Boat electrofishing in the Ohau Channel

Brendan J. Hicks, Ray Tana and Dudley Bell

Environmental Research Institute

Faculty of Science and Engineering

University of Waikato

Hamilton, NZ

Presentation to the BOPRC Rotorua Lakes Cultural Panel Meeting,

22 Nov 2013, Waiiti Marae, Rotorua

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

LERNZ
Lake Ecosystem Restoration NZ

Environmental Research Institute
Te Pūtahi Rangahau Taiao
THE UNIVERSITY OF WAIKATO

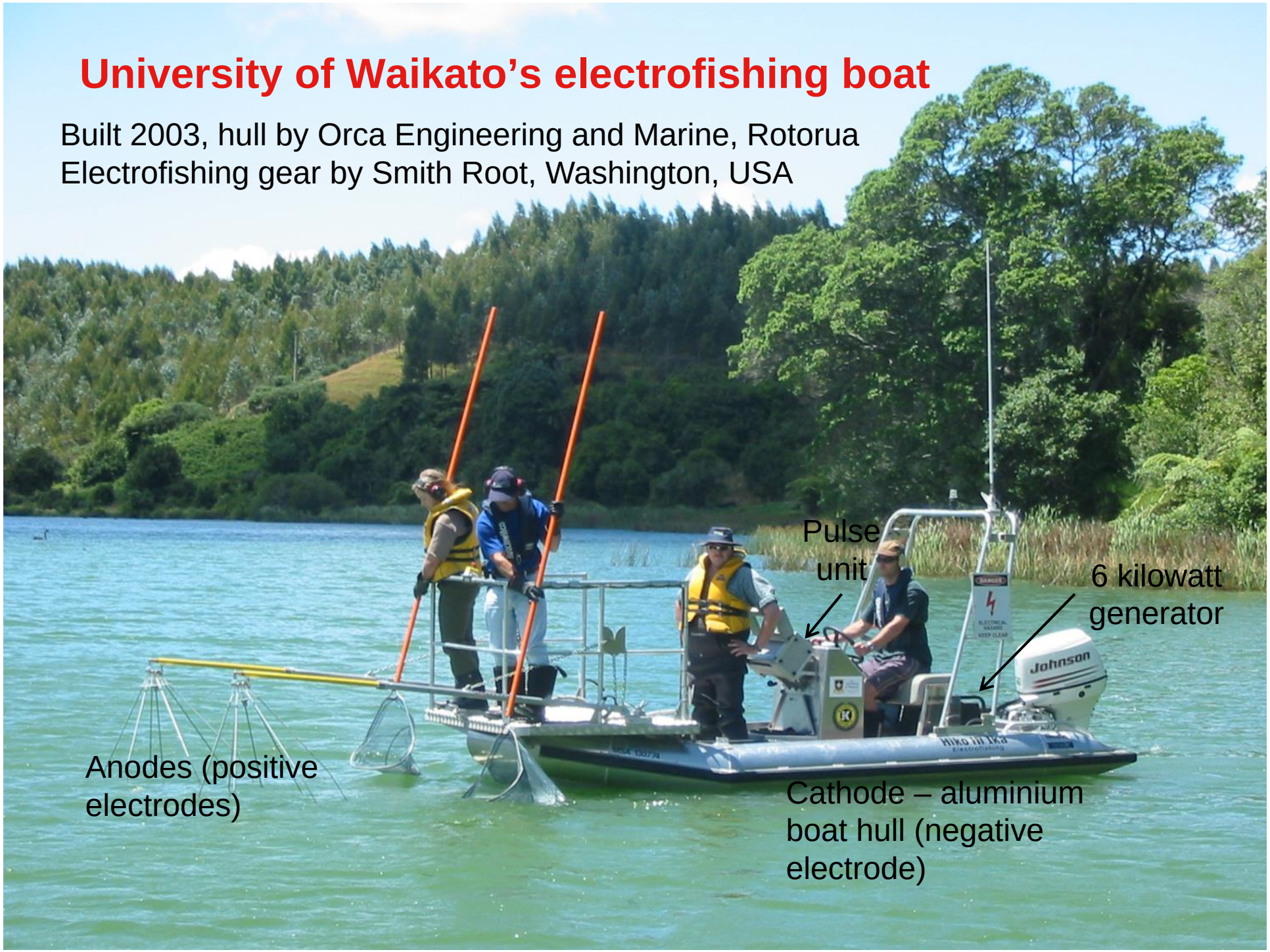
Objectives and methods

- To investigate the longitudinal pattern in densities of common smelt and common bullies along the Ohau Channel
