

Report of Te Awarua-o-Porirua Whaitua Committee Workshop

31 May 2018, 5.00pm – 9.00pm
Wellington City Council, 101 Wakefield Street, Wellington
Workshop (Closed to the Public)

Summary

This report summarises notes from a workshop of the Te Awarua-o-Porirua Whaitua Committee held on Thursday 31 May 2018 at Wellington City Council.

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Overview

Workshop Attendees Te Awarua-o-Porirua Whaitua Committee:

Present: Diane Strugnell, David Lee (absent from 6.30-7.15pm), Barbara Donaldson, John Gibbs, Sharli-Jo Solomon (until 5.45pm), John McKoy, Stu Farrant (Chair), Dale Williams (until 7pm), Hikitia Ropata (until 5.45pm), Larissa Toelupe, Warrick Lyon, Jennie Smeaton (until 5.45pm)

Apologies: Richard Cook

Greater Wellington Project Team: Alastair Smaill (Project Manager), Suze Keith, Jon Gabites, Sheryl Miller, Brent King, Shane Parata (until 6.30pm), Keith Calder (PCC)

Independent Facilitator: Kristy McGregor (Mitchell Daysh)

Guests:

- Leigh Stevens, Senior Scientist, Saltwater Ecology
- Megan Oliver, Team Leader - Aquatic Ecosystems and Quality, Greater

Wellington Regional Council

Notes prepared by Suze Keith and Kristy McGregor.

Workshop Purpose The purpose of this workshop was to:

- Complete the development of Harbour Objectives, as narrative objectives.

The purpose of the meeting was achieved.

Agenda The agenda¹ is detailed in the table below.

TIME	TASK	PURPOSE	WHO
Part 1: Introduction			
5.00pm	Karakia & Update from the Chair <i>Committee Only Session</i> <ul style="list-style-type: none"> • Apologies 	To receive and discuss update from the Chair and Jennie Smeaton	Stu
5.30pm	Welcome <ul style="list-style-type: none"> • Introductions Chair's Direction <ul style="list-style-type: none"> • Purpose of meeting & agenda outline 	Establish purpose of meeting	Stu
	Housekeeping		
5.40pm	Role of Tonight's Workshop <ul style="list-style-type: none"> • Focus of this evening's workshop 	Clarify what we are doing tonight, and where this fits in the decision-making process	Kristy
5.45pm	Check in on Freshwater Objective Setting <ul style="list-style-type: none"> • Progress made at last Committee Meeting • Check in on objectives summary table & gaps filled in by the Project Team • Opportunities for further review 	Signpost for the Committee where we are at; brief check in on comfort with draft objectives	Kristy
Part 2: Harbour Objectives			
6.00pm	Presentation: Harbour Assessments <ul style="list-style-type: none"> • The areas we are looking at – why just the harbour and not the open coast? 	Inform Committee of harbour assessment work	Sheryl, Leigh & Megan

¹ As established at the commencement of the meeting. The agenda was altered at the Committee's discretion so that the group activity did not occur, in favour of a general discussion on the presentation.

	<ul style="list-style-type: none"> • Why we are looking at the six attributes • Process of completing the assessment • Main drivers of change; patterns of note 		
6.40pm	Dinner		
7.10pm	Introduction to Narrative Objectives & Group Activity	Introduce group activity	Kristy/Al
7.15pm	Group Activity: Consider Material, Develop Narrative Objectives & Questions for Technical Experts <ul style="list-style-type: none"> • Break into two allocated groups • Work through material and develop narrative objectives • Identify questions to pitch to technical experts 	Consider material; identify questions for technical experts and develop narrative objectives	Group Facilitators
7.45pm	Q&A with Technical Experts <ul style="list-style-type: none"> • Discussion on top 3 questions developed by each group 	Answer queries Committee members have about material	Kristy
8.15pm	Interim Decisions on Narrative Objectives <ul style="list-style-type: none"> • Discuss and confirm as a group narrative objectives 	Confirm narrative objectives	Kristy
Part 3: Conclusion			
8:45pm	Other Business <ul style="list-style-type: none"> • Update on field trip/stream walkover • Engagement update memo: Rural Landowners Meeting; GOPI Meeting • Next meeting 		Suze
8.55pm	Thank yous Karakia		Stu

