

2013

Kete Tangariki - Pilot Tuna Enhancement Project



Tui Shortland

Nga Tirairaka o Ngati Hine

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Cover picture courtesy of Cilla Brown

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Background

Across the country customary and commercial fishers have concerns for the deterioration of tuna (eels). The common reasons for tuna deterioration have been identified as habitat degradation or modification; obstructions to fish passage; and commercial pressures. Te Wai Maori has been supporting iwi and hapu to gather together to discuss these issues. At a meeting in late 2012, both customary and commercial parties met to seek out potential collaborative work to address the issues and build relationships. This pilot project has been designed by iwi and hapu and commercial fishers as a potential model to be used in other areas to improve the health of tuna.

Parties to the Project

Working Party:

- Tui Shortland (Ngati Hine project management),
- Bill Kerrison (Kokopu Trust with scientific support of Mick Kearney),
- Ben Potaka (Whanganui),
- John Jameson (Aotearoa Fisheries Limited- administrative support),
- Mike Holmes (Eel Enhancement Company),
- Mark Kuijten(Eel Enhancement Company), and
- Doug Jones (Te Wai Maori Trust- facilitation assistance).

Supporting Parties:

- John Hohapata Oke (Ngati Awa),
- Abe Witana (Te Rarawa),
- Nicolas Manukau (Waikato-Tainui)

Issues Raised By Tangata Whenua

During 2012, meetings of iwi and hapu, supported by Te Wai Maori Trust produced a discussion paper identifying issues facing the eel fishery. The four key issues identified in the paper were the need to;

- Maintain an environment in which eel stocks can thrive
- Maintain eel fisheries to ensure sustainability
- Discuss consents and their effect on the eel habitat and passage
- Build capacity and capability for iwi to be kaitiaki, including stock assessments, sustainability practices, developing the fishery, and influence policy processes and decisions.

Issues Raised By Commercial

The following is a summary of the issues concerning commercial sector;

- Need to build up the wild stocks, especially if eel farming is going to occur
- Dairy industry is the single biggest threat to eels due to effluent and nutrient loading
- Habitat quality (and a lack of use of indicators for healthy habitats such as eels, koura, wild duck etc)
- Decline in fishermen, especially Māori

- Eel industry is very small, on a global scale, in terms of interest and value
- Māori as eel quota owners could explore how to utilise their position better and monitor fisheries health
- The need for smaller quota management areas, where the data and health of eel stocks are being indicated at a catchment level instead of a QMA

The Ngati Hine Opportunity

Ngati Hine is a fishing nation and maintains a day to day relationship with tuna. Over the past ten years they have expressed concerns for the declining eel populations.

In 2011 Ngati Hine completed an eel population survey with the support of NIWA, peer reviewed by the Ministry of Fisheries.

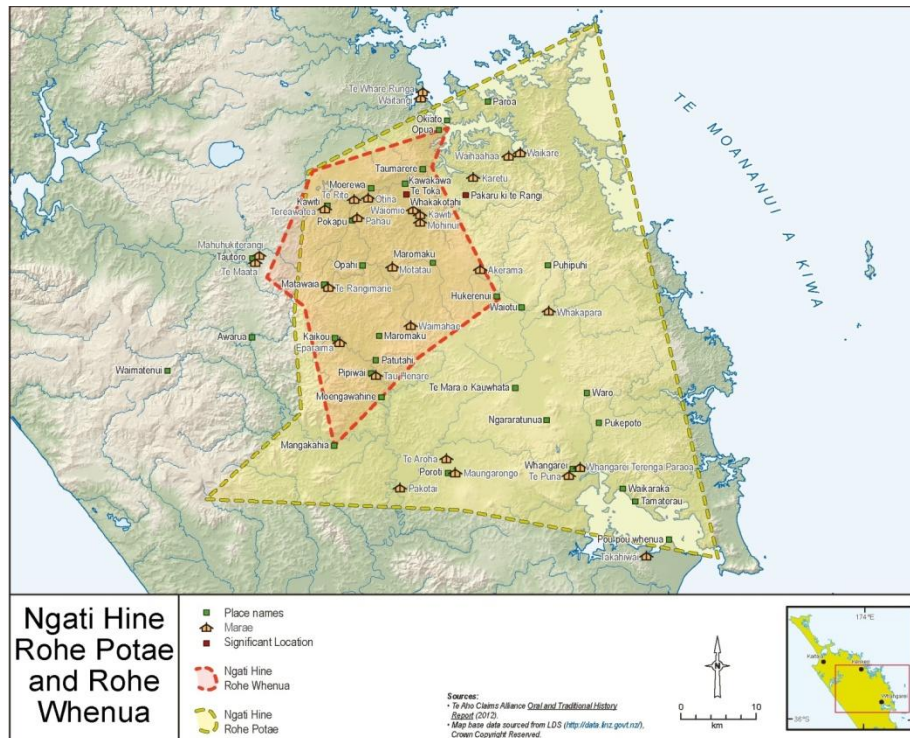
The report confirmed that;

