

TANK Collaborative Stakeholder Group

Meeting Twenty-Three - Record

When: Tuesday, 20 September 2016, 10:00am – 4:00pm

Where: Ellwood Function Centre, Hastings

- Note: this meeting record is not minutes per se. It is not intended to capture everything that was said; rather it is a summary of the proceedings with key comments noted. *Text in italics indicates a response from HBRC to questions posed during the meeting.*
- *Where additional information has become available subsequent to the meeting (such as answers to questions unable to be answered in the meeting), this is included in red italics [as up to 24 October 2016].*

Meeting Objectives (slide 4)

1. Understand estuary state in relation to freshwater inputs
2. Receive information about modelled land use effects on water quality – pastoral catchments and sources of:
 - Sediment – SedNet
 - Phosphorus - Overseer
3. Discuss sediment and erosion mitigation options and strategies
4. Build on the values/attributes works of the TANK Group by receiving the findings of the *Translating mana whenua values to attributes for the Ngaruroro awa* engagement project.

AGENDA ITEMS

1. Welcome and karakia

Robyn welcomed everybody and Marei delivered a karakia.

2. Agenda and early discussion

- Housekeeping matters covered.
- Meeting being recorded but will not be available publicly. It is recorded for the purpose of assisting in compiling the minutes.
- A few visitors today so there was a round table of introductions
- The meeting agenda and objectives were outlined.
- Ground rules for observers confirmed
- Apologies were confirmed (see attendance table above).
- Engagement etiquette was covered.
- No notices or announcements from TANK members
- TANK members were asked to add their consultation to the Contacts Register

3. Item # 1 – Meeting Record 22

Meeting record accepted. It was confirmed that following circulation of the draft minutes the priority for Ohiwia Stream and Tutaekuri-Waimate Stream was changed to “High” to better reflect what was decided at the meeting. Meeting minutes were confirmed by the TANK Group to be accurate.

Action points relayed.

4. Item # 2 – Field Trip (slide 9)

Options for a field trip were proposed.

5. Item # 3 – Update on Havelock North contamination

Stephen Swabey presented some maps, a brief overview of the investigation that HBRC is doing into the campylobacter outbreak in Havelock North and put it into the context of the TANK work programme.

He answered a small number of questions and invited TANK members to record other questions on the whiteboard to be discussed at the next meeting at which groundwater quality will be on the agenda.

6. Item # 4 – Sediment Modelling in TANK catchments

Barry provided an overview of what the SedNet model can do, where sediments comes from, where it goes and how much.

A graph was presented that showed the reduction of sediment loss as stock is excluded. It was acknowledged that 100% stock exclusion is unlikely to be practical due to factors such as cost. Moreover, it is a natural occurrence and we need sediment and nutrients in the water to keep the rivers healthy.

The relationship between sediment and phosphorus in waterways was discussed. Barry also showed a geology map which showed areas of naturally occurring phosphorous.

We also need to think about keep soil on the land for soil conservation and to keep the land productive.

Matters raised by the TANK Group:

- **The size of catch of the catchments was requested in order to identify the problems such as causes of erosion**

The presentation today is an overview but the model can be broken down into more detailed information such as the location and area of each type of erosion (i.e. landslide, sheet erosion, bank erosion) and that can be presented at a later date.

- **Stock exclusion modelling**

There was further discussion about what modelling information presented was based on and is predicting. The TANK Riparian Assessment (slide 21) is estimated using visual inspection of aerial photography which showed where the river is accessible. The modelling of the relationship between stock exclusion and sediment loss assumes that stock has been excluded on both sides of the river and planting has been put in or allowed to regrow. The modelling presented only considers river bank erosion. River bank erosion is about 25% of all erosion and reducing river bank erosion could be an effective way of reducing sediment loss to the rivers.

- **Are there differences in sediment load for different types of erosion and costs of mitigation options for different types of erosion**

Yes. Further information can be provided by Brendan in relation to mitigation options and costs. The maps presented are a model. At farm scale you need to consider the different management practices of that farm and what are the most effective mitigation options for the site. There is some erosion that cannot be stopped. Further investigations are required.

- **Concern was raised about the assumptions underpinning the model and the numbers**

The first map showing exclusion of stock (slide 21) was based on 2012 aerial imagery. There may be difference between the model and what is observed on the ground due to changes since 2012. In addition, the modelling does not account for different management practices and enhancement on individual sites such as sediment traps. The model takes into account factors such as land cover, slope and river flows.

Erosion from stock access in the model is only related to river bank erosion. Other types of erosion like landslides will be picked up in a different way.

As with all models there are assumptions but the quality of the model will increase as more data is put into it.

The model is a useful way to consider different options under the same conditions to predict what is going to result in the most reduction in sediment loss.

- **Do you have topographical maps which show how much of the land has a slope of 15 degrees or less? This is an area where we should focus as that is the national direction.**

It is not included in the model yet but the Council has layers on slope in GIS. This can be included in the modelling to look at what the erosion is within those areas.

- **People require resource consent to deposit material into the coastal marine area. Erosion of land is like depositing that material into the public domain.**

Some is natural that keeps the land healthy and vibrant but there is some caused by human impact. We need to try to tease the two sources apart and spatially spread that out to see where the sediment is coming from. Then policy decisions need to be made about what we do about that.

