

Wedge-tailed Eagle Nest Monitoring Project – Interim progress report

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This interim progress report covers the contract reporting period from December 2009 to December 2010. A final report will be provided to Roaring 40s in June 2011 which will provide greater detail on the study results.

Background

The overall aim of this project was to evaluate the effectiveness of current management prescriptions in reducing adverse effects of forestry practices on the breeding success of wedge-tailed eagles. The results of this project will assist in the ongoing development of management options.

The aims of the work carried out in the first year of the project (July 2007– July 2008) were to establish methods and 84 nest sites for monitoring over the next five years, to explore the relationship between nest site and tree characteristics and the success of a nest site (Wiersma et al. 2009), and to evaluate the use of indirect signs in determining nest site ‘activity status’ (Wiersma and Koch, submitted).

The aim of the work carried out in the second year of the project (July 2008– July 2009) was to continue monitoring the use of nest sites designated for monitoring. Due to nest loss or an inability to locate nests, data were collected for only 61 of the 84 nests. The results of the first two years suggest that a large proportion of nests are not used in any given year but that re-use of some nests may be high. A comparison of the timing of breeding events between the two years indicated that the 08/09 season started approximately six weeks later than the 07/08 season (Wiersma 2010).

This current report summarises the results of the third year of the project (July 2009 -2010). The results from the fourth year (July 2010-2011) are also included where available, although the surveys in this year were outside of the funding contract with Roaring 40s.

Aims and objectives

The aim of the work carried out in the third year of the project was to continue monitoring established nests and collecting data to address the overall aim of the project.

Specific sub-objectives for the third year of monitoring were to:

- select and monitor additional nests to account for nest loss over time;
- determine timing of breeding in 09/10;
- determine the activity status of the nests monitored in 09/10;
- use available data to explore the relationship between nest site and tree characteristics and the success of a nest site (results will be provided in June 2011 report);
- review and update the model used to predict the occurrence of wedge-tailed eagle nesting habitat (results will be provided in June 2011 report);
- examine the relationship between forest patch size and breeding success (results will be provided in June 2011 report).

Methods

Due to the small number of sites found during the 08/09 breeding season, a further 90 nests were selected from the raptor nest database for monitoring in 2009/10. GIS analysis and aerial imagery were used to randomly select ‘managed’ (nests subject to forestry activities within 1km of the nest) and ‘semi-natural’ sites (nests that did not contain forestry activities within 1km of the nest) as

described in Wiersma et al. (2009) and Wiersma 2010. Industry provided information on forestry operations around the eagle nests, including harvesting, planting and pest control. Nests were classified as a Forest Operations Nest (FON) if they were subject to an active forestry operation during the year of study (June-June), or 'semi-natural' if not. As per the other years, aerial surveys were conducted during November to assess the activity status of nests. Nests containing a nestling were classified as 'successful' and all other nests were classified as 'unsuccessful'. The 'unsuccessful' category included nests that had evidence of use but did not contain a chick ('maintained' category described in Wiersma et al 2009 and Wiersma 2010). The age of chicks was estimated whenever possible and used to estimate the timing of the breeding season (courtship, incubation, chick development and fledging).

Nests were also monitored in the 2010/2011 breeding season which provides a fourth year of breeding data. Where available, this data is included in the current report despite being conducted outside of the funding contract with Roaring 40s.

Preliminary results

The number of nests surveyed varied between the years, although attempts were made to survey the same nests each year.

A total of 49 nests were surveyed during all of the first three years of this study. Of these, 18 (36.7%) never showed any signs of use. One nest was successful in all three years (2.0%). Eight nests were successful in two of the years (16.3%). Fifteen nests were successful in only one of the years (30.6%). The remaining seven nests (14.3%) showed some signs of activity on at least one of the years but were never found to be successful. Of the 20 nests that were not used (no sign of eagle activity) in the first two years, only one was 'maintained' in the third year and one was successful in producing a chick.

A small percentage of nests were lost each year, primarily due to wildfire or windthrow (Table 1). The rate at which monitored nests were found to produce chicks were fairly consistent between years, apart from 08/09 (Table 1). The rate at which nests were successful appears to be slightly lower for areas that had a forest operation activity (harvesting, planting or wildlife control) within a 1 km radius than those that did not (Figure 1), although it is not yet known if the difference was significant. This will be explored further in the final June 2011 report.

