

Australian Pied Oystercatchers leapfrog to reproductive success in the Worimi Conservation Lands

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A pair of Australian Pied Oystercatchers *Haematopus longirostris* successfully raised one juvenile in the Worimi Conservation Lands north of Newcastle, NSW. Oystercatcher breeding success is very low at this location, which is subject to extremely high levels of recreational disturbance. Reproductive success was achieved by adopting a strategy which involved the selection of a nest site in a physically protected midden area and flying in food to provision the chick throughout the fledging period. This strategy is similar to that used in “Leapfrog Territories” in the Netherlands. However, there may be penalties associated with this strategy and the Netherlands experience suggests that when more than one chick is involved they usually starve.

INTRODUCTION

During our regular patrols of the Worimi Conservation Lands north of Newcastle NSW (previously known as Stockton Beach) as part of our role as Visitor Service Assistants for National Parks and Wildlife Service, we took the opportunity to monitor the breeding activities of the Australian Pied Oystercatcher *Haematopus longirostris*. Five pairs of oystercatchers hold territories along the 32km length of the Worimi Conservation Lands. In the 2011/12 season one pair fledged a chick, which is very unusual on this particular beach. In this note we document the breeding event and explain the strategy adopted by the birds to overcome the extreme disturbance associated with recreational activities in the park, which normally results in breeding failure.

OBSERVATIONS

Oystercatcher numbers and breeding activity were observed and recorded during routine beach patrols, which are conducted approximately five times per week in off-road vehicles.

In recent years the resident oystercatchers' nests were mainly found at the base of the frontal dunes, and they were almost always unsuccessful. By nesting in this location, they were subject to high levels of disturbance due to high-density traffic (which can exceed 1200 vehicles/day during peak periods), domestic dogs, campers, high tides and

various natural predators. In the 2011 breeding season we perceived a change in nesting behaviour. The oystercatchers were observed more frequently nesting behind the frontal dunes and away from heavy traffic flow along the beach. On 15 September 2011 we discovered four oystercatcher nests in this new location and a further three nests over the following month and a half (**Table 1**). We believe that five pairs of oystercatchers were involved, all occupying territories within an approximately 4km strip of beach south from nest 7 (**Table 1**), which was located at 32°47.77' S 151°59.89' E.

Table 1. Summary of clutch information for Australian Pied Oystercatchers nesting in the Worimi Conservation Lands during 2011.

Nest	Date found	Number of eggs	Date failed ¹
1	15 Sept.	2	19 Sept.
2	15 Sept.	1 ²	10 Oct.
3	15 Sept.	2	25 Sept.
4	15 Sept.	2	26 Sept.
5 ³	14 Oct.	2	Unknown
6	14 Oct.	1	Unknown
7	2 Nov.	2	Successful

¹ Date first noticed that eggs were missing and no evidence of young.

² Second egg present on 19 September.

³ Nests 5 and 6 are thought to be repeat attempts of some of the pairs involved in nests 1 to 4.

Nest 7 was located in a Midden Protection Area which is surrounded by bollards and into which entry by any vehicle is prohibited. The Midden Protection Area is heavily vegetated in places making it an ideal place for nesting parents to hide their young. The nest site, which was approximately 300 metres from the high-tide mark and well behind the frontal dunes, was a scrape in open ground located near broken bits of dead wood. The bird sitting on the nest was well camouflaged and difficult to spot. The other bird, when not on the shore foraging, would be at the top of the dune closest to the nest, watching for threats and calling out a warning to its partner sitting on the nest. To our knowledge this was the first breeding attempt for this pair during the 2011 season.

During a routine check of the nest on 9 December we discovered that there was no bird sitting on the eggs. We approached the nest to find one egg gone with no shell remnants remaining and the other still intact and completely cold. The parents were not in sight, but there had been a lot of activity around the nest, which was evident from footprints. We tracked the bird prints to a clump of Bitou Bush in the Midden Protection Area. One chick was hiding in the sand among a few small leaves under the bush. Meanwhile the parents were calling vigorously and attempting to distract us from their young. After sighting the chick and very, very thrilled to know that the egg had hatched, we left.

The next sighting of the chick was on 19 December. We came across the parents taking the chick towards the shore. Once our presence became known the oystercatchers began to call to the chick, which ran and hid in the roots of some Bitou Bush about 150 to 200m from the high-tide mark. The chick appeared to have doubled in size and we estimated it to be around two to three weeks old.

During the next few weeks we did not spot the chick. One adult bird would feed on the shore and the other would remain in the Midden Protection Area, but the location of the adult bird and footprints suggested that the chick had been moved further into the dune system to an area approximately 500m from the high-tide mark where the Bitou Bush cover was heavier. We never saw the chick on the shore feeding, so we assumed that the parents flew food into the area, at least during the day time.

On 13 January 2012 while checking the vicinity of the nest site we saw the juvenile flying with one of

the parent oystercatchers. When the adult alighted and called, the juvenile flew to it, moving a distance of 50 to 80 m from one midden site to another. The first sighting of the family on the shore was on 2 February 2012. All three were at the water's edge foraging for food and presumably teaching the juvenile about life outside the Midden Protection Area. The young bird, now about 8 or 9 weeks old, was well grown.

