Ngāti Huarere ki Whangapoua
Mauri Model Analysis

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Executive Summary

The Whangapoua Harbour is located within the Ngāti Huarere region, on the northeast of the Coromandel Peninsula. Ngāti Huarere are considered kaitiaki of the harbour. Today, the harbour is a popular destination for holidaymakers and tourists. With approximately 350-400 permanent residents, this number can spike to over 7200 in the holiday season; far exceeding the operating capacity of the Matarangi Wastewater Treatment Plant; the municipal wastewater management system. It is within the scope of this project to analyse the situation that Ngāti Huarere have become so concerned about.

The concept of Mauri has been introduced to analyse the overall state of well-being of the harbour. This incorporates the four dimensions of well-being; environmental, economic, social and cultural.

Ngāti Huarere have provided a set of sustainability indicators, with an accompanying set of worldview weightings whilst other stakeholder worldviews have been extracted through proxy indications in the literature that has been discussed in this report. These stakeholder bias values have been used in a stakeholder analysis to capture an objective and quantitative measure of the mauri of the Whangapoua harbour.

From the analysis conducted using the Mauri Model, it can concluded that the mauri of the Whangapoua Harbour is diminishing, heading toward an unsustainable state. A worldview analysis shows that stakeholders perceive and agree with the overall decrease in mauri. This report provides all stakeholders with an in-depth holistic analysis of the Whangapoua harbour that quantifies concerns of Ngāti Huarere surrounding the trending decrease in mauri.

It is recommended that a healthy and working relationship between Ngāti Huarere, Thames-Coromandel District Council and Waikato Regional Council be established to recognise and respect Ngāti Huarere as kaitiaki of the area.

This relationship will provide a platform for all parties to begin a process of re-consenting the Matarangi Wastewater Treatment Plant, with the ambition of upgrading or completely replacing the existing plant. With the impending expiry of the current resource consent, this re-consenting process should be actioned immediately.

Figure 1. Whangapoua Beach (Drok, 2011)

Table of Contents

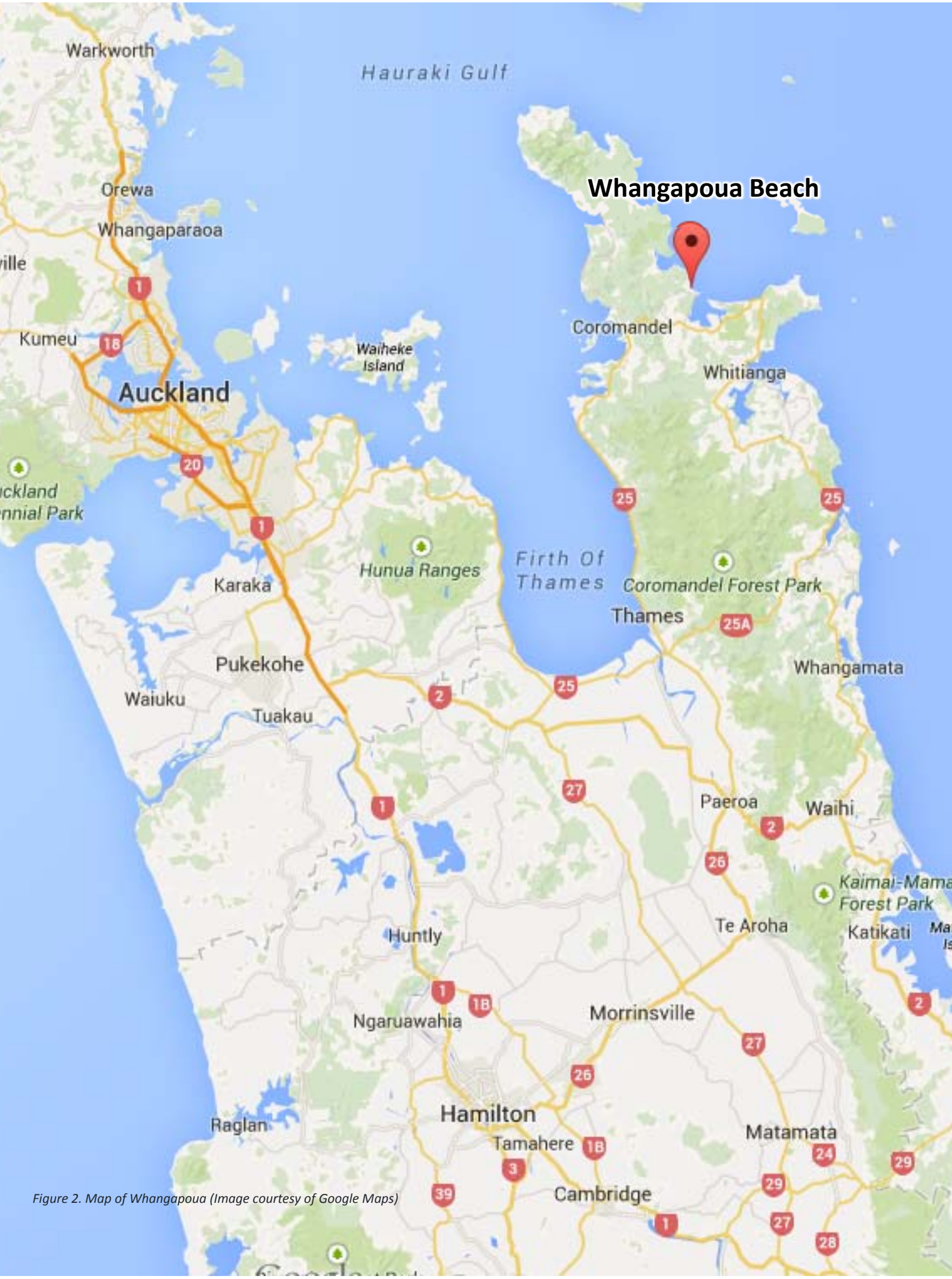

Figure 2. Map of Whangapoua (Image courtesy of Google Maps)

Introduction

Huarere is the eponymous ancestor of the Ngāti Huarere hapū. Huarere was the grandson of Te Arawa chief, Tama-te-kapua, and son of Tuhoro, therefore Ngāti Huarere share genealogical links with Te Arawa (Graham, 1923). Originally based in the lower Coromandel area, warfare between adjacent hapū (peoples) resulted in the emigration of Huarere and his followers to the northern districts of the Coromandel. Those who descend from the Ngāti Huarere hapu that immigrated to this area are today known as Ngāti Huarere ki Whangapoua.

Today, the harbour is a popular destination for holidaymakers and tourists. With approximately 350-400 permanent residents, this number can spike to over 7200 in the holiday season. This far exceeds the operating capacity of the Matarangi Wastewater Treatment Plan; the municipal wastewater management system[1].

Ngāti Huarere ki Whangapoua[2] are concerned about the well-being of the Whangapoua Harbour. It provides key resources for the hapū and is a vehicle for the transfer of traditional knowledge of mahinga kai and manaakitanga. Furthermore, Ngāti Huarere are concerned about discharge from the Matarangi Wastewater Treatment Plant during times of peak operation. This is seen by Ngāti Huarere as having adverse effects on the mauri of the harbour and threatens the geographical and cultural relationship that Ngāti Huarere share with the harbour.

To understand the scope of the project, many key concepts must be understood. Indigenous knowledge systems must be involved to understand the perspective that Ngāti Huarere have toward the ecosystem, and furthermore their responsibilities as kaitiaki. It is imperative that indigenous knowledge be incorporated as it is, in many instances, incompatible with generic 'western' models (White, 2006). Morgan (2008) argues that cultural understanding is essential as contemporary legislations requires consideration of environmental, cultural, social and economic effects.

Sustainability, and the method by which one defines this concept, must be highlighted in both a western and indigenous people's context. Due to the quantitative nature of the analysis, it is within the scope of the project to consider existing methods and tools that are currently used to determine the level of 'sustainability' of a system.

The Mauri Model (Morgan, 2006a) utilises mauri as a holistic indicator of the four dimensions of well-being by virtue of Section 5 of the Resource Management Act 1991; these are environmental, economic, social and cultural[3]. The Mauri Model will include societal and cultural effects in the assessment of the Whangapoua Harbour to acknowledge the status of the Ngāti Huarere hapū as kaitiaki.

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[1] Thames-coromandel proposed district plan, (2013).
[2] The terms 'Ngati Huarere ki Whangapoua' and 'Ngati Huarere' will be used interchangeably, both referring to Ngati Huarere ki Whangapoua.
[3] Resource management act, 69, (1991).

Mauri

Mauri is a concept that permeates all Maori thinking. It is the binding force between the physical and spiritual components of all things being (Morgan, 2006a). Mauri is the natural holistic force that allows all things to exist synchronously and harmoniously (Marsden & Royal, 2003). Mauri is considered the spark of life that all things hold (Williams, 2006). All things are deemed to have mauri; people, fish, animals and birds, land, seas and rivers (Te Maire Tau, Anake Goodall, Palmer, & Tau, 1990).

Morgan (2008) highlights many cultures that share a similar spiritual concept based around the connection between all things. This alludes to the acceptability of the concept of mauri within many indigenous knowledge systems (Morgan, 2008). Such examples include Qi; a traditional Chinese concept of the 'life force' that exists in all things (Wu, Cheng, Fang, & He, 2013), Mana; a concept found in the culture of the indigenous people of Hawai'i (Marshall, 2011) and Thymos; the Grecian concept pertaining to, what is referred to today as, consciousness, awareness and thought. Mauri is also akin to the Asmat value of ja asamanam apcamar, interpreted as "keep in balance" (Wambrauw & Morgan, 2014). Western culture popularize a "binding, metaphysical, and ubiquitous power" in the fictional universe of Star Wars, aptly named 'The Force' (Wikipedia Contributors, 2015).

Morgan (2006) uses the discussion above to justify the suitability of mauri as a measure of sustainability. The preservation of mauri controls the sustainability of a resource. The goal of the inhabitants of the ecosystem is to ensure the mauri of all resources are maintained or enhanced.

