THE STATUS OF THE BRISTLE-THIGHED CURLEW ON THE YUKON DELTA NATIONAL WILDLIFE REFUGE, ALASKA

by Brian J. McCaffery and Gene Peltola, Jr.

INTRODUCTION

The Bristle-thighed Curlew *Numenius tahitiensis* has been, and still remains, one of the most enigmatic of North American birds. Discovered in 1769 on the island of Tahiti, the curlews' breeding grounds remained unknown until 1948, when the first nests were found in the low mountains north of Mountain Village in western Alaska (Kyllingstad 1948). Only one nest has been reported since then, and it was found very near the earlier nests (D.D. Gibson, pers. comm.). Kyllingstad (1948) surmised that the bulk of the world's Bristle-thighed Curlew breeding population nested in these mountains (Figures 1 and 2), but this suspicion has never been confirmed. Gill and Handel (1981) summarize what is known about the species' distribution in Alaska, but the information is extremely fragmentary. The geographic range and the total size of the breeding population is a continuing mystery. Furthermore, information concerning migration ecology and wintering status is also very sparse. Although the species is known to winter throughout the central Pacific archipelagos, the small sizes

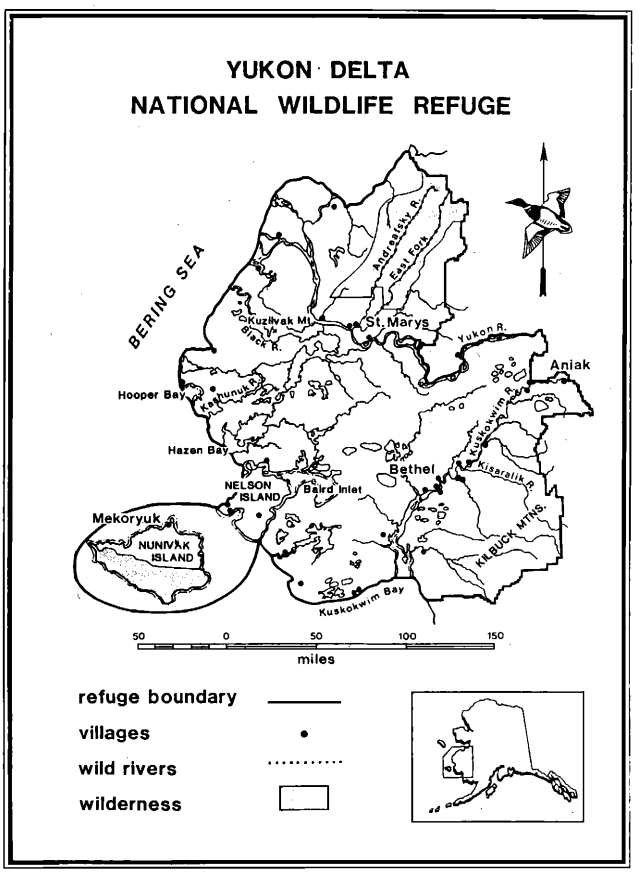

Figure 1. Location of Yukon Delta National Wildlife Refuge.