- long fin female numbers are low in the upper catchments
- there are several eel passage obstructions
- significant habitats are degraded
- there are lakes with the potential for stocking including Lake Owhareiti where tuna mature within four years
- there is potential to stock rivers in the upper catchments
- In the 1980s a study was carried out on Ngati Hine eel harvesting that found that the customary harvest practices of approximately 30,000kgs was sustainable over a seven year period
- Ngati Hine maintains a high level of traditional knowledge and customary use including how to transfer and hold tuna in boxes for up to twelve months
- There is potential to establish a nationally significant reserve area at the lower Taumarere River

Location

The Ngati Hine heartlands, where the pilot project was carried out, was described by Tā Himi Henare as Te Rohe Whenua o Ngāti Hine (shown in the map below) or ‘the land area of Ngāti Hine’ as:

“Haere mai Opua ki Pouerua: i Pouerua ki Tautoro, te maunga Tōtoro i roto Kereru; i reira, Hikurangi; Hikurangi ki Mangakahia; i Mangakahia ka huri mai ki Moengawahine; whakawhiti tonu ki runga i te tihi o Motatau, ko Unuwahao; haere mai ki runga i tena kāweka kia tau mai ki Hukerenui; ka huri iho ki Akerama; nā ki Taumārere. He rohe tino nui, nā te mana o tēnei wahine a Hineāmaru.”



Purpose of Project

This project vision was to enhance the relationship of local people with the eel population within Ngāti Hine catchments as a pilot strategy that can be implemented in other catchments across the North Island. The name of the project is Kete Tangariki which is a common Ngāti Hine term for assisting tangariki (elvers) above Otiria waterfalls so that they can move into the upper catchments of Ngāti Hine. Kete tangariki is about intervening and working together to assist the health of tuna.

The objectives of this project are to;

1. Improve eel populations, particularly long fin females for customary and commercial interests
2. Improve habitat appropriate for eels
3. Support local established and new customary and commercial fishermen
4. Advocate for law, policy and eel management to local and central government, industry and the public

Each objective outline is described below.

Objective 1 - Improve eel populations, particularly long fin females for customary and commercial interests

Elver Recruitment

Managing Elver Passage:

There is much concern for elvers by local kaitiaki in the Taumarere Catchment about the obstructions at both Otiria Falls and the perched culvert on the Waiharakeke stream

Local kaitiaki have historically and currently helped transfer the elvers above the natural obstacle of Otiria falls. This practice is also embodied in the local story of a taniwha, Rangiriri, who saw young children using a kete (tightly woven flax basket) to help elvers (tangariki) up the waterfall at Otiria.

The culvert on the Waiharakeke stream is fairly new. It encompasses 9-10 individual culverts side by side with a concrete platform above to allow for vehicles and stock to cross the stream. The culvert has now altered and increased the natural flow of the stream, so much so that elvers are unable to swim up the culverts. Elvers have changed their approach of going up stream by going over a section of the culvert where the water is calmer, but in doing so, dry out and die before making it to the other side, or are crushed by vehicles or stock.