- **Most of the sediment in the waterways comes from tributaries. Processes of straightening and aligning those waterways and flow may be contributing to landslides and creating a legacy for example in the Raupare Stream and Ahuriri.**

- **There are a number of different systems used around the world. How does SedNet rate?**

There are a range of tools available. SedNet was developed in Australia and adapted for NZ conditions. SedNet was chosen. There are parts of the model that need work but we will see how good the model is as better data is input to the model.

- **How is the SedNet calibrated?**

It is calibrated against data HBRC has on instream loads. Things like river bank erosion are calibrated using cross-sectional information of river data collected over time, erosion and climate over that period. Information is collected from a range of sources and we make sense of it in the context of the TANK catchments.

7. Item # 5 – TANK minutes online

There was a discussion about putting the TANK minutes online available to the public to assist in communicating what is happening with the TANK process. Some concerns were raised about providing too much information, the need to keep information concise, how we will respond to questions, diversion of resources to public inquiries, and there was concern about having the TANK members' names and the record of attendance with the minutes online.

TANK members also recognised the benefits of communicating this information and bringing the public along to build trust in what the TANK Group is deciding. There was a desire to be transparent. The TANK Group also recognised the benefits of being able to see progress on the different catchment plan changes occurring across the Hawke's Bay Region at the same time.

Management of the information communicated can be carried out with the assistance of Drew and the Engagement Working Party.

Decision:

Make the TANK meeting minutes available online with the attendee list removed.

8. Item # 6 – Overview of Erosion and Management

An overview of erosion and mitigation options was presented by Brendan.

Three common responses when talking to people about erosion are:

- Following stormwater events, people say that was a just really bad storm and we've never seen anything like it before, it was unpredictable
- Erosion is just a natural process that's how the plains got there so should we really be worried about it
- Forestry harvesting is bad as it pumps sediment into the streams.

In the Hawke's Bay context based on geology and climate, the TANK catchment is relatively low risk.

The Tutira area has provided a lot of information and insight into what happens with land use change and storms and Brendan presented some statistics on natural disasters. When forest was burned off and converted to pasture natural erosion was accelerated. A paired catchment "Pakuratahi land use study" provided information about sediment loss associated with forestry. The sediment loss from the pasture catchment is higher than sediment loss from the forestry catchment.

Brendan explained some of the different types of erosion in NZ, causes of that erosion, and the options and challenges around management of erosion. This included areas on the plains prone to risk and priority for soil conservation where, when cultivated, the land with bare soil can be at risk of loss of soil from wind erosion. Wilderness areas can also naturally erode due to the type of geology.

Brendan briefly introduced the Land Use Capability (LUC) system and how it can be used online to help identifying risk and the types of mitigation techniques that can be used to manage those risk.

Following on from questions asked of Barry, Brendan explained that the SedNet model is very new. HBRC used SedNet modelling for the Tukituki River catchment about three years ago. There is a programme this year to go into the Tukituki valley and look at the sites that SedNet has identified as high risk and talk to the farmers. This will help us to determine how to use it in the future. The SedNet modelling for the TANK area only became available about a week ago. We will be able to ask the model questions, generate some answers and enable us to question the assumptions that have gone into the model.

Matters raised by the TANK Group included:

Steepness of terrain

- As far as erosion is concerned we are looking at slopes that are plus or minus 15 degrees so is there any work being done to linking this back to steepness of terrain?
Most of the research has been done on steeper terrain as this is where the most erosion occurs. The details of the research were not on hand at the TANK meeting but more research has been carried out looking at steepness of terrain and rainfall, such as the number of millimetres to get soil mobilised on different slope angles and how that increases as rainfall intensity increases.

Forestry harvesting

- In Wairoa, iwi representatives have large land blocks where forestry is being harvested in areas with very tough terrain. There is interest in how many studies have been carried out in that area looking at factors such as loading and sediment. There are potentially large problems in the future when very large forestry blocks will be harvested. What part is HBRC going to take in studies on those areas?
In general, HBRC is aware of forestry related issues in northern Hawke's Bay that will need to be addressed and further up the coast in the Gisborne area where the land is even more erodible. Trees have been planted in some areas for the purpose of reducing erosion but in the longer term the really steep areas are not a good place for getting a good forestry crop and there are challenges with harvesting those forested areas, i.e. income from harvesting those areas would be relatively low due to factors such

as the high cost of harvesting and the sites being distant from ports. Those problems have not been resolved yet.

Management practices are important and there are a number of management options that can be used to help minimise impacts after harvest. In the Pakuratahi study good forestry management practices were used, i.e. grass seed was planted straight after harvest, so the period over which sediment loss was generated was short. Bad management practices such as long periods between replanting can result in higher impacts of sediment loss.

Investigation of this using SedNet is part of the work programme to help decision-making in those catchments.

There are problems in the steeper areas of the catchments on the margins where sediment is mobile. There are areas where indigenous forest should never have been removed and there is still a problem with sediment loss. One challenge of addressing this issue is that the land is privately owned, is currently generating income and in terms of good ongoing revenue and ecosystem benefits it is difficult to find financial incentives to take that land out of production and put into conservation. It is worse in northern Hawke's Bay than the TANK catchments with 10s of thousands of hectares like this and there will have to be larger discussions with those communities about financial incentives if people wish to improve water quality.