Mauri has been recognised, through the Waikato Regional Policy Statement 2000, as an appropriate measure of active protection of resources of importance to Maori; a key element of the principles of the Treaty of Waitangi. Waikato Regional Council state that "the diminution of mauri has a negative impact on the natural and physical resources and also impacts on the mana of tangata whenua, who have the responsibility as kaitiaki, to ensure that the mauri of their taonga is not affected".[4]

In accordance with Section 8 of the Resource Management Act 1991[5], "all persons exercising functions and powers under [the Resource Management Act] in relation to the use, development and protection of natural and physical resources shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi)". The indigenous concept of Mauri can therefore be validate as an appropriate metric in the assessment of the state of the Whangapoua Harbour by virtue of the Resource Management Act and supporting regional plans.

[4] Operative waikato regional policy statement, (2000).
[5] Resource management act, (1991).

Background

An Indigenous Perspective of Water

Marsden (1975) retells the well-known Maori story of creation. The sky father, Ranginui, and the earth mother, Papatūānuku, joined together at the hip, are forced apart by their children. As gods of their respective realms, their children flourished the world to create the seas, the winds, and the forest and so on. The yearning of Ranginui for Papatūānuku is visualised as rainfall, tears from the sky father, whilst the longing that Papatūānuku feels is captured through the presence of naturally occurring fresh water springs, tears from the earth mother. These are considered as the purest forms of water. These tapu (or sacred) waters and only usable after they have passed over Papatūānuku and become noa (or profane) (Morgan, 2011).

Morgan (2006b) states that the previous 20 years of Waitangi Tribunal claims reinforce the fact the Maori see water as a 'taonga'– something to be cherished and treasured. Morgan (2011) and Dixon (2007) both discuss the cultural significance of water. Water is categorised by its physical and spiritual health and geographical location. *Wai Ora* is the purest form of water, not tainted physically or spiritually. After it has passed over the land it becomes *Wai Maori*. Wai Maori is clean, profane, and suitable for most uses. *Wai Tapu* is sacred water due to its location, origin, or relationship to other sacred entities. *Wai Tai* is tidal and coastal water. *Wai Kino* is water that has been exposed to pollution and can negatively affect other water sources, whereas Wai Mate has been contaminated and polluted and completely exhausted of its mauri (Morgan, 2011).

Complex rules surrounding the appropriate use of water have been actioned as kawa (or protocols) and practices to ensure that it is used in a manner that does not degrade the mauri of the water (Dixon, 2007). The past 20 years of Waitangi Tribunal claims demonstrate this (Morgan, 2006b).

The Waitangi Tribunal have received many claims pertaining to the pollution of waters due to industrial development and municipal utilities adversely impacting traditional food sources. These claims include WAI6 (1983) lodged by Te Ati Awa, WAI8 (1984) submitted by Ngāti Pikiao, WAI8 (1985) submitted by Ngāti Te Ata, and WAI3 (1990) submitted by Tauranga Maori Committee. The numerous claims submitted to the Waitangi Tribunal, regarding the cultural significance of the water, illustrate the importance of the tribal waters to tangata whenua.

Muru (2010) argues that Waikato River is at the heart of the identity of the Tainui people, whom which see the Waikato River as an important tribal ancestor; the bloodline of the kingitanga. Dixon (2007) further discusses the colonization of Waikato and Tauranga regions, and the introduction of foreign water management techniques which have seriously degraded the health of water systems in these areas. This is directly transferrable to Ngāti Huarere ki Whangapoua and the Whangapoua Harbour.

The Whangapoua Harbour

The Whangapoua Harbour is located within the Ngāti Huarere ki Whangapoua geographical jurisdiction, on the northeast of the Coromandel Peninsula. Ngāti Huarere are considered kaitiaki of the harbour. The harbour is a shallow estuary composed of brackish water, with the Waitekuri River, Opitonui River,

Owera Stream, Otanguru Stream, and Mapauriki Stream draining into the harbour leading through a single narrow outlet into the sea[6].

The harbour provides recreational, cultural and commercial uses, such as swimming, boating, fishing, and shellfish gathering. It provides locations for marinas and marine farms, and more importantly is a feeding, spawning and nursery habitat for many species of fish, shellfish and birds. The estuary acts as a natural silt trap collecting sediment, reducing the level of contaminants that reach the sea.

Natural factors that affect the health and water quality of the harbour are seasonal changes, the impact of episodic events (such as major storms), the state of the tide, the distance from the coast and the extent to which inflowing freshwater is diluted with clean seawater. This being said, the harbour is most at risk from human activities[7]. Anthropogenic disturbances are due to factors such as: the dumping of sediment, nutrients and pollutants; coastal development which increase pressure on landfills and waste treatment systems; clearing for development; resource extraction; and the introduction of foreign species into the ecosystem.

There is a clear environmental risk associated with the local utilities due to the geographical placement and cultural significance of the area, particularly with the wastewater treatment plant. If a non-compliant activity were poorly monitored, damaging effects to the harbour can be expected. This impacts the surrounding ecosystem, its tributaries, and the status of Ngāti Huarere as kaitiaki.

Ngāti Huarere have perceived a decline in the mauri of the Whangapoua harbour through indigenous observations and proxy indicators such as the decline in healthy seafood stocks. F. Berkes, M. K. Berkes and Fast (2007) discuss indigenous monitoring of coastal regions through indigenous indicators. Although indigenous observations cannot quantify the state of the harbour as precisely as scientific measurements, different knowledge systems are required from different stakeholders help to fully understand the health of coastal ecosystems (Berkes et al., 2007). Ngāti Huarere, and their role of kaitiaki, should be incorporated in to the holistic understanding of the Whangapoua harbour.

Roberts et al. (1995) seek to define kaitiaki and kaitiakitanga. Kaitiaki can be directly translated to ‘guardian’, and kaitiakitanga to ‘the act of guardianship’. Many complex laws have been put in place to ensure the appropriate guardianship of the mauri of resources (Roberts et al., 1995). Those who are tangata whenua take on the act of kaitiaki. Minihinnick (1989) states “only tangata whenua can be kaitiaki”. Kaitiaki are given the role of preserving the mauri of a specific area within the locality of a hapū. Roberts et al (1995) further discusses the concept of culture being the ‘indivisible sum’ of both the physical environment and the spiritual realm. That is to say there is no isolated landscape where one does not exist without the other. Western science has dichotomized the observable world in to two categories leaving one in the shadow of the other. The western concept of ‘nature’ is a landscape that

[6] “Estuaries”, Waikato Regional Council, http://www.waikatoregion.govt.nz/Environment/Natural-resources/coast/Coastal-ecosystems/Estuaries/¹⁷

[7] “Threats to Estuaries”, Waikato Regional Council, http://www.waikatoregion.govt.nz/Environment/Natural-resources/coast/Coastal-ecosystems/Estuaries/Threats-to-estuaries/

holds all physical entities, while the 'spiritual' realm is shunned to the side (Roberts et al., 1995). This is inconsistent with the indigenous view of the world.

Legislation

The concept of kaitiakitanga is more notably mentioned in legislation through the New Zealand's Resource Management Act 1991 and its amendments. Section 7(a) of the Resource Management Act 1991 (RMA) outlines the recognition of kaitiakitanga, that is "the exercise or guardianship by the tangata whenua of an area in accordance with Tikanga Maori in relation to natural and physical resources; and includes the ethic of stewardship"[8]

Morgan (2006b) discusses further legislative documents as significant references to indigenous principles all originating from New Zealand's founding document, Te Tiriti o Waitangi 1840. History showcases many instances where the Principles of the Treaty have not been upheld, and at times, blatantly ignored. The principles of the Treaty of Waitangi were not clearly defined and understood until the Treaty of Waitangi Act 1975, followed by the establishment of the permanent commission of enquiry, the Waitangi Tribunal (Stokes, 1992). The Waitangi Tribunal allows Maori to exercise guardianship over their lands and promote their status as tangata whenua (Morgan, 2006b).

Bess (2001) discusses that the majority of all claims are in relation to the misuse and degradation of water bodies and aquatic ecosystems. Morgan (2011) argues that there is need for an effective process for the inclusion of Maori input on water management issues, given very few processes have been developed specifically for Aotearoa.

Waikato Regional Council (2010) highlight the use of mauri and claim that the mauri of fresh water bodies be protected by maintaining relationships with tangata whenua, and recognising the value of harvesting aquatic food species and mahinga kai. The Waikato Regional Policy Statement (RPS) provides policies and a range of methods to achieve integrated management of the regions natural and physical resources. Section 32 of the Resource Management Act 1991 (RMA) requires councils to consider alternative ways to achieve the environmental outcomes sought. An accompanying document to the Waikato RPS, the Section 32 Analysis Report, is produced by Waikato Regional Council (WRC) to assess the extent to which each objective proposed through the Waikato RPS is appropriate to achieve the purpose of the RMA. The WRC therefore have outlined strong considerations of tangata whenua values, such as kaitiakitanga and mauri, all in accordance with NZ legislation.

The Thames Coromandel Proposed District Plan[9] states that the local authority have a requirement under the Resource Management Act 1991 of "recognising and providing for the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu and other taonga". Thames- Coromandel District Council state in Section 17 of the Thames-Coromandel Proposed District

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[8] *Guidelines for consulting with tangata whenua under the RMA: An update on case law. (). Wellington, New Zealand: Ministry for the Environment.*

[9] *Thames-coromandel proposed district plan: Section 17 - tangata whenua. (2013). (Proposal).Thames-Coromandel District Council.*

Plan that “the Council must also have particular regard to kaitiakitanga, and take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi)”. The role that Ngāti Huarere fulfil as kaitiaki for the Whangapoua harbour must be therefore be recognised by local authorities as it is outlined in the Thames-Coromandel Proposed District Plan (TCPDP).

The TCPDP states in Section 17.1.3 that the council must develop contacts, processes, and procedures to include Maori values in land use. Another important extract from this report surrounds non-regulatory methods stating that the “Council will work with tangata whenua to develop contacts, processes and procedures for involvement in resource management”. Ngāti Huarere, acting as kaitiaki, have raised issues of serious concern with reference to the well-being of the harbour. As of such the council should provide adequate support for tangata whenua and involve tangata whenua in resource management processes as is mentioned above.

