Brown bullhead catfish

Incursion response update – Lake Rotoiti.

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Points to consider

The world we live in is not black and white

- Expectations to manage vs effective use of resources.
- Aim high but be realistic about what we can achieve.
- Limitations of current technology.
- What does the current distribution mean?
- An opportunity to think outside the square?
- Minimising non-target damage.

Brown bullhead catfish

The basics

- Introduced in 1877 to the Auckland region.
- Opportunistic predatory scavengers, eat diverse range of food.
- Typically nocturnal bottom feeders.
- Prefer slow flowing, weedy, shallow habitat.
- Identified as one of the most significant threats to koura in New Zealand.
- Throughout the Waikato River system including Lake Taupō.

Brown bullhead catfish

The basics

- Can cope with huge range of temperatures, water quality, and are capable of surviving extended periods out of water.
- Typically grow to average of 230 – 305mm in length, rarely exceed 450mm.
- Mature at 2-3 years (approx. 200mm length).
- Serial spawners (few hundred to greater than 6000 eggs).
- Most catfish 1-5 years old though some have reached 8 years of age.

Lake Rotoiti

Previous reports (to our knowledge)

Numerous over a number of years:

- **1993:** Single catfish presented to DOC, captured post boat launching at Okere Inlet.
- **2004:** Electrofishing survey by UOW in response to circular excavations noted by NIWA divers in 2003.
- **2009:** Large dead catfish found washed ashore in Okawa Bay.
- **2015**: Owners of Lake Rotoiti hot pools apparently report capture of live catfish.
- **2016:** Live capture by weed harvester in Te Weta Bay.

Lake Rotoiti incursion 2016

Initial discovery

- **16/03/2016** – First discovery of live catfish in Lake Rotoiti, caught by weed harvester in Te Weta bay.
- First live catfish ever captured in BOP region.
- Two catfish seen within 30 minutes, only one able to be gathered.
- Incursion response planning began immediately.

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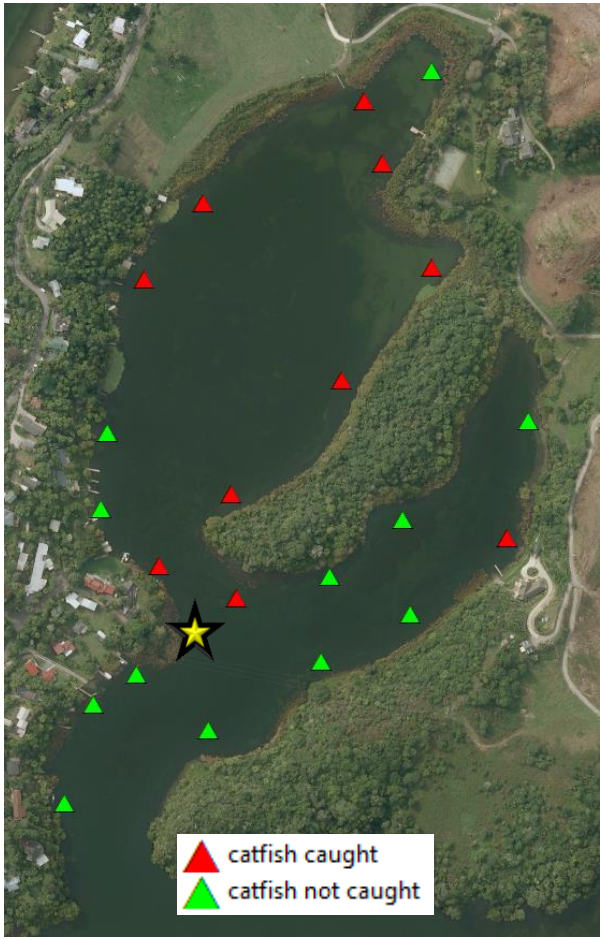
Lake Rotoiti incursion 2016

Initial response

- Netting began 30/03/2016.
- Initial night – 52 catfish caught (CPUE = 2.48).
- Majority of catch juvenile, less than 100mm.
- Effort the focussed on likely habitat at western end of lake.



