Threatened birds on Dirk Hartog Island: reconnaissance survey May 2013

Allan Burbidge

DEC Science Division
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Summary

Three threatened bird subspecies are endemic to Dirk Hartog Island: subspecies of the Rufous Fieldwren, Southern Emu-wren and White-winged Fairy-wren (black and white subspecies). The Western (Thick-billed) Grasswren has also been recorded from the island, but is possibly locally extinct.

During a reconnaissance survey in May 2013, carried out opportunistically during a survey for Black Rats, Rufous Fieldwrens were found at about 20 locations across the island, and Black and White Fairy-wrens at about five locations. Neither the emu-wren or grasswren were located during this very brief inspection, but recent records exist for the emu-wren and apparently suitable habitat was noted for both taxa, especially in the northern third of the island. A dedicated survey will be carried out in August 2013, to determine current distribution and habitat usage for each of these taxa.

Introduction

Numerous animals have declined across the Australian arid zone (Letnic 2007) and, in particular, a number of bird species have declined in the Shark Bay region (Johnstone *et al.* 2000). Several of these are listed as threatened (Garnett *et al.* 2011). The greatest concentration of threatened bird taxa in the region is on Dirk Hartog Island, where there are three endemic subspecies (Table 1).

Common name	Scientific name	Action Plan status	EPBC status	WA status	Range
Dirk Hartog Island Black-and-White Fairy-wren	*Malurus leucopterus leucopterus*	VU	VU	Schedule 1 (VU)	endemic to Dirk Hartog Island
Dirk Hartog Island Southern Emu-wren	*Stipiturus malachurus hartogi*	VU	not listed	Schedule 1 (VU)	endemic to Dirk Hartog Island
Western Grasswren (Shark Bay subspecies)	*Amytornis textilis textilis*	LC	not listed	P4	restricted to Shark Bay area; possibly extinct on Dirk Hartog
Dirk Hartog Island Rufous Fieldwren	*Calamanthus campestris hartogi*	VU	not listed	Schedule 1 (VU)	endemic to Dirk Hartog Island

Table 1. Threatened and rare bird taxa known from Dirk Hartog Island. 'Action Plan status' is from Garnett *et al*. (2011).

Dirk Hartog Island once supported 13 native mammal species, now reduced to three (Gillen *et al.* 2011), presumably as a result of impacts from pastoral activities and the introduction of cats. The endemic birds may also be at risk (and the grasswren may already have been lost from the island) but there is, however, remarkably little known about any of these taxa. Even basic information, such as the distribution of the birds on the island, their habitat usage, or population trends, is unknown. The current study was commenced to gather base-line data that can be used as the basis for future management action and to monitor the status of these taxa. This report documents the results of a reconnaissance survey carried out in May 2013.

Methods

The main purpose of the visit to Dirk Hartog was to survey for the presence of Black Rats (*Rattus rattus*) as part of a project to reconstruct the mammal fauna of the island (Gillen *et al.* 2011). Observations on birds were, therefore, primarily opportunistic in nature, and related to activities concerning rat survey. Nevertheless, a broad range of sites on the island were visited. Occurrences of all bird species were recorded, to provide context for observations on the threatened taxa.

Observations on the island extended from the 7th to the 12th of May, 2013.

There are three main land systems on Dirk Hartog Island (Payne *et al.* 1987) and we traversed all three.

Results

About 85 bird species are known from Dirk Hartog Island (Burbidge and George 1978, A.H. Burbidge unpubl.) and 42 of these were observed during the brief visit described here. The observed occurrence of each species recorded is mapped in Appendix 1. Notes on selected species follow.

Nankeen Kestrel
Pellets were collected from three locations and taken by R. Palmer for later analysis of prey items, specifically to determine whether the pellets contained any *Rattus* remains.

Barn Owl
One bird was located in the Herald Bay Outcamp, and >30 pellets collected. Again, these will be examined by R. Palmer for any remains of *Rattus* species. This number of pellets probably represents 2-6 weeks of hunting (Bunn *et al.* 1982), although studies elsewhere in arid Australia (Morton and Martin 1979) suggest that the longer period is more likely, as pellet production at roost sites in semi-arid environments is likely to be about 1 pellet per day.

