

WAIREWA RŪNANGA
MINUTES OF MEETING OF STAKEHOLDERS OF LAKE WAIREWA (LAKE FORSYTH)
HELD ON TUESDAY 18 OCTOBER 2005

AT TE WAIPOUNAMU HOUSE, CHRISTCHURCH COMMENCING AT 9.00AM

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|-----------------------|--|---|
| PRESENT: | <i>E Livingstone</i> | Facilitator |
| | <i>Mrs N Barker</i> | Wairewa Rūnanga |
| | <i>John Panirau</i> | Wairewa Rūnanga |
| | <i>R Wybrow</i> | Chairman – Wairewa Rūnanga |
| | <i>R Simon</i> | Secretary - Wairewa Rūnanga |
| | <i>I Cranwell</i> | Kaiwhakarite – Takuahi R & D Ltd |
| | <i>John Boyles</i> | Wairewa Rūnanga |
| | <i>Sandy Young</i> | Wairewa Rūnanga |
| | <i>D Craig</i> | Planning Consultant |
| | <i>C Woodward</i> | University of Canterbury |
| | <i>J Holland</i> | Fish & Game |
| | <i>T Davie</i> | Landcare Research |
| | <i>Chrys Horn</i> | Landcare Research |
| | <i>Kelvin McMillan</i> | Christchurch City Council |
| | <i>Riki Ellison</i> | Ministry for the Environment |
| | <i>Barbara Dolamore</i> | CPIT Scientific Studies |
| | <i>Don Jellyman</i> | NIWA |
| | <i>Bryan Morgan</i> | Akaroa-Wairewa Community Board Chairman, Councillor BPDC |
| | <i>Stewart Millar</i> | Councillor – Banks Peninsular District Council |
| | <i>Steve Lowndes</i> | Councillor - Banks Peninsular District Council |
| | <i>Chris Hopman</i> | Banks Peninsular District Council |
| | <i>John Porter</i> | Banks Peninsular District Council |
| | <i>Richard Suggate</i> | Department of Conservation |
| | <i>Joy Burt</i> | Department of Conservation |
| | <i>Kate Whyte</i> | Banks Peninsular Conservation Trust |
| | <i>John Talbot</i> | Director Policy and Planning - Environment Canterbury |
| | <i>Shirley Hayward</i> | Environment Canterbury |
| | <i>Dave Lane</i> | Environment Canterbury |
| | <i>Jenny Bond</i> | Environment Canterbury |
| IN ATTENDANCE: | <i>Members of “The Press” and “Akaroa Mail” Minute Secretary</i> | M Brown |

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1.0 KARAKIA – J Panirau

2.0 APOLOGIES – Bob Parker and Sue Davidson – Banks Peninsula District Council

3.0 WAIREWA RUNANGA & THE LAKE

R Wybrow thanked stakeholders for their attendance and their reliance on the wealth of knowledge and history surrounding Lake Wairewa to provide a long term vision, historically and genealogically. The project to restore Lake Wairewa is expansive and inclusive – culturally, environmentally, economically with social outcomes that requires the backing of the community with scientific information and research support. Consultative processes must benefit and be innovative in saving the Lake, with commitment from inter-agencies and stakeholder collaboration working to the same accord. See Attachment – power-point slides entitled

3.1 The Vision is About

3.2 Our Brand represents the Vision

3.3 The Project has Multiple Outcome Areas – cultural, environmental, economic and social.

4.0 BACKGROUND TAKUahi RESEARCH & DEVELOPMENT LTD AND PROJECT

I Cranwell provided background to Takuahi Research and Development, and its commercial arm Te Kete O Wairewa - to create and grow the wealth of the Runanga. Takuahi has the aim of the development of a Mahinga Kai Cultural Park – land and water assets - to rehabilitate the environment through the nurturing of indigenous flora and fauna and by using new technology.