Lake Rotoiti incursion 2016

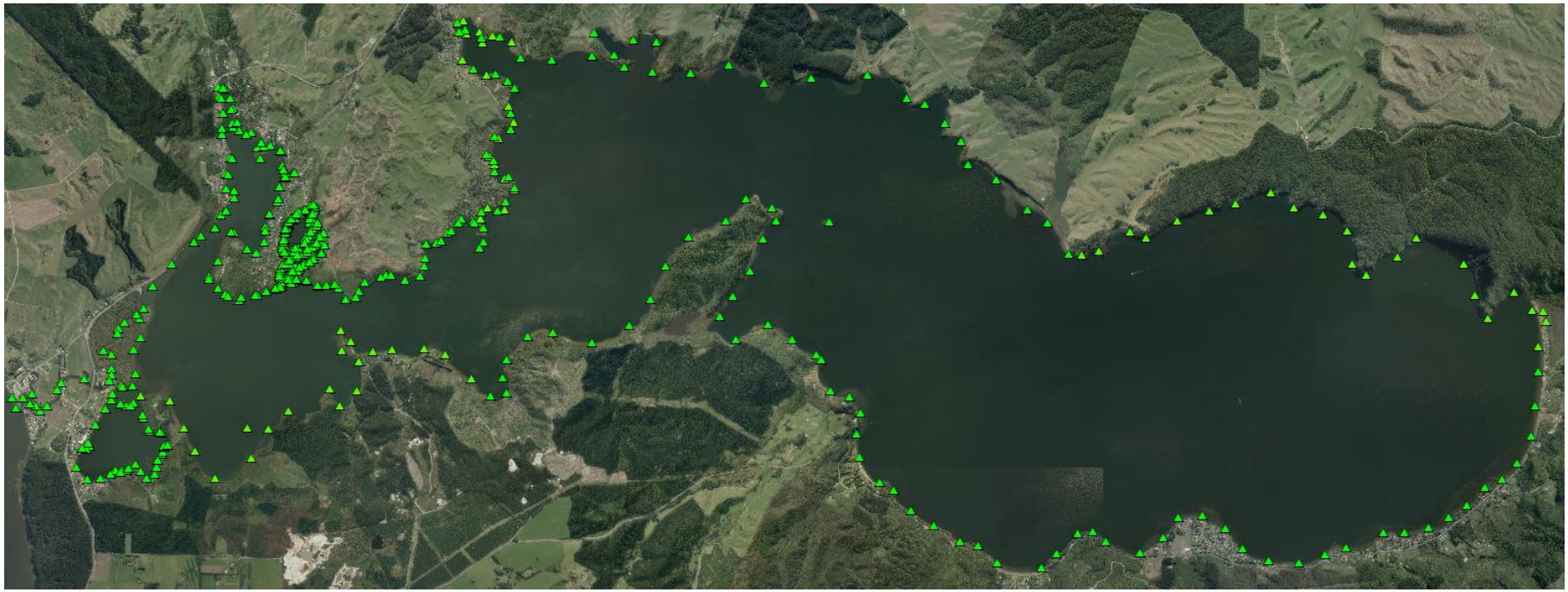
Delimitation survey – effort since

Since initial discovery:

- 26 net nights = 586 nets set, entire lake surveyed.
- Some parts twice over (Okawa Bay, Okere Inlet, shoreline from Okere Inlet past Otaramarae.
- Support from UOW boat - 29 kilometres of fishing in Lake Rotorua, Ohau Channel, Te Weta bay, Okere Inlet.

