



Acknowledgment of Country

'I would like to acknowledge the First Nations people as the Traditional Owners of the land on which this meeting is taking place today, Meeanjin, Brisbane. I recognise the country north and south of the Brisbane River, as the home of both the Turrbul and Jagera nations. I pay deep respects to all Elders past and present and future.'

Local platypus name 'Wajin'



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HISTORY

- First platypus specimen
 - Arrived in England in 1798
- Hoax
 - Duck billed, beaver tailed and otter footed
- Mammal – monotreme
 - Lay eggs
 - Young also suckle on milk like the other mammals
- Two surviving monotremes in the world
 - Echidna



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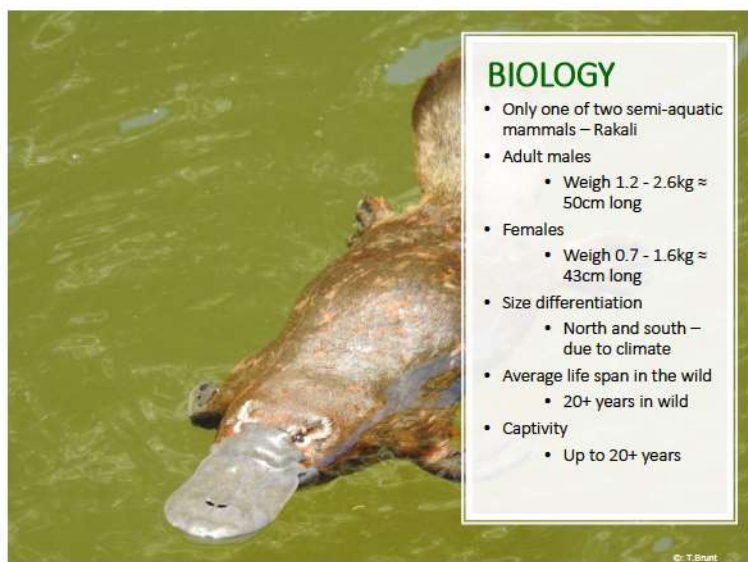


DISTRIBUTION

- Endemic to Eastern Australia
- Populations throughout Tasmania, east coast of Victoria, NSW and Queensland (Cooktown)
- The platypus is now extinct in South Australia
- Kangaroo Island has a reintroduced population.



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BIOLOGY

- Deep brown fur on the top, golden or silky grey underneath
- This thick fur traps air and keeps the platypus dry when submerged
- Approximately 600 - 900 hairs per square millimetre
- Waterproof fur helps in the colder alpine regions where the water can be near freezing



BIOLOGY

- Male venomous spur
 - Small bony spur on both hind legs which they can use for defence
 - Age class based on sheath around spur
- Connected to a venom producing gland in the thigh
- Venom is not lethal to humans
- Pain is apparently so excruciating that the victim may be incapacitated



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BREEDING BIOLOGY

- Mating season late winter – spring
 - Qld – July
 - Later in Southern states
- Gestation period – 23 days
- Females produce a clutch of 1 – 3 eggs
 - Laid directly on her abdomen
- Eggs - 15-18 millimetres long
 - Similar to reptile eggs they have a soft parchment like shell.
- Female will incubate eggs
 - period of approximately 10 days.



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ARKive

www.arkive.org

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BREEDING BIOLOGY

- Born blind and hairless – 15 mm
- Milk is secreted from patches along the mothers belly
- The juveniles first enter the water at around 4 months
 - 80-90% fully grown



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Ecology - Habitat

- Highly dependant on freshwater rivers, lakes and creeks
- Can tolerate a wide range of environments
 - Sub-alpine to wet tropics
 - Urban streams
 - Housing estates
 - Highways
 - Industrial areas
- Ideal platypus habitat
 - Freshwater
 - Native vegetation
 - High stable banks
 - Deep pools and shaded areas
 - Coarse substrate
 - Snags/debris to forage around



FEEDING

- Nocturnal
- 13 – 28% of its own weight each night
- Forages ≈ 10-12 hours a day
- Insects larvae
- Fish eggs
- Worms
- Crustaceans
- Molluscs
- Tadpoles



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FEEDING



- Hearing and vision are of little use
- Rubbery bill to locate prey
- Electroreception – tiny pores
- Cheek pouches

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Created by Tamselle Brunt

IMPORTANCE

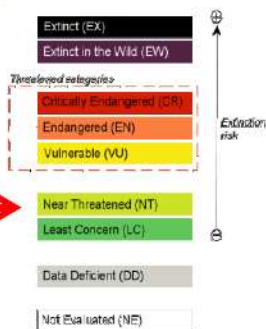
- **Ecosystem**
 - Predator
 - Increase productivity when foraging
 - Feeds invertebrates
 - Microorganisms
- **Research**
 - Females milk
 - Components for antibiotics
 - Males venom
 - Pain killers
- **Iconic**
 - Umbrella/flagship species

