Process for Developing a Targeted and Climate Resilient Natural Resource Damage Restoration Project

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Background/Objectives. The natural resource damage (NRD) assessment process—from initiation of the assessment of damages to restoration implementation—frequently spans decades. Arguably, this pace was warranted in the early years of NRD practice when agencies and potentially responsible parties were defining and navigating the process. Now, however, reaching restoration implementation expeditiously is paramount. Habitat alteration due to climate change over the next 30 years is expected to be significant, especially for species with highly specialized habitat requirements. The NRD process is most efficient when injury assessment and restoration project development occur simultaneously. The objective of the NRD process is to scale the restoration project(s) to the injuries. Herein, we present an approach to identify a restoration project concept that incorporates both climate resiliency features for a particularly vulnerable species and elements that address multiple injury categories. Our approach is described through a case study of potential NRD injuries from historical releases in a coastal river with multiple fringe marshes. The potentially injured resources are the benthic community, fish, marsh birds, and recreational fishing.

Approach/Activities. Typical NRD restoration projects are developed through a generalized process of identifying ways to create, restore, or preserve habitat for injured resources. Instead, we focus on the resources' current stressors and seek ways to mitigate or eliminate them to improve the population's trajectory. While both methods may result in the same project, our latter approach offers more opportunity for creativity and efficiency. The phases of our restoration development process are 1) scoping likely NRD resource injuries, 2) identify non-chemical stressors to resources, 3) consulting literature and local and/or regional restoration plans that address mitigation of non-chemical stressors, 4) developing a list of restoration types or locations that address stressor(s), and 5) evaluating the feasibility of implementation opportunities.

In this case study, high-marsh nesting birds are present in the fringe marshes along the river and potentially being injured by chemical(s) present in the river. The primary non-chemical stressors are nest flooding, nest predation, habitat loss, and invasive wetland grasses. Since these high-marsh bird species build their nests in a narrow band of shallow water on the edges of marshes, they are particularly vulnerable to the sea level rise that is expected to accompany climate change over the next 30 years.

Results/Lessons Learned. The phases described in our approach result in the identification of a scalable, appropriate, and climate change-resilient restoration project. The project concept includes land acquisition to develop a buffer for marsh migration, in keeping with predicted sea level rise, thereby protecting the availability of high-marsh habitat for the imperiled high-marsh bird species. The benefits of a marsh migration buffer extend to benthic and fish communities as well. Other features of the project may include dredged material removal, invasive grass species removal, native species plantings, and improved recreational access opportunities. The final design of the project (e.g., number of parcels acquired, acres of marsh restored, size and type of recreational access) is flexible such that it can be scaled to compensate for the resource injuries identified.