Table 1. Summary of the survey effort, the rate at which nests were lost and the rate at which usable nests produced chicks for each year of the study.

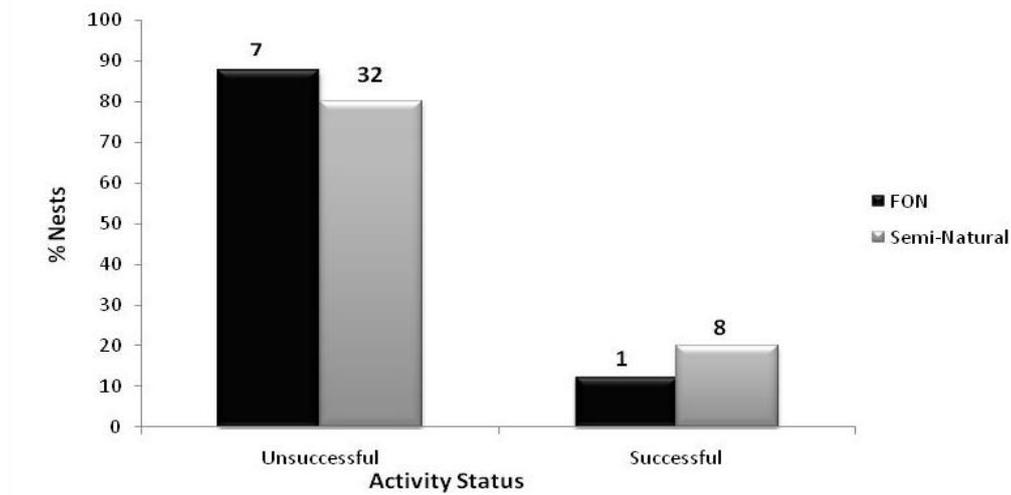
Breeding season	No. nests surveyed	Rate of nest loss*	Rate of nest success
2007/2008	84	1.2 %	26 %
2008/2009	61	1.6 %	9 %
2009/2010	113	3.5 %	27 %
2010/2011	83	3.6 %	22 %
Average	85.3	2.5 %	21 %

*Nests were lost because the nest and/or supporting structure collapses, often due to wildfire or windthrow.

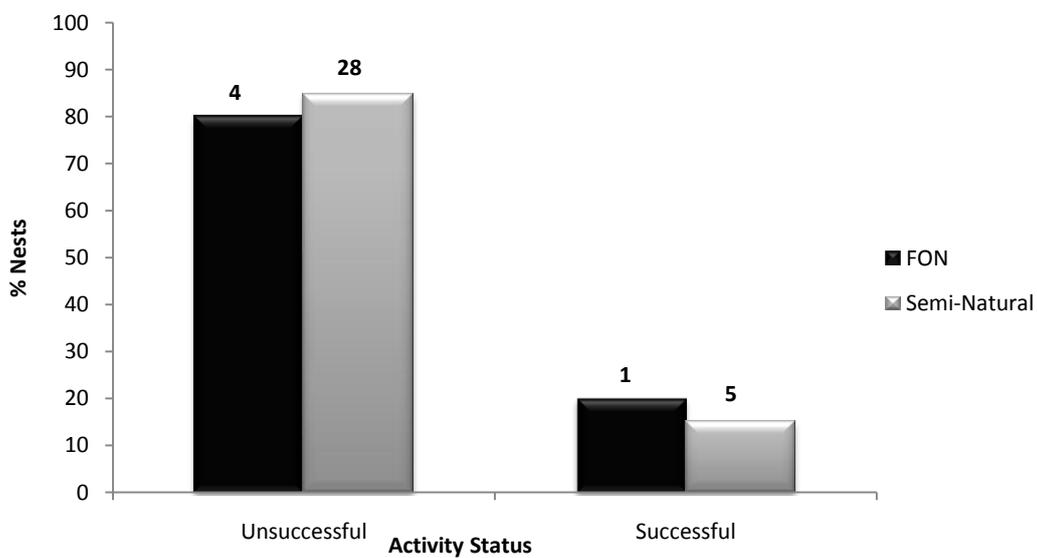
Breeding season timing

A comparison of the first three breeding seasons shows that the 08/09 season started later than the other two years (Figure 2). While it should be noted that the 2008/2009 data was based on only 10 nests, this result suggests that current nest activity checking could produce incorrect results for years with late breeding. During the 09/10 season the commencement of incubation varied up to five weeks between pairs. The total duration over which breeding activity occurred was consistent between years.