- Fish NIWA smelt trapping sites to provide an independent estimate of smelt densities
- New aim - to provide on-going monitoring of the fish communities and abundance in the Ohau Channel
- Taonga species to Maori (tuna, morihana, and koura).
- Six years of fishing in December (2007-2012)
- Length fished 1.6-3.5 km at 10 or 11 sites, 10-20 min fishing per site
- Assuming 1-m radius around anodes, width fished was 4 m
- Area fished 6,000-14,000 m^2 (0.60-1.40 ha)
- CBER repts 66, 97, 112, 124, ERI rept 26

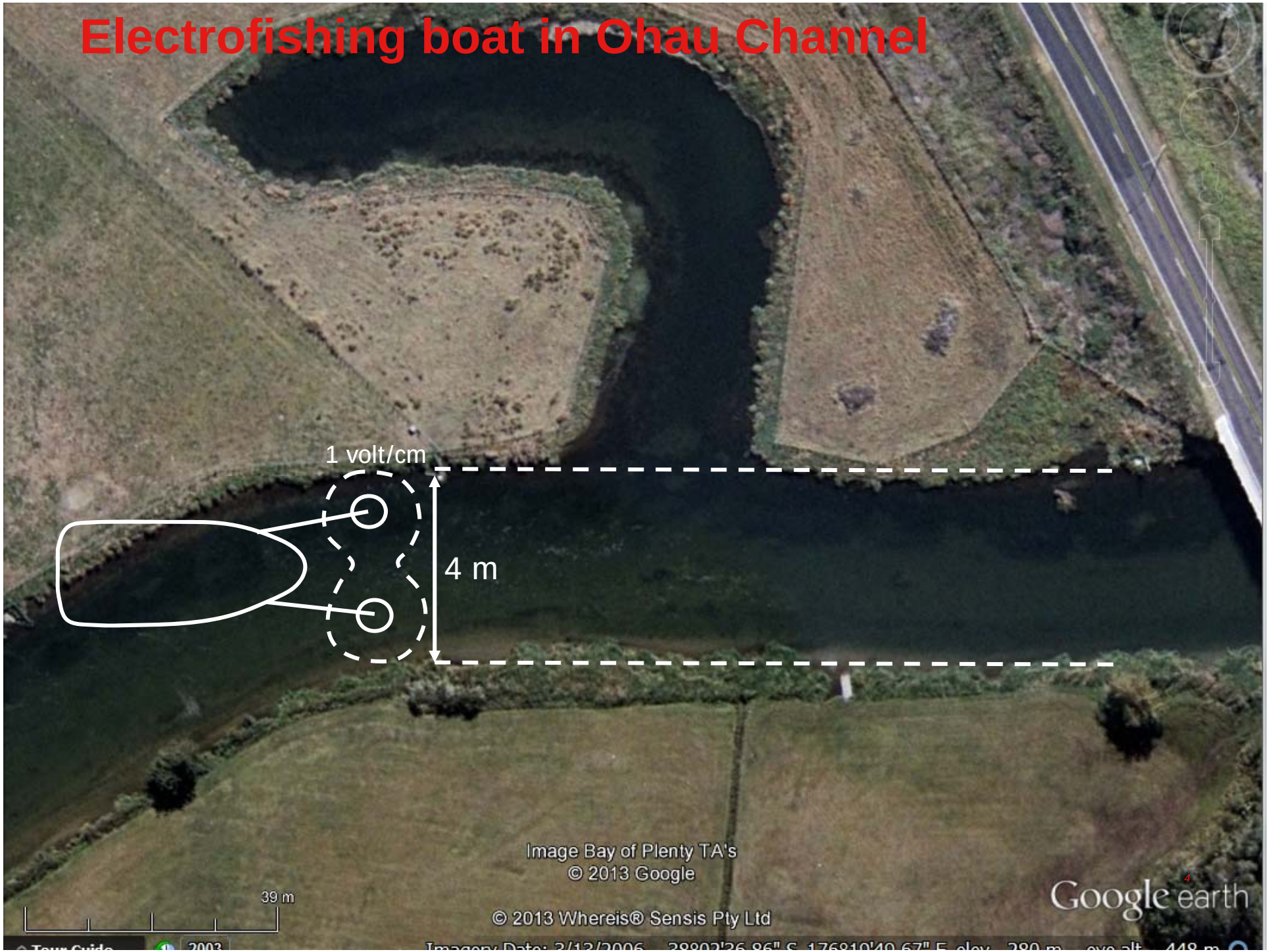
© THE UNIVERSITY OF WAIKATO • TE WHARE WANANGA O WAIKATO