Methodologies for elver recruitment have been discussed at two wananga held for this project. Many options were discussed by both locals and other iwi and hapu represented at the wananga. Sites were visited to discuss the potential options for locals to use.

Sites selected requiring specific management for elver recruitment due to obstructions were Otiria falls and the perched culvert on Waiharakeke stream. The project aims to establish fish passage systems at both of these sites. Kaitiaki will model their fish passage system off the system established by the Kokopu Trust at Lake Matahina. The project will also take advice and guidance from both the Kokopu Trust and the Eel Enhancement Company, both of whom are involved in the project.

An assessment of the options proposed by all parties was made according to ease of use, impact on local environment, cost and effectiveness. The decision was to actively manage the two sites by installing mussel spat ropes to assist elver recruitment.

The three pictures below show our young Ngati Hine fishermen being shown how to decide which culvert to place the rope through, the young men crawling through the culvert with the rope, and securing the rope upstream.



Monitoring Elver Recruitment:

The characteristics for elvers recruiting into the Taumarere Catchment were monitored by surveying elvers at the bottom of the Otiria falls and below the culvert at Waiharakeke Stream.

Both areas were monitored regularly, and some elvers were transported and transferred in buckets upstream of the obstructions. Sites selected for the release of elvers include Lake Owhareiti, Lake Kaiwae, the upper catchments of Kaikou, Pipiwai and Motatau. This work took place during the summer months of November to February.

In addition to the wananga and informal discussions to develop methodologies, visits to Te Kokopu Trust were also carried out to get a hands-on insight to their operations. The monitoring information proposed as useful by the working party for this research included:

- Total catch of elvers (as a weight or number) for each visit.
- Weight or number of other species captured.
- Weight and number of all transfers made and location of release sites.
- Species composition of subsamples (weight and number) preferably obtained at a minimum of 2-day intervals.
- Average weight and average length of a sample of longfin and shortfin elvers will be obtained as often as possible.

The monitoring equipment proposed as useful by the working party included the following.

- Waterproof recording sheets or Panasonic toughpads.
- Buckets, sieves, sorting trays, tweezers, dip nets, mesh bags for sorting juvenile eels, plastic bags, pottles, labels, etc.
- Balances (20 kg \pm 20 g, and 2 kg \pm 0.1 g), magnifying lenses, lighting, calculator.
- Clove oil (anaesthetic) to facilitate elver identification.

Weight, length and species composition

Estimates of the average elver weights and lengths, and species composition of the catches can be made from subsamples taken during the monitoring periods. Subsamples of at least 100 elvers should be collected at least every 2nd day, and analysed for species composition, average length (total length to the nearest 1 mm) and average weight (weight to the nearest 1 g).



Koroma (Long fin) Management

There are two phases to the Long fin management research. Phase One occurred in the upper-catchment and phase two was to occur in the lower catchments. Both phases involved a customary catch approach by whanau in the upper catchments who still fish during the tuna whakaheke (migration run).

As the movement of the adult migration are dependent on rainfall, temperature, and the maramataka, several scenarios had to be considered, recorded and prepared for acting on as needed. The chosen six Ngati Hine monitoring whanau actively monitored their areas, specifically, Otiria, Pokapu, Motatau, & Wairua. Monitors visited their assigned waterways during rainfall periods to check on movements. It was predicted by whanau that this year they may not move until April/May.

Movement was noted by monitors in the upper Taumarere Catchment from Maromaku to Motatau in the first week of April, however the tuna whakaheke did not eventuate until the heavy rains in May.

Phase one - upper-catchment:

Phase one of the research focussed on a customary catch approach by members of Ngati Hine.

In Ngati Hine, whanau still use traditional ways of catching the eel migrators during the tunawhakaheke, such as using pa tuna (e.g eel weir/traps) and hinaki etc, as shown in the pictures below. The first picture was taken at the first wananga during the discussion on methodologies for monitoring. The second picture was taken at the same site during the tuna whakaheke in May 2013.