Key Decisions to be made Harbour Objectives for the following attributes, for both the Onepoto Arm and the Pauatahanui Inlet, intertidal and subtidal:

- Sedimentation rates
- Percentage area with soft mud
- Zinc
- Copper
- Macroalgae
- Invertebrates

Committee Decisions The Committee made decisions on the objectives for harbour quality, both in terms of bands and in narrative form.

Workshop Actions The following actions were agreed to:

1. Megan Oliver to look into what's known about metal accumulation in shellfish, potential impact/s on human health, and if there are thresholds for metal accumulation.
2. Revisit at a future meeting on objective setting whether the Committee will set objectives for metals within the harbour.
3. Consider the need to describe the issues simply when this is to be communicated to a wider audience.

Workshop Notes

Part 1: Introduction

Committee Only Session

The first section of the meeting was a Committee only session to discuss and receive an update from the Chair. Formal workshop notes were not taken during this time, however, in summary, the Committee were informed that Jennie Smeaton had resigned and that Ngāti Toa had decided to withdraw from the committee and would be developing a parallel strategy in order to deliver their response to the whaitua process and the National Policy Statement for Freshwater Management. This means that Sharli Jo Solomon would also be leaving the Committee.

Role of the Workshop

Kristy explained that the workshop would be looking at the harbour and discussing harbour objectives. She explained that the science team would share the attributes they've assessed and talk through why they chose the attributes they did, the areas they apply to and how the assessments were conducted.

Kristy explained that we would then consider the material in greater depth and come up with any questions for the technical experts that may help with setting objectives. Kristy explained that the approach was different to the last two meetings, in that rather than focusing on the band objective the interest is more so in what we want to manage or achieve in the harbour, and why.

The Committee questioned the need to separate into groups, and indicated their preference to remain as a whole group for the duration of the evening. The agenda was subsequently altered.

Check in on Freshwater Objective Setting

The Committee was taken briefly to 'check in' on the draft freshwater objectives for the ecological attributes that were determined in small groups at the previous meeting. Kristy noted these were only drafts and that the Committee would have further time and information to review these objectives, however the focus was on ensuring, in light of them being modelled only on environmental data, the Committee was generally content with the positions.

The Committee clarified the reason for some areas not having objectives. Al explained this is because the results are proxies for the catchment. The Committee asked a question regarding the Takapu Stream and the question mark. Al explained that it was more of a guess than the other objectives because of the lack of detailed data for these attributes in this stream. The scenario modelling data indicated it could be shifted one band.

A Committee member commented that they thought a water sensitive approach should lead to an improvement in periphyton. Brent noted that treatment devices are going into greenfield areas; however there is a lot of legacy impact so the response is masked.

Committee noted that there were opportunities for improvement in the Mahinawa Stream. It is currently piped, and there are real opportunities to partially daylight. It was noted the pipe is very flat and there used to be a valve which stopped fish; this is gone but a few metres up there is a three metre fall which would be an easy fix for fish passage.

The Committee clarified whether there was an opportunity to recommend things specific to the place. Al noted that there was the opportunity within the Whaitua Implementation Plan (WIP) to put in specific actions. He encouraged the Committee to flesh out the band objectives with further comment and narrative, noting that the past few meetings we had captured band objectives but these had been quite limited in commentary.

The Committee acknowledged that other than the above comments, they were generally content with the direction of the draft freshwater objectives. Kristy noted that the draft freshwater objectives would be further revisited at future meetings.