- The management practices between different forestry harvesting operators appears to be inconsistent and there appears to be a gap in addressing this issue. Resource consent requirements could be a useful way of addressing this.

There is currently a national environment standard (NES) being developed for forestry and harvesting management which is expected to come out in April 2017. The TANK plan change process will have to have regard to this NES and specific rules could be developed for forestry harvesting activities and forestry more generally. The rules will be different to those currently in place, i.e. requirements to meet certain standards. There will be further work on this next year.

Wilderness areas

- There are some wilderness areas that have been affected by land use such as deer farming where deer graze on the understory plants. The erosion in those wilderness areas is not natural.
- On the Owhaako blocks just on the other side of the Kaweka range there was a great venture for horse riding. But a ban had to be introduced to horse riding because over the two years of that venture, significant damage was done to areas such as the scarps, where horse tracks on the soils created huge areas of erosion. It does not take long for human activities to have significant impacts.

Use of Native plants

- Have any studies been carried out on promoting use of native plants for biodiversity or on how effective Manuka or Kanuka can be given you can also receive a financial return to replace the loss of some areas? *There have been limited number of studies carried out such as Landcare looking at the root systems of different native plants. They have not looked at comparing the ability of those plants to retain soil. A lot of this work has been done in relation to riparian planting rather than slopes. The general reason for use of poplars and willows to reduce sediment loss is that they are relatively cheaper than native plants, they can establish at the same time that the land is used for grazing, planting methods are quick and 90% of the trees will grow. But further work will be done on native plants as use for riparian planting such as the effectiveness of manuka of reducing erosion at Tutira. More information will become available on manuka for slope erosion and regeneration.*

Earthquakes and fault lines

- There are major faults in Hawke's Bay such as Wairoa, Mohaka, Ruahine and Awanui and we are experiencing more frequent earthquakes. This impacts on the integrity of the land. Does HBRC take that into account the effects of earthquakes and shaking of the ground on erosion and sediment loss, i.e. slips?

Yes. A study was carried out when there were a couple of periods where there was a lot of soil erosion and it was deduced that there was more erosion than expected due to an earthquake that occurred around the same time and when the soil was loaded with water.

- Studies have been conducted on fault lines in Hawke's Bay and it would be useful to produce that information so the TANK Group can discuss mitigation options further.

Ecological impacts

- Is there a threshold for the effects on the river from an ecological perspective, i.e. if there are very high levels of sediment loss does it take longer for the river to respond? Impacts caused by peaks and troughs of sediment loss might be more of an issue than impacts of net sediment loss.

There is more detail available in the Pakuratahi study that may answer this question. The study shows that in a significantly high rainfall event, there will be more sediment loss from forested areas compared to normal rainfall events, but the impacts will be less. It is important to look at whether we are managing for the average sediment loss or loss from larger events.

Remediation of existing erosion and removal of sediment in waterways

- What about remediation of existing erosion? Are there any plant species that are adapted to those subsoils or other remediation measures like earthworks that can be used?

Remediation has been carried out using similar methods to mitigation i.e. re-grassing if the vegetation will grow but it can be difficult to get something to grow on exposed sub-soil. Poplars and willows can grow in those types of areas.

- Are there any investigations being done on removing sediment already in waterways such as use of settlement ponds?

Work has been done on a number of different methods for capturing and preventing sediment entering the waterway, i.e. use of sediment traps at the bottom of cropping fields and use of structures to settle out fine sediments after high flow (like a small pipe that can allow sediment to accumulate before it enters the waterway). Bay of Plenty has done a lot of work on this.

There are different methods that can be used to remove sediment from river beds but need to consider factors like calculating how quickly the sediments may settle out and therefore how long that method will keep the gravel clean of sediments.

Economic costs and benefits

- What work has been done in NZ to look at the economic benefits of controlling erosion? This would be useful when we are looking at cost/benefit scenarios and what the benefits of replanting areas would be to farmers.

This will be part of the economics analysis which will be underway soon and will include looking at costs and benefits of mitigation measures (i.e. benefits of not losing stock into gullies).

It would be helpful to know what specific questions the TANK Group has. Economic analysis is a large area and many studies have been done. There are a number of parts to this such as costs to farmers, disposal income, ecosystem service benefits both on farm and downstream.

- Areas can be fenced and vegetation used to control erosion but management factors such as how weeds will be controlled, who will be responsible and who will incur the cost needs to be considered.

Long term plans need to be made.

9. Item # 7 – Waitangi Estuary

Oli provided an overview of the land use types in the Waitangi Estuary catchment and the impacts of the rivers flowing into the estuary. Activities on the land in the catchment affect the water quality in the rivers and downstream in estuaries. The Ngaruroro River, Karamu Stream/Clive River and Tutaekuri River all flow into the Waitangi estuary as the freshwater flows out to sea. When considering the estuary

and influences on it, the TANK Group needs to think about the whole catchment and considered them as one.