Advocate for species richness in waterways

CONSERVATION STATUS

- 2016 – IUCN (International Union for Conservation of Nature) Redlist
- Near Threatened
- Localised declines
- Lack of knowledge to predict populations trends in the future
- In Queensland listed – Least Concern

We don't really know



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THREATS

- Increased urbanisation
- Increase in impervious structures
 - Concreting creeks and streams into channels
 - Stormwater – hard and fast flows
 - Driveways and pathways
- Habitat degradation
 - Removal of native vegetation
 - Erosion of banks – burrows
 - Sedimentation in water – disturbs food
- Pollution
 - Water – chemical runoff
 - Material, plastic ring pulls, fishing gear, rubber bands, hair ties



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THREATS

- Water utilisation
 - Dams and weirs
 - Lack of environmental flows
- Climate change
 - Drought – decrease in refuge pools
 - Higher water temperature



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PREDATORS

- | Native | Introduced |
|----------------------------|------------|
| • Birds of Prey | • Foxes |
| • Dingo | • Cats |
| • Murray cod | • Dogs |
| • Pythons | • People |
| • Goanna's | |
| • Water rats | |
| • Crocodiles (far Nth Qld) | |



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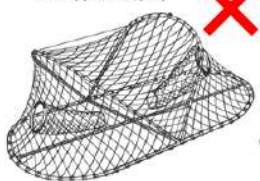
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funnel (opera house) trap



OPERA HOUSE NETS

- Opera House traps are a problem in all waterways
- Used to catch yabbies
- They trap and kill platypus, turtles, water rats and birds
- Attracted to the bait inside, unable to free themselves, they drown
- 1-minute searching for food



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OHN

- Banned in Victoria and ACT
- WPSQ lobbied to the government to ban traps
- Change the regulations 2015
 - Banned traps with entrance holes larger than 5cm
 - In waterways east of the Great Dividing Range and the Gore Highway



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- PlatypusWatch Network launched in 2003
- Community-based program
 - Aims to document where platypus occur so that we can develop a reliable 'snapshot' of platypus distribution and populations
- Platypus database
- Identify where conservation actions are needed
 - Now and in the future
 - To protect this unique animal
- Collaborate with catchment groups and local council to run their own surveys, monitoring and research



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Observational Surveying

Environmental DNA (eDNA)



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Observable reduction in reported sightings (WildNet data)

Losing platypus or losing interest?

1996 - 2005

2006 - 2016

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WHY PlatyCount?

- Understanding of population/distribution
 - Contracting or expanding?
 - Comparison to historical records
- Establishment of a longitudinal survey
 - Repeat measure, consistent survey locations, accessible data
- Trial eDNA as a reliable indicator of platypus occupancy in QLD waterways
 - Establish the method, implement as longitudinal survey?
- Community engagement and education



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WHAT IS eDNA?

- Genetic material obtained directly from environmental samples – soil, water, sediment
 - Aquatic environment
 - Platypus playing around – skin cells, hair cells and faeces
 - Developed species-specific primers
- Genetic analysis
 - PCR assays amplify the target DNA



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eDNA

- Ideal for cryptic species
- Non-invasive
- Facilitate ongoing data collection

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METHOD

- Two samples per site, two or three sites per creek
- Strict contamination avoidance protocol
- Collect 500ml creek water
- Pass through a specific filter
- Discard filtered water, retain filter (becomes the 'sample')
- Maintain sample at approximately 4C°
- Transport to Melbourne within 48hrs for processing



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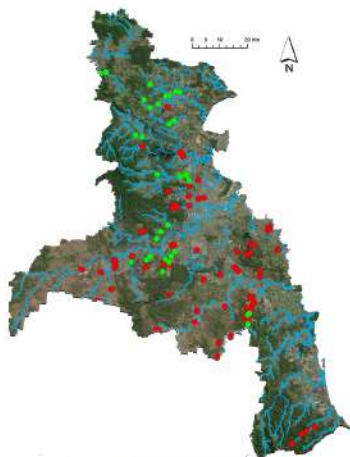
eDNA can tell us...