It is imperative that Ngāti Huarere and Thames-Coromandel District Council meet the requirements set out in the Thames-Coromandel District Plan, as well as the wider Operative Waikato Regional Council Plan, both of which are in accordance with the Resource Management Act 1991 and the Treaty of Waitangi Act 1975.

Sustainability

Many have examined the phrase ‘having particular regard to kaitiakitanga’ and what it should mean for decision-makers. In many instances, there exists tension when managing resources; the consenting authority may make decisions under the RMA, however kaitiakitanga over a resource can also be exercised.[10]

In addition to the misunderstandings surrounding the concept of kaitiakitanga, we approach the catch-all phrase for environmental management – sustainable development. A report prepared by Cawthron Institute (2013) for the Ministry of Business, Innovation and Employment investigates a range of sustainability assessment tools using different indicator sets and their ability to measure ‘sustainability’. The report highlights the inconsistencies with the definition of ‘sustainable development’ across different indicator sets. This adds further complexity to the project at hand.

In the Cawthron Report, Challenger (2013) defines ‘sustainability’ and ‘sustainable development’ using a credible process for developing sustainability indicator sets, the BellagioSTAMP method (Bakkes, 2012). Of all eleven indicator sets that were analysed, only two indicator sets used in the industry defined sustainability in a similar way to what was proposed: the Mauri Model and Whislter2020. A reoccurring flaw shared amongst of most indicator sets is the use of the Bruntland definition of sustainable development: the ability to make development sustainable is to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs (Robert, Parris, & Leiserowitz, 2005). The Bruntland definition defines the path towards sustainability, not what it looks like.

[10] *Guidelines for consulting with tangata whenua under the RMA: An update on case law. (2003). . Wellington, New Zealand: Ministry for the Environment.*

In another report by Hellström, Jeppsson, and Kärrman (2000), the lack of a concise definition for 'sustainable development' is again highlighted in the field of urban water mangament. Hellström et al. also propose a set of sustainability criteria covering a range of aspects including health, hygiene, social, cultural, environmental, economic and technical considerations. Corresponding indicators for the proposed criteria are discussed, focussing on urban water and water systems. Here a set of criteria have been established, with associated ecological indicators for each criteria.

Jørgensen, Burkhard, and Müller (2013) review the different types of ecological indicators that have been used in the past 20 years seeking to understand and determine the state of sustainability of a system. Indicators are aggregated and analysed as groups. Ecological indicators attempt to provide holistic and quantitative information for an ecosystem, from a set of simple measures and observable quantities (Jørgensen et al., 2013). It is concluded by Jørgensen et al. (2013) that more emphasis should be placed on aggregation of the indicators to provide a meaningful summary of the overall state of the system.

Morgan (2006a) discusses the use of mauri as a metric for the measurement of sustainability. In use of this metric, Morgan aggregates indicators sets into four dimensions of wellbeing: economic, social, cultural, and environmental wellbeing. These dimensions of wellbeing are consistent with those stated in the Resource Management Act 1991. This provides an overall index of mauri for the system.

Jørgensen et al. (2013) deliberates the necessity to quantify the weightings of the indicators, as author and decision maker subjectivity and viewpoints will strongly influence the outcomes when deriving an overall index. Morgan (2006a) handles this issue with the inclusion of worldview weightings in the arithmetic combination of the above dimensions of wellbeing, highlighting the inclusion of the decision-maker's own subjectivity.

Objective

The objective of this project was to provide Ngāti Huarere with an assessment of the Whangapoua harbour, in attempt to quantify the indigenous indicators that have shown a decrease in the mauri of the harbour. In order to meet this objective Ngāti Huarere, along with other stakeholders, would be considered in the analysis, provide indicator sets unique to the locality pertaining to the four dimensions of wellbeing (economic, environmental, social and cultural). The analysis would also provide the opportunity to comparatively assess the perspective of each stakeholders involved in the project.

The objective of the project was not to provide solutions, but to justify the concerns being shown and provide enough information for Thames-Coromandel District Council and Waikato Regional Council to observe the true state of the harbour and therefore act accordingly in collaboration with Ngāti Huarere. This report would provide the basis for all parties to undertake discussions amongst themselves and make their own decisions and solutions to maintain the natural character of the Whangapoua harbour.

Methodology

Mauri Model

The Mauri Model (Morgan, 2006a) is a decision support tool that utilises mauri as a holistic measurement of a system consistent. The Mauri Model aims to assess the absolute sustainability of the harbour system utilising a cultural based template within which indigenous values are recognised.

Legislation within New Zealand recognises the significance of sustainable development of the four dimensions of wellbeing. To adequately measure the dimensions of well-being using mauri as a metric, physical representations are required to evaluate each dimension. These representations have been chosen, by Morgan (2006a), as the mauri of the community (social), whanau or family unit (economic), ecosystem (environmental) and hapū or clan group (cultural). Furthermore each of the representations can be considered subsets of each other. The mauri model is a non-anthropocentric model. All whanau are part of the community, and the community combines with others to form hapū. The hapū identifies with significant geographic features with strong cultural connections to the ecosystem (Morgan, 2006a).

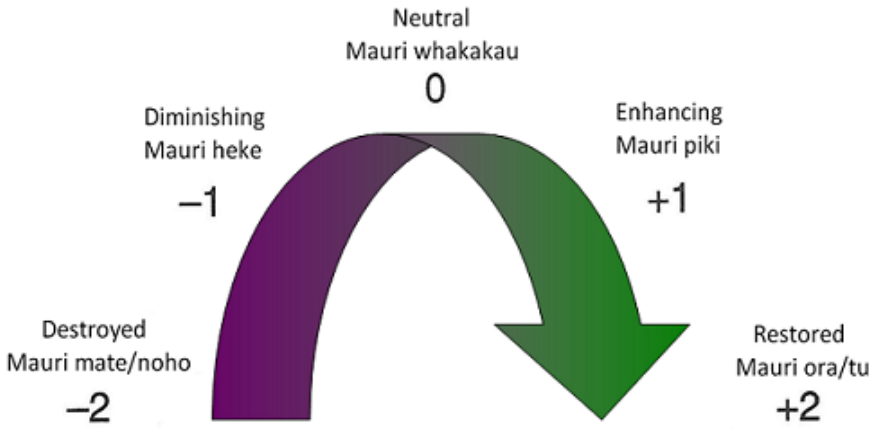

Figure 4. Mauri-ometer and impact on mauri (Morgan, 2008)

By using the sustainability indicators provided by the stakeholders, the mauri of the harbour can be identified as being enhanced, maintained, neutral, diminished or destroyed. The assessment of individual indicators is on an integer scale from -2 to +2. The scale for overall mauri is from +2 to -2 shown above on the Mauri-ometer (Figure 4). The overall mauri is an average of the mauri of each dimension. This average can then be adjusted according to relative importance of each dimension to each stakeholder.

The western idea of sustainability caters for the consideration of short term solutions; those which merely dance along the tipping point of mauri. Indigenous perspectives take into account ongoing sustainability with a focus on enhancing the mauri of the system.

The Mauri Model Analysis can be conducted over a long period of time using the same set of indicators. The timeline maps the evolution of mauri, and assists in the determination of any trends. This Mauri Model Analysis has been conducted over a period of 46 years, with key checkpoints outlined in Table 2. See Appendix C for supporting documentation that helped determine these dates.

Table 1. Timeline for Mauri Model Analysis

Date	Event
1974	Passing of the Ministry of Works Guidelines for Oxidation.
1991	Passing of the Resource Management Act 1991
2002	Matarangi Plant Upgrades conducted (See Appendix C)
2013	Thames Coromandel Proposed District Plan Released
2015	Present
2020	Matarangi WWTP Consent Expiry Date (See Appendix C)

Mauri-years

Calculated as the area beneath the trend-line of mauri, mauri-years is a measure of the cumulative change in mauri over time. If positive, or enhancing, mauri-years represents an increase in the resilience of the overall system. If negative, or diminishing, mauri-years represents a reduction in the overall resilience of the system to global impacts and major episodic events, such as climate change.

Aspirations of Ngāti Huarere

Ngāti Huarere wish to see the restoration of the mauri of the harbour through the ability to sustainably provide food & materials for ceremonial needs and hospitality. Ngāti Huarere wish to enjoy the harbour as a resource, but also a recreational area that allows for safe swimming and diving. As kaitiaki, Ngāti Huarere seek the enhancement of mauri for the Whangapoua harbour, with peace of mind that this taonga has been successfully protected.

Ngāti Huarere seek the revitalisation of the traditional values and protocols practiced by their ancestors to maintain their cultural identity. As the area is developing rapidly, Ngāti Huarere seek economic initiatives and see this as a viable means to provide for the people of Ngāti Huarere descent and create a positive legacy for future generations.

A retrospective assessment of the harbour has been conducted using the mauri model. Following the trend in mauri we can observe that projected state of mauri of the harbour. Additionally, another projection has been proposed which is in accordance with the aspirations of Ngāti Huarere. The difference between the current and aspired projected states of mauri can be comparatively assessed.

Stakeholders

The following stakeholders have been identified to have significant involvement in the harbour and the operation of the surrounding area, and are a part the concerns that have been raised:

- Matarangi Wastewater Treatment Plant Operators (WWTP)

- Matarangi Residents
- Ngāti Huarere ki Whangapoua
- Thames Coromandel District Council
- Waikato Regional Council

The assumption that all dimensions are perceived equally is non-realistic (Morgan, 2006a). It is necessary to apply relative weightings to each dimension to include the subjectivities of each stakeholder. An Analytical Hierarchy Process (AHP) is conducted to identify the true weightings of each dimension. The table below illustrates the perceived importance of each dimension to each stakeholder. As can be observed from Table 2, the stakeholders to have polar views.