University of Waikato's electrofishing boat

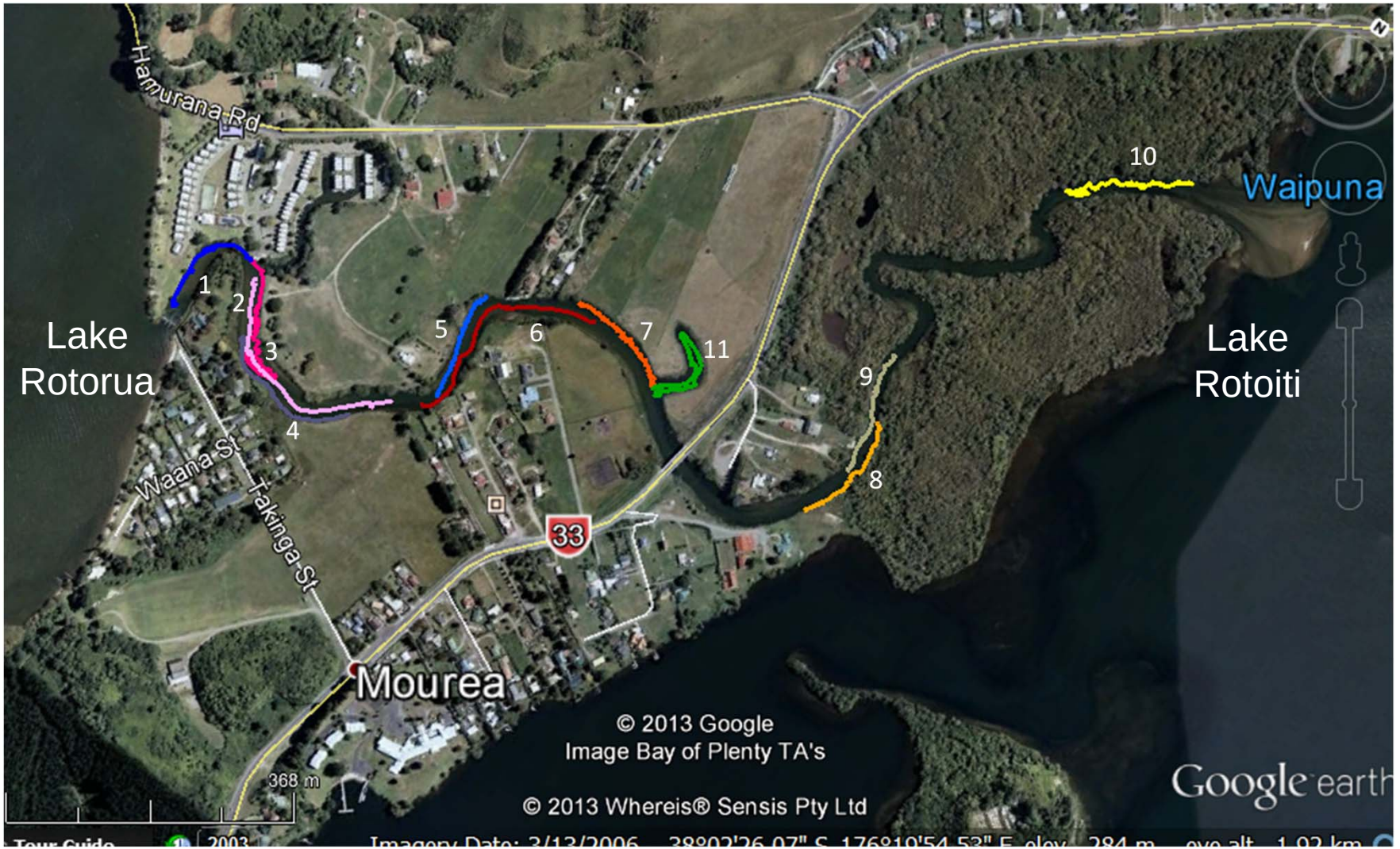
Built 2003, hull by Orca Engineering and Marine, Rotorua
Electrofishing gear by Smith Root, Washington, USA