Oli identified that there is one agreement (# 32) in the TANK Interim Report that relates to the estuary, but this is just a small part of the picture. The wider range of values that the estuary provides for the environment and people were explained along with potential sources of adverse effects that the TANK Group needs to consider. There are potential overlaps between values which will be in conflict at times and decisions will have to be made through this TANK process on how that will be managed.

Oli presented on factors that have effects on water quality, trophic state, sediment quality, pathogens and habitats in the estuary and how they are interconnected. Sampling commenced in the estuary in recent years.

- nutrient levels show that the ANZECC guidelines for DIP and DIN are exceeded in the Waitangi estuary and closer towards the river mouths. Signs of stress caused by nutrients are evident, i.e. in the form of phytoplankton blooms.
- dissolved oxygen is reduced in the estuary and river mouths particularly in the Clive River. This impacts on the behaviour of aquatic life and low dissolved oxygen can cause death of aquatic life.
- suspended sediments show a different pattern to nutrients and dissolved oxygen. They are much higher in the Ngaruroro River than the other river mouths and estuary. Sediments can be pushed back up the rivers during incoming tides.
- Settlement of fine sediments and deposited sediment in the Waitangi and Ahuriri estuaries can cause the sediment to become anoxic, kill invertebrates and some aquatic plants. It is worse in the Waitangi estuary than the Ahuriri estuary. The whole estuary shouldn't be muddy, there should be gravels in the bed substrate as well. Sediment plates were installed in the Waitangi estuary last week to allow surveying of sediment depth and assist with monitoring of sediment deposition.
- Sampling of fine sediments and infauna indicate the influence of sediment types on ecology. More than 20% fine mud impacts upon species present like mussels, tuatua, cockles and other kaimoana species.
- Contaminants bind to sediments. Monitoring of sediments and contaminants commenced at seven sites in the Waitangi estuary and upstream in the three rivers this year to look at the impacts of contaminant sources like stormwater, pesticides like DDT, PAHs associated with road run off. Zinc levels are approaching levels set in the ANZECC guidelines which indicate when the effects on the environment can be adverse.

The problems worsen from upstream to downstream in the rivers and those problems accumulate in the estuary.

Estimates of the amount of sediment entering the estuary from each of the river catchments indicate that the highest load comes from the Ngaruroro River. Sediment also comes from erosion of banks in the estuary itself.

Sediments move in Hawke Bay with currents and nearshore dynamics affect the fate of sediments. In considering values and setting limits through the TANK process the TANK Group needs to think about the input of the rivers into the Waitangi Estuary and also the combined impact that has on the marine environment. Sediment movement is extensive in Hawke Bay and the impacts can therefore be wide ranging such as smothering of reefs and shellfish beds, algal phytoplankton blooms and issues associated with dissolved oxygen. Sediment might also be one of the factors affecting habitats for fish and people are currently concerned about fish stocks and fish catch in Hawke Bay.

Oli also presented on Enterococci of the Waitangi estuary as an attribute for recreational values and an indicator of faecal contamination in the marine environment. At one site (monitored since 2001) in the Waitangi estuary, at the Clive boat ramp, a recreational monitoring site during the summer, there are regular exceedances of faecal contamination. It is one of the worst sites monitored in Hawke's Bay. Water quality is very poor there and recommend against swimming. HBRC is working on identifying the

source of the contamination but it is difficult to isolate the contaminant source as there are many sources of enterococci including breakdown of vegetation as well as bird and ruminant faeces.

Species diversity and habitats are linked to food gathering. Waitangi estuary is of great importance for white baiting. Part of the success in this estuary is the identification and protection of two whitebait spawning areas through measures such as stock exclusion. There is a much greater area in the Waitangi estuary that has the potential to be a spawning area but the habitat has been degraded. The area is also popular for surf casting and set netting of fish. It is very important for fish such as a nursery area, fish spawning, for juveniles, and for fish that eat the juveniles. This estuary is important for a number of migratory species.

Estuaries have a filtering function but a muddy estuary is not natural and sediment loads, suspension and deposition are a great threat to the estuarine and marine environment. Management of sediments will manage a number of other attributes and values as well.

Matters raised by TANK Group members included:

Sediment and contaminant sources

- Does the HDC sewage outfall contribute to the estuary?
The outfall is monitored closely under the consent conditions for the coastal discharge. The outfall diffuser dilutes the discharged effluent and there is a predominant northerly drift so it is expected that the outfall is not impacting on the estuary on the incoming tide.
- Could sediment in the Ngaruroro River be one source of sedimentation in the Clive River/Karamu Stream?
Yes. It is unclear how far water is pushed back up the Clive River but the sediment plume has been observed as far as the road bridge. It is unlikely to push sediment up as far as Kohupatiki Marae.
- Dredging in the Clive River is part of HBRC's work programme and this is the area where water and sediment has been observed to be pushing back up from the estuary into this river.
After dredging of sediment, it has been observed that the stream fills up starting at the downstream end.
- Can observation of sediments using a microscope be used to determine the origin of deposited sediment?
There are isotope methodologies available to look at sediment and compare sediment from different catchments and sub-catchments to see where it comes from.
- What is the source of the zinc found during the sediment testing?
Unknown at this time. Can be considered in terms of what activities are occurring in the catchments such as the high levels of stormwater discharged into the Karamu Stream.

