Lorna Glen Introduced Predator Monitoring

27-31 January 2012

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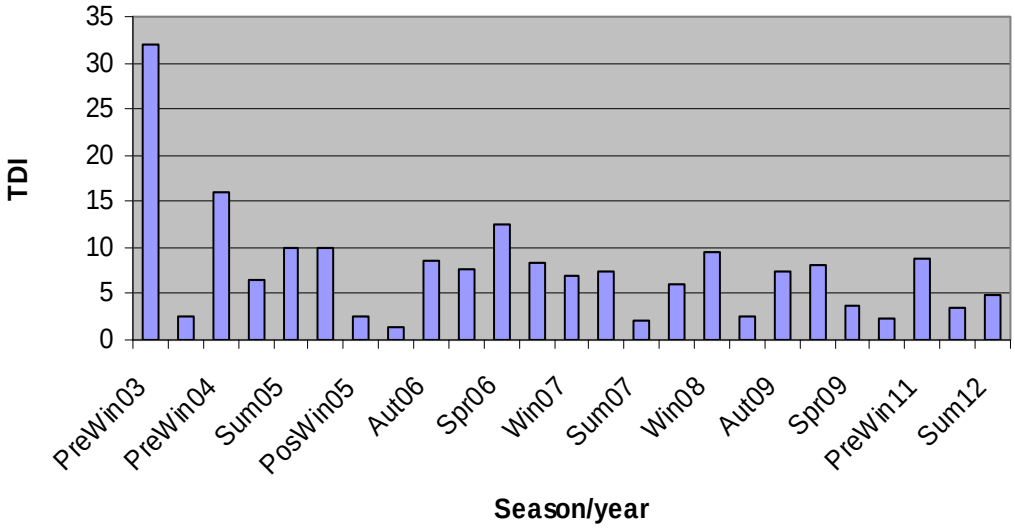
Summary

- The Spring 2011 introduced predator survey was cancelled due to rain.
- Despite well above average winter and summer rainfall in 2011, the cat and dog activity indices remain low with Cat TAI = 4.7 (up 37% since July 2011) and Dog TDI = 1.8 (down 47% since July 2011). Note: Prior to baiting in 2003, the Cat TAI was 30-35 (Algar *et al*. in press). The current Cat TAI is below the target of <10.0 and has mostly been so since winter 2004.
- 9 individual cats and 4 individual dogs intersected on 80 km of transects over 5 nights. This is equivalent to 11.3 cats per 100 km, which is about the same as July 2011, and 5.0 dogs per 100 km, which is significantly lower than July 2011.
- Dog tracks were also recorded at:
    - N of No. 2 Well
    - Between No. 1 Well and New Bore
    - Between No. 2 Bore and Pink Lake
    - E of No. 2 Bore
    - W of No. 9 Well
- Except for one instance where a "small to medium" cat was recorded, small cats / kittens were not recorded and have not been recorded for a couple of years. This, together with the fact that the cat density index has remained low since winter 2004 despite above average rainfall in 2011 suggests that baiting is interfering with breeding or removing recruits (kittens and young cats) from the population.
- The new Edge Predator Callers (Edge callers) imported from the USA were tried for the first time. These are small plastic black boxes that emit an electronic random bird call only (without the movement lures) and are significantly cheaper than the locally made FAPs (about 1/3 the price delivered).
- The Edge callers successfully attracted cats and dogs into the FAPs stations. A dog made off with one of the callers.
- There are two cats on the fence outside the compound that need to be trapped when their patrol pattern is established. Some 15 Edge callers and 50 new small (fox) soft catch legholds have been left at Lorna Glen for trapping cats in and around the compound.
- Visitation to the FAPs stations and take of non-toxic baits by varanids increased significantly (about 50-fold) compared with July 2011. This is to be expected given seasonal influences (winter vs summer). Comparing the same seasons, visitation by varanids to the FAPs stations has doubled from 8.8% in 2010 16.6% in 2012. This may be due to the new callers, but more likely, it is an indication that the varanid population is responding to baiting – this is supported by anecdotal evidence.
- Numerous bustard tracks were observed; 3 birds sighted.
- Visitation by mulgara to active (FAPs) stations, as evidenced by tracks and scats, was significantly higher than July 2011 with almost 17% of stations visited. Mulgara activity continues to be high and although most activity occurs in the Bullimore (sandplain spinifex) land system, activity was recorded in a range of other ecosystems.
- Echidna TAI was 4.6, down on the Winter 2011 count (8.8). Rabbit TAI was 4.1, down on the Winter 2011 count (6.3).
- The Suzuki broke down, the Honda leaks oil and there was no quad trailer on site to shift quads around so had to use the old rickety 6x4 box trailer.
- VHF Ch. 601 worked well and is a great facility to have.
- Potential bushfire threat when extensive areas of native grasses cure.