On 21 February we saw a juvenile bird, immediately distinguished by its darker bill tip, pale legs and browner plumage, on its own approximately 4 to 5km south of the nest site and foraging independently. We assumed that this bird was the successfully fledged chick, but the possibility of a juvenile oystercatcher which had been bred somewhere else cannot be excluded.

DISCUSSION

Ideally oystercatchers nest near the high tide mark (Fletcher & Newman 2010) and from an early age onwards chicks follow their foraging parents out to the foraging area as the tide falls and are fed prey as soon as it is captured (Ens *et al.* 1992). However, in the Netherlands many of the breeding Eurasian Oystercatchers *Haematopus ostralegus* studied by Ens were unable to secure a beachfront territory and had to nest in inferior territories behind the pairs nesting immediately adjacent to the feeding areas. These inferior territories were named leapfrog territories because the oystercatchers breeding in them had to fly food from their foraging territory to their chicks, which remained within their breeding territory until they were able to fly with their parents to the water's edge. Adults breeding in leapfrog territories adopted this strategy as a consequence of the strongly territorial behaviour of the oystercatchers breeding in the superior territories at the beachfront. It would be extremely unsafe if chicks were walked twice daily through the territory of another pair, with the possibility of fatal attacks on the chicks by the resident birds. The strategy adopted by the successful oystercatcher pair at the Worimi Conservation Lands in many respects mirrors those of leapfrog territory parents in the Netherlands, except that the need to breed in an inferior territory is a consequence of human recreational disturbance rather than to avoid competition with another pair of oystercatchers. At peak times over 1200 vehicles enter the northern entrance of the Worimi Conservation Lands and at these times the beach resembles a highway, making it impossible for unfledged chicks to walk

to the water's edge and feed with the adults (when disturbed, chicks often freeze and would be run over by vehicles).

In previous seasons the oystercatchers holding this territory have used nest sites in the dune system near the edge of the beach. Such sites, used by these and other pairs, are often located in open areas between dunes which are vulnerable to inundation by king tides and suffer disturbance from vehicles. In response to these threats a number of pairs have selected nest sites well back in the dune system, as occurred in this successful breeding attempt. On this occasion the oystercatchers selected a site in a midden area which is marked and protected by permanent bollards, approximately 300m from where the adults forage. Vehicles are supposed to avoid middens because of their cultural heritage importance. It is suggested that the oystercatchers identified the midden area as a preferred site because it was subject to less disturbance. It is also a flat, slightly elevated area providing some protection from tidal inundation with excellent visibility for the incubating bird. This is important as a predator defence, both for the incubating adults (e.g. from foxes and cats) and also for the protection of the eggs from predators like Australian Ravens *Corvus coronoides* (Fletcher & Newman 2010), which are locally abundant (there is no shelter for ravens from aerial attack by parental oystercatchers).

During the fledging period we never observed the parents feeding the chick on the beach where the adults foraged exclusively (there are no foraging opportunities in the dunes). As we patrolled the beach most days it can be concluded that diurnal feeding of the chick at the water's edge, either did not occur, or was extremely rare until the bird fledged. However, we cannot discount the possibility that the chick was moved to the beach at night when there was no disturbance. Initially the chick remained hidden under a Bitou Bush close to the nest site, where it was fed. After about two weeks the chick was moved further into the dune system and hidden in an area where there were more Bitou Bushes offering protective cover options, but increasing the distance the adults had to fly food to the chick up to 500m. Presumably the disadvantage of flying food the extra distance was more than offset by decreased risk of injury through recreational activities and of predation, it being less obvious where the chick was hidden.

The studies in the Netherlands found that on average the breeding success rate was 3.5 times

lower for oystercatchers breeding in leapfrog territories compared with the situations where the chicks could be taken out and fed by the adults on mud flats. Chick mortality was found to increase as the number of chicks being fed increased, primarily due to starvation, which was particularly pronounced during the period immediately before the chicks were able to fly. At this time leapfrog parents would need to spend approximately 1.1 hours extra time flying food to the chick each low-water period to provide as much food as a chick being fed at the water's edge; no parent was ever observed achieving this level of support. As a consequence leapfrog chicks took on average 4 days, or 10% longer to fledge and were 58g, or approximately 15% lighter than chicks which foraged with their parents. As the Australian Pied Oystercatcher is larger than the European species, these differences may be expected to be greater for oystercatchers breeding in leapfrog-type territories in the Worimi Conservation Lands.

The juvenile observed feeding independently approximately 3 weeks after the chick was last seen with the adults and 6 weeks after fledging was assumed to be from this breeding event. However, Australian Pied Oystercatchers often allow their young to remain in their territories for more extended periods (M. Newman pers. comm.) so the possibility that the juvenile died after fledging cannot be excluded. Later in the year several juvenile oystercatchers were observed foraging on the beach to the south of the rather limited stretch of beach where the five pairs breed.

CONCLUSIONS

A pair of Australian Pied Oystercatchers breeding on the Worimi Conservation Lands adopted a successful strategy which traded off increased safety during both the incubation and the chick-rearing stages of the breeding cycle against increased effort in provisioning the chick. It was probably advantageous that only one egg hatched as the probability of chick starvation in the period immediately before fledging would have increased if the adults had been feeding two siblings as opposed to a single chick.

Dual management priorities for the Worimi Conservation Lands are the protection of cultural, heritage and wildlife values. In this instance the protection of a midden contributed to the breeding success of a pair of Australian Pied Oystercatchers.

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