

Climate-Smart Coastal Impoundments: Replacing Projected Lost Functions and Values

Protecting Coastal Impoundments and Associated Wildlife from Sea-Level Rise

The Mid-Atlantic region is an epicenter for sea-level rise, with local sea levels rising three to four times the global average. Consequently, Delaware is experiencing accelerated levels of sea-level rise that are threatening many of its rich coastal wildlife habitats. Of particular concern are coastal impoundments, which provide fresh and brackish water habitat for a wide array of shorebirds, waterbirds, waterfowl, and fish species. Recent assessments have shown these impoundments and their habitats to be highly vulnerable to sea-level rise, with a significant risk of them being destroyed through inundation or sustaining substantial structural damage. Loss of these impoundments, translates into increased climate change risk to the shorebirds, waterfowl, and other species that depend on these habitats.

To address these threats to coastal impoundments and the wildlife that depend on them, the National Wildlife Federation (NWF) is partnering with the Delaware Division of Fish and Wildlife (DFW), using funding from the Wildlife Conservation Society (WCS) through its Climate Adaptation Fund, established with support from the Doris Duke Charitable Foundation, on an innovative effort to shift key coastal habitats inland in the face of rapid sea-level rise. Two new coastal impoundments will be constructed, creating an 86-acre wetland complex, at the Ted Harvey Wildlife Area that are inland and upland of existing impoundments, and that will replace the habitat functions and values that are currently at risk and will be lost due to projected inundation of existing impoundments. This project is also an important component of the Delaware Bayshore Initiative, which is nationally recognized by the U.S. Department of Interior as an America's Great Outdoors landscape project.

Reconsidering Management Due to Sea-Level Rise

Recognizing the impacts that sea-level rise and more intense storms are having and will have on Delaware's coastal impoundments, DFW initiated a Structure Decision-Making (SDM) process to help them reconsider management objectives for coastal impoundments. Based on that process, several potential pilot projects were identified. NWF then partnered with the agency and other experts under a 2010 WCS Wildlife Action Opportunities Fund grant to move the pilot projects forward and develop specific guidance on how to make coastal impoundment management climate-smart. This project and its activities have been designed based on the results of the DFW-led SDM process and the NWF-lead climate smart guidance. The need for these types of adaptation measures was made even clearer recently at Prime Hook National Wildlife Refuge in Delaware, where significant acreage of coastal impoundment habitat was lost to open deep water habitat from sea-level rise induced inundation and breaching of a barrier dune system.

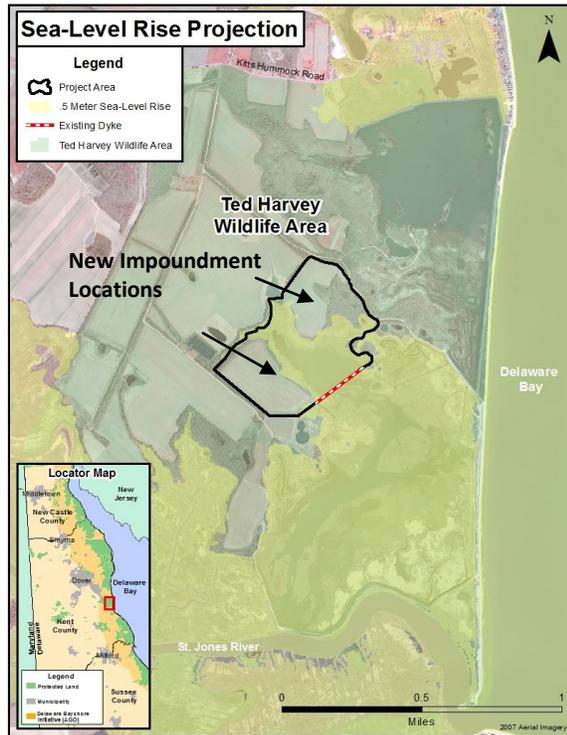


Photo Credit: USFWS

Prime Hook NWR Breach after Sandy 2012

How This Project Will Address Sea-Level Rise and Impacts from Storms

Traditional coastal impoundment management has focused on a range of objectives such as providing waterfowl habitat, maintaining roost habitat for selected shorebird species, providing foraging habitat for wading birds, invasive species control, and even mosquito control. While this project will integrate relevant species and habitat management objectives to maximize their functions and values, the entire design of the project and management of water levels will also take into consideration climate change impacts of sea-level rise and more intense storms.



This is relatively new to coastal impoundment management and will be important to those managing coastal impoundments up and down the East Coast.

Through this project, a new impoundment complex will be created upland of an existing coastal impoundment to replace the functions and values projected to be lost from sea-level rise. This project uses a sea-level rise projection of 0.5 meters of sea-level rise over the next 50 years. The 50-year projection is used, because 50 years doubles the lifespan of DFW's existing impoundments, and is a realistic timeframe to develop management and maintenance plans. However, the project also allows for the existing impoundment to convert partially to salt marsh to provide an additional buffer to the upland impoundment over time, as sea levels increase over 0.5 meters.

As noted above, building this upland impoundment complex will be critical as loss of existing impoundments will likely result in significant reduction of some bird species populations and may also result in extirpation of some breeding species from the state. This project is a proactive response to climate change impacts that will be a model for other agencies across the East Coast (e.g., the USFWS Refuge System maintains an estimated 52,480 acres of impoundments along the East Coast). NWF and DFW will share lessons-learned from this project with other managers, promote the integration of adaptation planning and on-the-ground implementation, and encourage similar management approaches at other coastal impoundments to ensure that these important coastal habitats continue to be available to support the East Coast's vast populations of migratory birds and other important species.



The upland agricultural field where the new impoundment will be constructed.



Example of how future fresh/brackish impoundment will look at the site.