

# Migratory behaviour of curlews with broken wings

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## INTRODUCTION

Between April 1988 and June 1991, I made five trips to Laysan Island (25° 46' N, 171° 44' W) to study the nonbreeding ecology of Bristle-thighed Curlews *Numenius tahitiensis*. Laysan is an uninhabited coral island, and at 397 ha, it is the largest of the north-western Hawaiian Islands. More than one million seabirds nest on Laysan (Ely & Clapp 1973; Harrison 1990), and year-round residents include four species of waders: Pacific Golden-Plover *Pluvialis fulva*, Wandering Tattler *Heteroscelus incanus*, Bristle-thighed Curlew and Ruddy Turnstone *Arenaria interpres*. Every time I visited the island, I found at least one broken-winged individual of each of these wader species. Their injuries probably resulted from mid-air collisions with seabirds. Aside from being unable to fly, these birds seemed to be healthy. Because Laysan has no terrestrial predators and is seldom visited by raptors, broken-winged waders can probably survive there for many years.

Most waders that 'over-summer' on their wintering grounds are thought to be subadults (Johnson 1979; van Dijk *et al.* 1990). Presumably, these birds do not prepare fully for spring migration. Broken-winged adults, however, might be expected to prepare for spring migration, even though they have no chance of migrating successfully. In this note, I describe apparent migratory behaviour by a Whimbrel *Numenius phaeopus* and a Bristle-thighed Curlew during May 1991. Both of these birds had been ringed on Laysan as adults and had survived at least two winters on the island with broken wings.

## BACKGROUND INFORMATION

Whimbrels are rare in Hawaii, and most individuals that visit Hawaii belong to the Asiatic subspecies *N. p. variegatus* (Pratt *et al.* 1987). On 26 August 1988, an adult *variegatus* landed on a research ship about 700 km north-west of Laysan. It was exhausted and thin and seemed unable to fly. I gave it food and water for the four days that I remained on the ship and cared for it for two days after arriving on Laysan. I ringed and released the Whimbrel on Laysan on 1 September 1988, and saw it near the release site several times in September and October. The Whimbrel had a broken wing when recaptured near the release site on 31 August 1989. I saw the Whimbrel 21 times between 10 September 1990 and 26 April 1991, never finding it more than 300 m from its

home range centre near the 1988 release site.

Throughout this period, the Whimbrel's typical behaviour was to run from any human it encountered. It was the only Whimbrel present on Laysan during spring 1991.

The Bristle-thighed Curlew had a broken wing when captured on the night of 24 August 1989. It was marked (colour rings plus metal ring no. 874) and released that same night. It did not see no. 874 again until catching it at night on 7 October 1990 and again during the day on 23 February 1991. Both recaptures occurred less than 50 m from the 1989 capture site. Much like the Bristle-thighed Curlews that become flightless during moult (Marks 1993), no. 874 was very secretive during daytime. It was the only Bristle-thighed Curlew with a broken wing known to be on Laysan during spring 1991.

## SPRING MIGRATION 1991

Especially during spring and early autumn, Bristle-thighed Curlews congregate at two coral rock ledges along the periphery of Laysan (Marks & Redmond 1994). During spring, the largest flocks (up to 156 individuals) gather at the South Ledge, from which smaller flocks fly to the final staging site above the beach crest near the northern tip of the island (Figure 1). Smaller numbers of curlews gather at the Northwest Ledge before flying to the staging site (Figure 1). In the Northwestern Hawaiian Islands, spring migration of Bristle-thighed Curlews peaks during the first week of May (Marks & Redmond 1994).

On 5 May, the Whimbrel was at the Northwest Ledge, having walked at least 2 km from its home range centre in the east-central part of the island (Figure 1). Before this date, the Whimbrel had never been seen at any of the rock ledges nor along the west side of the island (on average, these areas were visited at least once a day during the 62 weeks that I lived on the island). I saw the Whimbrel back in its normal home range on 12, 21 and 28 May 1991. I also captured the Whimbrel within the same area on 10 March and 1 August 1993 during two brief visits to Laysan.

On 6 May, Bristle-thighed Curlew no. 874 was in a flock of 33 curlews at the South Ledge. This was the first time it had been seen at one of the rock ledges, despite its home range centre being less than 400 m from the South Ledge (Figure 1). The next day I saw no. 874 at the staging site more than 3 km north of the South Ledge. I recorded the following in my field notes:

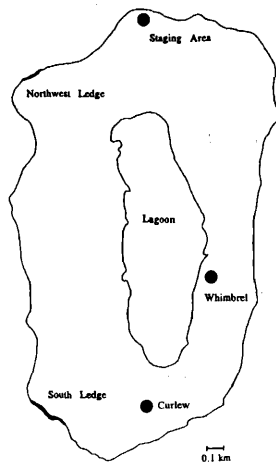


Figure 1. Map of Laysan Island showing the rock ledge roosting areas, the staging area, and the home range centres of the broken-winged Whimbrel and Bristle-thighed Curlew.

