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Abstracts

## FEATURE ARTICLES

### WINTER SHOREBIRD COMMUNITIES AND TIDAL FLAT CHARACTERISTICS AT HUMBOLDT BAY, CALIFORNIA

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*Abstract.* We examined winter (November–January) shorebird use at 19 sites around Humboldt Bay, California, an important site for nonbreeding shorebirds. We analyzed species richness (number of species), species densities, and incidences (presence/absence) in relation to habitat characteristics (tidal flat width, channelization, standing water, timing of tidal ebb, and sediment particle size). We included site area in analyses of incidence, and site area and substrate heterogeneity in the species richness analysis. We observed a total of 19 species, 8–16 at individual sites, and this variation correlated with substrate heterogeneity. Substrate particle size correlated positively with Sanderling (*Calidris alba*) incidence and negatively with American Avocet (*Recurvirostra americana*) incidence. Amount of standing water correlated positively with Whimbrel (*Numenius phaeopus*) and negatively with dowitcher (*Limnodromus griseus* and *L. scolopaceus*) incidence. Width of tidal flat correlated negatively with Whimbrel incidence. Sites at which tides ebbed earliest had higher incidences of Whimbrel and Sanderling and higher densities of Long-billed Curlew (*Numenius americanus*), but lower yellowlegs (*Tringa melanoleuca* and *T. flavipes*) densities. The amount of channelization correlated positively with curlew densities. These habitat relationships suggest that alteration of tidal flats at Humboldt Bay and elsewhere in coastal habitats have the potential to adversely affect patterns of shorebird distribution.

*Key words:* bird-habitat relationships, Charadrii, habitat characteristics, Humboldt Bay, intertidal habitats, nonbreeding distribution, shorebirds