Sediment accumulation in the estuary

- If the estuary continues to accumulate sediment is the estuary getting shallower?
Fine sediment accumulates but can be flushed out during flood events. Monitoring of the sediment plates recently installed will assist in investigating what is happening.
- Is the level of the bed of the estuary the same level as the exit and the sea bed? How does that affect the flow flushing the estuary?
Parts of the estuary are quite stratified and the freshwater flows over the saline water at the bottom. There are some deep areas for example about 4m depth in deep channels of the Ngaruroro River. This limits the mixing of the waters.

Mitigation

- Man-made structures such as stopbanks alongside the Ngaruroro River could be the cause of some of the sediment accumulation problems observed in the Karamu Stream. Are there actions that can be taken to mitigate the impacts of man-made structures/modifications?
The estuary is highly modified. When the Ngaruroro River use to flow down through the Karamu Stream this would have provided for some flushing of sediments. Diversion of that amount of flow of a river will have a significant impact. One of the values for the rivers that has been identified is

flood carrying capacity and the TANK Group will have to be weigh up this value against factors like sediment and ecosystem values.

- Is that feasible that sediment could be permanently removed from the river mouth and the sediments could be re-purposed something else?
Yes, but that does not solve the causes of the problem of sediment erosion and loss into the waterways, estuary and coastal area. Water from rivers that enter the estuary should be processed and cleaned in the estuary for example by shellfish. The water that enters the ocean should be relatively clean. But at the moment we have lost that function of the estuary i.e. through loss of shellfish beds.

Contaminant limits

- Is the threshold for contaminants discharged into the rivers set too high for holders of resource consents allowing contaminants to enter?
We don't have enough science to know what the acceptable level of load into the estuary is at this time, but we can look further into for nutrients for example.

10. Breakout – Further information required by TANK Group

The TANK Group was asked to identify what further information it needs to form policy options, for example more information on the SedNet model, erosion management options and information about the estuary.

Information the TANK group requested:

- Costs/benefits mitigation measures to farmers for different land uses especially higher/steep sloped areas with low production and economic value
- Impacts of erosion on the coast
- Suitability of soils for different land uses
- Use of LUC in making:
 - * Land use decisions
 - * Policy options
- Effect on the environment from erosion and sediment
- Economic cost of erosion and sediment to land practices for farmers
- Opportunities for improving biodiversity through mitigation measures and specifically using native plant species like manuka that can also provide economic benefits from conversion
- Effectiveness of sediment ponds with recreational benefits/wetlands (farm ponds) as a viable mitigation tool
- Trend information – potential differences in erosion over time with different land uses over time
- Historical data on sediment load to calibrate model to land use
- Modelling of mitigation for surficial and land slide erosion types (including the influence of climate change and pest control)
- Role of subsidies
- Risks with respect to geology/sediment type and soil loss, nutrient status/contaminants risk and soil loss, and relationship to the LUC
- Soil loss impacts on ecology
- Impacts of sediment loading on disruption to hydrology of streams and springs (in plains rivers)
- Peer review TAG input
- Provide for intertidal habitats to “creep” inland a result of effects of climate change and sea level rise
- What level of sediment input to the estuary would be acceptable?
- What is an acceptable level of nutrients in the estuary?
- Change in species presence in the estuary as a result of factors like avoidance behaviours? What historical data is available? The information held by hapū may be able to be correlated with data?
- What is the likely scenario for species if there is no change in management practices?
- What is the discrepancy between nutrient levels and sediment loads, i.e. high nutrients, low sediment load in the Clive River versus the high sediments, low nutrients in the Ngaruroro/Tutaekuri Rivers?

11. Item # 8 – Translating Mana Whenua Values to Attributes for the Ngaruroro Awa

Mana Whenua group

Marei introduced the Mana whenua members including the different entities they represent and what they have done to work towards compiling the Ngaruroro River values and attributes.

- NKII is a mandated iwi authority for the “iwi”, Ngaio Tiuka works for this entity.
- Te Taiwhenua o Heretaunga is one of the six Taiwhenua within the NKII area and 15 marae are within the TTOH area. Representatives on the TTOH go through a robust voting process voted by the marae. Marei works for this entity.
- Te Runanganui o Heretaunga, assisted by TTOH, has representatives from each of the 15 marae and focuses on environmental management and RMA and community development. This includes persons such as:

- Ngatai Huata is a member of one of these hapu and brings with her a repository of matauranga Maori that has been passed down since the arrival of Takitimu waka in the 1300s.
- Joella Brown connects to Korongata and Mangaroa marae
- Morry Black is engaged as a technical expert
- Other mana whenua members include Aki from Kohupatiki marae within the Te Taiwhenua Te Whanganui a Orotu area and others with passion about the awa including Jenny, Stephen and Hira.

Kate McArthur, from The Catalyst Group, has been engaged to provide technical expertise to the Mana Whenua Group for the Ngaruroro values and attributes project.

Spearhead Matrix

Ngatai Huata, talked the Group through a spearhead-shaped matrix of values based on Ko te Amorangi ki mua , which is a whakatauaki from their tipuna. Kawa is the policies and procedures that keep the Maori culture intact. Values and attributes are all behaviours that prompt us to behave in certain ways for specific reasons.