Table 2. Stakeholder weightings for each dimension of well-being

Stakeholders	Ecosystem Environment	Hapū Cultural	Whaanau Economic	Community Social	Total
Ngāti Huarere	**42%**	**42%**	0%	17%	100%
TCDC	20%	10%	**50%**	20%	100%
WWTP Operators	30%	5%	**50%**	15%	100%
Matarangi Residents	35%	5%	35%	25%	100%
Holiday Makers	**50%**	0%	35%	15%	100%

The following can be interpreted from Table 2:

- Ngāti Huarere have a strong affinity for the environment and their cultural identity. White (2006) comments that traditional knowledge is about the relationship of living beings with one another and with their environment.
- The TCDC has very clear expectations of the community to provide a prosperous economy for the residents of the district[11]. The Matarangi WWTP is under the operation of the council, sharing this view, with the addition of meeting statutory consenting requirements.
- A study conducted by Stewart et al. (2007) reports and discusses findings based on semi structured face-to-face interviews with local residents and long-term visitors at Whangapoua beach. For those interviewed, many see the area as a quiet, low-key and relatively undeveloped area. The residents spoke of the 'unspoilt' character of Whangapoua, with concern for the natural character of the area and the intrusion of future development.
- At approximately 2.5 hours from Auckland city, Holiday-makers seek a tranquil and beautiful location to escape from city, or to simply experience the beautiful seascape that Whangapoua has to offer.

[11]http://www.tcdc.govt.nz/PageFiles/16249/FINAL_WEB_-_Economic_Development_Strategy_280mm_x_280mm_due_31_Oct_2013[1].pdf

Indicators

Within Challenger's report for the Cawthron Institute, the Mauri Model, along with 11 other internationally recognised sustainability indicator sets were analysed. Among these, the Boston Indicator Project, the Mauri Model, and Whistler2020 were the only indicators sets to fulfil all BellagioSTAMP criteria (Challenger, 2013). Additionally, the Mauri Model is the "more transferable" model, as indicator sets can be uniquely developed for each locality. Using the same assessment process that is used by the United Nations and several European Countries, The Mauri Model has been recognised as a first-class sustainability indicator set (Challenger, 2013).

Ngāti Huarere have provided the indicator set for the Mauri Model Analysis. These indicators have been interpreted and given a method of measurement, whether it be direct or through a proxy. (See Appendix A - Sustainability Indicators for measurements)

Environmental

• Habitat Integrity	Algal blooms, noxious weeds and invasive species e.g. mangroves
• Fish Species	Healthy population of fish within the Whangapoua Catchment.
• Shellfish Species	Healthy population of benthic and nektonic shellfish is the harbour
• Pollution Levels	Pathogens, contaminants, chemicals, nutrients, endocrine disruptors
• Water Quality	Visual Appeal, Dissolved Oxygen Levels, Temperature, pH
• Sediment	Concentration of sediment in the water column.
• Sedimentation I	Sedimentation in riparian, benthic, nektonic, or coastal communities
• Sedimentation II	Contaminants in wetland, stream, river and estuarine sediment
• Pollution from agriculture	Contaminants as a result of agricultural activities e.g. effluent, growth hormones, fertilizers pesticides
• Pollution from forestry	Pesticides and nutrients used in forestry filtering into estuaries.
• Non-point source pollution	Stormwater runoff directly into the estuary from roads, highways, lawns, and households.

Cultural

• Mahinga Kai	Harbour provides for traditional food gathering
• Kai moana	Kai moana harvested from the harbour is safe to eat
• Kaitiakitanga	Iwi/hapū/whanau sustainable use of the harbour resources
• Kotahitanga	Iwi/hapū/whanau feelings about the water quality
• Rangatiratanga	Others use the harbour in accordance with Treaty principles.
• Manaakitanga	Water quality causing a loss of mana
• Water Quality I	Water quality impacting on waahi tapu sites
• Water Quality II	Water quality allow for teaching traditional activities
• Waahi Tapu	The integrity of traditionally and culturally significant sites
• Whanaungatanga	Establishing and maintaining relationships through adequate consultation with Ngāti Huarere

• Manaakitanga	Harbour sustainably provides food & materials for ceremony and hospitality
• Sedimentation	Sedimentation affecting traditional usage of harbour and streams leading into the estuary

Economic

• Cost to Community	Cost to the community to make Council address the issues
• Cost of water treatment	Cost to maintain and manage wastewater treatment
• Cost of farming	Fees incurred from effluent treatment and disposal
• Commercial fishing	Commercial fishing activity within the affected area
• Impact on Tourism	Impact on tourism activities and tourism providers
• Impact on Development	Impact on development – moratorium on new lots
• Forestry	Cost of forestry operations
• Aquaculture	Water quality acceptable for potential aquaculture developments
• Property Values	The change in property values due to water quality of the harbour
• Employment	Employment opportunities within the region
• Remediation/restoration	Cost for restoration solutions e.g. mangrove removal, contaminated sites, estuary development, monitoring, etc.

Social

• Food Gathering	Viability for food gathering along beaches
• Visual Amenity I	Visual amenity of waterways e.g. Surface scum, algae bloom.
• Visual Amenity II	Visual amenity of beaches e.g. Brown mullet, rubbish.
• Impact of Sedimentation	Sedimentation of the harbour affecting recreational use
• Recreational fishing	Impact on recreational fishing (pelagic and demersal species)
• Recreational sports	Impact on recreational water sports - surfing, swimming
• Recreational diving	Impact on recreational diving activities at Whangapoua
• Recreational beach use	Public use of the beaches along the affected coastline for recreational activities - walking, sunbathing, gatherings etc.
• Public Health	Physical health of swimmers, divers, holiday makers, and general public interacting with the estuary
• Pollution from recreational use	General rubbish accumulated from recreational use e.g. Plastic bags, drink bottles.
• Clean up cost e.g. Volunteer clean ups	Cost to keep the harbour in a condition that allows recreational and food gathering activities

Results

Considering the overall impact on mauri, a declining trend can be observed across the entire timeline. Upon inspection of each dimension, all but one share the same trend. It can be concluded that there is an exchange in mauri; enhanced mauri in the economic dimension at the expense of the other dimensions. The results suggest a steady incline in economic developments in the area, whilst the ecosystem, social, and cultural aspects have been in steady decline (Figure 5).

Considering the worldviews of each stakeholder, results confirm that all stakeholders observe this steady decline in mauri with no single stakeholder seeing otherwise. Therefore, this issue must be addressed to prevent the state of the harbour from falling into an unrecoverable state; that which the mauri of the system will have been exhausted.

Though the decline is not an imminent threat, the harbour is not operating at a sustainable level. It should be noted that all stakeholders see mauri at close proximities toward zero mauri. A snap shot of mauri would assume mauri is being maintained, however the trend in mauri across the past years suggest the state of the harbour is at a tipping point (Figure 6).

With the future of the harbour at risk, the issues raised by Ngāti Huarere must be addressed for the benefit of all stakeholders. Upon analysis of the aspirations of Ngāti Huarere compared to the currently projected mauri of the system, there stands to be an enhancement of +2.9 mauri-years if Ngāti Huarere concerns are addressed immediately (Figure 7).

It is quantifiable that all stakeholders will perceive positive benefits of addressing the issues surrounding the harbour thereby meeting the aspirations of Ngāti Huarere. Though Ngāti Huarere will experience the greatest perceived enhancement of mauri-years, all stakeholders will experience the enhancement of mauri (see Appendix B – Mauri Model Analysis Results).

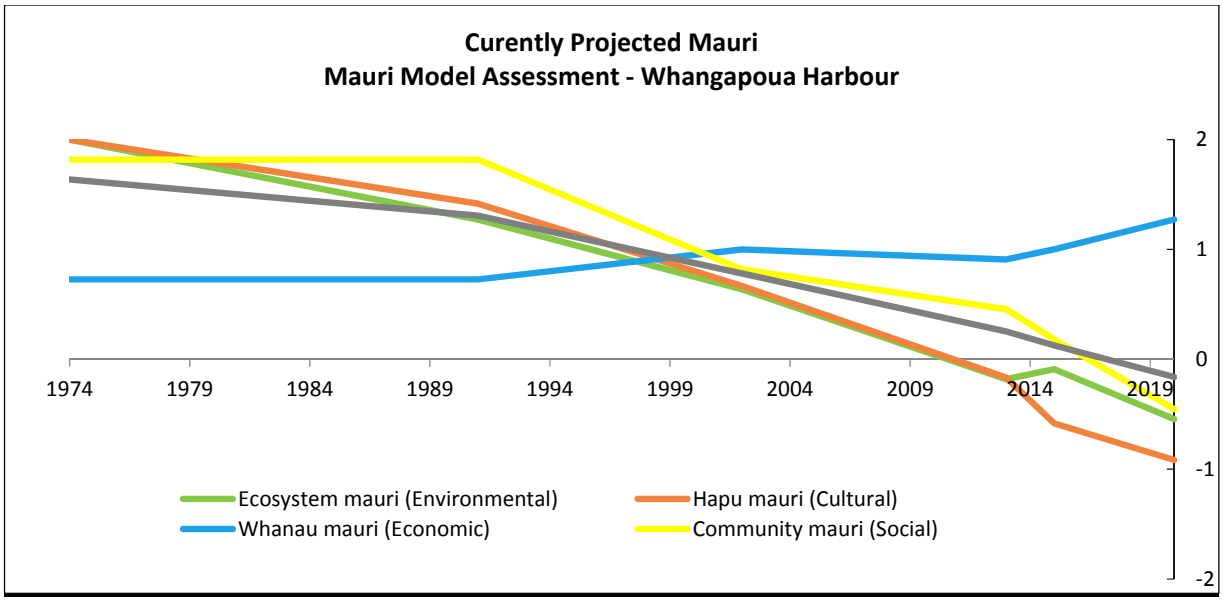

Figure 5. Currently projected mauri for 46 year time period (1974 - 2020)