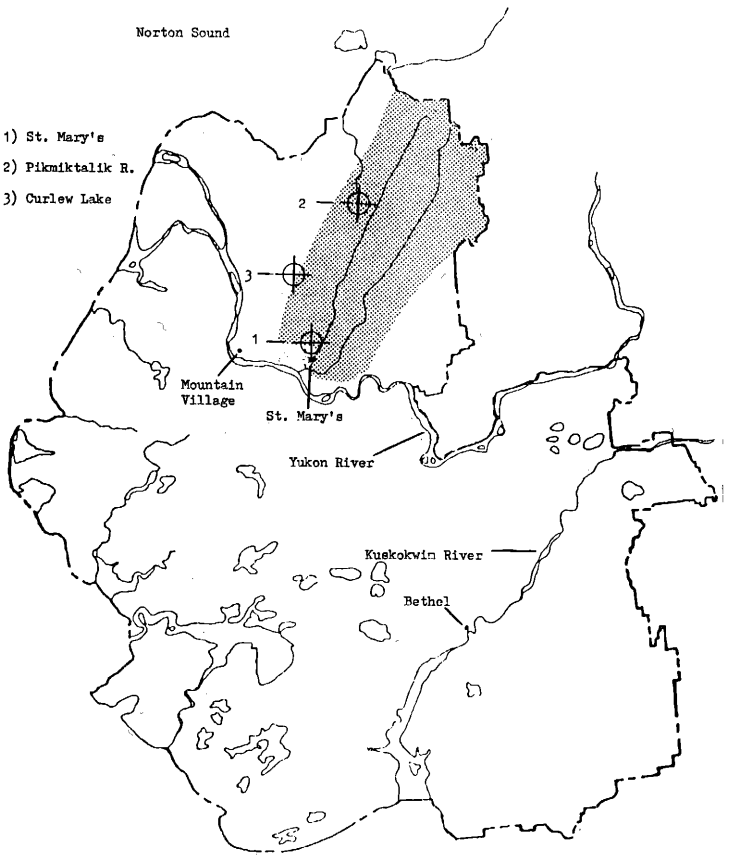

Figure 2. Location of field sites and the presumed breeding range of the Bristle-thighed Curlew (stippled).

of, and vast distances between, the islands on which the curlews occur have so far precluded systematic attempts to study them. Despite the assumed rigors of their spectacular overseas migration from Alaska to the central Pacific, virtually nothing is known about staging areas, pre-migratory requirements or landfalls during either spring or fall migration.

The purpose of this paper is to report the results of our first season's efforts which were intended to determine whether historical reports and hearsay reports of Bristle-thighed Curlew nesting were still valid. The long-term objectives of the study in the Yukon Delta National Wildlife Refuge (YDNWR) are to determine: 1) the nesting distribution of Bristle-thighed Curlews on the refuge; 2) if curlews continue to nest in areas previously identified as nesting areas; 3) the habitats used for nesting on the refuge; 4) the population parameters which characterize the curlews using the refuge for nesting and migration; 5) the estimated number of Bristle-thighed Curlews nesting on the refuge; 6) the annual contribution of the refuge population of curlews to the total

Bristle-thighed Curlew population; 7) the pre- and post-migrational requirements of this species and, more specifically, if those requirements are obtained within the refuge boundaries; and 8) where the Bristle-thighed Curlews which summer on the YDNWR spend the winter.

LOCATIONS AND METHODS

Field work in 1985, in search of Bristle-thighed Curlews, occurred in the mountains north of the Yukon River near the villages of St. Mary's and Mountain Village (Figure 2). These mountains represent the southern end of the Nulato Hills, an extensive system of rugged terrain which runs from the Yukon north to the base of the Seward Peninsula. We undertook 4 trips to 3 locations in this region: 1) St. Mary's and the Andreafsky Hills from 7-8 June and 15-19 June, 2) the headwaters of the Pikmiktalik River from 25-29 June, and 3) the ridges immediately east of Curlew Lake from 1-3 July. These three sites are described more fully below. In addition, BJM made observations during the 1985 spring migration at St. Mary's, and Buelna (pers. comm.) observed curlews while censusing birds for the YDNWR in the upper Andreafsky River drainage.

St. Mary's and the Andreafsky Hills. St. Mary's is located on the west bank of the Andreafsky River about 4 km from its confluence with the Yukon River. Three km upriver from St. Mary's, the North and East Forks of the Andreafsky merge. To the north of the village, the Andreafsky Hills, a 22-km long ridge system with several summits above 240 m, run in a SW-NE direction.

The major vegetation type in this vicinity is moist tundra. This tundra is dominated by cottongrass tussocks *Eriophorum* sp., but lichens, mosses, dwarf birch *Betula nana*, crowberry *Empetrum nigrum*, and various ericaceous species are common. On the higher ridges of the Andreafsky Hills, the tundra is drier and the vegetation is shorter than at lower elevations nearby, cottongrass is absent, and mosses and lichens dominate. These ridges run parallel to the mountains north of Mountain Village, only 30 km away, in which Bristle-thighed Curlews have been previously reported. Our surveys in 1985 revealed the elevation, geomorphology, flora and avifauna of the two ridge systems to be strikingly similar.

