

Abstracts of Wader Theses

compiled by ROB ROBINSON

As a means of disseminating information about important new wader studies well in advance of formal publication, this series features abstracts from recent wader theses (bachelors, masters and doctoral). Thesis authors are invited to submit abstracts to Rob Robinson, BTO, The Nunnery, Thetford, Norfolk IP24 2PU, UK, rob.robinson@bto.org or the Editor.

Reproductive ecology of Long-billed Curlews breeding in grazed landscapes of western South Dakota

(2006, M.Sc. thesis, South Dakota State University, USA)

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Long-billed Curlews (*Numenius americanus*) are currently undergoing significant population declines mainly attributed to the destruction of important breeding habitat for agriculture and development. Uncultivated rangelands and pastures support a majority of Long-billed Curlew breeding populations and reproductive success in these areas plays a major role in population dynamics. The western portion of South Dakota provides important mixed-grass prairie breeding habitats for Long-billed Curlews and most of these habitats are also used as pastureland for grazing domestic livestock.

The main objectives of this study were to estimate nesting success and brood survival and to characterize nesting and brood-rearing habitats of a population of Long-billed Curlews breeding in western South Dakota. The study was conducted during the spring and summer of 2005 and 2006 on the Triple U Buffalo Ranch in Stanley County, South Dakota. Nest sites were located by dragging a rope through pastures to flush incubating adults and broods were monitored by tracking radio-marked adults that successfully hatched young. Habitat preferences were characterized by comparing habitat at nest sites and brood location points to habitat at points randomly distributed throughout the study site.

A total of 48 nests were located and 43 adult curlews (21 males, 22 females) were radio-marked over the two years of the study. Habitat measurements were taken at 48 nest sites, 80 brood location points, and 154 random points. In 2005, curlews used nest sites similar to random points with an average of 100% grass and forb cover and an average visual obstruction reading (VOR) of 27 cm. In the fall of 2005, a natural range fire burned a large area of the study site. The following year, forb cover and VOR's at nest sites, brood points, and random points decreased significantly ($p < 0.05$). This reduction in vegetative cover also corresponded to a severe drought and a non-peak year for the biennial forb yellow sweetclover (*Melilotus officinalis*). Nest success decreased from 0.39 in 2005 to 0.15 in 2006 due to a large increase in the rate of nest predation which accounted for 64% of nest

failure in 2006. Daily nest survival rates for 2005 and 2006 combined were positively related to average VOR's taken at nest sites ($\beta = 6.45$) and negatively related to the density of bison grazed in pastures containing nests ($\beta = -1.29$). Despite the negative impact of reduced vegetative structure on reproductive success, curlews selected nest sites in shorter vegetation with lower VOR's than random points in 2006. Curlews selected nest sites composed of a greater proportion of junegrass (*Koeleria macrantha*) and buffalograss (*Buchloe dactyloides*) than random points in 2005 and 2006 and daily survival rate at nest sites dominated by these species was 100% during both years. In 2006, nest sites also had a greater amount of forb cover than random points and daily survival rate for 2005 and 2006 combined was higher at nest sites dominated by forb cover (0.98) than at nest sites dominated by grass cover (0.91). Of the 15 broods produced by radio-marked curlews in 2005 and 2006, only 33% were known to produce fledglings. Possible causes of chick mortality included avian predation and heat prostration. Broods used habitats composed of a greater proportion of sixweeks fescue (*Vulpia octoflora*), indianwheat (*Plantago patagonica*), junegrass, and American vetch (*Vicia americana*) than random points in 2005 and a greater proportion of creeping spikerush (*Eleocharis palustris*), bare ground, and water than random points in 2006. In 2006, broods also used areas with less grass cover and more bare ground than random points.

Nest success and brood survival was low for the population of Long-billed Curlews breeding on the Triple U Buffalo Ranch during both years of this study. Uncontrollable climatic factors that affect the vegetative structure of habitat appear to have a large impact on the reproductive success of Long-billed Curlews breeding in South Dakota. Controllable factors such as grazing pressure should be manipulated to help maximize nesting success and brood survival. This may require reducing livestock densities in pastures used by breeding curlews during the nesting period in order to reduce the risk of nest trampling.



