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A Case of Female Usurpation in the Australian Pied Oystercatcher *Haematopus longirostris*

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Summary

This note documents a prolonged and eventually successful territory usurpation experienced by a long-term breeding pair of Australian Pied Oystercatchers *Haematopus longirostris*. The disruption was caused by a novice female breeder and initially led to a temporary, apparently non-breeding, trio formation. Unusual aspects of the event are discussed and compared with known usurpation and divorce behaviour in this species and in the Eurasian Oystercatcher *H. ostralegus*.

Introduction

In common with other oystercatcher species, the Australian Pied Oystercatcher *Haematopus longirostris* has a typically monogamous breeding system, although unexplained divorce and polygynous breeding are also known (Newman 1986, 1992, 2008; Totterman & Harrison 2007). In the Eurasian Oystercatcher *H. ostralegus*, in which polygyny, divorce, usurpation and site attachment are well recorded and studied, female usurpation is the common cause of trio formation (Ens 1991; Safriel *et al.* 1993; Heg & van Treuren 1998; Heg *et al.* 2003). Similar exceptions to monogamy have also been reported in the North American Black Oystercatcher *H. bachmani* and American Oystercatcher *H. palliatus* (Chapman 1982; Lauro *et al.*1992; Morse 2005). One likely case of a breeding trio in the New Zealand endemic Variable Oystercatcher *H. unicolor* has also been recorded (Keeley 1989). This note documents an intrusion, trio formation, replacement of the original female and subsequent breeding results for a pair of Australian Pied Oystercatchers on the far North Coast of New South Wales.

Site description and observations

The pair subject to usurpation was part of a closed population on South Ballina Beach of a maximum of 19 pairs inhabiting ~18 km of beach frontage south of the Richmond River mouth. One territory within this stretch of beach had previously (1994–2003) been occupied by a polygynous trio (Totterman & Harrison 2007). The territory of the usurped pair was centred at ~28°29′S latitude, covering ~500 m of beachfront. The main breeding habitat is sandy ocean beach at a low gradient backed by sparsely vegetated dunes up to 3 m high. Permanent breeding territories of other Australian Pied Oystercatcher pairs abutted both the northern and southern boundaries of the usurpation site. Previous and subsequent to the usurpation, all clutches by the initial and 'new' pair were laid in the dunes or on ledges on an erosion cut when present, except one laid in an adjoining grazing paddock. Most non-breeding birds occupy a rockier area ~2–4 km south of the breeding population, where they form flocks in the breeding season, occasionally visiting the breeding territories singly or in small numbers.

Regular close monitoring of the breeding population commenced as a

10-year study in the 1994 season and continued until the end of the 2003 season. Monitoring in the last three seasons was undertaken as part of a protection program by the then New South Wales National Parks and Wildlife Service (Wellman *et al.* 2000). The usurpation was detected in 2004 while searching for birds that had been banded during the initial study period. Site visits to the usurped pair then continued through the 2004 to 2009 seasons at a lower frequency to monitor the progress of the intrusion and breeding outcomes of the 'new' pair.

The resident pair soon to be subject to the intrusion completed a clutch of three eggs, their first for the 2004 season, late in August. The clutch was lost in the first week of September. The pair was visited on 8 October, when the intruding banded female was first observed in this territory. The pair piped at the intruder but did not chase her out of the territory.

When the intruder's band was later read with a telescope, it was established that she came from the local population, hatched in a territory 11 km to the north, where she was banded as a nestling by Greg Clancy in the 2000 season. Accordingly, when first observed intruding she was 3 years 11 months old. She had apparently not bred before, as the age at first breeding is at least 3 years (Marchant & Higgins 1993) but normally older (Newman 1992), which largely agrees with band returns in the 10-year study population (unpubl. data).

A condensed chronology of important events since the first observation of the intruder at the site is presented below:

2004 season

The intruder remained for the rest of the breeding season, and at times roosted near the male without being attacked. When foraging, she was often attacked by the female but did not leave the territory permanently. The last observation was on 12 December, when all three Oystercatchers were present without any sign of aggressive behaviour. However, the resident pair did not display any breeding behaviour or show any signs of laying a replacement clutch after the loss of the first clutch in September.