5.0 SUMMARY OF MAJOR ISSUES FROM PUBLIC MEETING & COMMUNITY CONSULTATION

E Livingstone addressed the meeting following public meetings and consultation, not only with the community, but specialist groups. There had been 68 attendees at a meeting in the community on 17 August 2005, and 110 responses to the community survey from a 440 householder survey in the area. See Attachment – powerpoint slides entitled

5.1 Lake Rehabilitation;

5.2 Residents Views 1-4,

5.3 Public Meeting,

5.4 Main Issues Agreed Upon;

5.5 Other Topics Raised and

5.6 "Where to from Here"

The aim and intention of these meetings and today's process is to continue to research restorative methods to develop a multi-cord agency to co-ordinate a rescue plan for Lake Wairewa. The main consensus from community consultation is that Lake Wairewa be returned to a safe and healthy environment, and that based on the consultative processes with stakeholders the community would consider entering into a Charter Agreement to administer and oversee the lake's long term future.

Mr Livingstone expressed a vote of thanks to C Woodward on the core sample survey and the University of Canterbury for their support and other representative bodies for their assistance and input in this facilitation meeting.

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The following presentations were then called.

6. PRESENTATIONS BY ATTENDING ORGANISATIONS:-

6.1 University of Canterbury – Craig Woodward

Analysis of core sample results:-

- Taken from the deepest point of the basin (1.5m deep) to analyse what changes had taken place in the catchment in the last few thousand years. 1.5m of sediment.
- Deforestation, archaeological evidence about ancestors, but nothing really on the Peninsular about what these changes have been and how they interacted with the lake.
- First algae bloom started in 1907 but there is nothing telling us scientifically, merely historical accounts, how fishing has changed through time, conditions of the lake, etc.
- Core sample analysis showed radiocarbon dated 7314 to 7252 years when the Waimakariri River was running through the other side of the Peninsular 500 years ago.
- Core showed pollen and charcoal; land use changes and also sediment characteristics through time; bugs; diatoms (muni cellular algae); midges (blood worm), catis larvae/fly (mandevilles), forams, pinus radiata, grass pollen (bracken), and charcoal showing fire history in the area.
- 1840 – native canopy trees dropped – early European – a lot of grasses.
- Changes in the catchment – how did they affect the conditions of the lake.
- Open sea water is about 30g per litre – similar to Avon or Heathcote. Midge fly a nuisance.
- The Lake had been through a personality disorder, particularly a lot of conditions through the last seven years. Something has driven the lake turn in the period between 1840 - 1895.
- Lake closure happened about 1840 – you could walk across the bar. There was a period of 60 year when there was a lot of aquatic macrophytes. There were no aquatic weeds after 1895AD. Algae blooms are shedding the macrophytes.
- Biggest issue – salinity. When the lake was closed off the salinity levels didn't come down. 3.6 m was happening before the bar was closed. Bar closing might have dropped sedimentation; not sure how much deforestation was going on.
- Took one core sample from the biggest depth but you get a better focus of the representation of the lake. You probably would get more information about changes in the gravel bar at the end of the lake if you had taken another sample from the Little River end. Michael took a couple of other cores but they were only 50cm cores.
- Slumping – major weather events from the last 100 years may have caused the slumping but questionable whether they contributed to the sediment build-up.
- There is some ancestral history with the sea either tops the gravel bars and there is a lot of sea water coming, and there is a lot of movement between the lake and the sea underground. We have presumed when it was closed it was never really closed – the water had to go somewhere.
- At the moment the Lake is open and it is unbalanced at high tide so the sea is coming into the lake and when at low tide, the lake is continuing to run out. In historical times the lake would have been higher so the balance between the high and low tides would have been different.

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- Tried to reconstruct what the bar would have looked like historically, similar to Lake Ellesmere
- 3.6m to 3m after the Bar was closed – sedimentation rate dropped but we don't know the cause of the drop in sediment rate.
- Copies of the summary documents are available.
- Change in 1895 – timber milling would have been coming to an end by then. 1903 at the top of the valley deforestation had finished by then and the whole valley was closed. 1920 was the lowest point of forestry in the area. Did the timber boats go out through the bar or did they come across from Birdlings Flat?
- Whether the timber boats went out through the Bar or did they go across the area from Birdlings flat?