Process of compiling values

The Ngaruroro River wariu (values) and huanga (attributes) were compiled through wananga and workshops. The process of working through this was explained including looking at different hapu linkages and hapu areas and where there are commonalities between values, talking with tangata whenua about the current state of the environment, concerns and what their visions are through workshops and Wananga and looking at the Iwi Management Plans and Hapu Management Plans that have been received by HBRC.

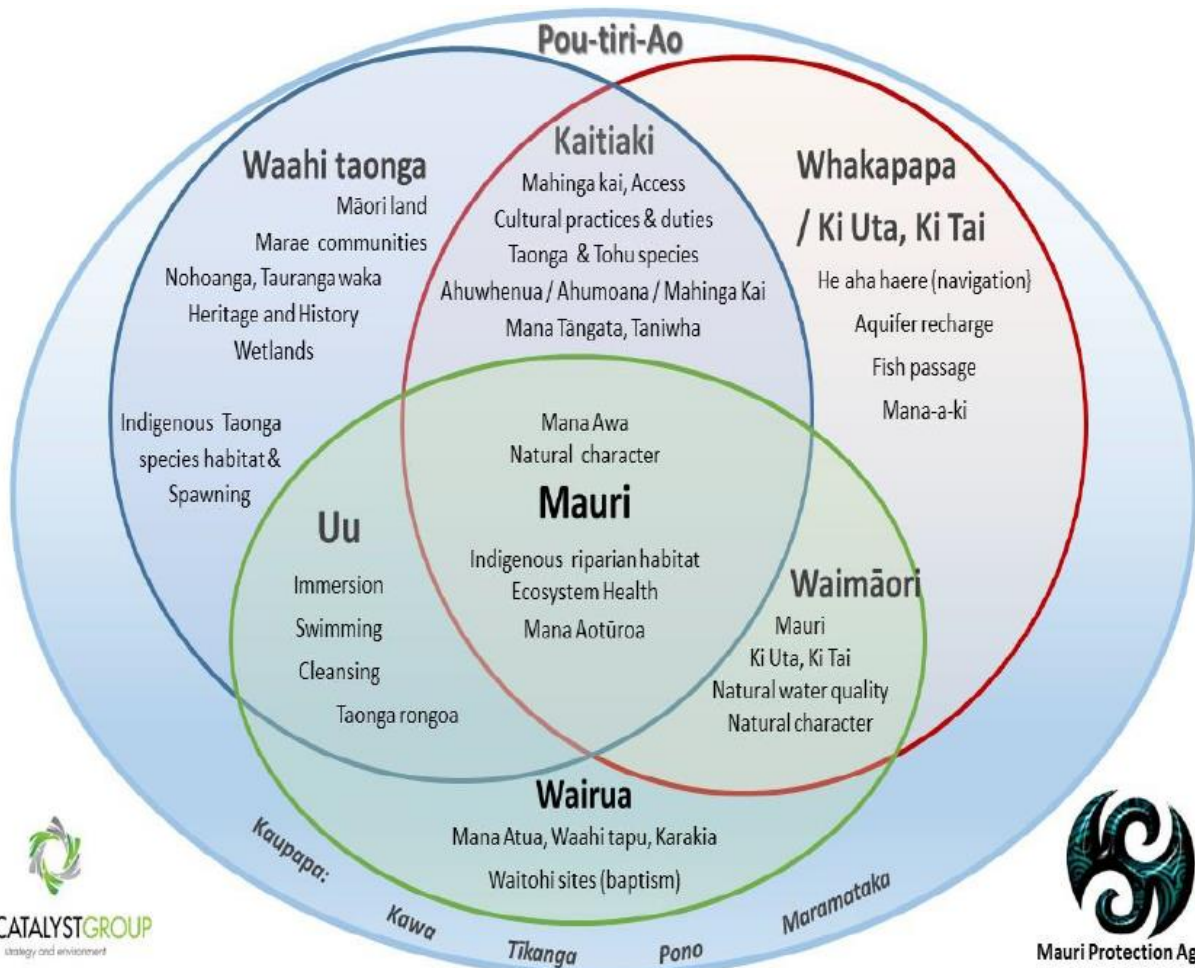
In working with tangata whenua in the process, these high level values were the start before moving further into planning processes, which was important for getting “buy in”. Kate assisted by working in the middle between the high level values and RMA processes.

The values and attributes developed so far were presented back to hui a hapu that associate with the Ngaruroro River (who connect to the Ngaruroro River through their genealogy and history) on the 12th August. People to the majority of marae attended. More detail has been added to the final paper. This will be presented to the RPC on 21 September. After this the mana whenua group will report back to the marae what changes have been made. The mana whenua group have obligations to continue to communicate and consult with the hapu.

Values (Wariu) and Attributes (Huanga)

Key concepts and values of Kaitiaki, Waahi taonga (under this comes a number of types of taonga – these have been mapped, see presentation for example), Whakapapa/Ki Uta Ki Tai, Waimaori, Wairua, Uu and Mauri were displayed in a circular diagram showing how they are interconnected/interrelated and sit within Pou-tiri-Ao (see figure below). This starts to introduce western science like ecosystem health alongside the Te Ao Maori world view.