Effects of traditional shellfishing on the feeding ecology of shorebirds in intertidal areas: a contribution towards the management of Cantabrian estuaries

(2006, Ph.D. thesis, University of Cantabria, Spain)

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Many shorebird species (Charadrii) are long distance migrants. To complete their annual migrations many of them rely on a few coastal wetlands, mainly intertidal areas. Today, many shorebird populations have decreasing trends, but the relative importance for their conservation of many wetlands is unknown. Shellfishing is an ancient traditional activity that is very common in coastal wetlands around the world. Thus, during low tide, both shorebirds and shellfishermen make use of intertidal areas and exploit the same resources.

Apart from disturbance arising from the presence of shellfishermen, mud-digging could also exert a negative influence on shorebird feeding ecology. In the present study, I experimentally analysed some of the effects of this activity on the feeding ecology of shorebirds, involving professional shellfishermen as well as recreational harvesters. My study site was the intertidal areas of the Santoña Marshes, N Spain. This is a wetland of International Importance for over-wintering waterbirds, especially for the Icelandic population of the Black-tailed Godwit *Limosa limosa islandica*.

I found that throughout the year current levels of human disturbance in intertidal areas, which is mainly caused by traditional shellfishermen, does not have any significant effect on the distribution of shorebirds at their current densi-

ties, except for Eurasian Curlew *Numenius arquata* during autumn migration. Similarly, if the density of shellfishermen exceeded 0.6 people per 10 ha, they had a negative effect on the foraging activity of curlews in autumn, even though their presence had no effect on the birds' feeding rates or on other behavioural variables. On the other hand, the experimental digging of 20% of the mud substrate with traditional methods had no effect on curlew feeding rates during their migration stopover.

A ban on recreational harvesting in the Santoña Marshes during autumn migration would reduce shellfishing pressure in this wetland to below 0.6 people per 10 ha. Such a ban would have a similar effect in the majority of coastal Special Protection Areas in the Iberian Peninsula.

I also found that the supratidal pastures around the Santoña Marshes are used as feeding grounds by 16% of over-wintering curlews. Such habitats are also found by the shores of many other Cantabrian estuaries.

Thus, my results show that the management of recreational harvesting and supratidal pastures are key elements in maintaining, in a sustainable way, traditional shellfishing activities that are compatible with the conservation of migrant shorebird populations in the Cantabrian region.

Shorebird and wading bird distribution, habitat use, and response to human disturbance at Cape Romain National Wildlife Refuge, South Carolina

(2006, Ph.D. thesis, Clemson University, U.S.A.)

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In response to a regional lack of knowledge about avian coastal habitat use, distribution, and response to boat disturbance, I examined shorebird and wading bird dynamics on the Cape Romain National Wildlife Refuge (CRNWR), South Carolina, from 1999 to 2002. The primary goals of the project were severalfold: 1) to determine how avifauna, particularly shorebirds and wading birds, were distributed spatially and temporally across the refuge, 2) to identify correlates of habitat selection in shorebirds and wading birds, and 3) to examine the behavioral responses of shorebirds and wading birds to human disturbance, with a focus on shrimp-baiting activities.

Unbiased estimates of species presence and relative abundance within tidal creeks and at high-tide roosts showed that CRNWR is an important migratory stopover and overwintering site for several species of shorebirds and wading birds. Habitat use and response to disturbance varied extensively among species, and numerous biotic and abiotic factors were related to habitat occupancy. The principal factors affecting shorebird presence at roosts on an annual scale were roost length size, local region, substrate, and aspect, and the extent and direction of these effects varied among species. Among

years, red knots (*Calidris canutus*) avoided roosts that had high average boat activity within 1,000 m, but disturbance did not appear to be a factor for other species. Daily roost use was influenced primarily by wind speed and the ability of roosts to provide shelter from the wind. Only dowitchers (*Limnodromus griseus*, *L. scolopaceus*) appeared to track daily disturbance, avoiding prospective roosts when boat activity within 100 m was high. Although fleeing responses to disturbance were recorded in several species of wading birds, this did not translate into habitat avoidance on a broader scale. In American oystercatcher (*Haematopus palliatus*), short-term behavioral indices of disturbance (i.e., vigilance) may have been confounded by natural predation risk, which varied temporally, and I detected no general effect of human disturbance on the distance moved between roosting and foraging areas.

Overall, this research underscores the sensitivity of disturbance studies to spatial and temporal scale, draws attention to the potential confounding effects of dynamic abiotic factors and natural predation risk on such studies, and calls into question the interpretation of traditional measures of disturbance such as flush rates, vigilance rates and roost occupancy.

