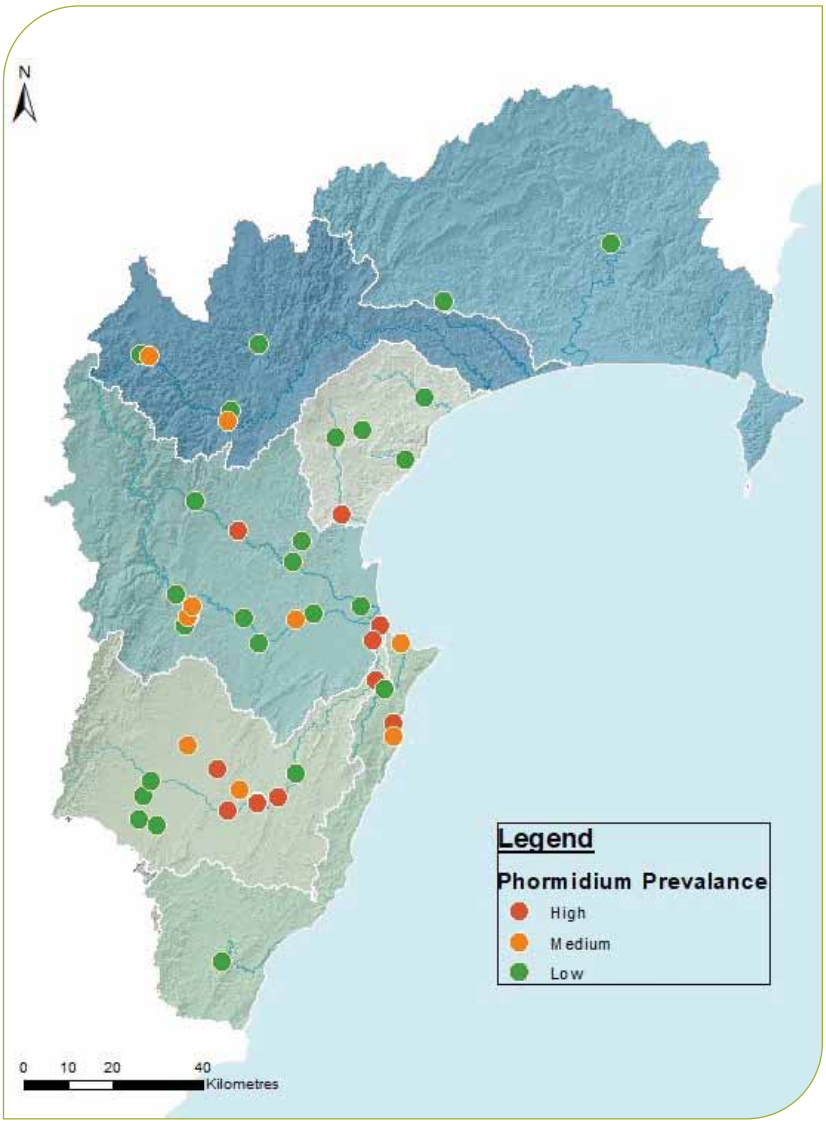

Figure 13-6. Probability of encountering Phormidium at river sites in Hawke's Bay.