This was also displayed in table format starting with wider values for the Ngaruroro River catchment (“Awa-wide wariu”) then “Site/reach specific wariu” to try to begin to introduce the western science alongside the Te Ao Maori view in a linear format (see below).



Awa-wide wariu

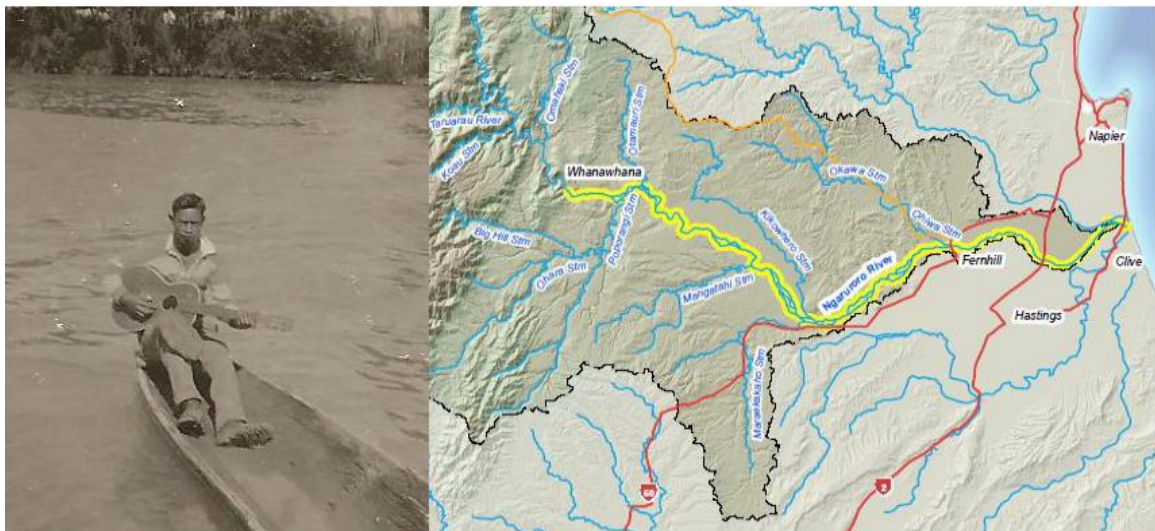
Wariu group	Sub-values: Awa-wide
Uu	Uu (immersion, swimming, cleansing)
Waimāori	Mauri; Ki Uta, Ki Tai
	Natural water quality
	Natural character
Mauri	Ecosystem health
	Indigenous riparian margin
	Natural character
Kaitiakitanga	Ahumoana, Ahuwhenua, Mahinga kai (species & practice)
	Te Tuturutanga mahi pono te hapai o ...
	Access
Whakapapa / Ki Uta, Ki Tai	Fish passage
Wairua	Karakia
	Mana Atua

Site/reach specific wariu

Wariu group	Sub-values	Site/reach
Whakapapa / Ki Uta, Ki Tai	He aha haere (navigability)	Mainstem river mouth to Whanawhana. Lake's Runanga, Oingo, Hinemoana, Kotuku.
	Aquifer recharge	Recharge zone – including land
Kaitiakitanga	Indigenous Taonga / Tohu species, habitat and spawning	Upland: all catchment and tributaries upstream of Whanawhana
		Awa kopaka (braided): Whanawhana to Fernhill
		Lowland: Fernhill to Chesterhope Bridge
		Estuarine: Chesterhope Bridge to sea

Site/reach specific wariu

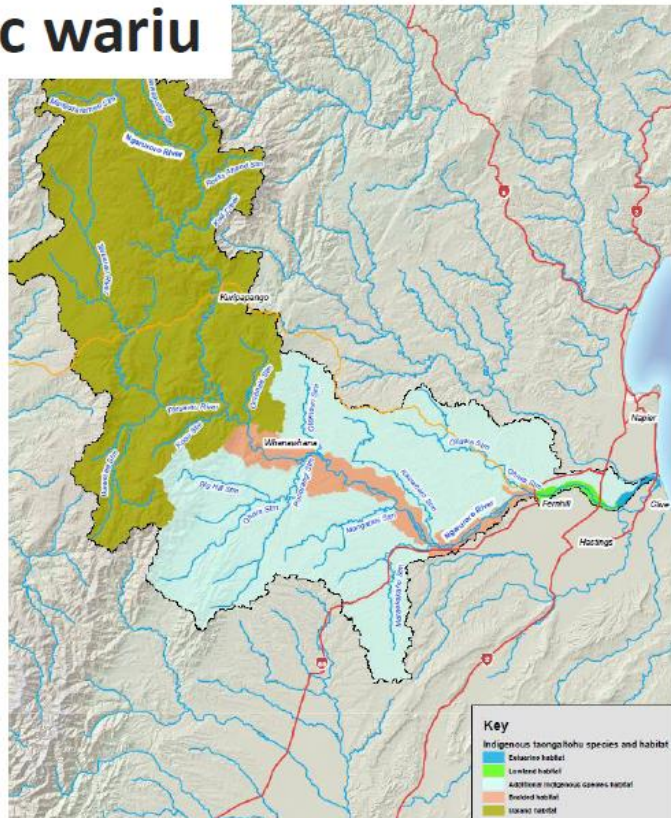
Wariu group	Sub-values	Site/reach
Whakapapa / Ki Uta, Ki Tai	He aha haere (navigability)	Mainstem river mouth to Whanawhana. Lake's Runanga, Oingo, Hinemoana, Kotuku.



