

Coastal Marsh Restoration Using Terraces to Increase Waterbird Diversity and Abundance in Louisiana's Chenier Plain

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Abstract: Various techniques are available to enhance wildlife quality in coastal wetlands. A new technique is terrace construction. Terraces are constructed by dredging shallow open water areas and piling the dredged material to form an exposed surface that are planted with wetland vegetation. Unlike spoil banks, which are continuous and rise above normal tides, terraces are discontinuous and flood at high tide. Constructing terraces gained popularity as a restoration and mitigation technique since the first terraces were constructed in 1993 on Sabine National Wildlife Refuge. Since then, terraces have been constructed in marsh ponds of coastal Louisiana and Texas to slow erosion of adjacent marsh as part of restoration and mitigation projects. Here we present the results of the first comparison of waterbird richness, waterbird density, and water quality between terraced and unterraced ponds. Waterbird and water quality data were collected from February 2005 to April 2006 in coastal marsh ponds of southwestern Louisiana where emergent vegetation was dominated by *Spartina patens*. Submerged aquatic vegetation (SAV) biomass and nekton density also were compared from February 2005 to September 2005. Terraces increased emergent edge habitat, but did not alter water quality variables that we measured (turbidity, salinity, conductivity, temperature, and depth). Waterbirds, SAV, and nekton were denser at the marsh edge than in open water habitats. Nekton and SAV did not differ significantly between ponds types at the whole pond scale, but waterbird density was greater in terraced ponds at the whole pond scale, and waterbird richness was greater at most times. During spring and summer, shorebirds, aerial foragers, and dabbling foragers were consistently denser in terraced ponds. Wading foragers generally were denser in terraced ponds. During winter, only dabbling and wading foragers were significantly denser in terraced ponds, but these two guilds represented 83% of all birds seen then. Bird density did not vary significantly with measured water quality variables, but did vary with the amount of available edge habitat. Terraces increase the density of SAV, nekton, and waterbirds, but those are secondary goals. The effects of terraces on marsh edge erosion, which they are intended to slow, remains unknown.

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