Mean seasonal Cat Track Density Index (TDI) for Lorna Glen from 2003.
Baiting commenced Winter 2003 (data pre 2010 modified from Algar et al. in press)



Recommendations

- Consider reducing the broad area predator survey frequency from four times per year to twice per year. This will save money and time. Reasons for suggesting this;
    - the cat and dog TDIs have remained consistently low (mostly <10.0) since aerial baiting in winter 2004,
    - we have been through dry and wet cycles without measuring a significant increase in cat density,
    - beyond some localized trapping, there is little we can do if cats increase across the landscape between baiting events.
- As mentioned above, we had problems with the quad bikes. We need to consider replacing them - it is unacceptable to be working with old, unreliable equipment in such an environment. Rather than thrash and throw away, we should implement and budget for a replacement program.
- Equipment maintenance - need to stick to the usage recording and maintenance schedule put together by Vanessa J and Tub L.
- In four out of four cases when we have trapped cats, we have correctly predicted their sex based on the pattern of their walk path (thanks to Martu knowledge). That is, males meander down the transects while females walk more-or-less straight lines or walk straight across the transects. In future, we will record both the size and the gender of cats on the transects.

Summary of data and notes – survey 27-31 January 2012

Table 1: Summary of track activity (TAI) for cats & dogs only.
TAI for 8 Transects (each 10 km) over five days = (Total individual tracks X 100) / 390

Transect (Drag lines)	Day 1		Day 2		Day 3		Day 4		Day 5		**Totals**	
	Cat	Dog	Cat	Dog	Cat	Dog	Cat	Dog	Cat	Dog	**Cat**	**Dog**
1	0	0	1	0	2	0	1	0	0	0	3	0
2	0	1	0	2	1	1	2	0	0	1	3	5
3	0	0	0	0	0	0	1	0	0	0	1	0
5	N/A	N/A	0	0	0	0	0	1	0	0	0	1
7	1	0	1	0	0	0	1	0	1	0	4	0
8	1		1	0	0	0	0	0	0	0	2	0
9	0	0	0	0	0	0	1	0	1	0	2	0
10	1	0	0	0	0	0	0	1	2	0	3	1
Total tracks	3	1	3	2	3	1	6	2	4	1	18	7
TAI	3.8	1.3	3.8	2.5	3.8	1.3	7.5	2.5	5.0	1.3		
										Mean TAI	**4.7**	**1.8**

Notes Table 1 (above): Track Activity Index (TAI)

- Transect 5 was not assessed on Day 1 due to quad bike breakdown hence total transect distance was reduced to 390 km.
- Both Cat and Dog activity is low. Mean Cat TAI was 4.7 and Dog TAI was 1.8, which is 37% higher and 47% lower respectively than when measured after baiting in July 2011 (when both Cat and Dog TDI was 3.4).
- Transect 10 – 10 km around the outside of the compound – is now a drag line.
- Cats travelled a total distance of ~3600 m along the transects (similar to Winter 2011) and dogs 1300 m (about ¼ of last winter). The longest continuous distance travelled by a cat was ~400 m and by a dog, ~500 m. These distances are considerably shorter than Winter 2011. On two occasions, cats walked across the transects (i.e., did not travel along the transects).

Table 2: Estimated number of individual cats and dogs encountered on 80 km of transects. Individual Density Index (IDI) = (No. individuals X 100) / 80

Transect	Cats	Dogs
1	1	0
2	1	2
3	1	0
5	0	1
7	2	0
8	1	0
9	1	0
10	2	1
Total animals	9	4
Mean IDI	**11.3 cats / 100 km**	**5.0 dogs / 100 km**

Notes Table 2 (above): Individual Density Index (IDI)

- Since July 2011 the Cat IDI has remained about the same (11.4 vs 11.3) and the Dog IDI has decreased from 8.6 to 5.0.
- No cats recorded on Transect 5.
- Dogs recorded on 3 of 8 transects.
- A 4.6 kg male cat was trapped on Transect 8 (using leghold traps) for the benefit of the film crew who are making a DVD / documentary of the Program.

Notes Table 3 - FAPS (below):

- Early days, but since the introduction of the new Edge callers, there has been a significant increase in activity at the FAPs stations. Historically, and across seasons, some 65% of stations record no activity, but this fell to 43% this survey.
- One FAP missing (not set up) on Transect 8.
- As mentioned, cats and dogs were attracted to the FAPs stations by the Edge callers; cats did not take the baits, dogs did. On one occasion, a dog took the Edge caller.
    - Cats: 1 pass; 9 visits; 0 bait take
    - Dogs: 0 pass; 4 visits; 3 bait take
- The FAPs stations continue to be a very useful index of activity of other animals such as mulgara and varanids.

