Nesting Habitat Availability for Cape Sable Seaside Sparrows as a Function of Everglades Water Depth

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The Cape Sable seaside sparrow (CSSS, Ammodramus maritima mirabilis), one of eight remaining subspecies of seaside sparrow, once ranged over freshwater and brackish marsh habitats in southern Florida. The current known distribution of this endangered sparrow is restricted to six separate subpopulation areas (A through F, fig. 1) in Everglades National Park (ENP). Changes in habitat and hydrology threaten the CSSS with extinction and efforts by regulatory and water-management agencies have had limited success in increasing populations. The sparrows build their nests on the ground and up to 17 centimeters (~7 inches) above the ground in mixed marl prairie communities. These short-hydroperiod prairies must remain mostly dry during the nesting season (roughly March 1 through July 15) to increase nesting success. Regulatory and water-management agencies have monitored water levels in nesting areas to simultaneously maintain adequate water depth in Everglades National Park and minimize flooding CSSS nesting areas. Previously, a single water-level gage was used to estimate water depths in one or more subpopulation areas. Recently, water-level gages used to assess water depths in CSSS habitats were discontinued due to reduction in funding levels. An alternative and improved method for assessing water depths was needed.

The Everglades Depth Estimation Network (EDEN) daily water-level and water-depth surfaces provide 400-square-meter gridded surfaces for the freshwater Everglades for the period 1991 to current (2015) (Telis and others, 2014; Conrads and others, 2014). An EDEN application was developed to use these surfaces to assess water levels and water depths in CSSS habitat on a real-time basis (fig. 2). An animated viewer shows the range of water depths and aerial statistics indicating percentages of flooded areas with water depths greater than nesting depths, and percent dry for the previous 40 and 90 consecutive days (fig. 3). Pop-up windows on the map provide gage information, historic water-level percentiles, real-time water levels, and links to EDEN gage pages and Explore and View EDEN (EVE) gage data (fig 4). The summary statistics tab provides compiled statistics on consecutive dry days during the nesting season (fig. 5) and non-consecutive hydroperiod during the calendar year. Wildlife-resource scientists can use this application to assess impacts on nesting success and develop management strategies for the future. Water-control managers can use these results to manage movement of water through water-control structures and, when possible, reduce flooding in these areas during the nesting season. This application of the EDEN water-level and water-depth data demonstrates how scientists and resource managers are using EDEN to analyze how water-management practices can affect vulnerable species in the Everglades.

References