6.2 Environment Canterbury :

S Hayward – Water Quality Monitoring Programme

- Sized the current state of the Lake and the tributary water quality.
- Have 10 years of water quality data. Seven tributaries were sampled 2002/2004
- 2004 rates it to the two Rivers - Okana and Okuti – sampled monthly for nutrients, bacteria and sediment.
- Weekly sampling – continuous measures on salinity and chlorophyll Fortnightly for nutrients and turbidity
- Photoplanktion, taxa and nodularian concentrations.
- Will continue monitoring for at least another year on nodularian work
- Nodularian work – did a series of analysis on the water quality, the issues and the effect of the algae bloom.
- Steve asked at the end of November when the toxicity levels shoot up (resulting from the temperature of the lake) salinity, light availability, how still the lake is, and disturbance levels. Don't know what the drivers are for the bloom.

Question:

Do you think the study will get us to the point where we can predict the blooms?"

One of the things the community is concerned about is the lack of warning on toxicity e.g. similar to our environmental fire signs in the district, e.g. low, medium or high – knowing the condition of the lake at any given time for residence.

Answer:

A predictive tool of a week or month may be difficult to predict but there is a strong pattern of November/December. Further down the track with more analysis it would be more worthwhile.

Question:

Tests for 10 years on water quality - Is there a general pattern of degradation?

Answer:

Within the lake itself there has been a trend of decline and concentration of soluble nitrates – but it doesn't appear to be changed significantly.

- Drink water - it would be relatively safe for at least half the year, but only in the cooler months. Advice and signs not happening with the community feeling left out and feeling angry about that.

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- Field Officer does talk to the farmers around the Lake when the algae bloom is at risk.
- Sampling site along the lakeshore is not ideal, but for ease of access, it is the most suitable site. It's an indicator of general conditions.
- B Dolamore's sites for nodular bloom collections – at the end of the lake close to the sea and the picnic spot (Catins) – excellent sites for the accumulation of scum – collect it by the bucket load.
- Strong co-relation between the chlorophyll A and Nodularia
- Community want to know who told the Health Department it was toxic. No one on the ground knows how poisonous it is. All the different contradictions.
- E Livingstone said the community would like continuous advice say every fortnight outside the post office.

6.2.2 D Lane/J Bond – Living Streams Project

- Programme was set up 3 years ago.
- "Living Streams" came from a recommendation from Science.
- Three complaints – local community, fisherman, conservation trusts.
- Look at complaints about the condition of a lake or water body or stream.
- There has generally been a long history of complaints, mainly from fishermen.
- Complaints generally are stock access, lack of reticulation and fencing.
- Advantage is working with individuals, landowners to change their practices.
- Now in a financial position and catchment wide.
- Three steps – investigation with the community, involvement and ultimately improvement.
- Walking the rivers with equipment, aerial mapping, checking the surroundings, e.g. whether the stock have access to the creek, good practices, bad practices and land usage to work out the impact on the stream.
- Hence the information that S Hayward has collected – sampling for nutrients and ecolife.
- Found in the programme that many of the lowland streams have been suffocated by fine sediment, faecal contamination, etc/.
- Reduced the weeds and then environmental enhancement (funded) around streams and riparian planting.
- Hope also to achieve this with Okana and Okuti.
- Information packs are available about the Living Streams project.
- Work effectively with landowners to encourage them to take these steps. However each catchment and each group of landowners are very different, e.g. economic times, neighbour relationships; reticulated water for stock.
- Financial assistance? – Transpower and sustainable farming funds, environmental enhancement funds. Majority of the work is done by the landowner from their own pocket.
- Most of the issues for the Lake are on the flat – there are other issues higher in the catchment but they are not in the public eye, but there are completely different views on how the system may be managed. There are issues at the top and at the bottom, but this at the bottom, it is more visible.

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6.3 Fish & Game – J Holland, Environmental Officer for North Canterbury – Fish and Game Council.