Lake Rotoiti incursion 2016

Delimitation survey – fyke nets set



Lake Rotoiti incursion 2016

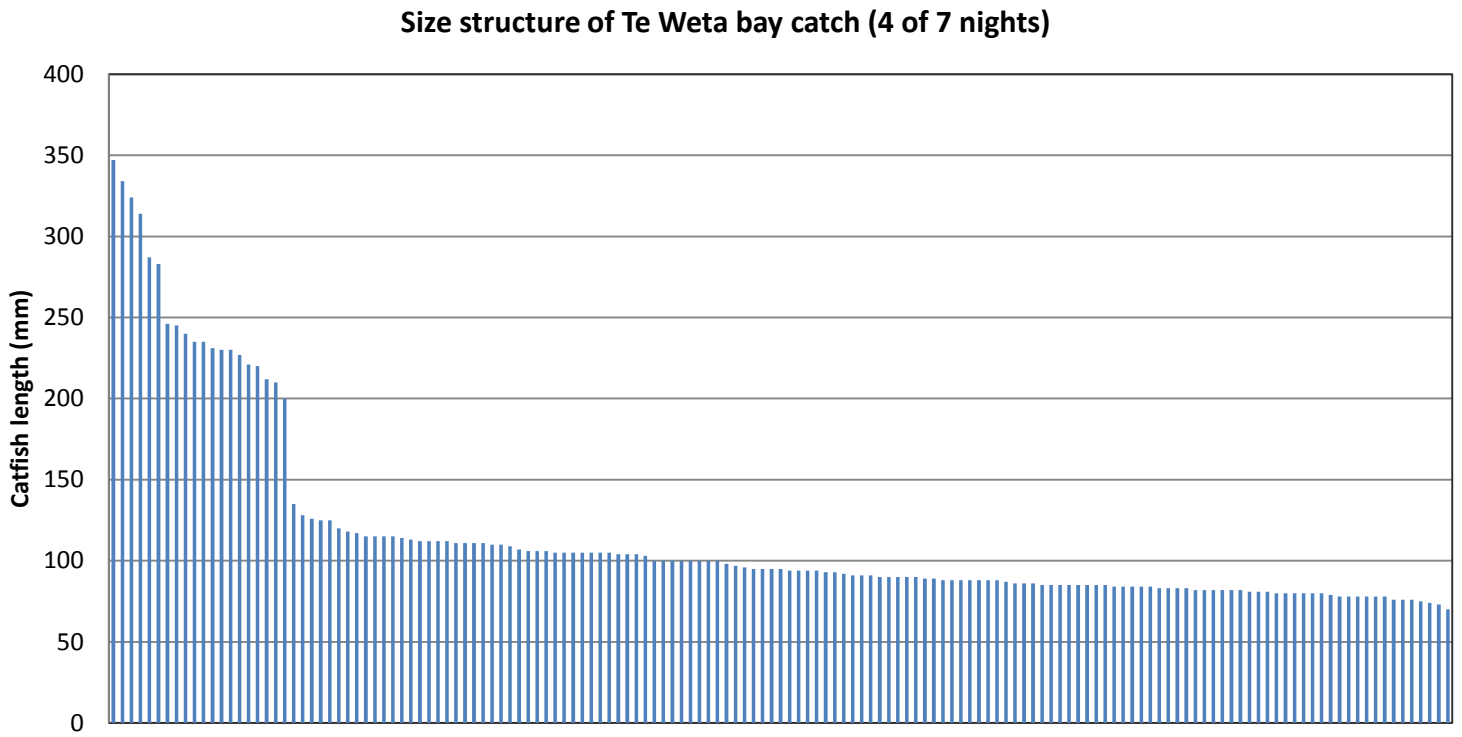
Delimitation survey - Results

Since initial discovery:

- Total of 331 catfish caught, 330 from within Te Weta bay.
- Average number of fish caught per night In Te Weta bay is 47!
- Average CPUE for Te Weta bay is 2.06 (fyke nets).
- Sizes range from 70mm to 347mm (4 of 7 nights sampled).

Lake Rotoiti incursion 2016

Delimitation survey – Results

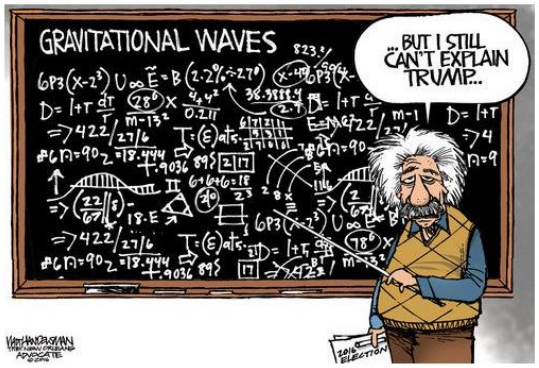


Incursion response

Issues we face

Still lots to learn:

- Current distribution a snap-shot in time.
- What parts of the lake they utilise for different life stages?
- Technology to assist in surveillance and control (e.g. eDNA).
- The impact in Rotoiti ecology?
- Presence in other lakes?
- Impacts on water quality?



