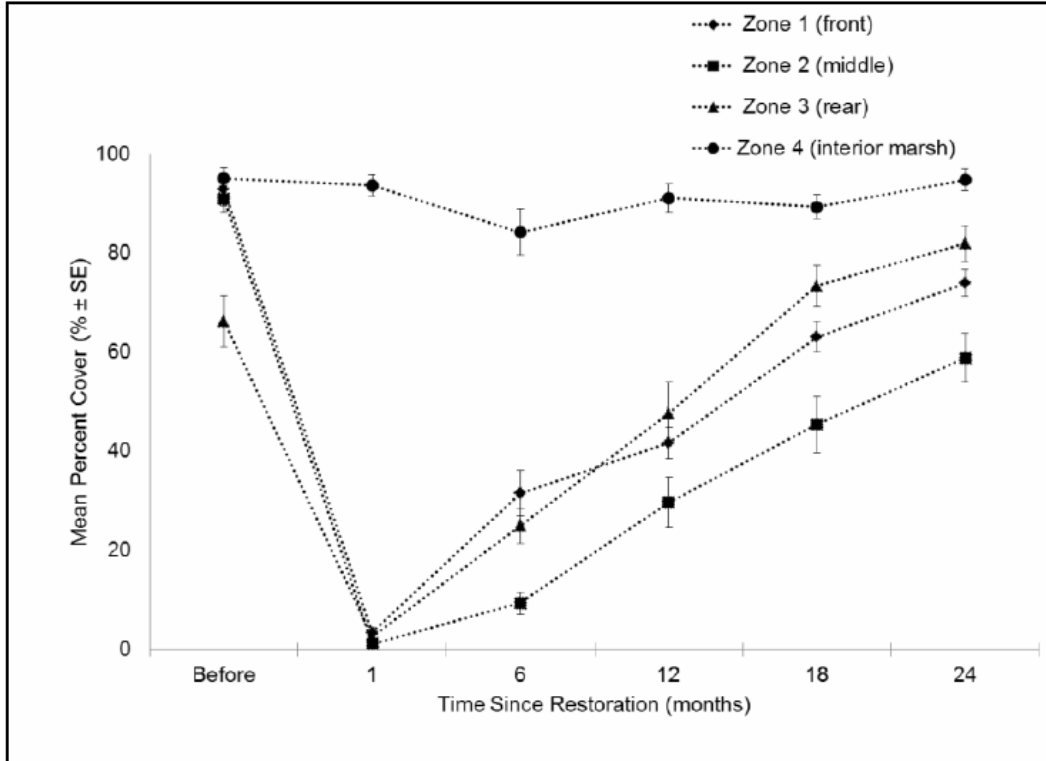


Effects on Vegetation, Fiddler Crabs and Birds

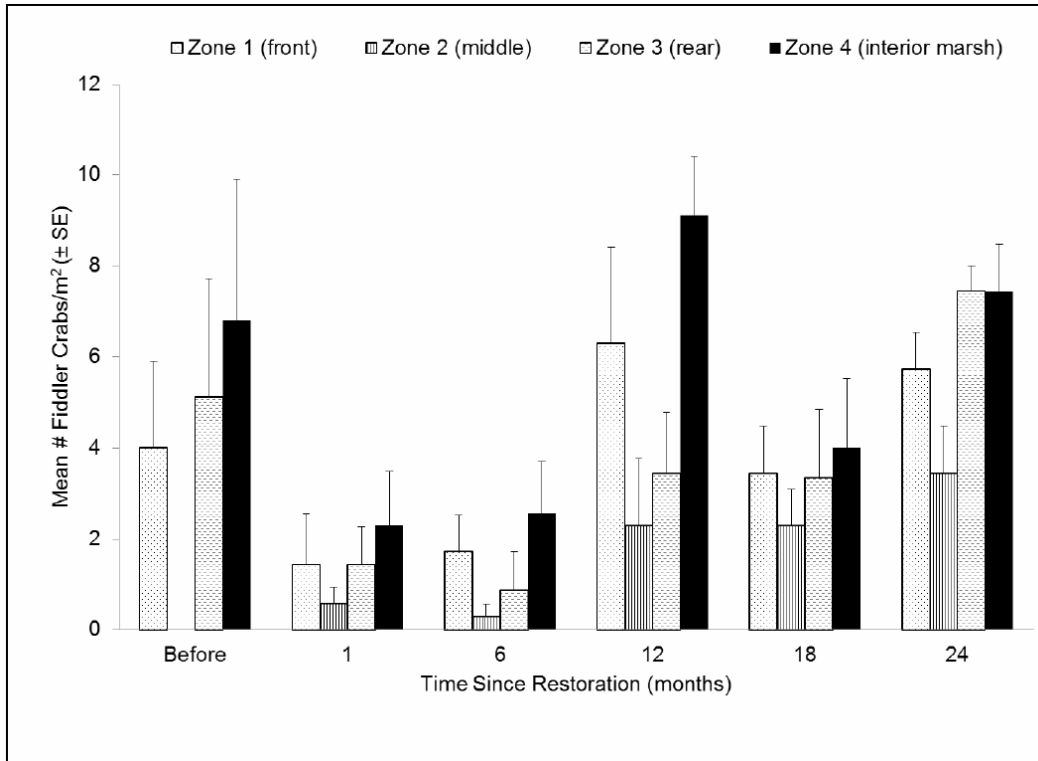
A key indicator of successful restoration is the plant community because we know that marsh plants provide energy and habitat for animals. Evidence of successful restoration comes from sampling of plants that characterized over 80 acres of restored wetland. Sampling at three restored sites (Zones 1-3) and one undisturbed site (Zone 4) showed that cover of plants rebounded within approximately 2 years (see figure below, Donnelly, M., Ph.D. dissertation, 2014, University of Central Florida).