- Waimakariri attracts 48,000 angler days. 30 angler days in 1994; 330 in 2001.
- Lake Forsyth not heavy fished as it was in the past. Little significant fishery. Want to get the angler days up into the 42 river numbers.
- Between 1994 and 2001 angler numbers dropped significantly in North Canterbury region. Low land waters, particularly in the Irwell and LII rivers. Licence holders are dropping but not to the same extent.
- Consistent numbers in the Lake Forsyth may be the presence of 'perch'.
- Gamebird is a lot more healthy on Lake Forsyth -- it is probably one of the most popular sites for gamebird. There are some distinct populations.
 - : 700/900 Canadian geese – recreational hunters have generally kept within that vicinity.
 - : Shelduck and Black Swan - probably the most populous area in North Canterbury.
- ECAN onto the problems; Catchment nutrient management is on target – hope to bring Lake Forsyth up to scratch again.
- D Lane was involved in the fish surveying; pulled perch out of the system but didn't get any other base fish – just brown trout; Rudd and tench was in the last survey. Believe Lake Janet is about to be trialled for eradication.

Question:

Nearly 4,000 birds on the lake which is equivalent to the number of sheep in the area. The effect on the Lake from defecating?

Answer:

Don't have any relevant information on this. If it is an issue, come and talk to us. Could be addressed by long term riparian planting around the edges of the lake and discuss the amount of bird life might have on the plans.

- Lake Forsyth has a different type of bird population than Lake Ellesmere.
- Tomahawk Lagoon, Dunedin doing an exercise on bird life browsing on the lake and the impact on the bloom – just keeping it at bay.
- Lake Forsyth now has a very high proportion of grebes =300. Don't know whether it is because we have been underestimating the populations for the whole SI. There is no definite conclusion.
- Lake Wairewa is very important as a natural bird habitat.

6.4 Landcare Research (Manaaki Whenua) – Dr T Davie, Monitoring Process

- Monitoring of sedimentation and deforestation – process of erosion and what caused it and then the reworking of sediment in the river banks.
- Riparian planting –why you do the planting. Important for shading and sometimes it's for bank stability – bank stability has tended to be the principle reason over the last 150 years. That is why we have tended to use willows. Root strength, root depth and spread – shading.
- Riparian planting will have its problems particularly in January when the algae bloom is just starting.
- Landcare have been looking at land use as well and how that may impact on the lake, as well as the catchment – sources of phosphorus – cyanobacteria.
- What is happening during peak storm events – phosphorous binds to the clay particles.

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- Loess soil present - a blown sediment deposit on Banks Peninsula mostly from the Greywacke on the Southern Alps.
- Different soil types in the catchment area. Volcanic rock has naturally high phosphorus levels. The area is prone to phosphorus – quite natural because of the volcanic soil.
- Looked at the total phosphorus in the top layer of the soil. There are more highly elevated phosphorus levels coming in – Reynolds stream is a tributary of the Okuti has naturally high phosphorus levels coming out of the ground water and it is due to the lithology.
- Loess soil still dominates overall.
- Stream care work comes in with the bank work.
- Sampling is done of what is coming down the catchment, suspended and dissolved and what can we do about that in terms of soils work and source of phosphorus in the lake.
- Copies of results can be made available

Question:

Phosphorus – is it an element that is taken up by any plant species?

Answer:

It's just not so readily dissolved so it sits in the sediment.

6.5 Department of Conservation – R Suggate, Current Activities in the Lake Catchment

- DOC work is by no means solely focused on managing the reserves. Programmes include fire control; pest control; animal pest control; fence maintenance; threatened animal and plant management; freshwater fisheries management, support to the Banks Peninsula Ngai Tahu projects and liaison with Ngai Tahu Runanga; conservation advocacy, community projects, habitat and lakeshore protections; Resource Management Act advocacy; visitor asset management and the Little River Rail Trail.
- There are interesting parallels with Te Wairewa management.
- DOC have issues on how well the fisheries are managed, lake opening, etc. Takuahi Research and Development have an interest in managing the areas around the lake, but DOC have the lake - close planning process with the Runanga is important in the future.
- The Living Streams project, restoration programme, community projects are all good models that we can use for Wairewa Lake.
- There is enormous difficulty in managing the catchment of Wairewa, yet the agency and community are actually working towards improving that.
- We have got a task that I think we will be able to put into progress over a shorter period of time, which will be very successful over the next few decades.