Incursion response

Issues we face

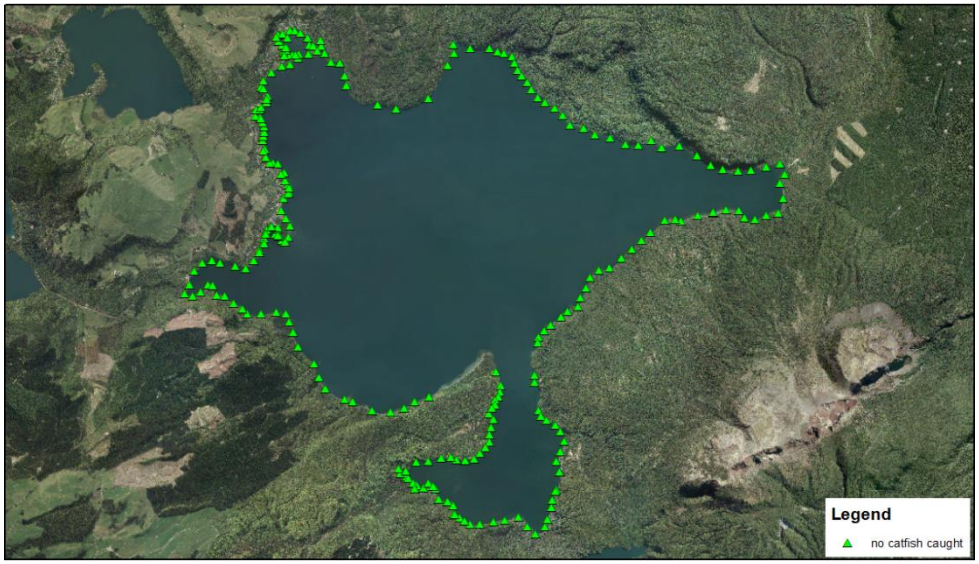
Prevention of by-catch:

- Balancing preserving other species vs effectiveness of fyke nets.
- Dabchick, trout and koaro the main concerns.

Lake Tarawera

Presence/absence survey

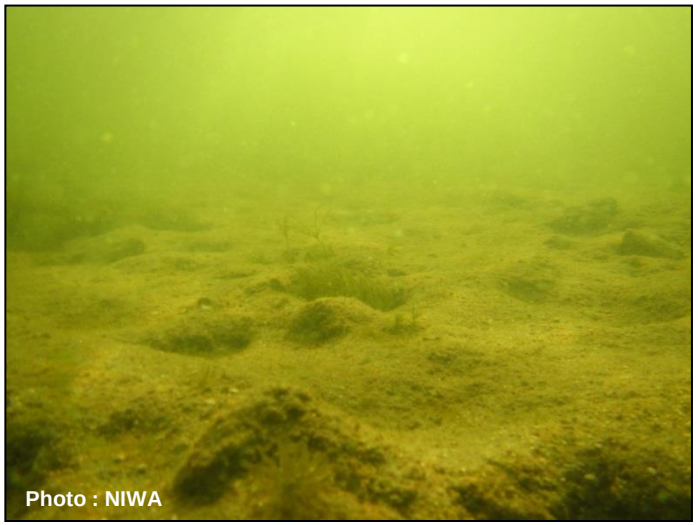
- 11 net nights.
- 253 nets set.
- 2 nights at high risk sites.
- No catfish caught.