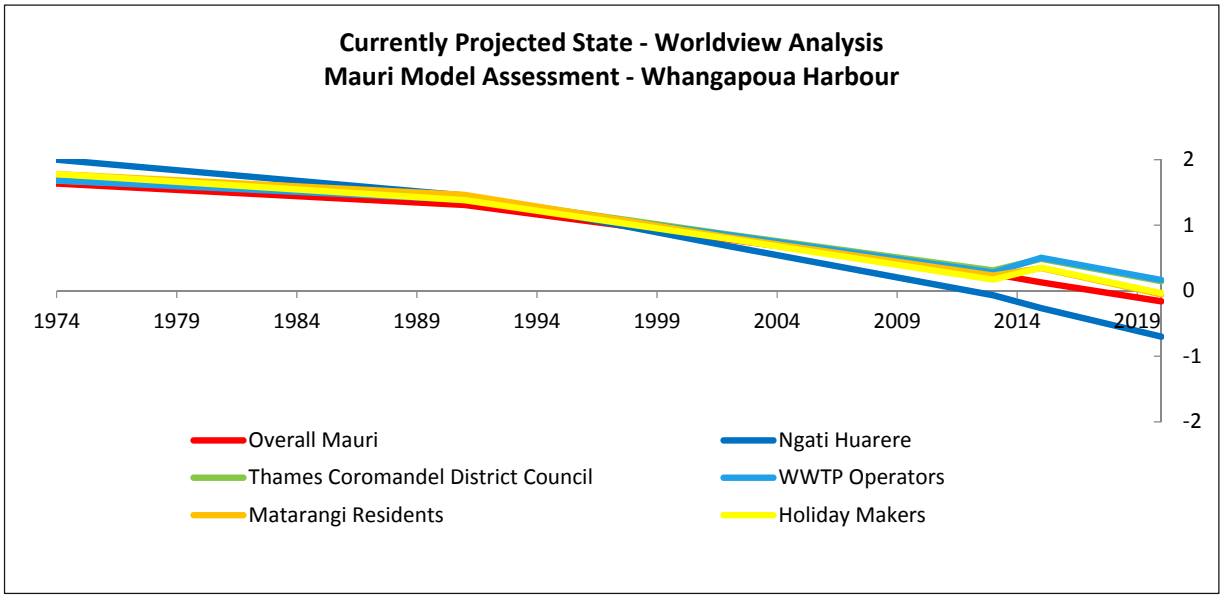

Figure 6. Stakeholder Worldviews of currently projected mauri

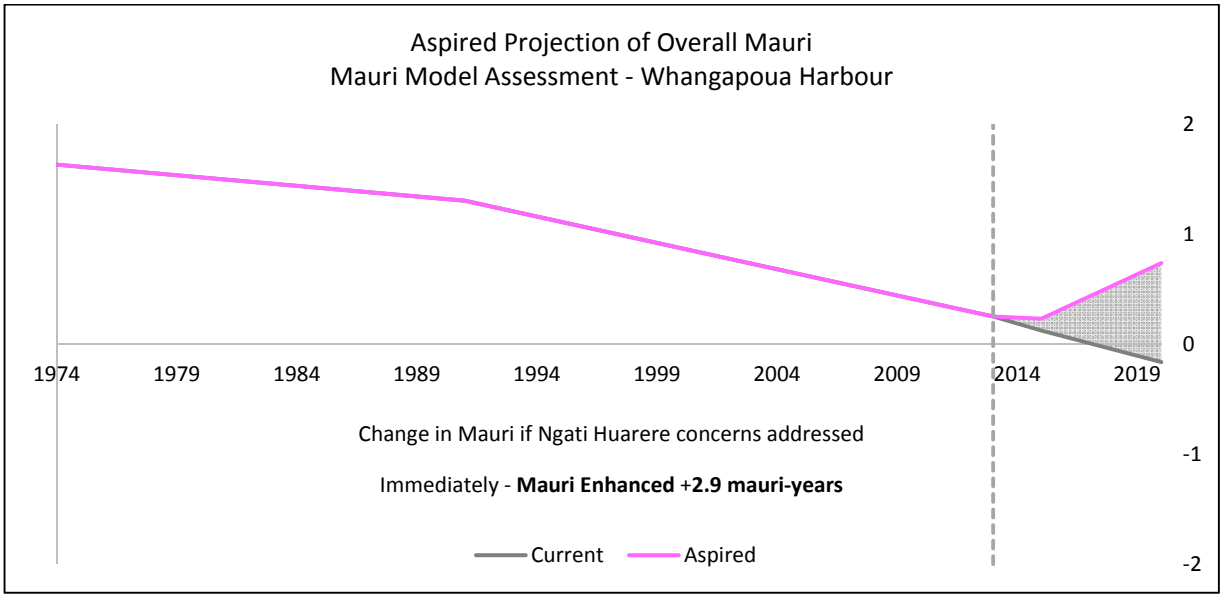

Figure 7. Comparison between currently projected mauri and aspired projection of mauri.

Discussions

Ngāti Huarere have shown serious concern toward the health of the Whangapoua harbour and its mauri. In the past 20 years, many Waitangi Tribunal claims pertain to the pollution of waters, thus it can be said that the mauri and overall health of culturally significant water systems is of frequent concern to tangata whenua.

The use of mauri is in accordance with legislation from national, regional and district plans. This justifies the necessity for tangata whenua to be inclusive of the decision-making process and the management of resources with their jurisdiction. It is not only stated by Waikato Regional Council that the relationships with tangata whenua are important in the protection of mauri, it is stated in the Resource Management Act 1991 that local authority a required to provide for the relationship of Māori and their culture and traditions with their ancestral lands.

As an effect of developing the model uniquely for the area, the success of the model is restricted by the level of stakeholder involvement, which provides for the development of accurate worldview representations and sustainability indicators.

The weightings of the indicators highly influence on results, as author and decision maker subjectivity and viewpoints will strongly influence the outcomes when deriving an overall index of mauri. As of such, Ngāti Huarere have provided a set of indicators, with an accompanying set of worldview weightings whilst other stakeholder worldviews have been extracted through proxy indications in the literature that has been discussed in this report.

The mauri of the Whangapoua has diminished over the years, apparently in exchange for economic developments bought about by the growing popularity of the area as a holiday destination, as well as housing developments that have been made in the past 20 years.

The influx of visitors during peak hours has stressed the Matarangi Wastewater Treatment Plant. Though the plant may not be the primary cause of the drop in mauri, it is of most concern to Ngāti Huarere and is the most preventable. There needs to be significant upgrades made to the plant to cope with the increased population during the holiday season to be decrease the likelihood of untreated discharge entering the Whangapoua harbour and its tributaries. This can potentially be accomplished through appropriately re-consenting the Matarangi WWTP such that it is capable of handling peak holiday populations.

Conclusions

The Coromandel Peninsula's natural environment provides a unique sense of place. Diminishing its natural character and degrading its mauri would detract from beauty of the area. Presently, the mauri of the Whangapoua harbour is diminishing. If left unaddressed, the resilience of the harbour will falter, leading to the undesirable exhaustion of mauri and resistance to global changes.

From the Mauri Model analysis, it can concluded that:

- The mauri of the Whangapoua Harbour has been in steady decline from 1974 to the present, and will continue doing so in the coming years. The worldview analysis shows all stakeholders perceive the overall decrease in mauri.
- Comparative analysis of current and aspired projections of mauri shows all stakeholders will experience an enhancement in mauri-years if the issues raised by Ngāti Huarere are addressed.
- The management of culturally significant resources must be inclusive of tangata whenua as is stated in local, regional and national legislation. Therefore, Thames-Coromandel District Council and Waikato Regional Council must recognise Ngāti Huarere and their role as kaitiaki of the area.
- This report provides Ngāti Huarere ki Whangapoua with a quantitative analysis of the trending decrease in the mauri, which allows for discussion with regional and territorial authorities.

It is vital that a healthy and working relationship between Ngāti Huarere, Thames-Coromandel District Council and Waikato Regional Council be stablished to recognise and respect Ngāti Huarere as kaitiaki of the area.

This relationship will provide a platform for all parties to begin a process of re-consenting the Matarangi Wastewater Treatment Plant, with the ambition of upgrading or completely replacing the existing plant. With the impending expiry of the current resource consent, the re-consenting process should be actioned immediately.

This is a small but crucial step toward the overall pursuit of restoring the mauri of the Whangapoua harbour and addressing the concerns of Ngāti Huarere.

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Appendix A - Sustainability Indicators

Environmental Wellbeing - Ecosystem Mauri

Indicator	Description	Direct measurement or proxy indicator	1974	1991	2002	2013	Proj. 2015	Proj. 2020	Asp. 2015	Asp. 2020
Habitat Integrity	Algal blooms, noxious weeds and invasive species e.g. mangroves	Direct	2	1	0	-1	0	0	0	1
Fish Species	Healthy population of fish within the Whangapoua Catchment.	Direct	2	2	1	1	1	0	1	1
Shellfish Species	Healthy population of benthic and nektonic shellfish is the harbour	Direct	2	1	0	0	0	-1	0	1
Sedimentation I	Concentration of sediment in the water column. Cause by increased	Proxy - Measure turbidity of water	2	1	1	0	0	0	0	1
Sedimentation II	Sedimentation affecting riparian, benthic, nektonic, or coastal	Proxy - Presence of indicator species to determine suitability of water	2	1	0	-1	-2	-2	0	1
Sedimentation III	Contaminants in wetland, stream, river and estuarine sediment	Proxy - measurement of contaminants with indicator benthic species	2	1	0	-2	-1	-2	-1	0
Agricultural Pollution	Contaminants as a result of agricultural activities e.g. effluent,	Proxy - Measure water levels for contaminants	2	0	1	-1	0	0	0	1
Silvicultural Pollution	Pesticides and nutrients used in forestry filtering into estuaries.	Proxy - Measure water levels for contaminants	2	1	0	-1	-1	-1	-1	0
Non-point source	Stormwater runoff directly into the estuary from roads, highways, lawns,	Direct	2	2	2	1	1	0	1	2
Pollution Levels	Pathogens, contaminants, chemicals, nutrients, endocrine disruptors	Direct	2	2	1	1	0	0	0	1
Water Quality	Visual Appeal, Dissolved Oxygen Levels, Temperature, pH	Direct	2	2	1	1	1	0	1	1

