

Submission to the Senate Inquiry into Australia's Extinction Crisis

A personal submission from

Dr Eric J Woehler OAM

Submitted by email to ec.sen@aph.gov.au

Dear Committee members

Please find attached a personal submission made to this Inquiry.

I previously authored a written submission (3 February 2019) and appeared before the Committee at their invitation in Hobart on 4 February 2019 on behalf of BirdLife Tasmania; this submission is a brief, personal submission in response to the opportunity to make a supplementary submission in light of the brief time frame available.

This submission reinforces a number of issues and concerns raised in the BirdLife Tasmania submission by providing the Committee with (a) an extract from an extended Foreword I was invited to prepare for a forthcoming book on Tasmania's birds, and (b) a brief synthesis on the status of two species of resident shorebirds in Tasmania, highlighting the national and international significance of Tasmania as a refuge for these species. Combined, these two brief contributions reinforce Tasmania's role as a refuge now, and increasingly so in the future for the survival of Australia's fauna (and flora). This role is manifested at national and international scales now, and will become increasingly so in the future.

The Foreword for the book was written for a general readership and not for an academic or technical audience. I trust the content, while broad in scope, is of value to the Committee. I have permission from the book's authors to submit this extract to the Inquiry.

The brief shorebird synthesis was published in late 2021, and was unavailable (even in draft form) when I appeared before the Committee in 2019. It is a contemporary synthesis of the population status for two species of resident shorebirds, for both of which Tasmania now serves as a refuge at national and international scales.

I hope the submission is of value to the Committee, and I am available to discuss any aspect raised if required.

Kind regards, your sincerely

Dr Eric J Woehler OAM

31 August 2022

(a) Extract from “Foreword –A sanctuary and an odyssey...” written for “Birds of Tasmania” to be published in 2023.

Everyone is familiar with the concept of a refuge – a place that provides safety or sanctuary from danger. In human terms, we all appreciated the refuge that Tasmania provided us at the height of the COVID-19 pandemic. Our isolation protected us from the spread of the virus on the mainland, as did the Australian mainland's relative isolation from the rest of the world. Perhaps only New Zealand and Pacific Island nations were more isolated. Islands around the world have long served as refugia for plants and animals – their isolation affords protection to the threats faced by those species elsewhere in their range. The critical role of islands as sanctuaries, and the conservation of their floras and faunas around the world, and in so doing protecting global biodiversity, cannot be under-estimated. Under extreme circumstances, islands may support the last individuals of a species, a final holdout to extinction.

Tasmania is one such island. Its relatively low human population (at least, until now), the physical separation from the Australian mainland and the lower intensity of numerous threats and associated habitat loss compared to mainland Australia means that Tasmania is a largely unrecognised and unappreciated refuge for many bird species threatened on the Australian mainland. Tasmania's woodlands, wetlands and coasts provide critical habitats to a wide spectrum of bird species whose habitats on the mainland are just a fraction of their former extents and whose continued survival there is less certain by the day. Tasmania is already a refuge of national and international significance for birds.

With the increasing human population on the Australian mainland, there have been increasing pressures on the remaining native habitats, especially on woodland habitats close to urban and rural centres. Many mainland bird populations have decreased as the human population has increased, fragmenting or removing habitats; thankfully, these pressures are less pronounced and less extensive here in Tasmania.

Today, Tasmania makes significant contributions to the conservation of global biodiversity. Despite its small size, the relatively intact habitats in Tasmania provide homes to more than 300 species of birds, of which 12 are endemic, and several other species only breed in Tasmania but travel farther in their lives, such as Shy Albatross and Swift Parrot. This contribution to global conservation is manifested in the international recognition of Important Bird Areas (IBAs) in the state, as part of a network of sites around the planet. These IBAs were identified more than a decade ago to identify areas that meet national and international criteria developed by BirdLife International and applied universally – an IBA in Tasmania meets the criteria as do all others elsewhere around the planet, including Antarctica. Tasmania has 43 IBAs of Australia's 314 – almost 14% – and clearly disproportionate to its size relative to that of the Australian mainland, reflecting the more intact habitats present in Tasmania.

Tasmania's role as a refuge or sanctuary spans from annually to decades and soon, for longer. Protection is afforded to Arctic shorebirds every Summer, and to mainland waterfowl during periods of mainland drought that may span several year. Looking into the future, Tasmania's role as a refuge will be for longer time spans. Ecologists talk about ‘climate envelopes’ – the relationship between the distribution of a species and the climate variables such as temperature that define where a species can potentially exist; other variables such as humidity are also involved. These current relationships between a species and its physical environment allow us to predict their possible future distributions, with the caveat that other factors (largely human-related) are likely to be influential.