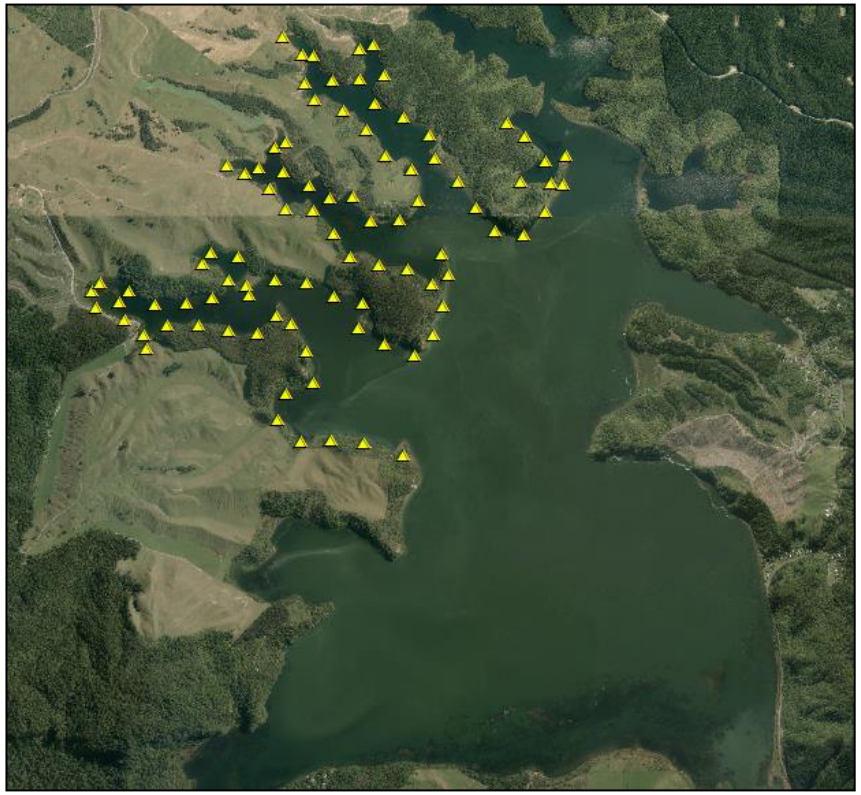


Lake Rotoehu

Presence/absence survey

- Surveillance in response to pot holes (NIWA).
- Underway this week.





Moving forward

The plan short-term

- Containment and population suppression, with eradication considered in future if further research deems this practicable.
- Research, research, research.
  - DNA assay and isotope analysis.
  - Impacts of catfish in Lake Rotoiti.
  - Tagging and acoustic surveys.
  - Utilisation of pheromone baits.
  - Bubble nets and electric barriers.

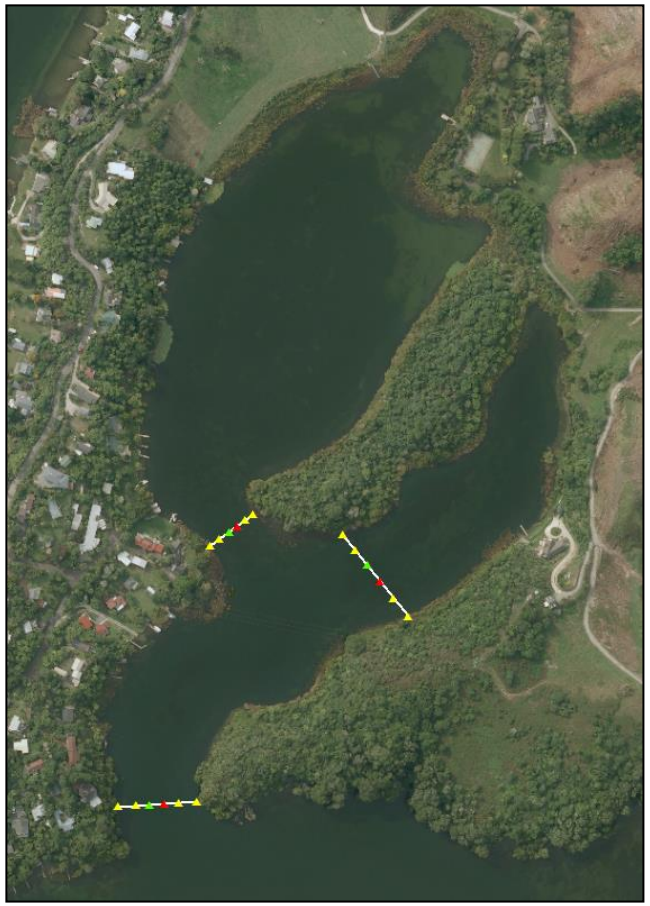
Moving forward

The plan short-term

- Learning their habits in Lake Rotoiti

SITE TYPE	MEAN CATCH PER UNIT EFFORT (FISH NET^{-1} NIGHT^{-1})				
	LATE SUMMER	AUTUMN	WINTER	SPRING	EARLY SUMMER
Weedy	19.6	26.9	6.0	22.6	92.1
Rocky	5.5	39.0	44.0	23.5	34.3
Sandy	2.0	0.8	0.0	3.0	–

- Continuation of control and surveillance.
- Containment cordons Te Weta Bay.
- Advocacy and communications to educate the public.



Things look bad, but…

It could be worse!