6.6 NIWA – Dr D Jellyman, Wairewa Runanga/NIWA Tuna Project

- The project is funded by the Ministry of Fisheries looking at tuna stock in the lake; getting the local knowledge, indigenous knowledge and scientific.
- Survey data was done in the 1970s and we are co-relating this to see the difference.
- Looked at the elvers and juveniles and the feeders, fish population. Trawling included night trawls using a mesh net. Juvenile and elver numbers were quite low.
- Algae bloom got in the way in January/February and delayed the project until May this year to finish it off.
- Moved to the Okana – fly net. Fish numbers were quite high.

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- Photos, measured the length and tags in the head to use when they are migrating.
- May 2005 wasn't as good as it had been in December ---- Algae colour - blue/green
- High recruitment of long fins (154) 3 / 4 years ago but not to the same degree of short fins (82).
- This is concerning because short fins is the main species the heki is based on and typically what you would expect.
- What is happening, because of the lack of recruitment, is you are starting to exploit the stock in the lake. Concern is within a few years time this will be driven right down because there aren't the recruits coming through.
- Tested samples to show ageing of tuna; - graphed rates.
- Also looked at chemistry.
- Growth rates in the tributaries is a bit slower; they grow about 25mm per year – short fins. Long fins are very similar as the graph rates between both species show.
- Looking back over the last 50 years – during the heki season – September/October is the time for recruitment of eels. When open it's only for a very small period of 3 / 4 days.

Comparison – Waihora and Wairewa.

- There is not a lot of small fish in the Wairewa lake – a lot more smelt than bullies. Some come in when the lake is shut is because they get dumped when the waves come in.
- They could be transported in at river mouths and could be introduced (small tuna) from a Waihora recruitment campaign.
- You don't need to have recruitment every year – five years is sufficient.
- You would be waiting 20/25 years before they migrate.

Question:

Is it possible to have a late opening regime that takes care of sports fishing and fish numbers, e.g. sea-run brown trout?

Most of the sports fish are contained in the lake anyway, so Don's concern is more with the natives, e.g. flounders, but it may not sit well with some interests, e.g. duck shooters, etc.

Question:

Are they susceptible to much?

Pretty robust but there are site-specific diseases.

In recent years there have been a few attempts to artificially close the lake –

September/October are critical months. Could have it open for a few days during

September/October but there are chances you may not get an intake. Ideal solution would be a permanent outlet.

Barbara Dolamore, BioChemist, CPIT - Bioaccumulation of *Nodularia spumigena* toxin in muscle and liver of the tuna

- Prior research has been done overseas. Merely preliminary results of the toxin – *Nodularia spumigena* blooms.
- About 300 significant food users on the lake. Overseas literature shows phosphate levels increase the bloom. While the bloom is in the growth phase, the actual levels of toxicity in the water can be low.
- It is when the toxin dies it releases the toxin
- The *Nodularia* forms spiral or straight filaments of 100's of bacterial cells. These are not algae but actually cyanobacteria.

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- Many anecdotal reports of cattle, sheep and dog deaths around the lake.
- Nodularin is related to the cyclic heptapeptide called microcystin. The toxin is a hepatotoxin, which affects the liver – 50 mg oral dose might kill an adult.
- Effects on the river. It's very stable; water-soluble.
- Inhibits the protein phosphatase activity in the liver; and creates decreased levels of the potent antioxidant agents.
- Effects of exposure – acute dose – long term sub-chronic dose could cause an increase in primary liver tumors.
- Summary of the study – focus was on the bioaccumulation of nodularin in migratory tuna tissues and measurement of nodularins/microcystins.
- High levels of nodularin in the tuna liver 71.2 and 41.3 between 2005 and 2004 migrants.
- Muscle nodularin 3.6 and 1.3 results between the 2005 and 2004 migrants.
- 2004 residents living in the lake December 2004 when there wasn't a bloom = liver nodularin 16.4 but higher average muscle nodularin at 8.2.
- Daily tolerable intake – 0.04 **microgram** per kg.
- Question – measure the content in the oil? (Very high levels –DELETE).
- Possible co-relation with S Hayward's data (ECAN)
- Why such high liver levels, but low muscle levels – prior to migration eels cease feeding and nodularins major route is via the gastrointestinal system.
- Conclusion – lake residents showing lower liver and higher muscle than migrants eels.
- Wanted to have some samples of eels over the bloom-time, but there were OSH issues.
- Want to look at flounder and possibly look at Waihora.