Weaving the refuge role with current projections of global warming, Tasmania will soon take on the role of a climate refuge – an island where species may persist for longer as global temperatures increase. Climate refugia exist on other continents. There, species faced with the increasing pressures of climate change and the rapid warming (and often associated drying) of their habitats have the options (all else being equal) of shifting to higher altitudes (ie gaining elevation) or shifting poleward; both offer the potential of maintaining current climatic needs (temperature and humidity for example) as the world around them warms (and dries).

These options – altitude or latitude – are species' last resort – their escape routes to avoid the spectre of extinction. Gaining elevation provides a cooling response of between 0.5°C and 1°C per 100m altitude. In

Australia, these options are highly limited. Australia's and Tasmania's highest peaks, Mt Kosciuszko (2228m) and Mt Ossa (1617m) respectively, offer little opportunities for escaping global warming through elevation. Perhaps 2 to 3°C at most – barely enough with current projections of temperature increases exceeding 2°C before 2100.

The other alternative of shifting southward would potentially see mainland species becoming climate refugees in Tasmania. A redistribution from the mainland to Tasmania might offer a reprieve of sorts, but that's the end of the road – there's nothing south of Tasmania until you reach the Antarctic continent, and that's not an option for any of our species, not even Little Penguins. As global warming continues, the climatic and environmental conditions required by many species of birds will no longer exist on the Australian mainland.

Species' climate envelopes will include Tasmania for the first time – and Tasmania will be perhaps the only option for some species to survive. Thus, Tasmania will provide the last refuge – the last hope – for many species of Australian birds in the future, species both currently present in Tasmania and those likely to seek refuge from the mainland as their climate envelope contracts there. Tasmania has a critical role to play in the future conservation of Australia's, and indeed, global biodiversity. While birds are the most mobile and can reach Tasmania on their own, other species may well be brought to Tasmania as a conservation strategy.

As warming of the planet continues, the conditions required for some mainland species to survive – their climate envelope – will slide southwards over Tasmania for the first time. Sadly, not all species will survive – Australia already has one of the worst extinction records of any continent – but intact habitats here will provide the best opportunities for many species.

Dr Eric J Woehler OAM

(b) PDF of article attached:

Woehler EJ 2021. Contemporary population estimates for Eastern Hooded Plover *Thinornis cucullatus* and Australian Pied Oystercatcher *Haematopus longirostris* in Tasmania. Tasmanian Bird Report 41, 19-23.

Tasmanian Bird Report 41

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Contemporary population estimates for Eastern Hooded Plover, *Thinornis cucullatus*, and Australian Pied Oystercatcher, *Haematopus longirostris*, in Tasmania

Eric J Woehler, *BirdLife Tasmania*

Abstract

Analyses of data obtained during dedicated surveys since 1992–93 indicate that Tasmania currently (2020–21) supports at least 750 breeding pairs of Eastern Hooded Plover, representing approximately 62% of the sub-species population. Tasmania also supports a minimum of 1000 breeding pairs of Pied Oystercatcher, with a total population estimated to be more than 30% of the Australasian and global population. Population data for the three Tasmanian NRM regions and the 20 coastal councils that support breeding populations clearly show local and regional differences in the distributions of the two species around Tasmania.

Introduction

Tasmania has long been recognised as supporting significant breeding populations of Eastern Hooded Plover, *Thinornis c. cucullatus*, and of Australian Pied Oystercatcher (hereafter Pied Oystercatcher), *Haematopus longirostris* (e.g. Newman 1982, Bryant 2002, Spruzen *et al.* 2006, DoE 2014, Taylor *et al.* 2014, DoE 2018). Various estimates of breeding and total populations for these species have been made since the early 1980s when surveys were initiated (e.g. Newman and Patterson 1984, Delany and Scott 2006, Garnett *et al.* 2011, Taylor *et al.* 2014) with varying assumptions and extrapolations.

In 2014, the Eastern Hooded Plover subspecies (hereafter Hooded Plover), *T. c. cucullatus*, was formally listed as *Threatened* under Federal and State legislations on the basis of decreasing populations in south-east Australia and Tasmania; the associated Conservation Advice (DOE 2014) suggested a total population of approximately 3000 individuals in NSW, Victoria, Tasmania and South Australia combined, based on the synthesis in Garnett *et al.* (2011). The Hooded Plover was one of the 20 priority bird species for the Federal Threatened Species Strategy (DoE 2018). In contrast, Pied Oystercatcher presently has no conservation status under the *EPBC Act 1999*.