a) 2007/2008



b) 2008/2009



c) 2009/2010

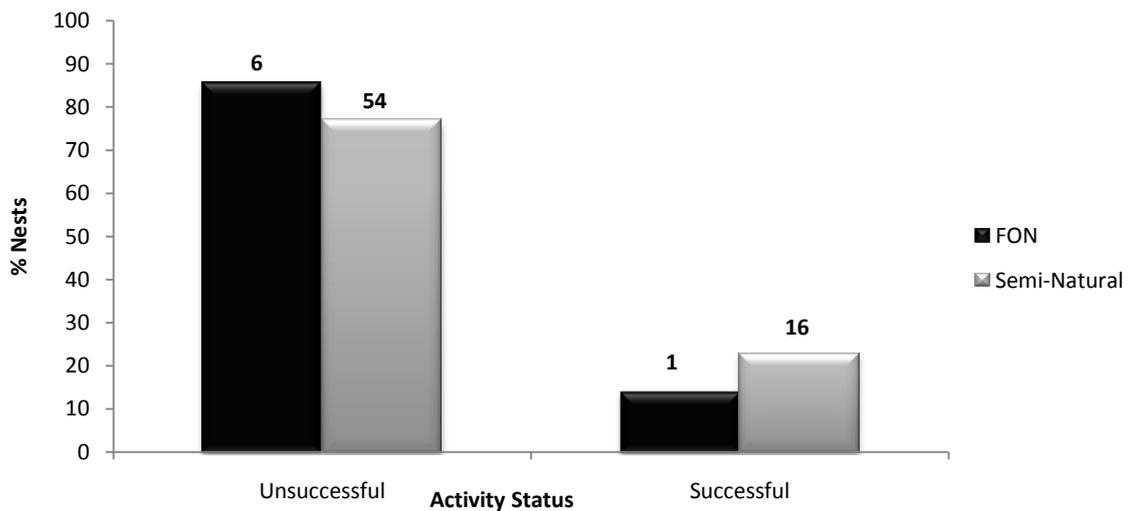
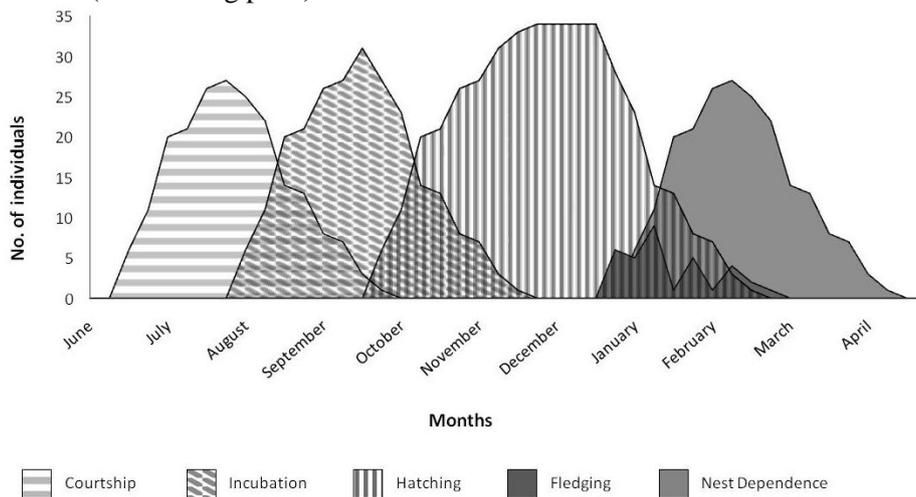
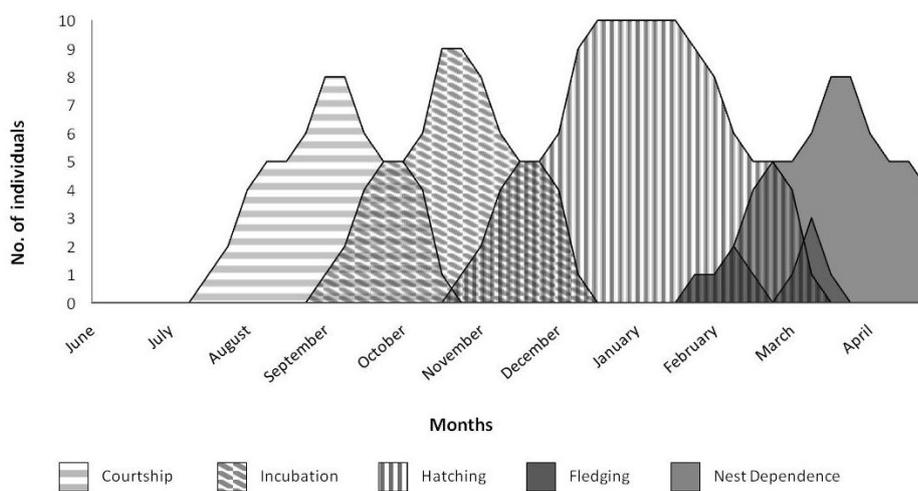