Dirk Hartog Island Black-and-White Fairy-wren

Detected in four areas: near the West Coast Well, near Sandy Point, near Tetrodon Loop and adjacent to the airstrip birrida (Figure 1).

Figure 1. Sites where the Dirk Hartog Island Black-and-White Fairy-wren was detected during May 2013.

Dirk Hartog Island Southern Emu-wren
No birds seen or heard. However, this species tends to be very cryptic, has only a feeble call, and the weather was windy for much of the time during our visit, so detection was unlikely under those conditions. Potentially suitable habitat was noted in various parts of the island.

Western Grasswren (Shark Bay subspecies)
No birds seen or heard, but searches were not conducted in the most promising habitat. Promising looking habitat was noted in the northern third of the island, from Brows Hollow northward.

Dirk Hartog Island Rufous Fieldwren
One or more birds were heard on 20 occasions, at sites extending across the length and breadth of the island (Figure 2). This taxon would appear to be relatively common, despite the presence of cats and the history of grazing.

Figure 2. Sites where the Dirk Hartog Island Rufous Fieldwren was detected during May 2013.

Discussion

No sign of breeding was observed in any species in May 2013, perhaps because there had been little rain. Although about 40 mm of rain fell while we were on the island (K. Wardle pers. comm.), much of the vegetation in the southern half of the island appeared to be suffering from drought. At Steep Point, the nearest rainfall recording station, 2011 was a relatively dry year, and in 2012 the rainfall was only 164 mm, compared with the average of 260 mm (Bureau of Meteorology, at

http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=139&p_display_type=dataFile&p_stn_num=006102). This meant that some birds were difficult to detect, and on

the few occasions that call broadcast was used, it was limited in effectiveness. The result would no doubt have been different at a time when breeding was likely.

Observations during May, together with previous experience in surveying for black and white White-winged Fairy-wrens and Western Grasswrens (Brooker 1998; Burbidge *et al.* 2000; Teale 2010) suggested that point transects supported by call broadcast surveys would be most useful for the detection of the threatened birds on Dirk Hartog Island. This is consistent with the advice provided for these species in the Commonwealth guidelines for survey of threatened birds (Department of the Environment Water Heritage and the Arts 2010).

The best time to carry out a systematic survey would be when the birds are breeding – this is most likely to be mid-August for the fairy-wren (Rathburn and Montgomerie 2003) and July-August for the emu-wren and fieldwren (Storr 1985). August is likely to be the optimum time for breeding of the grasswren (Brooker 1988), and they are known to call more frequently during the breeding season (Brooker 2000). August therefore is likely to be the optimum time for survey of these species.

There are two issues to be investigated. The first is to establish the distribution of the threatened bird species on the island, and to determine their habitat preferences. It is proposed to do this by sampling at a series of random points on the island, using aural and visual search techniques, supplemented with call broadcast. Vegetation characteristics (structure, species dominants and density) will be assessed at each site. Details are included in Appendix 2.

The second issue is the need to provide a monitoring framework that can be used to assess population trends in the threatened birds following the removal of cats and other threats from the island. This could be based on an occupancy model, using the survey data as a baseline, or be based on independently collected estimates of population density at selected sites, using distance sampling, much as is done for the Barrow Island Black-and-White Fairy-wren (Teale 2010). It will be necessary to complete the distribution survey first, before a robust monitoring program is designed.