Cultural Wellbeing - Hapū Mauri

Indicator	Description	Direct measurement or proxy indicator	1974	1991	2002	2013	Proj. 2015	Proj. 2020	Asp. 2015	Asp. 2020
Manaakitanga	Harbour sustainably provides food & materials for ceremony's and hospitality	Suitability of traditional food species for harvest (Health/Population). Proxy Indicator - Taonga Species	2	2	1	1	1	0	1	1
Mahinga Kai	Harbour provides for traditional food gathering	Access to traditional food gathering sites are	2	1	0	-1	-1	-1	-1	0
Kai moana	Kai moana harvested from the harbour is safe to eat	Direct	2	2	2	1	1	1	1	2
Kaitiakitanga	Iwi/hapū/whanau sustainable use of the harbour resources	Sustainable practices surrounding the gather of kai and use of the harbours resources	2	2	2	1	1	0	1	1
Kotahitanga	Iwi/hapū/whanau feelings about the water quality	Whaanau concerns heard and voiced through appropriate vehicles	2	1	-1	-2	-2	-2	-2	-1
Rangatiratanga	Others use the harbour in accordance with Treaty principles.	Use of harbour is consistent with RMA1991 and consenting conditions are being met by its users.	2	1	-1	-2	-2	-2	-2	-1
Manaakitanga	Water quality causing a loss of mana	Water quality affecting kaitiaki role and ability for Ngāti Huarere to manaaki whaanau and manuwhiri	2	2	2	1	1	0	1	1
Water Quality I	Water quality impacting on wahi tapu sites	Direct	2	2	2	2	1	1	1	2
Water Quality II	Water quality allow for teaching traditional activities	Direct	2	2	1	0	-1	-2	-1	0
Sedimentation	Sedimentation affecting traditional usage of harbour and streams leading into the estuary	Access to resources for traditional practices and integrity of resources used for traditional practices	2	0	0	0	-2	-2	-1	0
Whanaungatanga	Establishing and maintaining relationships through adequate consultation with Ngāti Huarere	Ability for iwi to maintain roles as kaitiaki with active role in decision making process	2	1	0	-2	-2	-2	-1	0
Waahi Tapu	The integrity of traditonally and culturally significant sites	Changes to the environs and resources associated with tradtional practices and knowledge	2	1	0	-1	-2	-2	-1	0

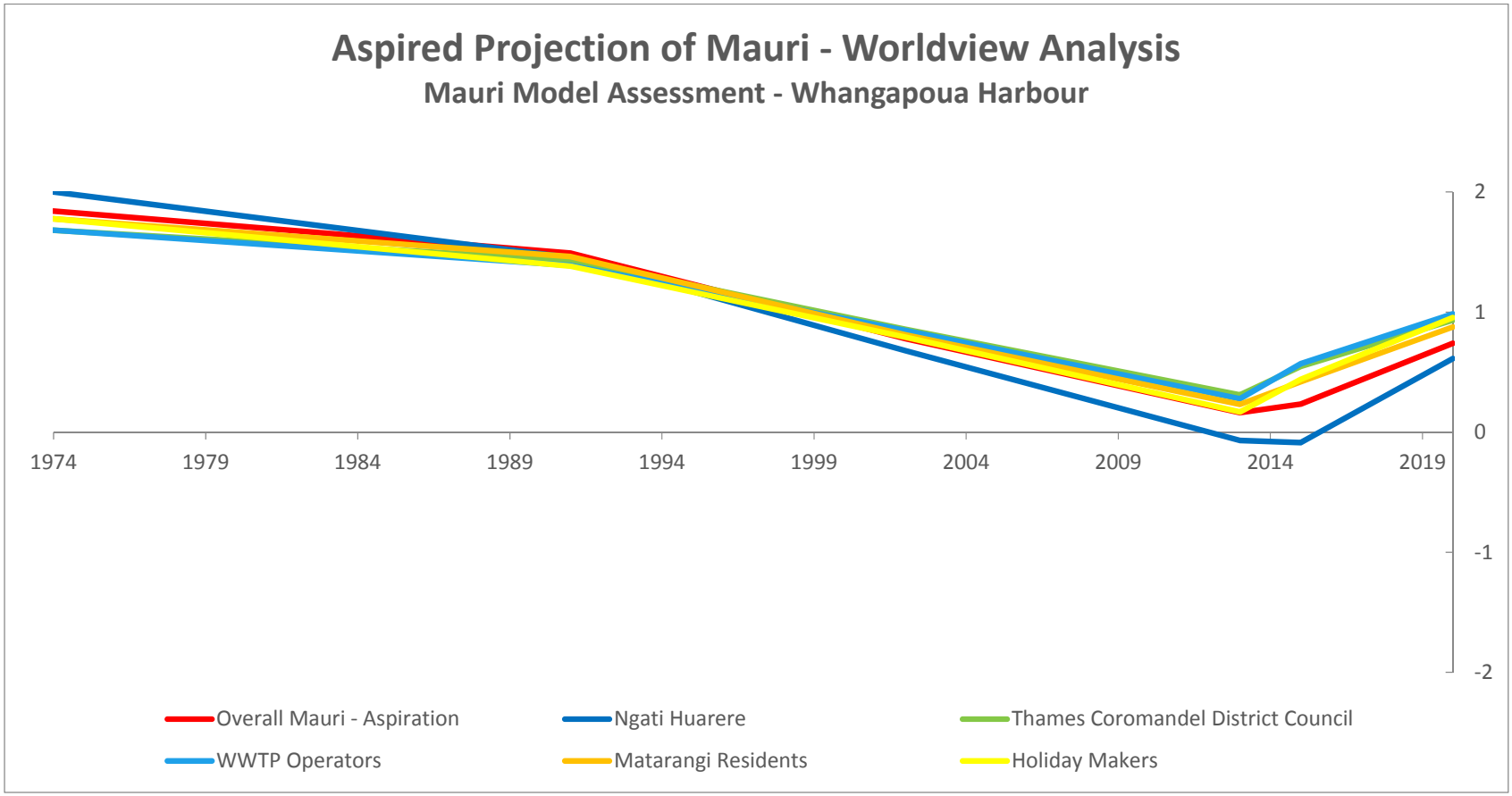
Economic Wellbeing - Whanau Mauri

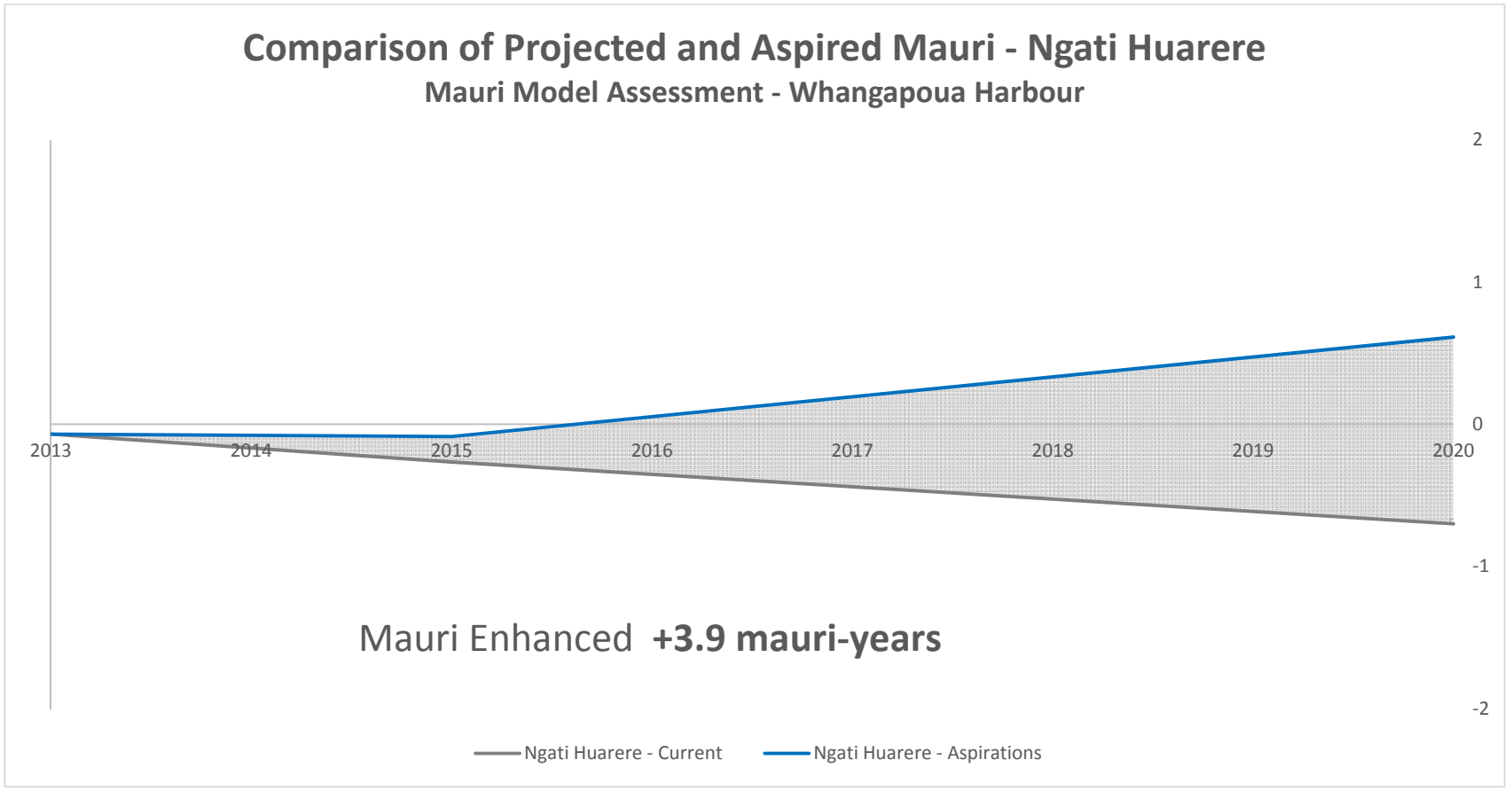
Indicator	Description	Direct measurement or proxy indicator	1974	1991	2002	2013	Proj. 2015	Proj. 2020	Asp. 2015	Asp. 2020
Potential for aquaculture	Water quality acceptable for aquaculture	Direct - Water quality meets standards for aquaculture production and harvest	2	2	2	1	1	0	1	1
Cost of wastewater treatment	Cost to maintain and manage wastewater treatment at a reasonable level	Proxy - Cost of waste management and disposal to industry	0	0	1	1	2	2	2	2
Cost of farming	Fees incurred from effluent treatment and disposal through water management plant	Proxy - Cost to operate farms	2	2	2	2	2	2	2	2
Remediation/restoration cost	Cost for restoration solutions e.g. mangrove removal, contaminated sites, estuary development, monitoring, etc.	Direct	0	0	0	0	0	0	0	-1
Impact on Development	Impact on development – moratorium on new lots	Proxy - New developments established in the region	0	0	1	1	1	2	1	1
Impact on Tourism	Impact on tourism activities and tourism providers within impacted region	Direct - Measure attractiveness of Whangapoua Harbour to tourists	0	0	1	1	1	2	1	2
Cost to Community	Cost to the community to make Council address the issues	Proxy - Measurement of community water rates and other service fees	2	1	0	0	-1	-1	-2	0
Property Values	The change in property values in the impacted areas due to water quality of the harbour	Direct - Change in property values compared to past years as a direct result of the quality of the location - excluding inflation prices	0	0	1	1	1	2	1	2
Commercial fishing	Commercial fishing activity within the affected area	Cost of disruption of commercial fishing	0	1	1	1	1	2	1	1
Forestry	Cost of forestry operations	Proxy - Change in productivity of forestry due to possible changes in consenting requirements surrounding wellbeing of harbour	2	2	1	1	1	1	1	0
Employment Opportunities	Employment opportunities within the region	Direct - Record of jobs	0	0	1	1	2	2	2	2