The aim of this brief synthesis is to provide a contemporary (December 2020) estimate of the minimum breeding and total populations of Hooded Plovers and Pied Oystercatchers in Tasmania, including King, Maria and the Furneaux islands, based on dedicated mapping and census surveys undertaken annually since 1992–93. Additional studies and analyses of Tasmanian populations of Red-capped Plover, Sooty

Oystercatcher, Fairy and Little Terns are presently underway, and are not included here.

Methods

For this synthesis, pre-breeding refers to immature birds that have yet to commence breeding, non-breeding refers to birds capable of breeding but not holding territories, and breeding birds are those with a territory and which are engaged in breeding efforts. The total population is the sum of these three categories, and does not include pre-fledged chicks.

All surveys outside of the Tasmanian Wilderness World Heritage Area (TW WHA) and the Tasmanian south coast have been undertaken by the author to eliminate inter-observer variability introduced into surveys involving multiple observers. The surveys are typically undertaken between mid-August and the end of March each summer. Beaches are walked close to the water line, with frequent and regular scanning of the beach to locate breeding territories and birds ahead of the observer.

Attempts have been made to survey beaches on approximately a 4–5 year rotation in light of the life expectancies of the focal species (e.g. Newman and Woehler 2017); beaches close to Hobart are typically surveyed more frequently, while remote(r) and/or logistically challenging beaches have been surveyed less often. This study does not include the data from four 'statewide' surveys organised in the period 1982–96 (e.g. Newman and Patterson 1984), nor does the study include roosting counts from the annual Summer and Winter Wader Counts as the sources, ages and breeding status of roosting birds can not be assessed.

No nest searches were made during surveys, but nests were encountered as a result of tide height, beach topography and geomorphology, etc., and all efforts were also made to avoid disturbing feeding shorebirds at the water's edge. Where nests with eggs or chicks were encountered, the GPS coordinates of the nest were captured in preference to the breeding territory centroid on the foreshore, which was based on the locations of the resident pair. Birds encountered as pairs on beaches, and/or displaying behaviours and vocalisations linked with nesting were considered to be breeding (Weston *et al.* 2009, E.J. Woehler, pers. obs.).

Data for the coast south of Cape Sorell and the TW WHA were provided by J. Marsden-Smedley. These data were based on observations made during annual removal of Sea Spurge, *Euphorbia paralias*. Data for the south coast from Bathurst Harbour to Southeast Cape were provided by B. Arthur, who used the methods described above. For both of these data sets, the data provide the minima estimates of breeding Hooded Plovers and Pied Oystercatchers on beaches visited.

All GPS data are captured with a Garmin 12-channel GPS receiver in real time. The coordinates of shorebird breeding territories' centroids and any nests encoun-

tered were recorded as UTM coordinates based on the WGS 84 datum and converted to latitude °S and longitude °E for mapping.

The population data were tabulated for 20 coastal councils and for the three Natural Resource Management (NRM) agencies in Tasmania to provide land managers and other coastal stakeholders with contemporary (December 2020) assessments of municipal populations in national and international contexts.

The study is different from efforts on the mainland in a number of key facets. The project's surveys report the numbers of breeding pairs and total numbers of individuals (breeding, non-breeding and pre-breeding birds) per beach. Calculations generating, 'mean densities' (i.e. birds/km) as generated in mainland studies are deliberately avoided as these overlook the non-regular distributions of these species on Tasmania's beaches (Webster 2014, Teo 2019); consequently, no extrapolations are made of un-surveyed sites based on 'densities' of birds along coasts.

Finally, no assumptions of what is deemed to be or may be, 'suitable habitat' (as used in mainland studies) are made to avoid preconceptions as to the distribution and abundances of the species in Tasmania. Differences exist in the habitats used by Hooded Plovers between mainland sites and Tasmania (Weston *et al.* 2020).

Results

As of December 2020, more than 1200 surveys have been undertaken on more than 450 beaches in Tasmania, comprising approximately 8000 records (figure 20, page 21). There are 2300 and 3600 records of Hooded Plover and Pied Oystercatcher, respectively for the period 1992–93 to 2020–21, comprising observations of breeding and non-breeding birds, figures 21 and 22, page 22.

Eastern Hooded Plover

As of December 2020, Tasmania supports a minimum of 750 breeding pairs of Eastern Hooded Plover, with a minimum total population comprising pre-breeding, non-breeding and breeding adults to be no less than 1850 birds, or approximately 62% of the Eastern subspecies population of 3000 birds (DoE 2014).