Part 2 – Harbour Objectives

Presentation & Discussion: Harbour Assessments

The harbour assessments were presented by Sheryl, Leigh and Megan. They spoke to the presentation – [see attached slides](#). Sheryl noted that six attributes had been used as a starting point. It was looked at what was known to date, the experience of the team, and discussed how they thought the attributes would react in certain scenarios.

Committee Concerns

The Committee noted that from the results, everything isn't too bad. Soft mud being the biggest issue. The Committee were not as concerned with metals as they were with the other indicators. Questions were raised that if the NPSFM does not require the need to set a limit/objective for metals why they are being established? Further it was raised if metals such as zinc and copper aren't going to bring any benefit then why the Committee was tasked – or distracted by – setting objectives for metals. This question was noted and would be considered further at a future date.

In terms of monitoring, to see whether you are making a difference, the Committee noted the harbour is quite heterogeneous in terms of habitat etc. so must keep it in mind when assessing changes.

Community Engagement

The Committee noted that when the Whaitua has community engagement, the explanations around what happens in the harbour with sea grass, sediment, etc. are exactly what the community want to hear. Is there a way of explaining it more simply? The Committee identified it as a great conversation point. It was also noted that for community engagement it will be important to put figures around the Improved and Water Sensitive scenarios. The quantification provides for a more informed discussion, because a scenario may not shift the band.

The Committee again noted the need for short 'what's the problem' explanations, noting that they will need to go out to people and recommend limit/objective, and it's going to involve this and cost this, and the community will want to know what the problem is.

Discussion on shellfish and cockles

Megan expressed an interest in receiving feedback from the Committee on other indicators, such as fish. There was a discussion on cockle counts, with some of the technical team noting they are not used as an indicator. Megan noted that the annual cockle count has seen numbers climbing since 1973 but it is not clear whether their health (flesh) has improved. It was noted there are no solid guidelines on what is safe to eat. It was noted by the Committee that these were important to people and that quality needs to be measured otherwise the Committee is not fulfilling mana whenua values or social and cultural values.

The Committee expressed an interest in making a recommendation about a shellfish survey methodology, and objective around availability of appropriately sized kai, for example, to match the harbour related values. An increase in the number and quality of cockles, as a narrative objective, was also discussed.

The technical advisors noted that they were working towards this direction with Ngāti Toa. A pilot on the indicator was completed with Ngāti Toa as part of the cockle survey last year. It is difficult to relate a decline in improvement to a specific reason. Need to juggle measuring something with managing it.

Questions raised by the Committee:

Sediment accumulation and flushing

- *What options within this process are there of considering ways to reduce sediment accumulation e.g. flushing activities - rather than just accepting the status quo? Can we recommend an approach?*
AI noted our constraint is to analyse approaches in a short space of time but could always get expert analysis. Committee are certainly able to recommend management approaches in the WIP.
- *What is the flushing rate?*
Leigh noted he understood the time for sediment to accumulate and flush out was 18 – 24 months in Onepoto Arm, a bit longer in Pauatahanui Inlet due to its topography, with that being day to day as opposed to heavy weather events. In 2015, there was some monitoring done which showed an eighteen month to two-year flushing time in Onepoto, whereas Pauatahanui is far slower as the sediment is not mobilised and flushed out as quickly.
- *What is the process for removal of sediment?*
Sediment builds up over time and is flushed out with natural processes. It is driven by the wind, suspended by waves. The incoming tide with

wind pushes sediment to the head of the estuary and similarly an outgoing tide with wind takes it out. It is a net give and take but the net process is for it to exit.

- *What's the sediment budget? In order to not accumulate you need more out than in. It is my understanding that the sediment is accumulating in the Pauatahanui.*

Leigh noted that there was a trend for accumulation of sediment in both arms, with it more pronounced in the Pauatahanui Inlet. Megan noted that the team does have a sense of that budget but wants modelling to describe the flushing out. Monitoring is annual loads, whereas modelling is looking at events and day to day patterns.