Site/reach specific wariu

Wariu group Kaitiakitanga

Sub-values	Site/reach
Indigenous Taonga / Tohu species, habitat and spawning	Upland: all catchment and tributaries upstream of Whanawhana
	Awa kopaka (braided): Whanawhana to Fernhill
	Lowland: Fernhill to Chesterhope Bridge
	Estuarine: Chesterhope Bridge to sea



Site/reach specific wariu

Wariu group	Sub-values	Site/reach
Waahi Taonga	Waahi tapu	Defined sites
	Mahinga kai	Defined sites
	Ahumoana, Ahuwhenua,	Defined sites
	Nohoanga	Defined sites
	Cultural practices	Defined sites
	Tauranga waka	Defined sites
	Heritage and History	Defined sites
	Wetlands	HBRC defined sites
	Māori land	Māori land containing or adjacent to waterbodies including tributaries
Marae / hapu	Defined areas of interest (Councils' Pataka project)	

These values were explained in detail and will be presented in a report, which is due on 28th October 2016.

Four main value groups have been identified, they are holistic. Western science can provide some information about these values but there are parts of these values that are beyond the biophysical. It has also been identified that there is a need to develop matauranga Maori (specifically for Ngati Kahungunu) tools to measure and monitor the values over time. There are still parts of the values that

the planning framework can only provide some recognition for and some narrative around them because some aspects sit essentially beyond the resource management realm.

From these values they have started to look at associated attributes and limits. For example:

Matrix: wāriu ki huanga - Ngā Ngaru o ngā Upokororo								
Kaitiakitanga	Min. flow	Dissolved oxygen	Deposited Sediment	MCI	E. coli	Periphyton % cover	Clarity	Stock access
Indigenous taonga/tohu species	✓	✓	✓	✓		✓	✓	✓
Mahingakai - practice	✓		✓		✓	✓	✓	✓
Uu								
Immersion, swimming, cleansing	✓		✓		✓ No human or animal waste	✓	✓	✓
Whakapapa								
Aquifer recharge	✓				✓			✓
He aha haere	✓				✓			

Wananga

Everyone has connectedness back to places, whatever their lineage. It was recognised that the concepts and values presented are new to many of the TANK Group members, and Marei offered to facilitate a wananga for the TANK members.

Matters raised by the TANK Group included:

- There was very positive feedback from the TANK members on the presentation. It was recognised that there will be a challenge on the awa-wide values and how to achieve the values presented.

The values and aspirations of tangata whenua have been presented even though meeting those values may not be achievable. These values have existed for hundreds of years, have been documented over time, and are unlikely to change very much. It is important to discuss them and put them forward for consideration in the planning process. There have been many compromises by tangata whenua over time and they have been very patient. There is more information within documents available if people would like to gain a greater understanding.

- There have been studies on eels and recruitment, i.e. Stella August's research. Glass eel recruitment from the Pacific appears to be ok but the total allowable catch limits, whether commercial or customary, for catching eels seems to be decreasing. Eels are impacted by the quality of the waterways, particularly the habitats. There has been a lot of research done and that data may be able to be used to enhance the information presented and attributes. It would be useful for tangata whenua and the TANK Group to see that.

There has been an inference of impacts from what is happening in the rivers. Tangata whenua have also had input to the process for the HDC wastewater outfall, including values.

- Next steps?

The mana whenua group has given this some thought. The first step is to go back to Council with a report.

- TANK members expressed interest in the wananga that was offered. The mana whenua group will discuss this further and get back to the TANK Group.

12. **Item # 9 – Verbal Updates from Working Groups (slide 9)**

Engagement Working Group

A series of meetings with pastoral farmers were held in Sheridan, Maraekakaho and Patoka to get the word out on the TANK process and inform them on what may happen. Meetings were well attended. There was positive feedback and enthusiasm to know and engage more. Peter is going to contact a number of attendees to form a small think-tank up for pastoral farmers to get more feedback from that sector. First meeting probably in March and everyone, not just pastoral farmers, is invited.

The WG will have another meeting soon and that will include providing more public understanding of what TANK is doing and putting more efforts into the website.

Economic Assessments

A Request for Proposal (RFP) on the economic assessment work will be sent out to possible providers soon and we will report back with an update on that within the next month.

Wetlands

Nothing to report. Have not meet yet.

Stormwater

WG went on a field trip to look at a range of systems from full Council reticulation to on-site systems and systems in-between like Lowe's Pit. Discussions took place on how to control the quality of stormwater at the source. WG met yesterday to define the vision for stormwater, there is more work to be done looking at objectives and policies and we are gathering information on what practical options are available to treat stormwater from roads and driveways.

15. **Item # 10 – Next meeting agenda (slide 55)**

Mary-Anne presented a slide on next steps in the process.

16. **Karakia and close.**

TANK Group said a karakia together, and the meeting ended at 4:30pm.