Electrofishing boat in Ohau Channel



Fishing sites 2012



Ohau Channel – Lake Rotorua end

Ohau Channel – middle

Ohau Channel – Lake Rotoiti end

Results

- Four native fish species - common bully, common smelt, longfin eel, shortfin eel
- Four introduced species - rainbow trout, brown trout, goldfish, gambusia

Year	Total number of fish	Common bully	Common smelt	Goldfish	Longfin eel	Shortfin eel	Rainbow trout	Brown trout	Gambusia	Koura
2007	1267	1099	140	9	2	0	17	0	0	0
2008	774	429	311	2	1	0	31	0	0	0
2009	353	149	152	8	1	0	43	0	0	0
2010	921	604	206	18	1	0	92	0	0	0
2011	399	298	39	28	4	0	25	2	1	2
2012	301	117	131	33	1	1	15	1	0	2


Morihana


Bullies

Longfin tuna


Smelt


Koura


Brown trout


Gambusia (Devil's guppy)

© THE UNIVERSITY OF WAIKATO • TE WHARE WANANGA O WAIKATO

Tuna released

© THE UNIVERSITY OF WAIKATO • TE WHARE WANANGA O WAIKATO

Conclusions

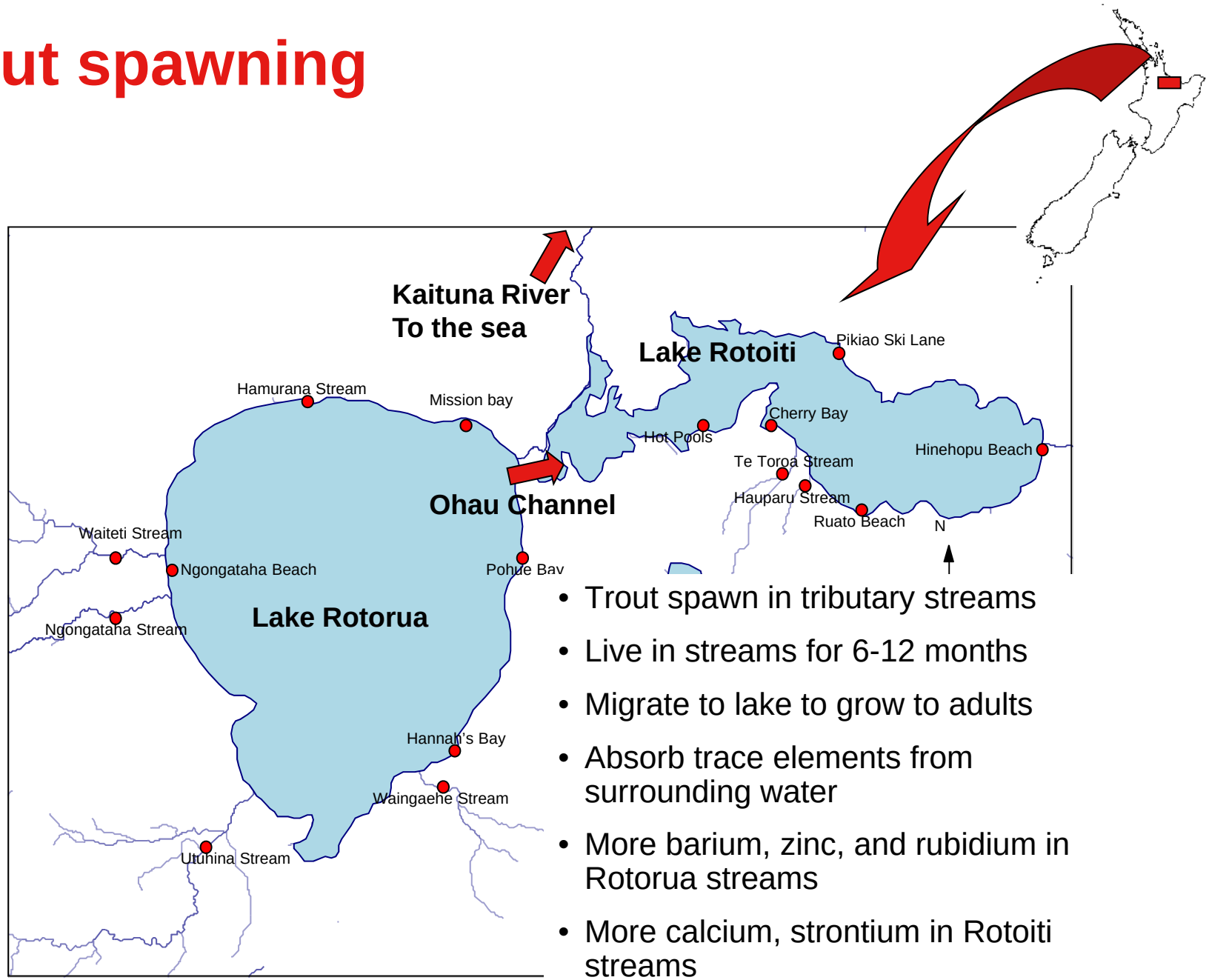
- Most goldfish in 2012 – 33 fish, 4.8 kg (17 at site 7 side channel)
- Goldfish were very abundant at specific sites, and were generally found in the lower river
- Longfin eels a consistent feature – just 1 in 2012, but 1.36 m long, 3.68 kg
- Decline in abundance of common bullies – reduced productivity of Lake Rotorua?
- Or – effect of the wall? – completed July 2008
- Recruitment from Rotoiti?

© THE UNIVERSITY OF WAIKATO • TE WHARE WANANGA O WAIKATO

Acknowledgements

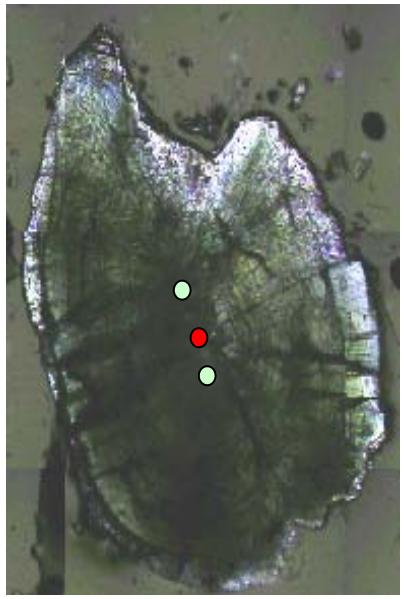
- Field and lab assistance from Jeroen Brijs, Ray Tana, Dai Morgan, Warrick Powrie, Josh de Villiers, Dudley Bell, Jennifer Blair and Grant Tempero
- Project funded by Bay of Plenty Regional Council