Pied Oystercatcher

As of December 2020, Tasmania supports a minimum of 1000 breeding pairs of Pied Oystercatcher, with a minimum total population comprising pre-breeding, non-breeding and breeding adults estimated to be no less than 3300 birds, or approximately 30% of the Australasian and global population of 11,000 birds (Taylor *et al.* 2014).

Council and NRM populations

Table 3 shows the percentages of Hooded Plovers and Pied Oystercatchers in 20 coastal councils around Tasmania, and the corresponding totals for the three NRM regions in the state. The estimated minimum

breeding populations of Hooded Plovers and Pied Oystercatchers in the three NRM regions in Tasmania are shown in Table 4.

Table 3: Estimated minima, expressed as percentages) of Hooded Plover (HOPL) and Pied Oystercatcher (PIOY) populations (all birds) per coastal council, arranged clockwise and summed for NRM regions in Tasmania (figures 20–22). Percentages are given for national (global) and Tasmanian populations. Councils supporting internationally significant populations of either or both species are denoted by an asterisk (*).

	HOPL	PIOY	HOPL	PIOY
Council/NRM	National/global		Tasmania	
West Coast*	9	3	14	10
King Island*	3	1	5	4
Circular Head*	12	6	20	21
Waratah–Wynyard	0	0	0	1
Burnie	0	0	0	0
Central Coast	0	0	0	0
Devonport	0	0	0	1
Latrobe	0	0	0	1
CC NRM total	24	11	39	38
West Tamar	0	0	1	1
George Town*	1	1	1	2
Dorset*	4	1	6	5
Flinders*	9	4	15	13
Break O'Day	7	2	11	7
NRM North total	21	9	34	28
Glamorgan Spring Bay*	9	4	15	13
Sorell*	1	3	1	9
Tasman*	3	1	5	2
Clarence*	0	1	0	2
Hobart	0	0	0	0
Kingborough*	1	1	4	3
Huon Valley*	2	1	4	3
NRM South total	16	10	29	34

The largest Hooded Plover and Pied Oystercatcher populations are present in the Circular Head municipality (12% and 6% of the national populations, respectively); similarly, these populations represent 20% and 21%, respectively, of the Tasmanian populations. West Coast, Flinders and Glamorgan Spring Bay municipalities support 9% each of the national Hooded Plover population, each equal to c.15% of the Tasmanian population.

A total of 12 of 20 municipalities support 1% or more of the global populations of Hooded Plovers and Pied Oystercatchers, exceeding the threshold for international significance for both species. Clarence municipality supports internationally significant numbers of Pied Oystercatchers (table 3).

The Cradle-Coast region, extending from Port Sorell on the central north coast to the north and west to Bathurst Harbour and includes much of the TW WHA coast, King Island and the Hunter Group, supports at least 40% and 36% of the estimated populations for the Eastern Hooded Plover subspecies and Pied Oystercatchers, respectively.

Table 4: Estimated minimum breeding populations (pairs) of Hooded Plover, *Thinornis cucullatus*, and Pied Oystercatcher, *Haematopus longirostris*, in the three NRM regions in Tasmania, 2020–21 (figures 20–22).

NRM region	Hooded Plover (pairs)	Pied Oystercatcher (pairs)
Cradle Coast	300	360
North	260	290
South	190	350
Total	750	1000

The NRM North region, extending from Port Sorell to the east and south to just north of Bicheno on the east coast and including the Furneaux Island Group (many of which have not been surveyed in this project), supports at least 35% and 29% of the estimated populations for Eastern Hooded Plover and Pied Oystercatchers, respectively. Finally, the NRM South region that extends from just north of Bicheno on the east coast southward to the Tasman Peninsula and west to Bathurst Harbour in the TW WHA, including Maria and Bruny Islands, supports at least 25% and 35% of the estimated populations for Eastern Hooded Plover and Pied Oystercatchers, respectively.

Discussion

Newman and Patterson (1984) estimated the Tasmanian Hooded Plover population to be 1730 birds, based on extrapolation of density data calculated from 'potentially suitable beaches' around Tasmania. This was the first quantitative estimate for the species in Tasmania,



Figure 20: Map showing survey effort for 1992–93 to 2020–21 (red symbols) for resident shorebirds in Tasmania and adjacent islands; $n = 8100$ records on more than 450 beaches as of December 2020. The three NRM regions are shown: Cradle Coast (orange), North (green) and South (blue). The grid shows $1^\circ \times 1^\circ$ latitude and longitude.

albeit based on c.50 beaches at varying times in 1981 and 1982. Woehler and Park (1997) provided the first evidence for decreases in Tasmanian Hooded Plover populations based on initial analyses of survey data collected on more than 50 beaches between 1982 and 1996, suggesting some beach populations were decreasing at up to 5% annually. Bryant (2002) noted decreases in populations both of Hooded Plover and Pied Oystercatcher in Tasmania, and estimated current populations to be 2000 and 2000–2500, respectively.