Pikmiktalik River. The headwaters of the Pikmiktalik River lie approximately 80 km NNE of St. Mary's. However, since the mountains run to the NE, the site is only 6 km E of the western escarpment of the Nulato Hills. Our base camp was at an elevation of 325 m, and was surrounded by mountainous ridges with several summits above 500 m. Cottongrass tussocks cover the flats between ridges as well as the lower more gentle slopes. Lichens and mosses are major components of this association. Willows *Salix* spp. between 0.5 and 2 m were scattered on the hillsides, generally below 300 m. Cottongrass tussocks are also prevalent on the plateaux and broad saddles connecting the higher ridges wherever the slope is minimal. Dwarf birch is present throughout the entire area, extending somewhat farther upslope than the willows into the higher tundra which is characterized by an extensive and varied cover of lichens. This rich lichen flora is found on all the ridgetops and summits in the area as well as on the adjacent steep slopes.

Curlew Lake. Curlew Lake is located approximately 30 km north of Mountain Village. The first Bristle-thighed Curlew nests ever discovered were found in 1948 on the ridges just to the east of the lake, and the area was fully described by Kyllingstad (1948) and Allen and Kyllingstad (1949). We visited this area in order to get a rough estimate of curlew density at a locale from which they had been previously reported.

At all three sites, 1-3 investigators walked through a variety of tundra habitats, keeping track of all curlews seen, curlew behaviour, and (when appropriate) the direction of flight. At the end of each day's field work, all sightings were plotted on maps. Based on our perception of curlew observability and mobility, we eliminated sightings which we subjectively decided were likely to be of the same birds. The remaining sightings served as the basis for our admittedly crude, subjective, and tentative density estimates.

RESULTS

Andreafsky Hills

Although Bristle-thighed Curlews were seen flying north over St. Mary's in May (BJM), none were observed during our June field work in the Andreafsky Hills. A variety of tundra habitats was surveyed, including ridge-tops, rolling tussock tundra, and old river terraces. Due to their strong similarity to the ridges near Curlew Lake, over 17 of the 22 km of summit ridges in the Andreafsky Hills were carefully searched for curlews without success. However, in all tundra habitats in the area, we did find breeding Whimbrels *Numenius phaeopus*. The linear density of Whimbrels along ridge-top tundra at this site was 0.56/km.

Pikmiktalik River

Bristle-thighed Curlews were widely distributed below 300 m and one nest was discovered (see Behavioural Observations). Curlews were found on steep lichen-dominated slopes and on gentler slopes covered with cottongrass tussocks and low willow thickets. They were not seen in the marshy flats separating the Pikmiktalik and Pastolik drainages. In contrast to Kyllingstad's (1948) findings above Curlew Lake, we did not find curlews on the high dry ridge-tops in the Pikmiktalik region. However, elevation may be a factor limiting curlew distribution at this site. The ridges drained by the Pikmiktalik and neighboring streams average much higher (summits > 300 m) than those near Curlew Lake (most summits < 300 m). Our tentative estimate of Bristle-thighed Curlew densty in occupied habitat is one per square km.

Three Whimbrel pairs were located and one nest was discovered. Two pairs were occupying the marshy saddle separating the Pikmiktalik and Pastolik drainages where Bristle-thighed Curlews were not observed. The third pair was located on a fairly steep slope with cottongrass tussocks and low willow thickets. A Bristle-thighed Curlew was seen at this location.