- *Could an ill-informed attempt to dredge have an adverse impact?*
Yes, it could create a potential problem with stratification, dark areas and no sunlight, making it benthic. If it made the harbour deeper you wouldn't see seagrass growing. Seagrass is good because it binds sediment, creating a positive feedback loop.
- *If we were able to stop sediment loads would it self-heal?*
Yes, but we don't know the timeframe. It is very dependent on floods, flushing rates and type of vegetation. Assume that Onepoto would recover more quickly than the Pauatahanui Inlet which may take longer.
- *Are both arms of the harbour resilient to the nutrient loads they currently have?*

The threshold is when see algae growth. Harbour is at 30, natural state is around 10. Hasn't moved much in the last decade. Too much nutrient can be toxic to sea grass but here it is sediment that is the problem. Water clarity has the most impact on sea grass.

- *If we're able to reduce the amount of sediment in the harbour each reduction we can make has the potential to give the harbour more opportunity to flush the remnant sediment out of the harbour? Is there a possibility that as a system in dynamic equilibrium it could self-dredge?*

Looking for a net loss of sediment. After flood events, sediment often move from inter to subtidal and then out of the subtidal area over time. Physical changes that create feedback loops themselves shape the bottom of the harbour. Can get quite big steep changes.

- *What's your assessment of sea level rise?*
Sea level rise refers to matching estuary infilling rates. If SLR gets higher, we'll see more water in and out. It is not clear the consequence of that. Increased erosion will play a role. Might lose salt marsh - which is a key factor of turbidity etc. SLR is currently static.
- *What is the natural state of the harbour? Sand or mud estuary?*
Leigh noted that it all would have been muddy, with gravel fans around streams and deep and clear waters. Committee members noted that it is a hugely modified estuary, with massive habitat change with the removal of vegetation so a lot is irreversible and not sure whether it will get to its original state. It was observed that clarity can have a significant impact on biodiversity especially those fish which are visual predators. Leigh noted that the areas of estuary near the neck are well flushed and still have sand, shellfish and clear waters. In these areas the estuary still retains a lot of its values, and is a really important

habitat.

- *What are the issues with dredging?*
It has an adverse effect on stratification, including sunlight. There are lots of areas of intertidal seagrass where it drops away quickly. The more seagrass, both intertidal and subtidal, the better the water quality is. Seagrass can trap sediment.
- *Have the results assumed compliance with erosion controls?*
Brent noted that through the Jacobs modelling we have the freshwater results. The big changes under the improved scenario are drawn from space planting of moderately erodible slopes and stock exclusion, reducing erosion. For Onepoto, under both scenarios we see a 50% reduction in sediment. Reductions are 35% under with the improved scenario and 40% for water sensitive, for Pauatahanui. Horokiri sees a 50% reduction for both scenarios.
- *Are those results based on rural becoming urban and assuming it is done without massive plugs of sediment?*
Brent noted there is an annual inclusion of some construction sediment. Transmission Gully is assumed to be operational.
- *Regarding annual average sedimentation rate, the bands are defined in terms of biological characteristics. People's values have nothing to do with those measures, but instead to do with people's access; mud under their feet. Could banding relate more closely to people values?*
Bands have been set to describe how many times above the natural state. If we can keep it within 10 times its natural state that's reasonable. It is about winding it back, so the harbour can mitigate sediment naturally. Doesn't address the legacy effect. Noting, these are environmental attributes and need to be assessed in the context of social and recreational values. The social impact assessment which is still to come will look at the social implications of water quality improvements.
- *When looking at E. coli the description of the bands is different from these ones. Effectively we are saying the same things, these bands don't reflect what we're trying to change but perhaps are the best we can do?*
Alastair noted that instead of looking at the mitigations themselves, we can look at the amount of shift; the analysis. Brent noted that it would need to be weighed up if want to go beyond Water Sensitive to Water Sensitive ++. Leigh noted too that the scenarios didn't necessarily have all the mitigations on the table, so there may be able to be some targeted mitigations such as the amount of land cover exposed at one time, forestry harvesting (amount and timing) to deliver low hanging fruit results.
- *Sediment hasn't been included in freshwater objectives yet. Don't we have to?*
Freshwater is about clarity or sedimentation rate. So instead we went for how much load reduction we could get.
- *What would it take to get to a B for sedimentation?*
There are possible refinements. It is how these changes are implemented that will make a difference; i.e. a cap on the length of type or soil exposed especially with climate change effects. Transmission Gully was capped and then it was removed; there