Delany and Scott (2006) and Spruzen *et al.* (2006) both adopted the estimates in Bryant (2002) and estimated Tasmania to support approximately 20% of the (Eastern) Hooded Plover and 45% of the national Pied Oystercatcher populations. Taylor *et al.* (2014) reviewed the data in Watkins (1993) and generated initial state-based estimates and a revised global population estimate of 12,000 to 14,000 Pied Oystercatchers, of which 3300 (27.5%) were present in Tasmania.

The estimates generated in the present synthesis represent minima for both species' current populations in Tasmania, as they are based on recent (and ongoing) mapping and census surveys of breeding populations on more than 450 beaches around Tasmania (figure 20). The data for the TW WHA and south coast contribute to the first statewide estimates for both species based on empirical data. Consequently, the estimates generated

here have significantly higher degrees of confidence than previous estimates.

With minimum population estimates of 1850 and 3300 for Eastern Hooded Plover and Pied Oystercatcher, respectively, Tasmania supports no less than some 62% and 30% of the national populations for these taxa. Based on initial analyses of the survey data and of that from the mainland (Adams *et al.* 2019, Maguire *et al.* in press), the greater precision of the Tasmanian data compared to mainland estimates and extrapolations strongly suggests that Tasmania supports even higher proportions of the two taxa's national breeding populations. Ongoing analyses are investigating the relative sizes of breeding and non-breeding populations for both taxa in Tasmania (E.J. Woehler unpubl. data).



Figure 21: Map showing the distribution of Hooded Plover, *Thinornis cucullatus*, in Tasmania, 1992–93 to 2020–21 (black symbols), $n = 2300$ records as of December 2020. Grid shows $1^\circ \times 1^\circ$ latitude and longitude. Orange symbols indicate surveys where no Hooded Plovers were observed.

Figures 22 and 23 clearly show the widespread nature of both species in Tasmania, albeit with obvious gaps in Hooded Plovers in the Derwent and Pittwater–Orielton areas and in the central north coast of the State. These gaps reflect the absence of suitable habitats and the high levels of anthropogenic disturbance. The larger gaps in the Hooded Plover distribution (figure 22) reinforces the greater vulnerability of Hooded Plovers compared with Pied Oystercatchers.

Based on the data presented here, it is clear that Tasmania is of national and international significance for both taxa, supporting substantial proportions of

their global populations. The analyses reinforce the speculations of Newman (1982) of the importance of Tasmania for Eastern Hooded Plovers almost 40 years ago. Many threats are common to both species (Bryant 2002, Spruzen *et al.* 2006, Maguire *et al.* in press), with the spectrum of threats increasing in frequency and intensity (Woehler in press). With mainland populations of Hooded Plover decreasing more rapidly than those in Tasmania (Maguire *et al.* in press, E.J. Woehler unpubl. data), there can be no doubt that Tasmania is already the refugium for both taxa. As the mainland populations for both taxa decrease, so the proportion of the populations in Tasmania will increase, further reinforcing Tasmania's critical role in the conservation of both taxa.



Figure 22: Map showing the distribution of Pied Oystercatcher, *Haematopus longirostris*, in Tasmania, 1992–93 to 2020–21 (black symbols), $n = 3600$ records as of December 2020. Grid shows $1^\circ \times 1^\circ$ latitude and longitude. Orange symbols indicate surveys where no Pied Oystercatchers were observed.

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Numerous PWS staff around Tasmania have provided extensive logistical and other support for the coastal surveys, especially of remote areas and islands over the three decades of the study. Similarly, many land-owners have permitted access to beaches through private property. Recent surveys of coastal lagoons have been supported by fin-fish and shellfish aquaculture companies. Numerous individuals and community care groups have supported the surveys, as have the three NRM agencies. To all, my most sincere thanks.

The surveys have been conducted under multiple

DPIPWE Scientific Research Permits and Animal Ethics Committee approvals. Surveys on Aboriginal lands have been undertaken with the permission of the local communities. Thanks to Mike Newman and Mike Weston for their comments on an earlier draft.

A special thanks to Priscilla Park, who inspired the initiation of this mapping and census project more than 30 years ago—her passion for Hooded Plovers provided critical guidance for the long-term project; this very preliminary synthesis of 28 years' of data is dedicated to her.

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