Doug Jones 1



Cilla Brown 1

This phase of research was intended to support Kaitiaki/Whanau to carry out their natural customary fishing while also carrying out specific data collection.

Catch Processing:

Kaitiaki/whanau conducting the information collection will include: catch volumes, species (kuwharu, koroma, puru, etc), sex (male/female), length (to the nearest mm), girth (to the nearest mm), and weight (to the nearest 100grams) at at least three sites (Pipiwai, Motatau and Pokapu) within the upper catchments of Ngati Hine.



Tohe Ashby 1

Method of catch:

The method of catch will be pa tuna, hinaki, fyke nets with wings, and nets that attach to fyke net wings that will stretch across the length of the streams. Fyke nets will be of standard mesh size 10mm, while the nets that attach to the fyke net wings will be 15-20mm mesh.



Cilla Brown 2

Any by catch will be returned at the point of capture, with the exception of unwanted organisms that will be destroyed upon capture.

Phase two - lower catchment:

Due to unforeseen circumstances, Phase two of the long fin management research was not able to be carried out, however we have identified the only ideal spot where most of the Taumarere catchment's streams merge into one where we can do research in the coming tunawhakaheke of 2014. Kaitiaki have been identified to manage and monitor this site during the tunawhakaheke, and will be assisted by the whanau fisherman from phase one, once they have finished their customary catch and monitoring in the upper reaches.

Catch Processing:

As above, kaitiaki will be carrying out specific data collection including: species (kuwharu, koroma, puru, etc), sex (male/female), length (to the nearest mm), girth (to the nearest mm), weight (to the nearest 100grams) before returning them back to the water. The intent is to collect data as fast as possible to minimise any effect on the migrators. Eels that prove difficult to collect data from may be anaesthetised (using a clove oil base mixture) for a short period, however, this is an extreme measure, and is unlikely to occur, therefore if a less obtrusive way can be found it will be used or those eels released and recorded as such.



Cilla Brown 3

Method of catch

Similar to the approach above, a net will be set with mesh size 15-20mm that stretches across the stream and joins onto a fyke net with a purpose made holding pen during the tunawhakaheke. Kaitiaki will collect the data as soon as eels enter the holding pen. If the holding pen becomes full, kaitiaki will transfer eels into purpose made holding bags. The holding bags will have a mesh size of 5mm. The holding bags will be secured and placed back into the water if the volumes of eel being caught in the holding pen are too many, and the recording of data will take place as soon as practically possible, before returning the eels to the water.

Any bycatch will be returned at the point of capture, with the exception of alien invasive species that will be recorded and destroyed in an appropriate manner.

The majority of this research will take place within approximately a 48-72 hour window during the eel migration.

Geographic Information Systems

During the pilot project, Nga Tirairaka o Ngati Hine decided to uptake Geographic Information Systems to record the monitoring information. We are self taught and are not trained programmers, however the use of GIS Cloud, as the Traditional Knowledge Multi-media database has been an efficient software for our use.

During the early stages of monitoring our fishers were using paper to record and cameras and at time GPS when available.

With the update of GIS Cloud software and its Mobile Data Collection application we supplied the monitors with Panasonic Toughpads to use as one piece of hardware that can record everything we need and upload live to our maps. Panasonic Toughpads are military grade, break, water, soil resistant and have been a great investment of this project.

We consider these tools as very efficient, user friendly, long lasting means of recording monitoring results.

We have run a workshop with our schools who we are piloting the use of the tools before rolling it out to all schools of interest.

Objective 2 - Improve habitat appropriate for eels

Ideal Eel Habitat

On the completion of the tuna whakaheke a two day wananga was held in July.

Riparian planting was discussed with a presentation by the Eel Enhancement Group promoting the planting of willows. The Eel Enhancement Group while promoting willows as a quick option for riparian stability and habitat for aquatic species, they also support the use of native vegetation. But willows and some small natives give immediate bang for your buck and buy you time to get your permanent riparian plantings established. An option suggested was to plant natives amongst willows and to cull the willows as necessary once the natives take hold.