Figure 1 Percentage of nests in each land use category (FON or semi-natural) that were successful and unsuccessful during (a) 2007/2008, (b) 2008/2009 and (c) 2009/2010. Successful nests contained a nestling during the aerial surveys and unsuccessful nests did not. FON indicates that a forestry activity (harvesting, planting or wildlife control) occurred within 1km of the nest site during the time of survey. Sample sizes are indicated above each bar, and sample sizes differ to total number of nests surveyed in a year because information on industry activities was not known for all nests.

a) 2007/2008 (34 breeding pairs)



b) 2008/2009 breeding season (10 breeding pairs).



c) 2009/2010 breeding season (31 breeding pairs).

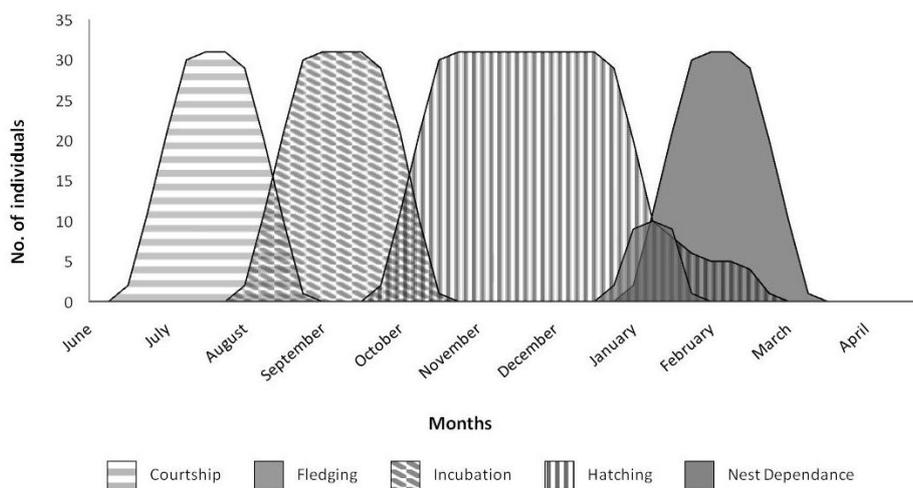


Figure 2. Chronology of breeding activities based on the estimated age of chicks observed in the nest for (a) 2007/2008, (b) 2008/2009 and (c) 2009/2010. The number of breeding pairs on which the figures are based are 34, 10 and 31 respectively.

Conclusions

- Current results suggest that a large proportion of nests are not used in any given year and that not all nests considered to be active actually produce nestlings.
- Some nests seem to be used (maintained and/or successful) more frequently than others. The final 2009/2010 report will start exploring the site and tree level variables that may affect nest use and re-use.
- Current results suggest that nests are lost at a rate of approximately 2% per year.
- This study suggests that the timing of breeding activities may vary substantially between years. This information is currently informing a review of eagle management practices.
- Long-term monitoring of these nest sites is crucial to fully understand the factors that influence eagle breeding success.

References

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