Environment Bay of Plenty

Rotorua Lakes TAG (No 11)

Date:	Wednesday 20 September 2006
File Reference:	3365 04
Venue:	Rotorua Office
Attendance:	*EBOP*: Paul Dell, John McIntosh *RDC*: Greg Manzano, Peter Dine *NIWA*: Clive Howard-Williams, Julie Hall, Max Gibbs, David Rowe *UoW*: David Hamilton, Warwick Silvester, Brendon Hicks, Kit Rutherford GNS: Paul White SCION: Trevor Stuthridge
Apologies	Roku Mihinui (TMTB)

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1 Welcome

Paul welcomed everyone and asked for those present to give a brief introduction.

2 Sediment Remediation Investigations

David circulated a summary document from the meeting he convened with representatives of the University, NIWA, SCION and Nick Miller to discuss Sediment Remediation Investigations. David gave a presentation on the sediment core work. In Lake Rotorua high concentrations of phosphorus were below the 15 m contour where the finer material and diatomaceous has accumulated. The area was about 20 km^2.

Phosphate concentrations in sediment pore water was high (> 10 mg/m^3) at the water/sediment interface: An issue is how much of an impact flocculants will have on the soluble phosphorus. At present nearly 50% of the phosphorus into Lake from catchment settles. However within the Lake approximately 450T/yr is released from sediments and 470T settles.

Lab experiments had shown stratification events result in major de-nitrification and therefore loss of nitrate in the sediments.

Discussion took place on the relative biomass of Blue-Green to Green/diatoms. At present blue-greens were relatively a small proportion.

The flux's of nutrient flow are much higher than initially thought. There is a need to set criteria to determine success.

Clive noted that a further workshop involving the sediment issue should be organised. This was agreed. Max also noted that we needed to consider the issue of what could be the effect of turning off de-nitrification at the same time that phosphorus is locked up in the sediments.

ACTION: It was agreed that the sediment Remediation Group (early November) would organise a workshop as soon as possible to further review sediment remediation issues, options and actions.

3 Update on Fish Investigations

3.1 Ohau Diversion

David Rowe gave a presentation on the results of monitoring undertaken on fish movement, including smelt migrations. NIWA have been monitoring density/biomass of smelt in Rotoiti, monitoring movement of smelt between Lakes and in Ohau Channel. Future work will be done on trout in the Kaituna at a later date. Once the wall is built the behaviour of fish will be assessed.

Various traps have been deployed. Monitoring has been done monthly during the day. Diurnal monitoring of larvae has also been done. Majority of movement at dawn and dusk. Strong smelt movements upstream in February of juveniles. Adult movement into channel in August. Majority probably go into Rotorua for spawning. Big migration started into channel on 19 August and still continues. Unsure if smelt are going into Rotoua.

Next phase will be to assess what happens in Rotorua once the wall is in. Will focus on acoustic survey of smelt at deeper level in Lake. Have been able to define various fish layering.

Overall David felt the impact of the wall of smelt would be minimal. In Lake monitoring would assess if the smelt population collapsed. There could be a natural 4 – 5 fold variation. Paul asked if the acoustic survey of Rotoiti should be reported. David felt it should.

3.2 Hamurana Diversion

Dave then discussed the Hamurana work. Work to date tended to suggest that temperature was unlikely to affect trout growth. But temperature could impact the distribution of fish. Fly fishing important in January – March (cold inflows) while trolling was more winter.

Undertook tracking of trout using electronic tracking. Receivers pick up the trout movements (individual trout). Monitoring has shown most trout were recorded in all sectors of Lake.

30 tagged, 6 died, 9 caught, 10 still in Lake, 5 somewhere. Three moved into Rotoiti and back. Trout avoid temperatures above 20ºC. Large proportion in colder water, 14 - 18ºC. In Summer trout using NW sector influenced by the coldsprings, preferring Ngongataha and Awahou. Both studies will be reported by the end of October.

ACTIONS: Paul to organise meeting with Fish and Game to present findings of Ohau and Hamuarna fishery investigation.

