

## **Prey location and prey processing methods in Australian Pied Oystercatchers *Haematopus longirostris* in Tasmania**

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This note summarises the results of studies undertaken at a range of coastal sites in Tasmania to determine methods used to locate and process prey by the Australian Pied Oystercatcher. The study covered the range of habitats used by Pied Oystercatchers in the state and the main prey species taken including gastropod and bivalve molluscs, polychaete worms and crabs.

### **The feeding behaviour of European Oystercatchers**

There have been many studies of the feeding behaviour of the European Oystercatcher *Haematopus ostralegus* in Europe (e.g. Norton-Griffiths 1968, Hulscher 1982, Hulscher 1996). In this species birds feed either by walking slowly over exposed sand flats or by wading in shallow water. They locate prey both visually and by touch. When locating prey by touch the birds hold the bill free of the mud surface while looking downwards and make rapid individual pecks at the surface, whereas when locating by touch they make a series of repeated probes while moving the bill in the vertical plane forward or sideways through the mud. Visual foraging is used to locate prey that are visible on the surface or prey that are buried but leave indications of their presence at the surface. Foraging by touch is used for buried prey that leave no signs on the surface or when foraging in darkness. Once captured, prey are prepared to remove the flesh from the shell and eaten using two basic methods: stabbing and hammering. Stabbing is used with gastropod molluscs and crabs and with bivalve molluscs when the valves of their shells are open. It consists of a hard and rapid downward jab between the shell valves, followed by “scissor-like” actions of the bill to remove the flesh. Hammering is used to open bivalve molluscs that have the valves of their shells closed. The birds usually wedge the shell in the substrate then direct strong vertical blows to the shell until the shell fractures. The behaviour involves distinctive rigid movements of the bird’s whole body to direct the blows and is readily recognisable. It results in large numbers of distinctively broken shells accumulating on sand flats where the birds are feeding and along high tide lines where they many are eventually washed up. The birds have specially strengthened bills, skulls and neck musculature to enable them to feed in this way.

### **The feeding behaviour of Australian Pied Oystercatchers in Tasmania**

In the present study, Australian Pied Oystercatchers were observed foraging at seven sites around Tasmania and on eight prey types including gastropod molluscs, polychaete worms, crabs and bivalve molluscs. In total, the birds were observed capturing and processing 921 prey items (Table 1). In all cases, the prey were located visually, using the criteria described above for European Oystercatchers. Stabbing was the only method used to prepare and eat prey. Hammering was never recorded and in none of the study areas were broken shells characteristic of hammering found.

Some prey, including polychaete worms and the small mollusc *Paphies elongata* were swallowed whole without special behaviour to remove flesh from shells.

Most of these observations were made in the early years of a long-term study. Since making these formalised observations specifically to record capture and processing methods, many thousands of prey capture events were observed at most of these sites to quantify diets and food intake rates. Although these did not involve a formalised quantification of prey location and handling methods, the hammering technique to process prey is so obvious and distinctive that had it occurred it would not have been missed. On no occasion was this technique seen and also at none of the study sites were the characteristic broken shell seen.

**Table 1.** Details of prey location methods and methods used to prepare and eat prey at seven coastal sites in Tasmania.

Date	Location	Habitat type	Prey species	Prey location method		Prey processing method		Total sample size
				Visual	Tactile	Stabbing	Hammering	
20/09/95	Orielton Lagoon	Estuary	<i>Katelysia scalarina</i>	140	0	140	0	140
21/09/95	Lauderdale (100-150 m below HT level)	Coastal bay	<i>Anapella cycladea</i>	37	0	37	0	37
22/09/95	Bruny Island (Great Bay – 50-100 m below HT level)	Coastal bay	<i>Salinator fragilis</i>	121	0	121	0	121
22/09/95	Bruny Island (Great Bay- 300-400 m below HT level)	Coastal bay	<i>Myctyrus platycheles</i> (Soldier crabs)	17	0	17	0	17
22/09/95	Bruny Island (Great Bay- 300-400 m below HT level)	Coastal bay	<i>Polychaete worms</i>	32	0	Swallowed whole		32
26/09/95	Anson's Bay	Estuary	<i>Katelysia scalarina</i>	144	0	144	0	144
25-26/11/95	Tamar Estuary	Estuary	<i>Katelysia scalarina</i>	156	0	156	0	156
31/12/98	Lauderdale (300-400 m below HT level)	Coastal bay	<i>Katelysia scalarina</i>	70	0	70	0	70
02-04/01/99	Seven Mile Beach	Ocean beach	<i>Mactra rufescens</i>	98	0	98	0	98
02-04/01/99	Seven Mile Beach	Ocean beach	<i>Paphies elongata</i>	52	0	Swallowed whole		52
06/01/99	Gwandalan Beach, Tasman Peninsula	Ocean beach	<i>Polinices conicus</i>	54	0	54	0	54

## Conclusions

In the situations studied, Australian Pied Oystercatchers located prey only by sight and processed prey only by using the stabbing technique. Ralph's Bay at Lauderdale was included in the observations. When feeding on the main prey taken at that site, *Katylsia scalarina* and *Anapella cyladea*, the birds used only visual prey location methods and did not hammer open shells. The shells taken were only those that were active in water with their shell valves open, where the method referred to as "stabbing" was employed. This behaviour largely restricts Pied Oystercatchers to feeding along the tide line at Lauderdale when they are feeding on their main prey there.

The reason for the absence of the hammering behaviour in Australian Pied Oystercatchers is unknown. However, it probably relates to ancestral relationships among the different species of oystercatcher. It is highly unlikely that the Australian species will have "lost" this behaviour in an evolutionary sense and much more likely that the behaviour developed independently in other species. This implies that the Australian species may be the ancestral species of oystercatcher from which others developed or that the Australian species developed independently from a common ancestor. This would be consistent with recent suggestions that the Australasian region was the origin of modern oystercatchers.

## References

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