possibly should be an unnegotiable cap? New Plimmerton development has requirements to not degrade the water around them. Could also do more with wetlands, farm plans, fencing and planting. (There was some discussion about whether more could be done given the 43% reduction in catchment load is a lot; the cost curve over 50%; and limited with topography to put in a wetland). There was discussion on what the starting point was. If practices are poor, understanding how far you are from the natural state helps form reasonable recommendations: how far the catchment can handle and work backwards. Allows the bars to be set realistically.

- *Is there scope to ask what would be the sedimentation rate that will make the sediment budget work? I.e. more in than out?*
Modelling will assist with that question. Sedimentation is a long term process with a five to ten year window. The harbour strategy seeks a 1mm per year reduction. Infilling is being offset by SLR. Currently the sedimentation rate is 2.3mm across both arms. In the Onepoto we are seeing a lot more sediment in there than when we were first in the Harbour.
- *How many sediment plates are there for monitoring and how representative are they of the harbour?*
There are eighteen sites plus bathymetry which takes the measurements every 20cm across the whole harbour, so provides a very good picture. And then we ground truth and this tells us what is going on over time. So we have a pretty good spatial coverage. Don't think it will change the overall picture we have here. The reason for a rolling average is the shifting baseline, which may get a trend down or up because of timing so a 5 year rolling mean.
- *Why is there no change in band with changed percentage of mud? What percentage is in natural state?*
Because of accumulation eighty percent is silky mud. Changes will take time, to shift mud and biological communities. 15% is in natural state. The intertidal has 20% mud which isn't that bad, but it's a retentive harbour. Biggest water quality changes would be in subtidal.
- *How much soft mud is there in Pauatahanui Inlet?*
Committee noted it was sometimes 1 – 1.5m deep. Leigh noted that he had seen subtidal sediment plates which in places have required walking through 200m expanse of mud to get to them; a large increase in the volume of mud. Heavier mud forms on stream deltas; the finer mud gets through and most of the mitigations stop the larger stuff. Finer stuff does get churned up and moved. The wind regime keeps the sediment in the harbour turned over, otherwise it would be anoxic. Leigh noted that when you have fine mud, you have increased contaminants, so when you are dealing with mud, don't just focus on the bands as there will be other benefits from its reduction, including water clarity and metal reductions.
- *People are concerned by the depth of the anoxic layer. Is that something we should be concerned about ecologically?*
Yes, we use it in the trophic index. Oxygenation is driven by sediment churning. If finer, it fills the gaps and goes anoxic. If the anoxic layer gets shallower (i.e. closer to the surface) then you have problems with flora and fauna. Generally the biology and measures of community

% of soft
mud

Fish and shellfish

tells us what's going on.

- *How long does it take to change the % of area that's soft mud?*
We've seen changes in a couple of years; it depends on flood regimes and if it's got good catchment control and land use controls.
- *The general perception in the harbour strategy is that it would be desirable to get net sedimentation rate down for a number of reasons, so it is maybe just a question of how much change in the net sediment rate is making a difference? Because we've been looking at the different scenarios, with the streams, are there intermediate steps in terms of some of the attributes.*

Al commented that instead of looking at the mitigation themselves, we can look at the amount of shift – so the analysis of the data. May need to go beyond water sensitive, to get the improvements, but will need to weigh this up. The Committee noted that it will be important to put figures around improved and water sensitive for community engagement. Quantification will provide for a much more informed discussion, because otherwise may not shift the band. There may be things that aren't in the scenarios modelled that may make a difference. Leigh noted that there may be the opportunity to be more targeted, for example the amount of land cover exposed at a time; the amount and timing of forestry harvesting – that may deliver low-hanging fruit results.

