

Birds Tasmania

Dr M Newman presentation to RPDC re Walker Corp proposal, June 2009



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Australian Pied Oystercatcher – Breeding Biology and Population Balance

Dr Mike Newman

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Mike Newman - Personal Background

- PhD – Physical Chemistry, Nottingham UK 1967
- Worked for Nyrstar (formerly EZ, Pasmnico and Zinifex) in a multi-disciplinary technical capacity for 37 years, at senior manager level for 18 years. Based in Hobart 1971-1992.
- Amateur Ornithologist – Elected Fellow of BA (RAOU); citation highlights work on the Australian Pied Oystercatcher in south-east Tasmania (note the number of Elected Fellows is limited to 15 living members; there are currently 8 Fellows).
- Former Vice-president of BA (RAOU) and Chair of the BA Research Committee for six years.
- Founding Member, Life Member and former President of Birds Tasmania.
- Author of over 20 papers on Australian Pied Oystercatchers and other shorebirds in the DEPA.

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- Role of Amateur Ornithologists

- Ornithology is a branch of science where the amateur makes an important contribution.
- A feature of amateur studies is their longevity which is essential for population studies like my work on the Australian Pied Oystercatcher.
- Amateur studies are highly cost effective, are not constrained by funding considerations and the novelty required for PhD studies.
- They fill in the gaps in our knowledge of birds behind the cutting edge of the science.
- In ornithology, amateurs contribute important field skills (eg specialised techniques like cannon-netting used in banding shorebirds).

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Australian Pied Oystercatcher Project 1977- 2009

- Initial Objective – To prove Australian Pied Oystercatchers were breeding successfully in the DEPA despite heavy metal contamination.
- Subsidiary Objective – To determine basic breeding parameters (eg laying dates, clutch size, incubation period, fledging period and breeding success rate).
- Outcome – Successful breeding demonstrated at Gorringes Beach and other DEPA locations.
- Outcome – Basic breeding parameters established and published in various articles and in the section on the Pied Oystercatcher HANZAB Volume 2 pp 716-726, these source data submitted to Birds Australia (RAOU) Nest Record Scheme.

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- Additional Objective – To determine the parameters needed for a population balance.
- Survival of breeding adults (> 90%; published Emu and Stilt).
- Survival of immature birds (at least 20% survive to breeding maturity)
- Age of place of first breeding (typically 4 to 6 years and <10 km from natal site; published HANZAB volume 2).
- These parameters were obtained by tracking breeding and non-breeding birds throughout the DEPA over many years; intensively over 7 years (published An Occasional Stint).

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Features of the Breeding Population

- Breeding adults faithful to territory and pair bond almost without exception (published Emu and Stilt).
- Very little evidence that many birds leave the south-east Tasmania based on small number of external recoveries.
- Hence largely residential population which does not undergo annual migrations; large flocks favour sheltered bays like Lauderdale.
- Age of first breeding exceeds minimum age capable of breeding; hence birds queuing for available breeding territory. Deceased adults replaced immediately in breeding season.
- Preferred nest site at beach edge (ie shortage of beach-front real estate!)

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Steady-state Population Balance – Assumptions and Imperatives.

- Assumption - Number of breeding territories limited.
- Imperative to sustain population - Each Territorial Pair must on average produce two fledged young which survive to enter the breeding population.
- At an immature survival rate of 20%, 10 fledged young must be produced to provide 2 birds of breeding maturity (ie a replacement adult pair).
- Hence required breeding success rate is on average 1 fledged young/annum for a pair with a life expectancy of 10 years.

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Population Balance – Fit with other evidence

- Typical age of first breeding 5 years exceeds minimum age of breeding maturity (3 or 4 Years)
- Some much older birds (6+) queuing for a territory in the non-breeding flocks.
- Measured breeding success rate 1.0 fledged young/pair at Gorringes Beach at start of study and at other undisturbed beaches.
- Deceased territorial birds rapidly replaced during the breeding season.

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Prediction of Population Crash in 1991

- Based on a substantial fall in the breeding success rate at Gorringes Beach and other disturbed locations.
- Predicted initial impact – a decrease in the size and age structure of the non-breeding flocks and the minimum age of breeding.
- Ultimately a decrease in the number of territorial pairs because of lack of replacement breeding adults; however this would be a slow decline buffered by the longevity of the breeding pairs.

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1991 Prediction Wrong

- Population increased in Ralphs Bay; particularly at Lauderdale (see Birds Tasmania graph in Proof of Evidence).
- Why did this increase occur and can it be sustained?
- These questions must be answered before any predictions of the impact the proposed Lauderdale Quays development can be made with confidence.

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Some Possible Explanations

- Increased number of territories as a consequence of birds progressively moving to sub-optimal nest sites behind shoreline. My personal observations and the Walker breeding surveys support this proposition.
- Progressive improvement of the environmental quality of the DEPA as a consequence of the treatment of industrial and municipal discharges and the closure of the Lauderdale municipal tip. This has allowed the oystercatchers to forage and breed in new areas (eg upstream of the Derwent Bridge). It may have improved immature survival, particularly inexperienced first year birds.
- The survival rates of breeding adults are pessimistic (ie survival of territorial birds >10 years).

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Concern that Walker Studies overestimate breeding success rate.

- Maximum value of 1.0 fledged young/annum based on zero mortality of runners.
- 22% decrease in number of pairs between the two years of surveys is inconsistent with low mortality and high site fidelity.
- Three visits per season is inadequate, particularly when one visit is up to one month before all young are fledged.
- Breeding success must be based on territorial pairs, not on nests found.
- However net breeding productivity may have increased (product of increased number of pairs breeding relatively inefficiently).

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Concerns

- No estimates of future population trends made on population balance modelling. It is not enough to consider carrying capacity.
- Modelling must be dynamic; my steady-state approach is limited, but is useful in highlighting the issues. Model parameters may have changed and need to be re-determined using long term studies of banded birds.
- Australian Pied Oystercatchers are exceptionally adaptable (eg the observed change in strategy of nest site selection to combat rising sea levels and disturbance. It should be assumed that the large numbers of oystercatchers at Lauderdale indicate that it is optimum habitat. It may be particularly important to the survival of inexperienced first year birds. Alienation of birds from Lauderdale may cause mortality.
- The long term dynamics of predator (oystercatchers) prey (oystercatcher food resources) have not been determined.

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Concerns Continued

- The proposed development is high risk to the oystercatcher population.
- Approval without proven mitigation/compensation based on unvalidated carrying capacity predictions would set a bad precedent.
- The development will set a poor environmental example if approved and undermine Australia's advocacy to prevent the reclamation of mudflats in the Yellow Sea, which are essential to the shorebirds migrating between Australia and their northern hemisphere breeding grounds.