2005 season

The intruder and the resident pair were present in the territory throughout the non-breeding season. During this period the resident female occasionally attacked the intruder while feeding, although not seriously. All three birds were also present during the breeding season, which normally begins in the first half of August. Minor squabbles with the resident pair were observed, but only while feeding together. On 31 August the intruder was observed piping away a non-breeding Oystercatcher that was roosting on the beach 200 m from the breeding pair. Apart from a possible nest-scrape in the dunes found on 7 September, there were no indications of breeding behaviour, breeding attempts or copulation observed during this season. The last observed altercation between one member of the resident pair and the intruder was on 11 October, and the last time the three birds were seen together was on 14 December, when all were foraging in the wash-zone. The resident male and the intruder remained in the territory until monitoring ceased in March 2006.

2006 season

The new pair (i.e. the presumed original resident male and the intruding, banded female) was observed in the territory during the non-breeding season. In early October the birds showed signs of apprehension and typical breeding behaviour. A clutch of two eggs was found in the dunes on 5 November. The usurping female's age at first breeding (laying date) was estimated as 5 years 11 months. The fledgling was banded and tagged at the nest-site by G.P. Clancy and was observed with the pair on 2 January 2007.

2007 season

The new pair was observed in the territory, but organised monitoring did not continue this season.

2008 season

The new pair was again present during the non-breeding season. The two birds were observed circling and calling over the dunes on 20 October, and a well-coloured pre-fledging chick (runner) was present on 14 November. The runner disappeared before the next observation visit. The last observation date was 27 January 2009, when both Oystercatchers were feeding in the territory.

2009 season

The new pair again remained in the territory during the non-breeding season. A clutch of one egg, found on 15 October, subsequently disappeared. A replacement clutch of two eggs was laid, and a runner was observed hiding on the dune-face on 16 December. It disappeared in early January, before the last observation date, 8 January 2010.

Discussion

What caused this usurpation event to last for more than a year and why was there the long breeding hiatus? The intrusion appears to agree with the habitat saturation theory and 'draw' situation in the Eurasian Oystercatcher but not with either the aggressive or co-operative polygyny scenario (Heg & van Treuren 1998). Nor does it agree with the desertion or usurpation definitions of Heg *et al.* (2000). As there was no apparent true polygynous breeding involved, it may be better described as an unusually protracted usurpation.

Territories occupied by Oystercatchers were counted in the 2004 breeding season, and at 19 territories this was the highest number since monitoring commenced in 1994 (unpubl. data). The resident pair had a long history of high fledging success and multiple replacement clutches, including in the 2003 season (unpubl. data), but apparently they abruptly ceased breeding when the intruder appeared. It is unlikely that disruption by an intruding non-breeder would cause a long-established pair to abandon breeding, which had already commenced, well into the season. A more likely scenario is that such a drastic change was because of some underlying event affecting the resident pair.

The questions above about the protracted usurpation and the long breeding hiatus remain unanswered, and it should be noted that the following possible explanations are speculative. Monitoring in the 2005 season was intensive, with

38 visits from August to November (unpubl. data), so it is highly unlikely that any breeding attempts or breeding behaviour would have remained undetected. The displaced female may have been at the end of her reproductive life. Reproductive senescence in birds is well known (e.g. Fowler 1995; Gill 2007) and documented in the Eurasian Oystercatcher (van de Pol *et al.* 2006) as occurring gradually. This could partly explain the lack of breeding in 2005, but the absence of any indication of reduced breeding effort or success before the abrupt cessation of breeding in 2004 makes this scenario tenuous at best.

Adult birds were not banded or individually marked in the 10-year study. However, years of close observation of unbanded birds led to a familiarity with individual traits, including appearance and especially behaviour in the breeding season, when a change is often immediately detected (pers. obs.). No such changes were evident in the 2004 season before the intrusion, and no change was noticed after the event. Yet, between the first clutch loss in early September and the intrusion, there was ample time for the loss of and undetected replacement of the resident female. Consequently, another possible explanation is that the resident female had died and was rapidly replaced by an inexperienced bird which was in turn soon usurped and finally expelled by the banded newcomer. However, the presence of two inexperienced females does not fully explain the breeding hiatus, especially since novice Australian Pied Oystercatcher breeding females are known to quickly take up vacancies and lay clutches (Newman 1992). Similar rapid replacement and breeding were also observed in other breeding pairs in the 10-year study (pers. obs.).

Observations like this obviously add some data to our knowledge but, as suggested by Ens (1998), questions like 'what incites some females to challenge others?' are unlikely to be answered without experimental studies.

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