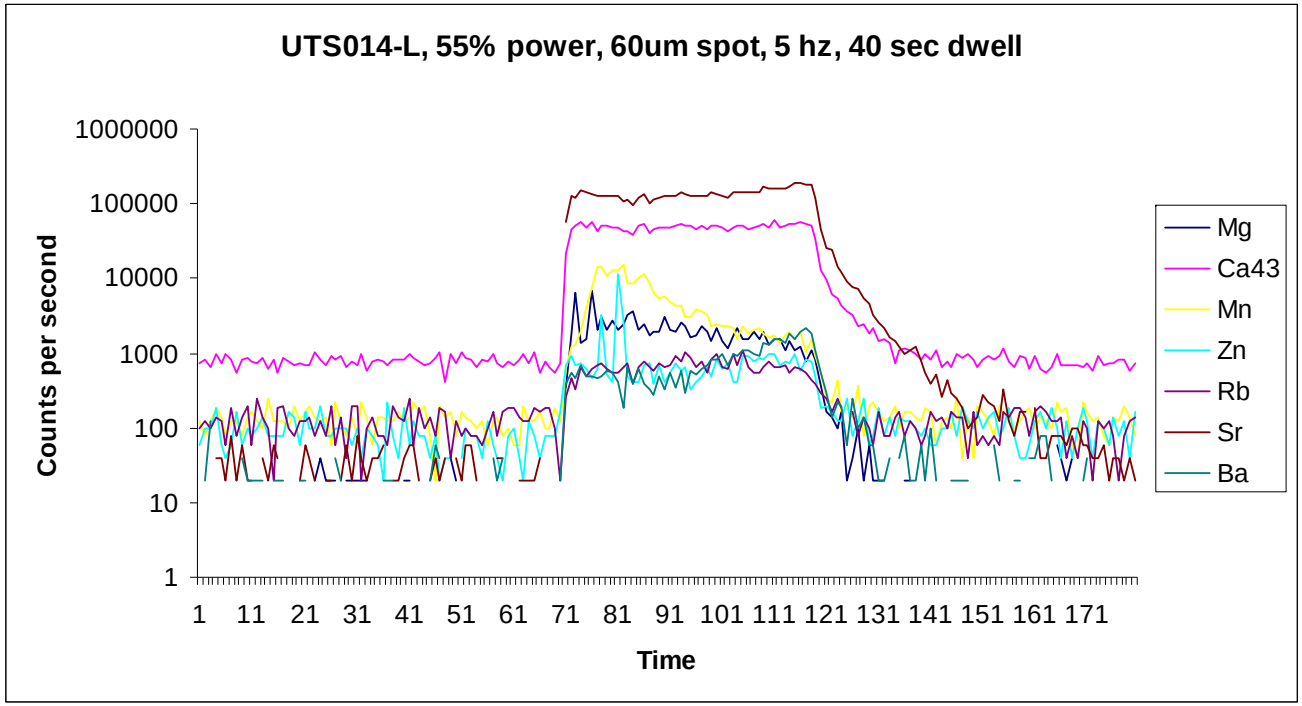
Trout spawning



- Trout spawn in tributary streams
- Live in streams for 6-12 months
- Migrate to lake to grow to adults
- Absorb trace elements from surrounding water
- More barium, zinc, and rubidium in Rotorua streams
- More calcium, strontium in Rotoiti streams