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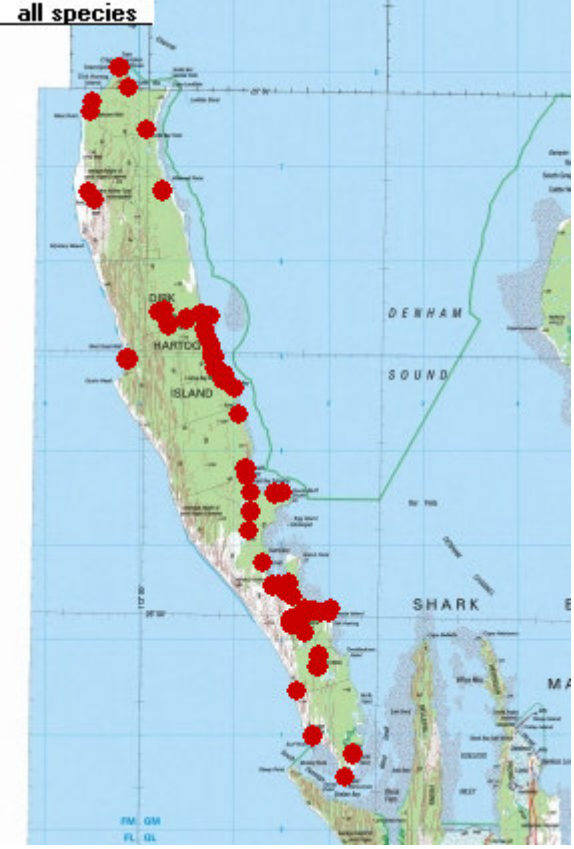
Appendix 1.

Occurrence records for all bird species observed on Dirk Hartog Island, 7-12 May, 2013.

all species



Australian Shelduck

Pied Cormorant

Australian Pelican

White-faced Heron

Eastern Reef Egret

Eastern Great Egret

Eastern Osprey

Black-shouldered Kite

White-bellied Sea-Eagle

Spotted Harrier

Brown Goshawk

Wedge-tailed Eagle

Nankeen Kestrel

Australian Bustard

Whimbrel

Common Greenshank

Grey-tailed Tattler

Ruddy Turnstone

Red Knot

Red-necked Stint

Australian Pied Oystercatcher

Red-capped Plover

Banded Lapwing

Pacific Gull

Silver Gull

Caspian Tern

Crested Tern

Laughing Dove

Eastern Barn Owl

Variegated Fairy-wren

White-winged Fairy-wren

White-browed Scrubwren

Rufous Fieldwren

Singing Honeyeater

Willie Wagtail

Black-faced Woodswallow

Grey Butcherbird

Little Crow

Australasian Pipit

Zebra Finch

Welcome Swallow

Silvereye

Appendix 2.

Sampling protocol for determination of the distribution and habitat preferences of threatened birds on Dirk Hartog Island

Birds

At least 30 randomly selected sites will be assessed for the presence of the threatened bird taxa. For ease of access, these will be near existing tracks. The mobile dunes will not be sampled as they do not contain suitable habitat for the species of interest. Random sites will be chosen by generating a list of 30 random numbers in the domain of 0 to x, where x is the total length of trafficable tracks on the island (yet to be determined). The distribution of points will then be checked to ensure that there is reasonable representation of the different land systems described by Payne et al. (1987).

Wherever any of the threatened taxa are encountered opportunistically (eg from flushing by vehicle), those sites will also be sampled systematically.

Vegetation

Following earlier work on Western Grasswrens at Shark Bay (Brooker 2000), vegetation will be surveyed along transects at each site using a levy pole, 2 m in height and 10 mm in diameter, marked at 50-cm intervals. At 10-m intervals along each transect line, the levy pole will be held vertically from the ground and the total number of touches of perennial plant species within each height category counted. Height categories based on the structure of the vegetation will include heights of 0–0.5 m (very low shrubs/grasses), 0.5–1 m (low shrubs), 1–2 m (shrubs) and >2 m (trees and tall acacias). At each point, the identities of all perennial plant species touching the levy pole will be recorded. Plant species will be identified to the level of species where possible. The cover of perennial vegetation within each height category will be calculated as the proportion of levy pole placements per site where perennial plant species touched the pole. These proportions will be used to calculate the mean cover of vegetation, expressed as a percentage, within each height category and the total cover at each survey site. The cover of shrub plant species will be calculated as the proportion of levy pole placements where at least one shrub species touched the pole.

Each site will also be assessed for the presence of shrub ‘nesting species’ (Brooker 2000) with a foliage density of >60% (which is correlated with grasswren presence on the nearby mainland).

Analysis

Univariate vegetation characteristics can be compared between sites with or without a given bird species using Mann-Whitney tests, or both presence and absence sites can be used in a discriminant function analysis to elucidate multivariate differences between sites with and without a given bird species.