After the valuable discussions amongst the working party and on site assessments of established willows within the Taumarere catchment, willows were identified by locals as having a choking effect on waterways and therefore Ngati Hine have chosen to focus on using natives for riparian planting. The willows will not be pulled out en masse but will be replaced in a managed way to avoid any erosion or other negative impacts.

Puru tuna, or underground wetlands, were also identified as important unique habitat which Ngati Hine must ensure the health of. Many whanau have identified changes since the planting of pine forestry throughout the catchments. Water flow is another important factor for puru tuna.

An analysis of some of the vast swamp areas within the Taumarere Catchment and some of the waterways running into and from the repo was carried out with the working party, Te Wai Maori, Nga Tirairaka o Ngati Hine and our local school, Te Kura Reo Rua o Motatau.



Tohe Ashby 2

It was agreed that the appropriate flow of swamps are an important factor which could be measured by the keeping of tuna boxes as those shown above. Tuna box mortality and health can also indicate the amount of food available flowing through for the tuna.

Impacts of farming and pine forestry were identified as having harmful effects on elvers and tuna habitat such as flora and fauna used for grazing and shelter. Elders and adults who had grown up on Lake Kaiwae (shown below) expressed concern with the lack of tuna in recent times in the Lake.



Doug Jones 2

Enhancement Work

On completion of discussions about ideal eel habitat, sites for prioritisation for enhancement work were confirmed as:

1. Maromaku - intensive farming and flooding area where high nutrients flow into the waterways; and during flooding there are areas where tuna die in deoxygenated pools of water (it was noted that this has also been observed south of Kawakawa township and should be monitored after flooding).
2. Pine forestry lands where pine are disrupting the acidity of the waterways which have a negative impact on elvers
3. Lake Kaiwae small outlet is currently choked
4. Lake Owhareiti currently surrounded by mostly unfenced, unplanted farmland
5. Pokapu-Otiria within this area there is a dramatic decline in water quality whereby it is no longer safe to swim at a traditional swimming spot at Te Rere I Tiria (see picture below)



Doug Jones 3

Landowner consent & Resources

A focus on large landowners who could quickly make decisions on supporting enhancement work was the strategy for this objective. Support was received from the Ngati Hine Forestry Trust, the Far North District Council (FNDC) and some landowners in the Maromaku dairy farm area.

The Ngati Hine Forestry Trust who administer approximately 5000ha of pine forestry within Taumarere Catchment has developed a process whereby the second rotation planting areas of *pinus radiata* are approved by Tui Shortland on site to ensure appropriate buffer zones for waterways. The buffer zones are between five and twenty metres in width depending on the land topography. This has been established so that riparian planting can be carried out.

We have also gained commitment from FNDC to plant their entire Waste Water Treatment Plant property in Kawakawa to assist with lessening the impact of flooding in the area.

Some of the Maromaku dairy farmers have also agreed to planting their waterways to assist with water quality and flows.

During the pilot project Nga Tirairaka o Ngati Hine also confirmed support from the Northland Regional Council for Ngati Hine lead enhancement work as a part of a Joint Management Agreement of which the legal details are currently being worked through. This support was received from the Northland Regional Council at the enhancement wananga in Motatua.

Living Waters, a Non-government organisation motivated to improve the health of the Bay of Islands has made a commitment to assist us with any planting work including bringing together expertise, marketing planting day events, planning, focusing on enhancing livelihoods, etc.

Local Ngati Hine schools involved in the pilot project who attended the wananga have also committed the plants they earn in their recycling paper efforts to be used in the planting days.



Joey Rapana 1

Unfortunately due to the timing of the tunawhakaheke we were beyond the best planting season of year which ended in May and we were therefore unable to carry out the planting programme. We have however, embedded the enhancement programme into our Waiora Taumarere Plan which we will be working on until 2015.