- *Doesn't seem to be much difference between improved and water sensitive? What would it take to get to a B?*
Improved versus water sensitive practices at Pauatahanui Stream don't necessarily produce a better outcome. A difference in stream bank erosion, through riparian and stock exclusion, was the biggest source, followed by hill side erosion. Water sensitive is a lot more effort for not necessarily much improvement.
- *Do the scenarios consider instream erosion from urban development?*
Yes, reduction in flow with water sensitive urban design and retirement slows down water. Leads to less erosion.
- *Sediment hasn't been included in the freshwater objectives yet – don't we have to?*
Haven't worked out how to set instream sediment objectives. In freshwater it relates to clarity or sedimentation rate. Instead went for how much load reduction we could get. The Committee noted that in the Pauatahanui there are short catchments so the connection between Horokiri and Pauatahanui is very obvious, and people make that connection.
- *What about the mud living fish, such as flat fish?*
Megan explained there were different users in the fish world. Rig mate and pup, and eat the crabs, and rays which eat fish and shellfish. The amount of time they are there differs. Different user groups, a bit like an index for freshwater fish you'd need mixed indices to measure what impacts. We can use different measures, e.g. seagrass, food, nursery therefore if lots of it can assume high biodiversity, and a foundering shellfish collection.
- *Are shellfish and fish part of any assessment?*
Leigh noted that the macro-invertebrate index captures fish, and the presence of different species tells you about the health of the

communities. The index for macro-invertebrates is known as AMBI. They look at the whole response so see some impact of all things going on in the estuary just like MCI. A Committee member noted you could contemplate a fish AMBI but this wouldn't be worth the effort. Megan noted that the other complication would be external factors influencing the fish population, including fisheries, source of rig, snapper. Where do they come from? Their decline might be influenced by fishing, climate change, heat wave, etc. It was discussed that while a change could be observed, it would be sorting out the causes of that change.

- *Does the index pick up the quality of the shellfish or fish? Not just numbers but quality?*

Megan noted this was about cultural values in terms of taste and texture.

- *The metals appear to be easily measured. I'm surprised at the As?*
Yes, there are hotspots in the CBD, but localised, so those bands are averaged data for the whole intertidal area. The hotspots exceed the guidelines for health often at outfall points.

Metals

- *From an estuary health point of view, are dissolved metals a problem?*
Not so much, and even bound metals are not really. Lots of metals in communities living in areas such as spillways but not affecting the size of communities.
- *Is there an issue around accumulation of metals in shellfish? Would like someone to do some work into what's known about these metals particularly in shellfish and what the impact is on human health.*

Megan noted there are no useful guidelines around concentration of zinc in a cockle. There is ongoing work, and there is a master's student looking at the concentrations, but not for human health. Metals are not necessarily a good marker for environmental health. There are metal guidelines for aquaculture, but otherwise there are no guidelines for what is safe to consume in terms of metals concentrations. Keith noted that a staff member at GW had done some work on heavy metals in shellfish in the harbour and there were no detectable levels in the shell fish.

- *If metals bind to the mud and they don't have a large impact, what's the problem?*

There are not only bound metals, there are dissolved metals, which can impact shellfish larvae and paua larvae, and then there is the stuff that binds to the sediment. If you have high sediment metals that is a fair indication that you have high levels of metals in the water for some of the time. The impact of fine sediments is much more important – and to know that metals will be taken care of through this change of practice.

- *Isn't the problem the birds that eat things and then it bioaccumulates? What about cadmium?*

There are only a couple of things including mercury and pesticides that bioaccumulate. Most marine organisms don't bioaccumulate metals. Apparently people bioregulate cadmium.