Mean percent cover of native plants.

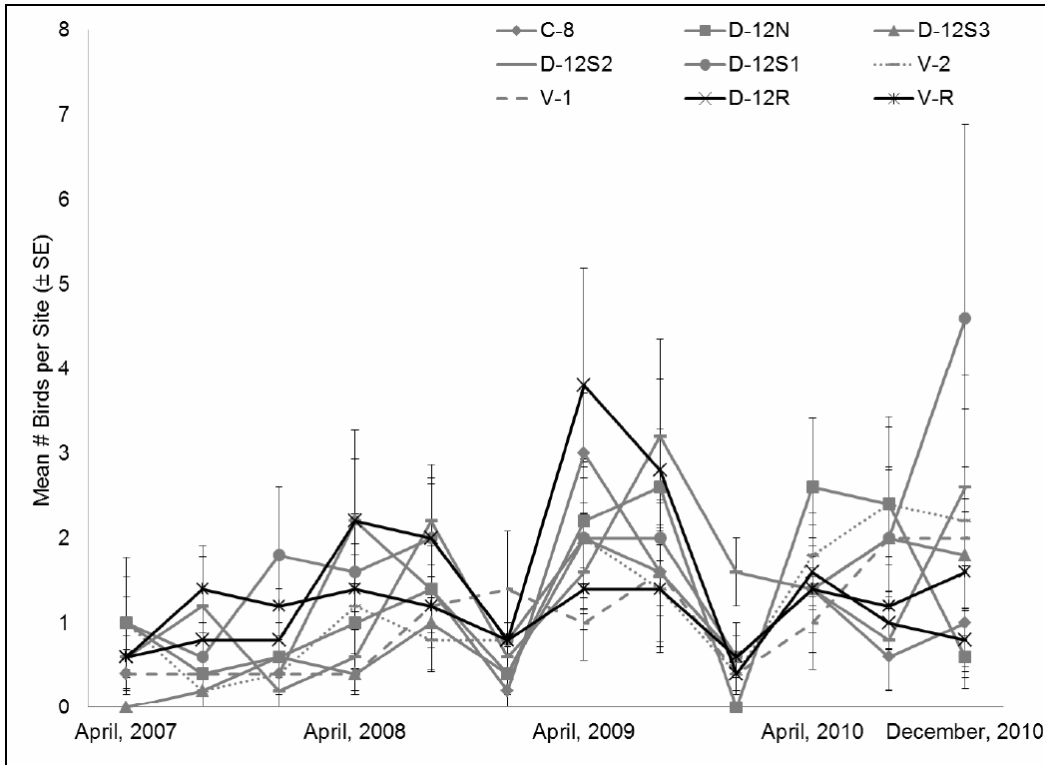
Zones 1, 2 and 3 were restored and Zone 4 is an untouched, natural wetland

Surveys of fiddler crabs in approximately 80 acres that were restored to wetland elevation (Zones 1, 2 and 3 in the figure below, Donnelly, M., Ph.D. dissertation, 2014, University of Central Florida) showed that their numbers remained similar to those in undisturbed areas (Zone 4) throughout restoration. Numbers on the highest ground (Zone 2 on the top of spoil) increased from zero before restoration to 3–4 crabs per square meter after 24 months because grading the area to the elevation of the surrounding wetland provided a better habitat for crabs.



Mean numbers of fiddler crabs per square meter (m^2 , approximately 11 square feet).

Standard visual surveys of birds at sites where approximately 80 acres were restored to wetland elevation showed that their numbers were not different at restored and nearby undisturbed reference sites (see figure below, Donnelly, M., Ph.D. dissertation, 2014, University of Central Florida). Again, restoring wetlands safeguards the resilience and improves the health and productivity of the system in the long term.



Mean numbers of birds \pm standard errors (SE).
 C-8, D-12N, D-12S3, D-12S2, D-12S1, V-2 and V-1 are restored areas,
 D-12R and V-R are undisturbed, reference areas

We also examined bird numbers near past restoration at a longer timescale, by accessing records submitted to eBird, an online reporting system managed by Cornell University (<https://ebird.org/home>). The Turtle Mound site in Canaveral National Seashore (L127379) was near past restoration, and it had records from before and after that activity. There have been 159 species recorded across all surveys, with 112 species recorded from 2008 to 2013 and 129 species recorded after restoration from 2013 to 2018. Seventy-nine species were sighted in both periods, which represents 70% or 61% of the totals, respectively. Thus, counts submitted by independent observers indicate that birds are not disturbed by restoration.