Objective 3 - Support local established and new customary and commercial fishermen

The pilot project brought together customary and commercial fishers from around the country who built stronger relationships amongst one another through respect and understanding. They also shared information about fishing related practices. Some of the commercial fishers during the meeting in Wellington expressed a lack of understanding of why Maori needed to take more than the recreational limits allowed. Many customary fishers held assumptions that commercial fishers were the major contributors to eel population decline.

After the first wananga held in Motatau in January both the customary and commercial fishers admitted to their new understandings of customary needs and commercial impacts. This has been an invaluable contribution of the pilot project.

At the June wananga kaumatua requested that a traditional knowledge database be collated and made available to encourage learning and further discussions on eel management. The database is currently being approved for public distribution.

Local fishers have been the key people nominated to take part in the wananga and lead the field work and young people have attended the wananga and taken part in the monitoring and management work who have demonstrated an interest in eels. Young members of the wider whanau of the monitors took part in the monitoring over this period, particularly in the Taumarere Catchment.



Joey Rapana 2

The feasibility of promoting young fishers into commercial fishing has been an ongoing discussion during this project. In essence Ngati Hine believes that tuna should be left to sustain the livelihoods of the people in the first instance. And there is a strong desire amongst young and old to continue this journey of assessing the on-going health and management of tuna.

However we are not opposed to exploring freshwater aquaculture opportunities. Since our involvement in the pilot project Nga Tirairaka o Ngati Hine has learnt that our preferred koroma are not ideal but rather the short fins are, which we do not consume traditionally.

We therefore are committed to maintaining relationships with commercial fishers both locally and nationally to work together to improve tuna population and health and will, at a time when new information comes to hand we will assess the feasibility again.

An on-going theme of the pilot project has been a focus on mentoring young fishers. As expressed above young people have been woven through the fabric of the pilot project.

On March 15th & 16th we held a stall at the Ngati Hine Te Ahuareka bi-annual festival. Live tuna were available for tamariki to pick up a hold. We also had posters of information about the life cycle of tuna and our stall keepers actively promoted the kaupapa of the Kete Tangariki Project. This was a popular feature of the festival attendees who were estimated to have been around 7,000 people over the two days.



Tohe Ashby 3

Objective 4 - Advocate for law, policy and eel management to local and central government, industry and the public

As touched on earlier, during this course of the pilot project Nga Tirairaka o Ngati Hine gave a multi-media presentation at the Regional Policy Statement Hearings which we hosted at Otiria Marae and gained support from the Northland Regional Council CEO, Malcolm Nicolson, for the Kete Tangariki project and ongoing support for our management of Taumarere Catchment and freshwater biodiversity.

Within the Taumarere JMA we are establishing a Stakeholder Liaison Committee made up of council, Fonterra, Doc, schools, business owners, etc. We currently have the support of these sectors to join the group to work together on eel management.

Nga Tirairaka o Ngati Hine also attended meetings in relation to the Traditional Knowledge Indicators for the UN Convention on Biological Diversity Strategic Plan and Aichi Targets over the course of the pilot project. In the Philippines we met other eel communities who are eager to learn more about the enhancement work the pilot project is undertaking. More recently in Indonesia we were asked to present on the cultural indicators and information and monitoring systems used to map biodiversity.

Facebook has also been a continuing media tool for us to keep in touch with Ngati Hine and other interested people in the pilot project.

Recommendations

Some suggested future work has been recommended by the working party,

1. research into wetland restoration
2. research on puru tuna (underground/plutonic wetlands) as a very important but vulnerable tuna habitat
3. complete a freshwater fisheries plan template
4. identify a suitable catchment for a waiora approach including iwi, industry, farming, fishing, urban, marae, riparian margin management - the lot with Fonterra, Councils, Central government, Niwa, farming, road makers, water users together to sort a manageable area
5. TWMTL could formulate advice for iwi on how they might generate funds to support on-going projects
6. funding for, advocacy actors, enforcement, and on-going elver management
7. presentation to the special WG meeting on 30 October to gauge the reaction of the scientists and managers
8. upcoming monitoring of the female heke in 2014 could be an important test case to demonstrate how to include iwi data in the on-going MPI monitoring of eel stocks.