- Positive sample indicates a platypus occupancy
- Number of positive PCR's (amount of DNA present in the sample) per site may provide an indication of level of activity
- Cannot tell us.....
 - Number of individuals
 - Relatedness
 - Precise location of animals



RESULTS

- 5 years
- 185 sample locations
- 66 waterways
- 25 individual waterways positive for platypus DNA

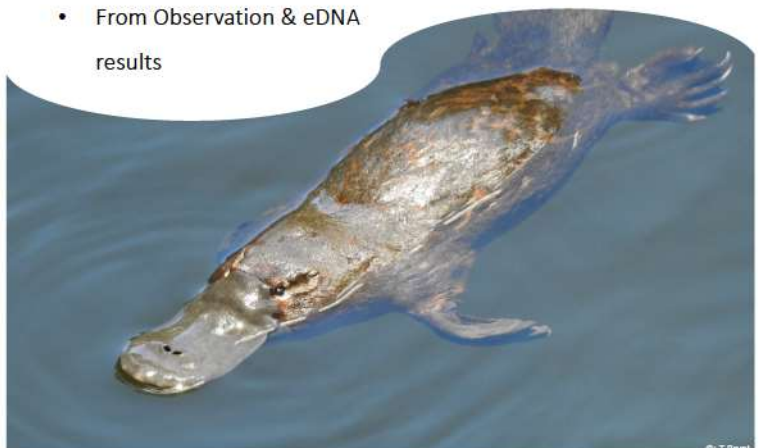


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Then ...

- From Observation & eDNA results



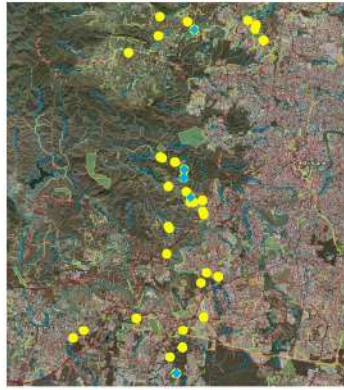
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POPULATION STUDIES

- Detailed population data
- To determine the impacts of threats on populations.
 - Decline
 - Isolation
 - Area's of interest – impact
- Data
 - Body conditions
 - Genetics



*Under strict animal ethic permits



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Methods



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Process



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FUTURE



- National distribution data
- Report of findings
 - Engage with stakeholders (local councils, local NRM groups etc)
- Influence future catchment rehabilitation programs
- Continue monitoring (multiple methods)



PROTECT AN ICON AND OUR FRESHWATER ECOSYSTEMS

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HOW YOU CAN HELP



1. Reduce water consumption
2. Clean up rubbish
3. Cut circular rubbish
4. Rehabilitate banks
5. Leave logs in the waterways
6. Exclude livestock to protect banks for burrowing sites
7. Weed removal
8. Fish responsibly
9. Use wildlife friendly alternative yabby nets – FishWatch
10. Control dogs around waterways especially at dawn and dusk

Further information

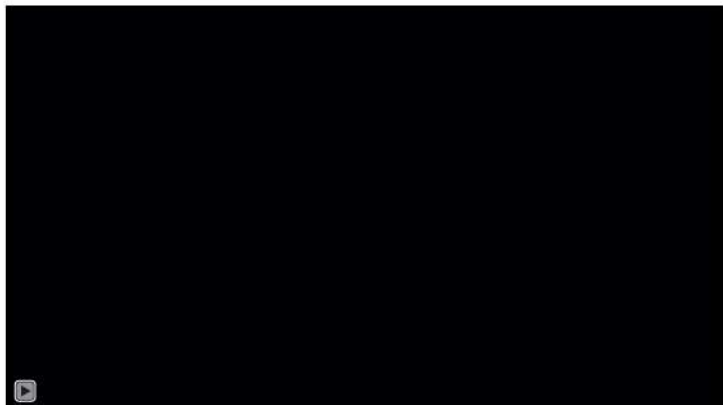
Resources

- PlatypusWatch Network – email us platypus@wildlife.org.au
- Happy Platypus
<https://wildlife.org.au/wp-content/uploads/2013/12/Happy-Platypus-flyer-10-steps.pdf>
- Platypus Puzzle & Activity booklet
<https://drive.google.com/open?id=1-KtvEDUJ0fME8Y2w0FV6o2I3GzJRdpaF>
- PlatypusSPOT – App record sightings
- Australian Platypus Conservancy – information



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SPOTTING PLATYPUS



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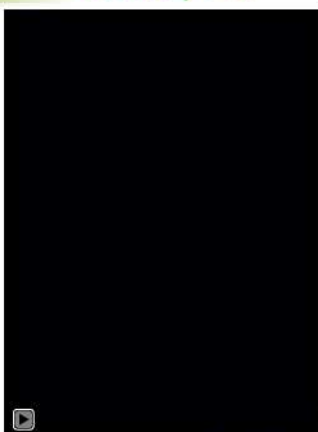
ACKNOWLEDGEMENTS

Thank

- Local Councils
 - Ipswich City Council
 - Logan City Council
 - Redland City Council
 - Brisbane City Council
 - Moreton Bay Regional Council
- Members, supporters, volunteers of WPSQ
- Brisbane Airport Community Fund

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Thank you!



Follow research updates
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