Paul to organise presentation of Ohau fishery investigations to Ngati Pikiao

Paul to organise presentation of Hamurana fishery investigations to Ngati Rangiwewehe.

David Rowe to organise acoustic survey of Lake Rotoiti.

4 Update Otolith Research

Otoliths are a hearing structure in a fish's head. Most of the Otolith structure (calcium carbonate) is impacted by the water the fish lives in, not its diet. Use to trace the spawning origins of smelt and trout in Lakes Rotorua and Rotoiti. The university has recently purchased a $600,000 machine to enable the assessments to be made.

A large number of common smelt had already been sampled (250). More sampling will be undertaken prior to wall construction.

The smelt production PhD is currently being advertised.
- Determine dynamics
- Determine relationship between smelt and trout production
- Determine?
- Evaluate options to enhance smelt habitat.

Some background information already exists from previous researchers.

ACTION: Paul to organise Brendon to present to Fish and Game at the same meeting as Dave Rowe.

5 Tikitere Geothermal

Greg noted that the community were supportive of further evaluation of treating Tikitere geothermal in RDC's sewage plant. Initial costings appeared to be $1.9M for 6 years of treatment. Greg would now seek a further cost from consultants to evaluate some remaining aspects. He would then pass to Paul for approval.

ACTION: Greg to seek a proposal from consultants for approval by Paul

6 Hamurana Diversion

Peter outlined the engineering assessment prepared by BECA's on design options for a diversion structure. There were geotechnical issues, but these could be engineered. The initial range in construction estimates was $14M - $36M. Peter was keen to further evaluate some form of mudcrete wall using fine material. Impacts on temperature in channel needed to be considered as would fishery habitat. Peter Dine would talk to Max Gibbs/Dave Rowe.

Paul noted that David's work would be critical in determining if the diversion should proceed.

Action: Peter Dine to further evaluate the mudcrete option

Peter to discuss with Max/Dave temperature and fishery habitat aspects of an artificial diversion channel.

7 Modelling Update

David gave an update on the progress with model development for various Lakes. An outline of the work being done in Lake Tarawera was presented. In Tarawera 80% of the input of N & P are retained. This is similar to Taupo.

- Further work done on improving accuracy of Rotoiti's model. Reduced the previous lag responses.

- Developing Tarawera model

- Coupling of Rotoiti models for Rotorua and Kaituna

- A range of scenarios were being run for Lake Rotorua using the I-D model. It is expected to have a 3D model within 8 – 12 months

- Models for Okareka , Rotoehu and Okaro are starting now.

8 Assessment of Nitrogen in Lake Algae

Warwick presented his early assessment of the amount of nitrogen cycling in Lake Rotorua's water column compared to inflows and sediment releases. His initial view was that 3600T/yr was in the algae, 800T/yr inflows and an estimate of 400T/yr could be released from sediments.

Therefore there was 2400T/yr in the water column. This work was to assess what tonnages existed in the algae in the Lakes and whether harvesting was possible. Warwick would complete his review within next 4 weeks.

ACTION: Warwick to complete review for discussion at next TAG.

9 Catchment Modelling - ROTAN

Kit Rutherford gave a presentation on development of the catchment modelling (ROTAN) and outlined the various inputs and outputs. As part of calibrating the model a number of sub-catchments are being focussed on. Detailed work had been done on defining the rainfall pattern for the catchment.

The next stage has been to adjust the ground water catchments to better reflect the water balance for each sub-catchment.

Next month will focus on:

- Further rainfall analysis
- PET/AET Estimates
- 1940 land cover being processed
- 1940, 1958, 1986, 1989
- Ag Research – nitrate leaching rates
- Uncertainty > management

Paul White than gave an update on the groundwater project. Two reports to be compiled. One currently being done. This will cover base-flow – water, baseflow – nitrogen, rainfall recharge and groundwater catchments.