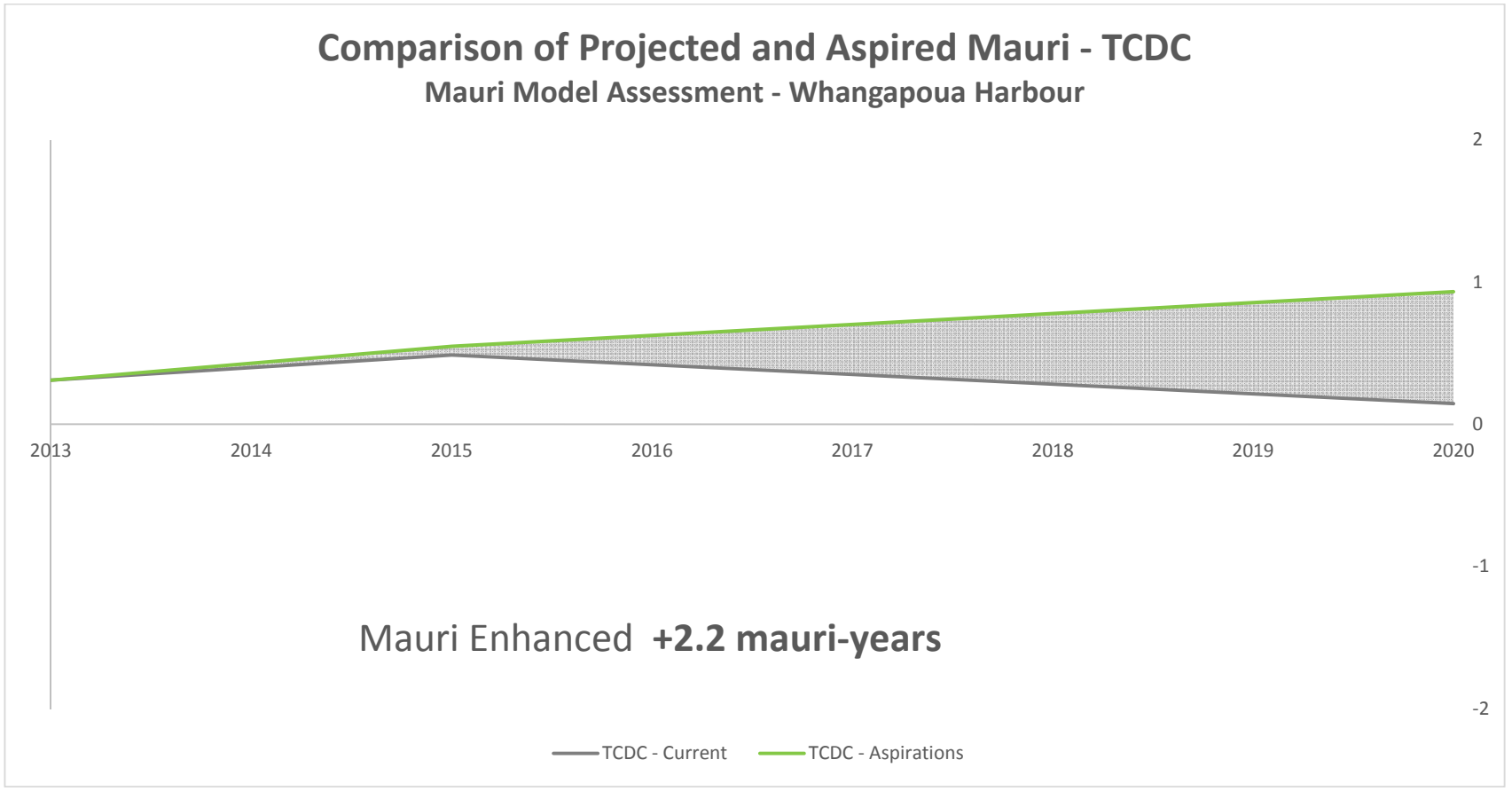
Social Wellbeing – Community Mauri

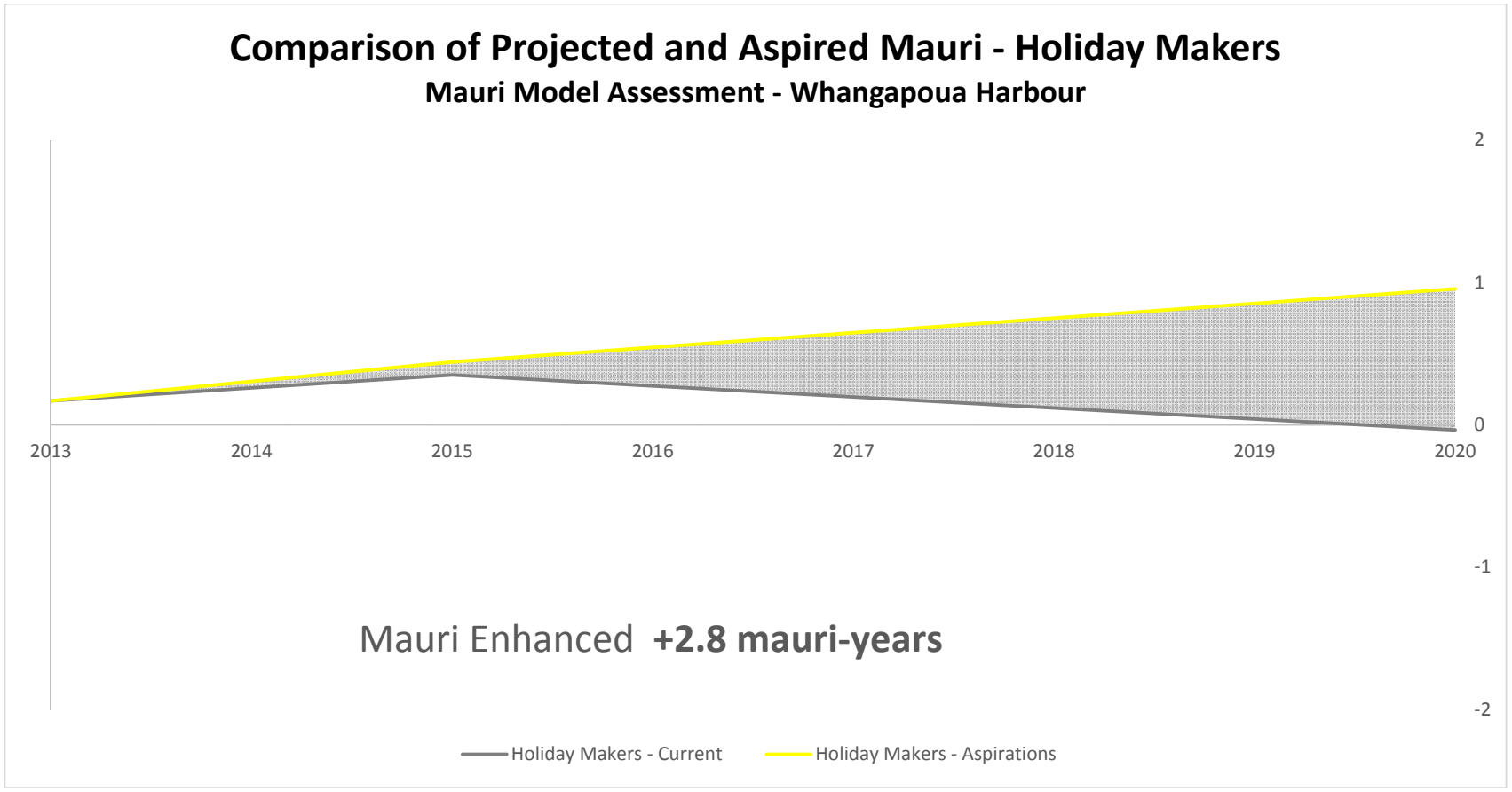
Indicator	Description	Direct measurement or proxy indicator	1974	1991	2002	2013	Proj. 2015	Proj. 2020	Asp. 2015	Asp. 2020
Food Gathering	Viability for food gathering along beaches - shellfish gathering, fishing	Access to harbour and zones for food gathering, contaminant presence/level in food species	2	2	1	1	1	0	1	1
Recreational fishing	Impact on recreational fishing (pelagic and demersal species) off shore	Health/contaminant presence of pelagic and demersal fish species found in areas of recreational fishing	2	2	1	1	1	0	1	1
Recreational water sports	Impact on recreational water sports - surfing, swimming	Safety of users in water - debris along shoreline, likelihood of injury	2	2	1	1	1	0	1	1
Recreational diving	Impact on recreational diving activities at Whangapoua	Safety of recreational divers - contaminants in the water	0	0	1	1	2	1	2	2
Recreational beach use	Public use of the beaches along the affected coastline for recreational activities - walking, sunbathing, gatherings etc.	Safety of beach users long coastline - contaminant and debris presence along coast	2	2	1	1	0	0	0	1
Impact of Sedimentation	Sedimentation of the harbour affecting recreational use	Proxy - Measurement of flow rates in and out of the harbour	2	2	0	0	-1	-1	0	1
Visual Amenity I	Visual amenity of waterways e.g. Surface scum, algae bloom	Direct	2	2	1	1	1	0	1	1
Visual Amenity II	Visual amenity of beaches e.g. Brown mullet, rubbish	Direct	2	2	1	0	-1	-1	-1	0
Public Health	Physical health of swimmers, divers, holiday makers, and general public interacting with the estuary	Proxy - Presence of indicator species in the harbour	2	2	1	0	0	0	0	0
Pollution from recreational use e.g. Plastic bags, drink bottles	General rubbish accumulated from recreational use	Direct	2	2	1	0	-1	-2	-1	-1
Clean up cost e.g. Volunteer clean ups	Cost to keep the harbour in a condition that allows recreational and food gathering activities	Direct - Restoration Costs	2	2	0	-1	-1	-2	-1	-1