Table 3: Summary of active sample points (FAPs, non-toxic baits (NTB) & sand pads). Transects 1,2,3,5,7,8,9 & 10 have FAPS and NTBs only; n = 50 per Transect. Transects 4 & 6 also have sand pads between FAPs; n = 95 per transect

Transect	Totals over 5 days			
	Nil activity (%)	Pass (%)	Visit (%)	Bait take (NTB) (%)
1 (n=50)	36	Cat - 2 Rabbit – 2	Cat – 2 Varanid - 12 Bird – 6 Mulgara - 4 Unknown - 2	Varanid – 14 Bird – 8 Ants – 8 Unknown - 4
2 (n=50)	52	0	Cat – 2 Bird - 4	Varanid - 16 Mulgara – 4 Bird – 8 Ants - 14
3 (n=50)	18	0	Mulgara -12 Bird - 2	Varanid - 34 Mulgara – 22 Bird – 2 Ants - 6 Unknown - 4
4 (n=95)	68	Dog - 2 Rabbit - 2	Dog – 1 Bird – 4 Varanid – 2	Varanid - 14 Bird – 6
5 (n=50)	34	0	Bird – 8 Mulgara – 2	Varanid- 10 Bird – 10 Mulgara – 10 Unknown - 8 Not assessed - 20
6 (n=95)	40	0	Cat – 2 Dog - 2 Bird – 10 Mulgara - 4	Bird – 16 Varanid - 6 Dog - 2 Ants – 2
7 (n=50)	38	0	Cat - 2 Birds – 10 Mulgara – 4	Mulgara – 34 Bird – 8 Varanid - 4
8 (n=50)	32	0	Cat - 10 Mulgara -8 Bird – 4	Mulgara – 10 Varanid – 12 Bird – 10 Unknown – 4 Not assessed - 10
9 (n=50)	34	0	Cat - 2 Bird – 10 Mulgara - 10	Mulgara – 34 Bird – 4 Varanid – 4 Unknown - 2
10 (n=50)	70	0	Cat - 4 Bird - 2	Varanid - 8 Bird – 10 Ants – 4 Unknown - 2
Total (n=590)	**43%**	**0.8%** Cat – 0.2% Dog- 0.2% Rabbit – 0.4%	**14.7%** Cat – 2.4% Dog – 0.3% Bird – 6.0%; Mulgara – 4.4%; Varanid-1.4%; Unknown – 0.2%	**41.6%** Varanid – 12.2% Mulgara – 12.2% Bird – 8.2% Ants – 3.4% Unknown – 2.4% N/assessed - 3.0% Dog – 0.2%

Appendix
Explanatory notes - estimating introduced predator density

Feral cats, and to a lesser extent, wild dogs, are rarely seen and their populations are difficult to determine using trapping or spotlighting techniques. Therefore, indirect measures are used to estimate relative abundance. We use two measures, which rely on skilled observers and some sampling rule sets.

1. The Track Activity Index (TAI), which is calculated from the total number of sets of tracks (footprint sets) recorded over 5 nights for the 8 dragged transects each 10 km long. Algar and Burrows provide a rule set for determining whether a set of discontinuous track sets detected on a transect on the same day is counted as one or more track sets. In essence, if cat tracks are the same size, going in the same direction and are less than 2 km apart, we assume it is the same animal. The TAI is the measure currently used to set thresholds for free range fauna re-introductions (TAI<10.0).

TAI = (total number of track sets counted over 5 nights X 100) / 400.

Where cats have not been controlled in the arid zone, the TAI is usually 25-35. It can be as high as 55-65 in regions such as Shark Bay that sustains very high rabbit populations.

2. The Individual Density Index (IDI): This is calculated from the estimated number of individual animals (cats or dogs) detected by footprints along the dragged transects over 5 nights. That is, after 5 nights, we examine the data and estimate how many individual animals we think there are along the 70 km (7 transects x 10 km) of dragged transects and express this as a number per 100 km. This is estimated based on the size of the cat (or dog) and where along the transect it is detected each night. The IDI is calculated by:

IDI = (No. of individuals X 100) / 70.

The IDI is less reliable than the TDI because it requires somewhat subjective (expert) judgments and assumptions to be made about the actual number of individual animals on the transects over 5 nights.

To compare the TAI and the IDI, consider the following example:

After 5 nights of surveying a 10 km transect, we record one cat track set each night, so the TAI = (5 x 100) / 50 = 10.0. However, because of the size and location of the tracks, we conclude that the tracks have been made by 2 individual cats, so the IDI = (2 x 100) / 10 = 20.0. If we concluded that the tracks were made by 3 cats, then the IDI = (3 x 100) / 10 = 30.0, etc.