Uve, then gave an outline of the groundwater aging investigations. One issue identified is that it is based on land-use changes approximately 50 years ago. It would assist if the recent land use change – e.g. dairy conversions in the last 15 years could be identified. Environment Bay of Plenty would review the consents database to identify dairy conversions. Paul also noted to Kit that it would be good to present to the land-use focus group and stakeholder forum.

ACTION: Environment Bay of Plenty to review consent data to identify conversions. Presentation on modelling to be given to Land Use Focus Group and Stakeholders Forum.

10 Update Z_2

Trevor presented on the Zeolite work to make the product anionic and cationic. Try to absorb both N & P but particularly P. Trials showed good capture of P in a short time. Removal occurred over a good pH range (3 – 9). Trials showed removal of N and Ammonia as well. Can be formulated to work as a flocullant or Cap. Current focussing on using it as a capping material.

Focussed on assessing toxicity, reversion and benthic impacts. Trial in Lake Okaro - October 2006 – June 2007. Volume of 60 tonnes at 200 g/m²

Suggesting a trial in Lake Rotorua using 10 – 20 tonnes @ 200 g/m². NIWA and SCION were working on some lab trials also. Paul noted that his team needed a 6 – 9 month lead in for consent requirements.

SCION were making a trial tonne of Z^2 today and were aiming to have 100 tonnes available by end of October 2006. There will be issues with the consistency of the bed material and how any capping will operate. Overall good progress is being made. Focussed on a 10,000 tonne capability by 2009.

ACTION: Trevor to discuss Lake Rotorua field trials with the sediment remediation group. Trevor also to note lead in for consent.

11 Ohau Consent Conditions

Paul circulated the "draft" consent conditions for Ohau and checked on progress with the monitoring requirements.

Condition 10: Monitoring – John McIntosh confirmed actions

Condition 10.8: Erosion Monitoring – Paul to check with Peter Dine

Condition 13.1: Fisheries baseline – completed report October

Condition 13.2: Spawning areas – Brendon working on

Condition 13.4: Kakahi and koura – Paul check with Ian Kusabs

Condition 13.12: Trigger values trout – Follow up with ERFG

12 P Locking Trial

John McIntosh outlined progress on the P locking trial on the Utuhina stream. There had been problems in monitoring fish due to stream flows, cages getting covered in debris and erosion. Future monitoring would be done downstream, Paul asked if Environment Bay of Plenty had been notified of the problems in monitoring fish effects.

ACTION: Notify Environment Bay of Plenty of the difficulties in monitoring fish effects at this time in the Utuhina Stream.

13 Phoslock Trial

John gave an update on the second Phoslock trial in Lake Okareka. The material had settled quicker due to the bigger size of the particles.

The early data was still uncertain at this time. Discussion took place on the importance of being clear what is actually specified in consent condition. Discussion also took place on how to determine what might be an acceptable lanthanum level in fish livers/flesh.

ACTION: John to consider how to define an acceptable Lanthanum level in fish liver/flesh.

Paul and John to be clear on definitions in consent conditions.

14 Update Advanced OET Systems

Paul briefly updated the group on the work done on trialling advanced OET systems. Clive noted that NIWA had a wetland system they were keen to include in such a trial.

15 Review of Restoration Programme Actions

Paul circulated the current restoration programme of actions and discussed the alignment of various projects. Some discussion took place on the spread and quantum of land use change allocations. Overall the group felt the current alignments were still appropriate at this time.

Paul noted the recent work by BECA on the costs of oxygenation. The initial $4.5M cost had now been evaluated as more likely $40M plus to set up. David noted that a single barge unit may be an option in the future.

16 Next Meeting

Paul noted that at the next meeting he would like to revisit the position statement to assess if there were any major changes.

Topics to include:

- Review position statement
- Update weed harvesting

- Role of Grass Carp
- Update flocullant trials
- Review of Sediment Remediation
- Consideration of Warwick's review
- Te Arawa Native Fishery project.

Paul to organise meeting in mid November 2006.

Paul Dell
Lakes Project Coordinator