"1021-- I see a curlew trotting (yes, trotting, not walking) up the desert above Pupland Beach and heading right for me (I'm on the beach crest above the North Ledge). I watch it for 2 minutes from 300 m away, and see that it has a broken wing... it's 874, whom Shawne saw yesterday at the South Ledge! It has walked the 3 km north as if it's trying to migrate! It has a black bill and has accumulated fat. I don't have the Pesola with me, but I think it weighs close to 500 g... I released 874 and it continued trotting north, away from cover, calling several times and disappearing over the beach crest above the North Ledge, right where all the other curlews stage before departure."

I hurried toward the beach crest to observe no. 874 at the water's edge. Just before I got there, however, a flock of curlews departed the island, and I watched them for 10 minutes until they disappeared to the north. In that short time no. 874 had also disappeared. The hypothesis that no. 874 entered the ocean and swam towards Alaska (surely a fatal move) was rejected when I saw the bird, again at the South Ledge, on 15 and 22 May.

## DISCUSSION

Although anecdotal, these observations suggest that adult curlews with no chance of migrating successfully nonetheless prepare for spring migration both physiologically and behaviourally. Because the Whimbrel was not captured, I do not know whether it had taken on fat stores. The Bristle-thighed Curlew clearly had the heft of a bird with stored fat, although it was not obese like the healthy adults that I handled in late April and early May. In addition, its bill had turned black, as had the bills of at least 70% of the colour-marked adults (*i.e.* after-third-year;  $n = 149$ ) present on Laysan during spring 1991. Colour changes in the bills of Bristle-thighed Curlews are age-related and seasonal. The bills of most adults become completely black in April and remain so until August or September after the birds have returned to their winter quarters (Marks unpubl. data). Only two of the 62 colour-marked subadults on Laysan developed completely black bills during spring 1991.

Perhaps of greater significance were the behavioural changes of the two birds (which presumably could not have occurred without the physiological changes). The

Whimbrel moved at least 2 km from its home range centre to visit a rock ledge used by migrating flocks of curlews. The Bristle-thighed Curlew not only accompanied a flock of curlews at the South Ledge, but also traversed the entire length of Laysan to visit the exact spot where curlews stage immediately before leaving the island for Alaska. So far as I know, broken-winged curlews do not visit Laysan's rock ledges during other times of the year.

Both birds headed north during the peak of migration by Laysan's curlews and then returned to their normal home ranges. Thus, to the best of their abilities, these birds 'migrated'. Injured waders could live for many years on predator-free islands. Indeed, the Whimbrel has survived on Laysan Island for at least five years. It is tempting to speculate that these birds would attempt to migrate spring after spring. Especially in tropical wintering areas (with little change in photoperiod), such behaviour would be consistent with other studies suggesting that vernal migration is controlled by an endogenous circannual clock (see Gwinner 1986). I encourage researchers on oceanic islands to colour-mark injured waders and view them as sources of valuable information.

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## REFERENCES

- Dijk, A.J. van, de Roder, F.E., Marteign, E.C.L. & Spiekman, H. 1990. Summering waders on the Banc d'Arguin, Mauritania: a census in June 1988. *Ardea* 78: 145-156.
- Ely, C.A. & Clapp, R.B. 1973. The natural history of Laysan Island, northwestern Hawaiian Islands. *Atoll Research Bull.* 171.
- Gwinner, E. 1986. Circannual rhythms in the control of avian migrations. *Adv. Study Behav.* 16: 191-228.
- Harrison, C.S. 1990. *Seabirds of Hawaii: natural history and conservation*. Cornell University Press, Ithaca & London.
- Johnson, O.W. 1979. Biology of shorebirds summering on Enewetak Atoll. *Studies in Avian Biol.* 2: 193-205.
- Marks, J.S. 1993. Molt of Bristle-thighed Curlews in the Northwestern Hawaiian Islands. *Auk* 110: 573-587.
- Marks, J.S. & Redmond, R.L. 1994. Migration of Bristle-thighed Curlews on Laysan Island: timing, behavior, and estimated flight range. *Condor* 96: 316-330.
- Pratt, H.D., Bruner, P.L. & Berrett, D.G. 1987. *A field guide to the birds of Hawaii and the tropical Pacific*. Princeton University Press, Princeton.