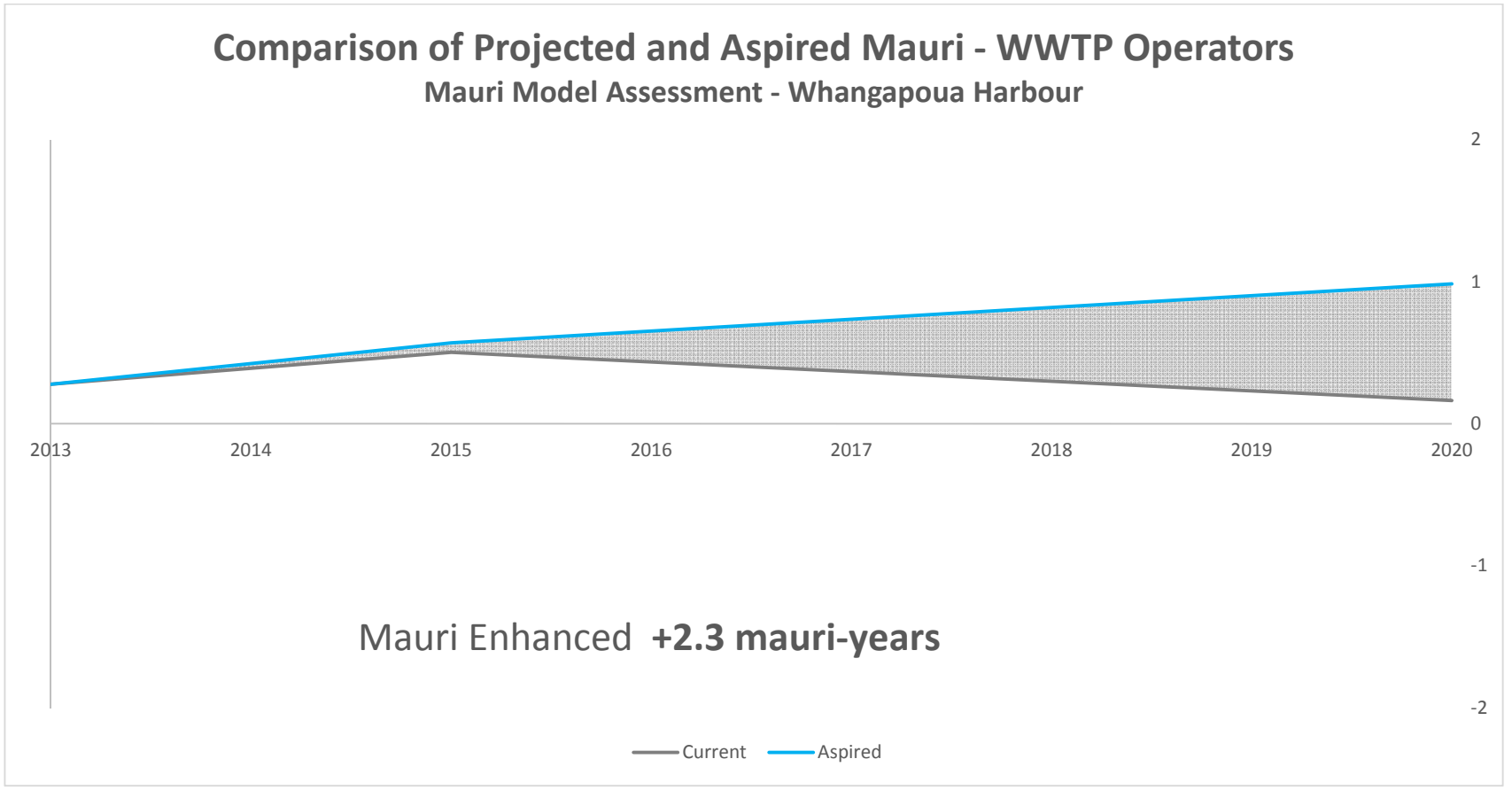
Appendix B – Mauri Model Analysis Results

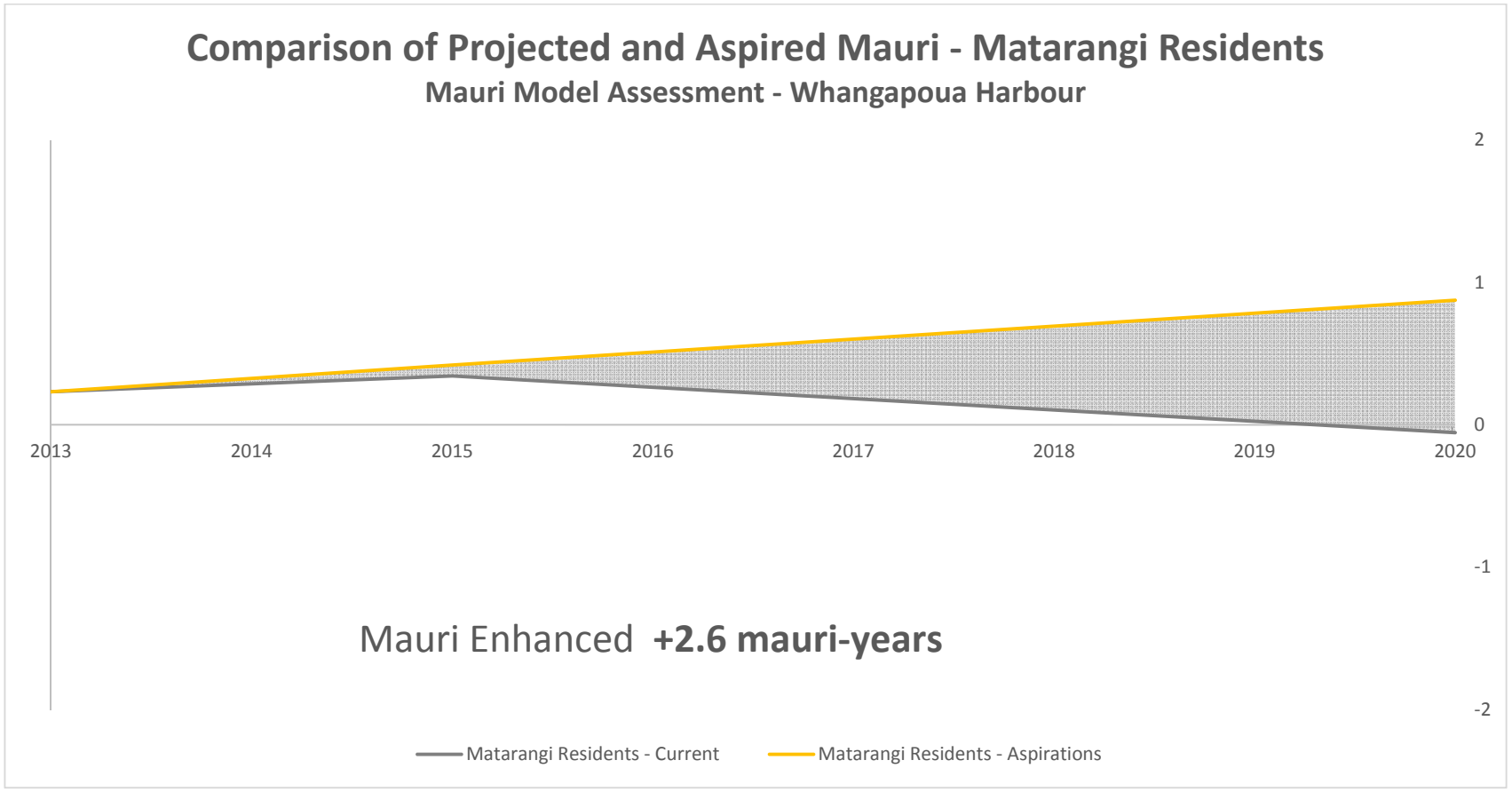



Comparison of Projected and Aspired Mauri - Ngati Huarere
Mauri Model Assessment - Whangapoua Harbour
2
1
0
-1
-2
2013
2014
2015
2016
2017
2018
2019
2020
Mauri Enhanced +3.9 mauri-years
Ngati Huarere - Current
Ngati Huarere - Aspirations


Comparison of Projected and Aspired Mauri - TCDC
Mauri Model Assessment - Whangapoua Harbour
2
1
0
-1
-2
2013
2014
2015
2016
2017
2018
2019
2020
Mauri Enhanced +2.2 mauri-years
TCDC - Current
TCDC - Aspirations


Comparison of Projected and Aspired Mauri - Holiday Makers
Mauri Model Assessment - Whangapoua Harbour
2
1
0
-1
-2
2013
2014
2015
2016
2017
2018
2019
2020
Mauri Enhanced +2.8 mauri-years
Holiday Makers - Current
Holiday Makers - Aspirations


Comparison of Projected and Aspired Mauri - WWTP Operators
Mauri Model Assessment - Whangapoua Harbour
2
1
0
-1
-2
2013
2014
2015
2016
2017
2018
2019
2020
Mauri Enhanced +2.3 mauri-years
Current
Aspired


Comparison of Projected and Aspired Mauri - Matarangi Residents
Mauri Model Assessment - Whangapoua Harbour
2
1
0
-1
-2
2013
2014
2015
2016
2017
2018
2019
2020
Mauri Enhanced +2.6 mauri-years
Matarangi Residents - Current
Matarangi Residents - Aspirations

Appendix C – Supporting Documentation

See attached PDF documents.