Curlew Lake

Our base camp was 3.2 km SE of Curlew Lake at an elevation of just over 150 m. On 2 July, four field crews explored the ridges to the north, the southwest, and the east, as well as

the drainage immediately east of camp. Approximately 40 km² were surveyed and 36 Bristle-thighed Curlews were observed, yielding a density of 0.9 per km². This estimate is very close to the estimated curlew density at the headwaters of the Pikmiktalik (1 per km²). At both locales, curlews were not encountered above 300 m. However, since ridges above 300 m occupy a much smaller fraction of the landscape near Curlew Lake, curlews are more generally distributed throughout all available habitats at that site. Fifteen curlews were observed above 150 m along upper slopes and ridge-tops, and 21 were observed below 150 m on the lower slopes and along the drainage east of camp.

Nineteen Whimbrels were observed by the Curlew Lake field crews during the survey on 2 July, for an area-wide density of 0.48 per km². However, only 2 of the 19 were observed above 150 m, all of the others were found along the low drainage east of camp. Local density of Whimbrels in this habitat was approximately 3 per km².

Behavioural Observations

A Bristle-thighed Curlew nest was discovered on the afternoon of 25 June on a steep slope 200 m above a willow-lined creek at an elevation of approximately 850 m. The nest was located on hummocky tundra less than 5 m from a meter-high willow thicket, and less than 1 m from a smaller isolated willow 20 cm high. Shortly after discovering the nest, we realized that a pair of Long-tailed Jaegers was nesting only 20 m away. This proximity between Long-tailed Jaeger nests and the nests of large shorebirds has been reported previously, and does not appear to be random (McCaffery 1982). Both pairs of birds were disturbed by our presence. We approached the curlew nest within 10 m and the incubating bird did not flush. Its mate and both jaegers were mobbing us; since we didn't want the jaegers to get the curlew's eggs, we continued past the nest without stopping at it. At our closest approach to the nest, the attack-mobbing curlew dove within 1 m of Peltola's head. After we left the area, the incubating jaeger returned to its nest, but the non-incubating member of each pair continued circling and screaming, occasionally diving at one another. The curlew eventually landed, whereupon the jaeger dove at it two more times. On both occasions, the curlew crouched, pulled its neck back against its shoulders, half-spread its wings, and sang briefly.

On 27 June, we saw a different Bristle-thighed Curlew singing from the ground on a steep hillside less than 100 m away from a Whimbrel. Whether the song was a response to the Whimbrel, our presence, or other factors, could not be determined. With the exception of these two observations, curlews were only observed singing while doing flight displays.

No direct interactions between Bristle-thighed Curlews and Whimbrels were observed. On the Pikmiktalik trip, the only interaction involving these two species was noted on the evening of 25 June when two Bristle-thighed Culews, a Whimbrel, and two lesser Golden Plovers *Pluvialis dominica* flew in a wild chase high over the marshy saddle. However, neither the beginning nor the end of the chase was observed. On the Curlew Lake trip, the two species of *Numenius* curlews were found in very close proximity to one another east of camp. On three separate occasions, Bristle-thighed Curlews landed within one meter of single Whimbrels and elicited no observable response.

On 2 July, all 4 Curlew Lake field crews encountered at least one pair of curlews which behaved as if eggs or young were present. No nests or chicks were found on that day, but on 3 July, Peltola's crew discovered a chick at an elevation of 150 m at the southwestern tip of the ridge immediately east of Curlew Lake. Both adults mobbed the observers and dove within 2 m of their heads.

DISCUSSION

The discovery of nesting Bristle-thighed Curlews near the headwaters of the Pikmiktalik River, although not unexpected, establishes a new breeding locale for the species 75 km NE of the previously known breeding site near Curlew Lake. Curlews were also found during June atop the ridges flanking the upper North Fork of the Andreafsky River. Thus as Kyllingstad suspected, it appears as if Bristle-thighed Curlews may be widely distributed throughout the southern Nulato Hills. However, in striking contrast with this general picture is their absence from the Andreafsky Hills only 30 km SE of the Curlew Lake study site. Clearly, we need to investigate more thoroughly the factors which determine curlew distribution in this region.