Question

Your comment on the toxicity of the bloom is important after it has died.
The toxicity would still be in the organism.

Question

What is its life cycle when it hits the water?
Different environments show different levels.

- You can boil it to extract it. Ultraviolet light ALONE doesn't break it down. It can last up to weeks. If it gets into the sediment it can stay for some considerable time. It's very versatile. Tried cultivating the stuff (21°C) – it likes the warm temperature. It is quite robust with phosphorus. Nitrogen at very high levels could have an adverse effect on it.
- Light levels are greater in Wairewa which enable the blooms to come to the surface.

Question

Do you have to ingest it to be in danger?

Yes, but some cyanobacteria can cause also problems through the skin – skin irritations – eczema, etc. Perhaps there may be an issue once it's dried up and blowing around the beach – (DELETE there is still nodularin present – sheep can be eating on it. Sports fish – microcystins (related compound) showed higher bioaccumulation in some of the North Island lakes.

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6.7 Banks Peninsula District Council – C Hopman, Lake Opening and Closings Procedure

- Most of the photos were taken in 2000. First opening each year is very difficult to achieve. Peer Higginbottom the farmer there manages the lake opening process for BPDC.
- Involves drainage work prior to the opening. Opening is relative to the weather forecasts and the swell predictions.
- Occasionally the lake activities get quite low as it did in 2000.
- Standard trigger level for opening - 7' over winter and 8' between December and April. Reason for that is because that is when the eels are being caught.
- Gauge used is the ECAN gauge. So the concern when it gets higher is we do not have the resource consent for it and the Wairewa Runanga have major concerns – quite a large land area is absorbed by water so there is pressure on us to keep the high level low and the low level high. BPDC is caught in the middle.
- Worst case scenario if left alone – Little River Township would flood; septic tanks would float.

Question:

How high could the lake get to without encroaching on the septic tank system or people's homes?

Answer:

10'/12' - it all comes back to the fact the gauge is there related to sea level; out 100mm between the BPDC and ECAN gauge.

- In terms of the lake opening we have a 24 hour notification to re-open – all done with email. If anyone wanted to be put on that notification, we could do that.
- Lake Ellesmere has recently gone for that consent. They need to do some scientific research on how they should be opening and closing the lake.

Question:

What scientific research has BPDC done?

Answer:

We have had an existing use right and we have tried to operate to that regime. Basically we have been looking at the effects, rather than doing anything scientific. We had a consultant who has looked at all the history and best practice and taken as much information as he has in terms of the temperature and other variations. We contracted the Runanga to do a cultural impact assessment and we have been working in partnership with them on developing a MOU and from there go to other effected parties and work with them. Most others have been involved.

Question from Fish & Game:

When can we expect to be consulted? Alan Stevens Chairman of the Canterbury Coarse Fishing Club should not be the representative for Fish and Game.

- Consent was initially for 35 years, reduced that to 15 with five yearly review periods. In the meantime we have been talking with BPDC on the opening and closing regime. On the permanent opening suggestion – Canterbury Engineering students have just done some half yearly studies – review of permanent structures that have been banded around for Waihora, e.g.

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wind generators, syphons, etc. In an ideal world we can maintain the lake level and use a permanent opening to clean the lake. We need to think about those structures and take them back to the community and once we have got back to the community, then we can go wider and try and get a resource consent to do it.