Macroalgal growth

- *Is climate change and increased temperatures an issue for creating conditions for increased algae growth? Should we be trying to manage*

nutrients?

Leigh noted that macroalgae grows when nutrients are coming in, through the uptake of dissolved nutrients. Macroalgae responds to temperature and turbidity. It is difficult to get a shift in macroalgae in the harbour. Nutrients coming into the harbour are not a problem; macroalgae is not a major driver of problems in the harbour.

- *Why is macroalgae in the C band?*
Most estuaries sit in the medium band. It is difficult to get into a good band in an urban developed catchment. Leigh noted that there were not excessive nutrients coming in to the harbour, so it wasn't near the tipping point with macroalgae. Flushing out of the harbour means the health is ok. The value takes into account the area of intertidal (which is quite small) with macroalgae takes up most of the available habitat. Macroalgae not really a big issue for the harbour. Keith noted that one of the unique aspects of the Pauatahanui Inlet is that it has one of the highest subtidal areas, so we have a restricted intertidal area compared to other estuaries.
- *Why is it not likely to tip back?*
There are not enough nutrients coming in that would tip the harbour to be macroalgae dominated. The water flushing out means that it is not a problem. If water was trapped then there might be, but no issues with trapping in the harbour.

Setting Narrative Objectives

The Committee's consideration of the objectives can be summarised below, in narrative form and as bands.

Attribute	Narrative Objective	Pauatahanui Band Objective	Onepoto Band Objective
Sedimentation rate	Sedimentation rates a concern for access and navigation. Feel that sediment is accumulating in Pauatahanui. Desirable to get net sedimentation rate down i.e. the annual sedimentation rate to result in a net loss of sediment. Because these are short catchments, the connection between what comes off the hill and ends up in the harbour is obvious. Doesn't seem to be much difference between improved and water sensitive; water sensitive takes a lot more effort but doesn't make that much more improvement. The main differences were in stream bank erosion (from riparian and stock exclusion) and hill side erosion.	Can we get higher than a C? What would it take to get to B?	A
Percentage area with soft mud	"How much mud there is" is the main thing that the community cares about, so need to go for water sensitive. People are concerned about the depth of the anoxic layer. The challenge is the difficulty with improvements. The estuary is hugely modified, with massive habitat change with removal of vegetation which has changed it from a	B and D – Still good to see an increase in the D band. Realise may take a long time.	B and D

	sandy bottom to mud.		
Copper	About human health and ecological values. Concern with metals in shellfish in the harbour. Healthy mahinga kai is the main value we are wanting to achieve. Interested to know what is known about metals and association – needs some work on this. If metals bind to mud why are we worried about them? How much effort should go into reducing metals? Metals are not as important as other attributes, such as sedimentation. Therefore, focus should be on managing soft mud and the other metals will be taken care of.	A	A and B+
Zinc		A/B and B+	A and C+
Macroalgae	The residents and community that live around the harbour are concerned with the macroalgae, and feel as though there has been a notable increase. Concerned regarding the role of temperatures in managing nutrients; possibility of climate change leading to increased blooms. Committee would like to be seen to be making a step difference.	C is what assessment is showing - but need to revisit – C is not a good place to be	C+ (revisit)
Invertebrates	Greater effort should be on managing mud. However, want to increase the number and quality of cockles; the availability of appropriately sized mahinga kai.	B+ and C	B+ and C+

Part 3: Conclusion

General Business

John Gibbs, Warrick and Diane will attend the Rural Landowners Meeting on 27th June.

The speaker for the GOPI Annual General Meeting in June has already been filled.

John G noted his apologies for 21st June, as did Stu and Kristy. Barbara agreed to chair the meeting in Stu's absence.

Thankyous

Stu thanked Leigh and Megan for attending.

The meeting closed at 9.10pm.