One such factor may be competitive interactions between the Bristle-thighed Curlew and its sympatric congener, the Whimbrel. Whimbrels were found in the Andreafsky Hills, at the headwaters of the Pikmiktalik, and on the ridges east of Curlew Lake; Bristle-thighed Curlews were found only at the latter two sites. In general, where the two species occurred together, Bristle-thighed Curlews were found at a somewhat higher elevation, although there was considerable overlap. A comparison of *Numenius* curlew numbers at Curlew Lake and in the Andreafsky Hills indicates that Whimbrels may be more abundant in ridge-top tundra in the absence of Bristle-thighed Curlews (Table 1). Do these species exclude each other from particular habitats and/or geographical areas? Arguing against this hypothesis is the total lack of observed aggression between members of the two species when they encountered each other at close range. In two other closely related shorebirds species pairs, we have observed either ritualized territorial behaviour (Black-bellied Plover *Pluvialis squatarola* vs. Lesser Golden Plover) or, at least occasionally, overt interspecific aggression (Pectoral Sandpiper *Calidris melanotus* vs. Dunlin *C. alpina*) when the two species occupy the same habitat at the same site during the breeding season. In terms of morphology and plumage, the Whimbrel and the Bristle-thighed Curlew resemble each other more closely than either the plovers or the sandpipers. Thus the lack of aggression between

Table 1. Comparison of *Numenius* curlew density on ridge-top tundra at Curlew Lake and in the Andreafsky Hills. Densities are expressed in curlews per kilometer of ridge-top.

	Andreafsky Hills	Curlew Lake
Bristle-thighed Curlew	0.00	0.75
Whimbrel	0.56	0.10

them is somewhat puzzling. Again our observations are not yet sufficiently extensive to address these questions.

At both Curlew Lake and at the headwaters of the Pikmiktalik River, Bristle-thighed Curlew densities were approximately 1 per km². These are rough breeding density estimates since at both sites we encountered (and counted) curlews which were apparently not breeding.

Our studies of the Bristle-thighed Curlew in the southern Nulato Hills will continue in 1986. We have 3 primary objectives for the second field season: 1) to describe more fully the distribution of the Bristle-thighed Curlew and the Whimbrel on a regional basis in terms of geographic range and habitat use, 2) to develop a sampling protocol which will allow us to quantify behavioural interactions between the two species, and 3) to refine our censusing techniques so as to produce an accurate breeding density estimate for *Numenius* curlews on the YDNWR.

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A COMPARISON BETWEEN COUNTS AT ROOST SITES AND ON FEEDING GROUNDS OF OYSTERCATCHERS AND CURLEWS IN SPAIN

by J. Dominguez

INTRODUCTION

The possibility that there are differences at study sites between the numbers of waders counted at roosts and on their feeding grounds, and its implications, has received rather little attention. Goss-Custard (1981) compared the 2 counting methods for Oystercatchers *Haematopus ostralegus* at 2 estuaries in Britain, and Barrett and Barrett (1984) made a similar comparison between roosting and feeding ground counts of several species at one part of the Firth of Forth estuarine complex in Scotland. This note documents roosting and feeding site counts at an estuary in north-west Spain.

METHODS

During the 12 months from September 1984 to September 1985, I made monthly counts of Oystercatchers and Curlews *Numenius arquata* on the Ortigueira estuary in Galicia, north-west Spain. During low water both species fed on wide sand and mudflats, some covered with eel-grass *Zostera*, the largest being 920 ha. Feeding birds were usually scattered over the tidal flats, rather than in tight flocks. At high tide Oystercatchers roosted on a small bare sandy island. Curlews sometimes roosted on this island, and sometimes on others covered with low vegetation.

Both high water and low water counts were made on the same days. Counts of birds on the feeding grounds were made within 3 h of low water, from a car at various vantage points around the estuary. All intertidal areas were counted, but this sometimes took up to 3 days of low tides to achieve (see also Figure 1). Roost counts were made within 1 h of high water, and on a day when low water counts were made.

RESULTS AND DISCUSSION

Eleven pairs of counts for Oystercatchers and 7 pairs for Curlews are shown in Figure 1. Some