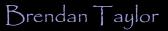
TIME LAPSE & CONCRETE PIPES:

some surprises from two years of frog pipe monitoring



SANDPIPER





Monitoring Site

- Sapphire to Woolgoolga Pacific Highway upgrade
- Operational July 2014
- 2 dedicated frog pipes to mitigate impact on Federally listed (Vulnerable) giant barred frog (*Mixophyes iteratus*)
- <u>RC pipes</u>: 1050mm diam., 56m long, mulch floor
- Either side & above tributary of Woolgoolga Creek











North

Methods

- Oct Apr 2015/16 and 2016/17
- Reconyx cameras SC950 (IR flash) & HC550 (white flash) in security housing
- Mounted on obvert, 5m inside each pipe end facing out
- Time lapse 1 pic/min between 1800 & 0500 hours







Results

Frogs:

- 7 spp. at 5.2 detections/week
- <u>Confirmed crossings</u>: giant barred frog, greater barred frog, eastern stony creek frog, striped marsh frog



Striped marsh frog

Reptiles:

- 11 spp. at 2.5 detections/week
- <u>Confirmed crossings</u>: carpet python, smalleyed snake, golden-crowned snake, eastern water dragon



2016-12-05 4:54:00 AM

25°C

Golden-crowned snake

Mammals:

- 16 spp. at 12.9 detections/week
- <u>Confirmed crossings</u>: echidna, brown antechinus, long-nosed bandicoot, northern brown bandicoot, common brushtail possum, common ringtail possum, red-necked wallaby, swamp wallaby, water rat, bush rat, swamp rat, black rat, house mouse, cat, red fox



Common brushtail possum



Echidna





Long-nosed bandicoot



Brown antechinus



Discussion/Management Implications

Pipe use:

- 34 species recorded using
- 23 species Confirmed crossings
- Crossings unlikely by large mammals (eastern grey kangaroo) and small frogs and small reptiles

Method:

- Time lapse enabled detection of species largely missed by PIR camera traps (e.g. small species, ectotherms)
- Time lapse 'movement trails' assisted crossing confirmation

Pipes as crossing structures:

 RC pipes should be more readily considered in crossing structure mix as part of mitigation package



Acknowledgments

Monitoring was conducted on behalf of Roads and Maritime Services NSW under contract 15.2544.0085.

We wish to thank Project Managers Scott Lawrence and Natasha Ray for their assistance during the monitoring program.





Analysis – Determining Crossings

Definite Crossing (+90% certainty):

- Same species, both ends, same direction within 30 min (mammals) & 60 min (reptile & frog)
- Directional movement one end & proportional 'disturbance trail' in same direction at other end within 30 min (large snakes & >medium-sized mammals)

Probable Crossing (75-90% certainty):

• Directional movement into pipe at one end & not detected at other end & not photographed exiting entry end

Non-crossing Movements:

 No directional movement into pipe or entered, turned around and exited