Single spot trout analysis





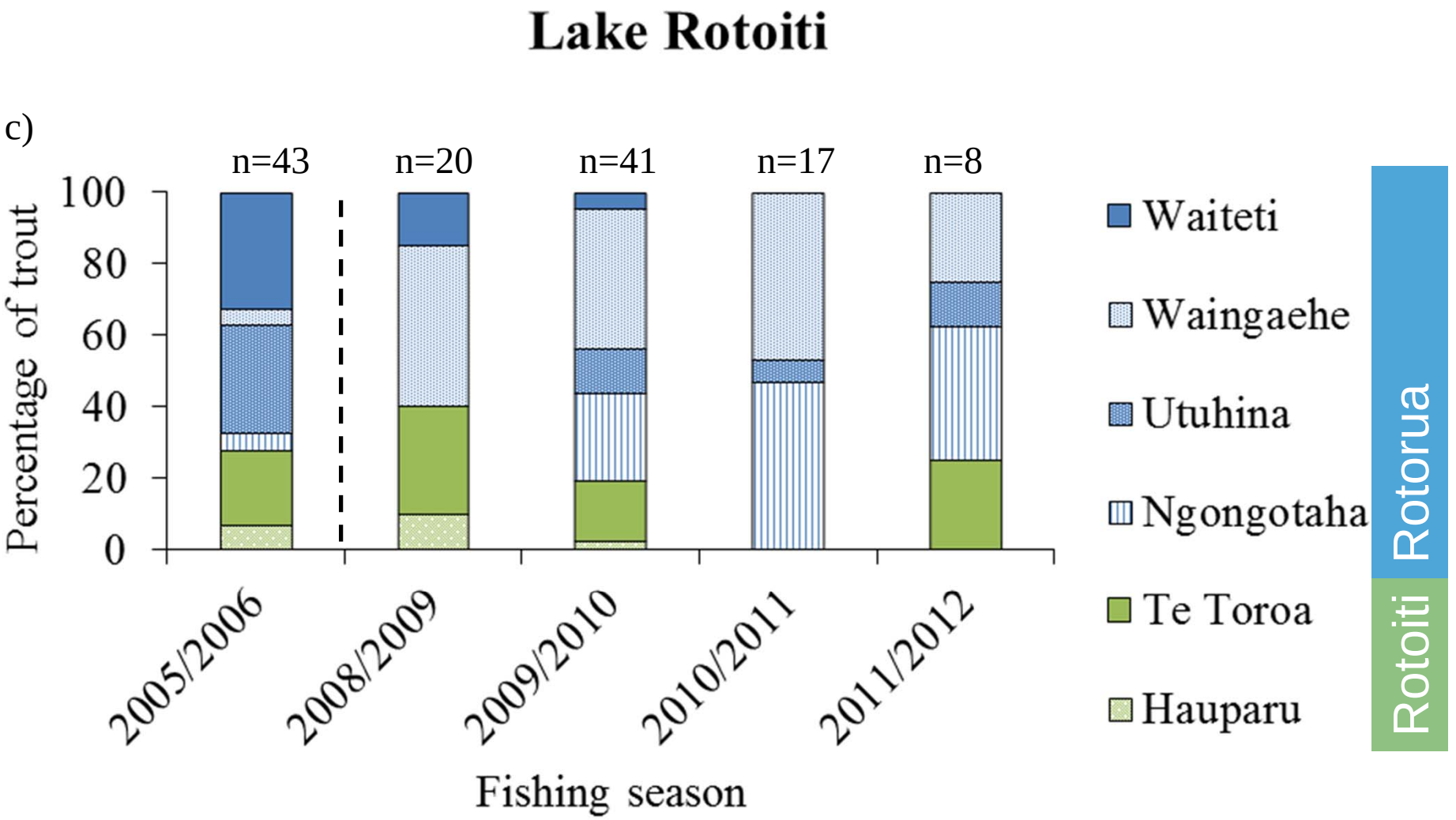
Juvenile trout otolith illustrating single spot analysis

Single spot, 55% laser power, 60 µm spot diameter

NIST 612 standard

GLITTER used for post-processing - Simon Jackson, Macquarie U

http://fishbase.org/Photos/PicturesSummary.cfm?StartRow=2&ID=239&what=species



Dashed line = Wall installation