

NATIONAL BIOLOGICAL SERVICE
U.S. DEPARTMENT OF THE INTERIOR

NBS INFORMATION BULLETIN

No. 58 1995

HABITAT USE BY SHOREBIRDS IN THE MISSISSIPPI ALLUVIAL VALLEY

Wildlife managers, in cooperation with public and private landowners, increased flooded habitat within the Mississippi Alluvial Valley (MAV) to provide additional shorebird habitat by establishing water management capabilities on agricultural lands. We combined information from three studies within the central portion of the MAV on diurnal observations of shorebirds.

AGRICULTURAL FIELDS MONITORED IN WINTER AND SPRING

In Arkansas and Mississippi during 1991–92 and 1992–93, 60 study fields were monitored: five rice fields, five soybean fields, and five noncrop, moist-soil units within each state during each winter. Four survey routes were traversed among study fields: two in Arkansas (165 and 160 km) and two in Mississippi (210 and 190 km). Each study field was observed 36 times between 15 November and 21 March. We monitored shorebirds along survey routes from 1 November through 15 May.

Arkansas fields tended to flood early in winter, whereas Mississippi fields retained water later in winter. Killdeer (*Charadrius vociferus*) and common snipe (*Capella gallinago*) were common throughout winter. The species composition of the 27,392 shorebirds observed along survey routes became most diverse from late February through mid-April.

Shorebird densities on study fields increased in both Arkansas and Mississippi in winter ($F > 8.06$, $df = 1, 900$, $P < 0.01$). Significant interaction among crop, year, and sampling period suggests shorebirds used moist soil, rice fields, and soybean fields differently over time (Figure). Shorebird densities were generally greater ($F > 4.5$, $df = 1, 48$, $P < 0.04$) on soybean fields than on moist soil or rice fields

from November through January. Shorebird densities were also greater ($F > 4.4$, $df = 1, 48$, $P < 0.04$) on soybean fields than on moist soil during February and March, and shorebird densities were greater on rice fields than on moist soil ($F > 5.5$, $df = 1, 48$, $P < 0.02$) during late February and March.

LOUISIANA AGRICULTURAL FIELDS MONITORED

Shorebird use of fields was monitored along two survey routes (32 and 35 km) in northeast Louisiana from 18 July through 30 December 1991. Where possible we measured water depth at the location of mixed-species flocks.

Species diversity and abundance were greatest during July and August. Shorebirds were observed most frequently in rice (>60%) and plowed-fallow fields (27%); they occurred in these habitats significantly more than expected ($P \leq 0.05$). More than 70% of the shorebirds were close to water when observed. Of 421 water depths measured at locations of mixed-species flocks, 393 were less than 5 cm. Black-necked stilts (*Himantopus mexicanus*) and yellowlegs (*Tringa flavipes* and *T. melanoleuca*), however, were associated with water deeper than 5 cm, whereas killdeer and pectoral sandpipers (*Calidris melanotos*) were commonly observed at a distance from water.

MANAGED FIELDS MONITORED

Seven sites in Arkansas, Louisiana, and Mississippi, under active management by the U.S. Fish and Wildlife Service to provide shorebird habitat, were monitored once a week for 8 weeks beginning 15 August 1994. Three of the sites monitored were disced fields that were subsequently flooded, whereas four were drawn-down impoundments.

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A total of 14,564 individuals of 22 species were recorded at these sites. The greatest mean density for all species of shorebirds combined occurred during the 30 August–2 September sampling period when 2,058 birds/100 ha were observed. Killdeer, least sandpipers (*Calidris minutilla*), and yellowlegs were common throughout the study period.

OPTIONS FOR SHOREBIRD MANAGEMENT

As one would expect, shorebirds were found in flooded areas with little cover. Although shorebird densities were greater on soybean fields than on moist-soil or rice fields in winter, only a small proportion of available soybean habitat is flooded in winter. Winter flooding of soybean fields concurrently provides valuable wintering habitat for ducks such as northern shovelers (*Anas clypeata*). Similarly, in northeast Louisiana, shorebirds were most often observed on mud flats and on rice fields with little residue after harvest. Drawn-down impoundments, which had sparse cover, seemed to attract more fall migrants than disced fields on managed lands.

The high number of shorebirds observed on USFWS-managed lands may, in part, reflect higher population densities because of fall migration, but it suggests that intensive management of small areas can provide well-used shorebird habitat. During the time that observations were made on public lands, water was probably the limiting factor in shorebird distribution.

Rice fields and plowed-fallow fields provide shorebird habitat from late summer through early winter. Rolling or lightly discing rice fields tends to break down stubble, increasing their value to shorebirds. Flooding fields with about 5 cm of water is most beneficial to shorebirds, but deeper flooding is also beneficial if shallow-water edge habitat is associated with the flood regime.

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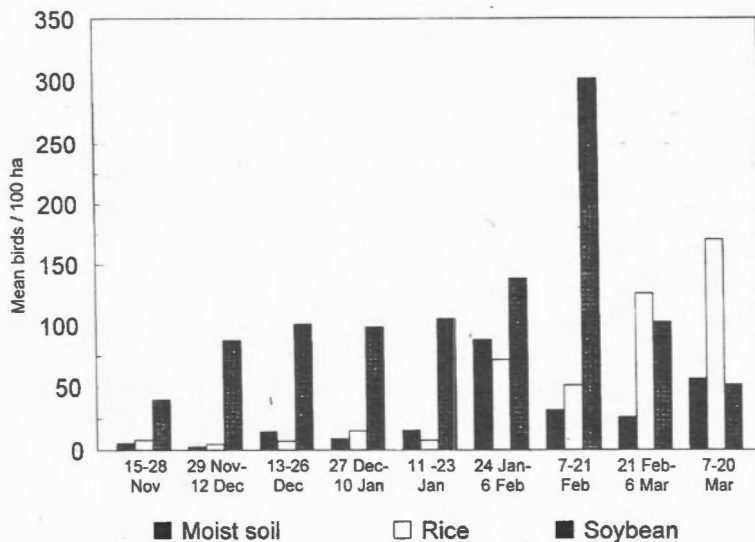


Figure. Mean shorebird density on randomly selected moist-soil, soybean, and rice fields in Arkansas and Mississippi in the winters of 1991-92 and 1992-93.