7. OPEN DISCUSSION

E Livingston summed up as follows:-

- Many issues raised today; may need subgroups and timelines;
- “Living Streams” project - walk the two streams before Christmas. ECAN could report back by February/March.
- Community expressed s they wanted more information about the condition of the lake and some of the scientific information early in the new year.
- We have brought the issues to you but we do need a discussion. Whether that happens with individual organizations or clusters?

- Highlights the information is inclusive. We know where the big gaps are.
- There is enough evidence to say there is a significant health risk from the algae bloom and need to avoid a public panic health issue. You can see at various times “Poison” signs up; need a credible warning system. Err on the side of safety.
- Process can be managed – develop a Community Information Plan on how this is fed out.

Question:

What is the Runanga’s aspiration for this process? What sort of structure does it want to run with? Do you have a formal idea of where you are actually going.

Answer:

Core group of key players in this room – management responsibilities ECAN, BPDC working with the Runanga with the community. Runanga doesn’t have its own plan – it’s what the community wants. WET? concept. We need to find out from this group who would join a core group to take it back to the community, or should the Runanga carry on with its own consultation and get some core players involved. The Runanga has already generated the community involvement and brought the key stakeholders in to feed back to the community as a whole. At the moment you have the community working in isolation, it’s a merge between the agencies and the scientific information in order to come up with something that will grow from that. If we take it a bit slower the right structure will grow from what has happened today and what has happened previously.

- Funding sources needed, e.g. for B Dolamore to take her research further. Nobody knows how sick the lake is at various times. Over time we have to be able to tell the community how things are progressing.
- Smaller think tanks to do with nutrients, lake toxin issues and a group of people can come up with some options identifying what the core issues are and then form small groups around it.
- Wairewa Runanga and the two Councils to get together to share their ideas about the process.

8. WHERE FROM HERE –

Toxicity – No. 1 area of concern

Information inclusive – gaps/funding

Health graded warning – consultation B Dolamore, Crown Public Health and ECAN

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Management of Information – toxicity
 Community Information Plan
 Core group of key players – develop the process.
 Runanga bring core groups in
 Ownership by the community
 Smaller think tanks – identify core issues.

R Wybrow / I Cranwell to circulate the outcome of the meeting to all parties..
 Subgroups to be formed. What are the big issues.

Food for Thought

- Is there a solution?
- Bar is growing at the rate of 1.5 / 2 m per year.
- Sediment is growing at 36mm per year.
- Water in the lake has a high phosphorus content.
- Any radical solution to these problems won't be to everyone's satisfaction.
- Massive predicament - maybe need to concentrate on mitigating the effects.
- Lake levels need to be more constant; take off a metre or so of water and if we are going to stabilize the lake we have to stabilize the environment.
- How do we allow the sea the ability to restock the lake. In a geological sense shallow lakes fill in. In this situation it is filling in faster than it should be. Reversing that process is going to take a lot of intervention and expense. There is no quick fix.
- Involvement with the community is the critical.

| CURRENT CONDITION | ISSUES | CAUSES | UNKNOWNNS | NEEDS |
|--------------------------|---|---------------|------------------|--------------|
| Salinity | Opening | | | |
| Sedimentation | Volcanic Lake Turbity – storms | | | |
| Algae | Testing – lake levels | | | |
| Head of Lake Streams |) Stock) | | | |
| Fish | Diminishing – Openings | | | |
| Birds | Nutrients | | | |
| Tuna | Recruitment – opening times/closing times Water Quality | | | |

WAIREWA RŪNANGA
MINUTES OF MEETING OF STAKEHOLDERS OF LAKE WAIREWA (LAKE FORSYTH)
HELD ON TUESDAY 18 OCTOBER 2005

| | | | | |
|-------------------------------|---|--|--|--|
| | Barrier Growing Toxicity – livers - flesh | | | |
| Opening and Closing Levels | Resource Consent | | | |

9. **KARAKIA** – I Cranwell

10. Meeting closed with R Wybrow, on behalf of members of the Te Wairewa Trust, thanking stakeholders for their input into the Facilitation meeting/discussion.

The meeting adjourned at 1.55pm