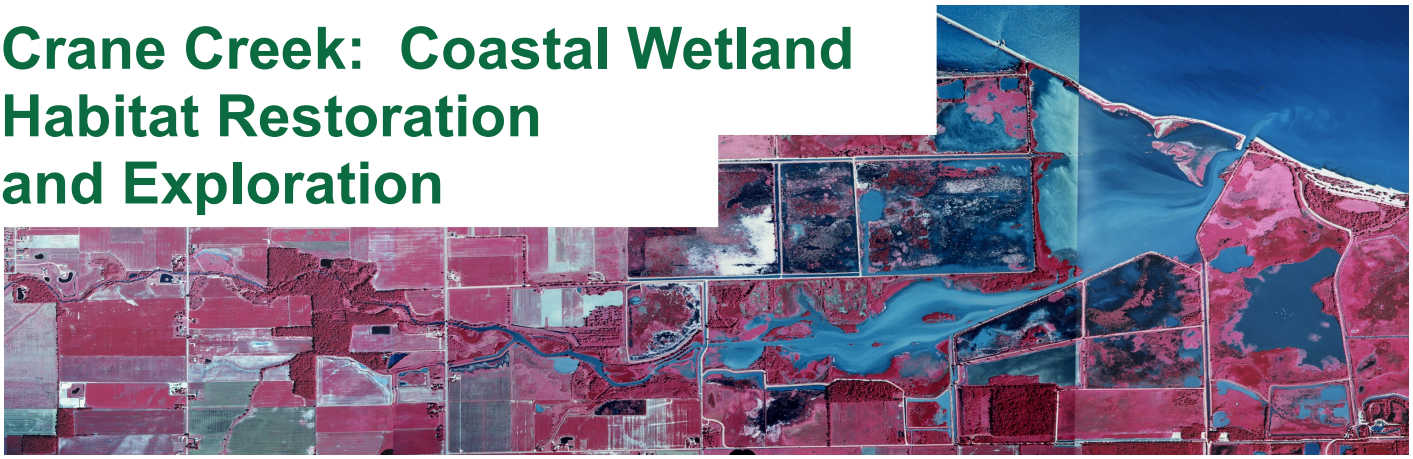
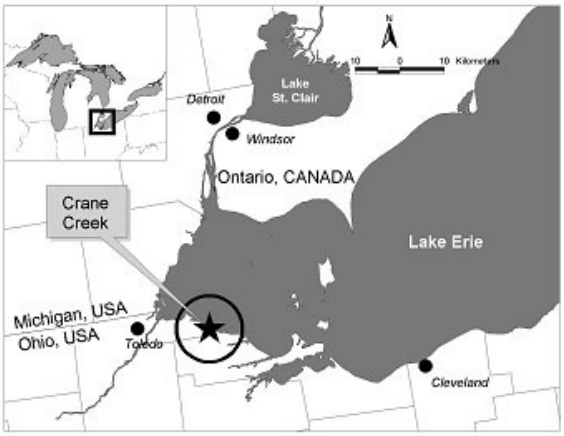
Great Lakes Science Center

Crane Creek: Coastal Wetland Habitat Restoration and Exploration



Historical Perspective

Over 95% of the original wetland habitat along the U.S. shoreline of western Lake Erie has been lost since the 1860s. Most of the remaining coastal



wetlands have been isolated by earthen dikes and no longer provide many of the functions of coastal wetlands (e.g., fish habitat). Unfortunately, most of the few remaining undiked wetlands are severely degraded. While these areas remain hydrologically connected to the lake, the wetland vegetation that provides vital fish habitat is sufficiently degraded to have a negative impact on the approximately 43 species of Great Lakes fishes that use wetland habitats. Invasive plant species and high water levels are continued threats to wetland plant assemblages.

Since historical descriptions of Crane Creek suggest a much broader expanse of wetlands than the 345 ha (852 ac) present in the Creek vicinity, diked and undiked wetlands in the complex are being examined to evaluate options for short- and long-term ecological restoration.

Role of USGS

By testing techniques to reestablish wetland vegetation and evaluating the potential for a hydrologic reconnection to the wetlands of this near-shore zone of Lake Erie, project managers are exploring new restoration methods that effectively add

critical fish and wildlife habitat to Lake Erie.

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Restoration of these wetlands also may create good habitat for struggling native clam populations. This project is located in the EPA Maumee River Area of Concern as identified through the Remedial Action Plan, addresses many of the high-priority research areas identified by the 1998 EPA Science Advisory Board report on marsh management, and restores critical coastal wetland habitat, identified as a special focus area in the Great Lakes Strategy and identified as a priority by the Council of Great Lakes Governors. Results of this project are of great value to local managers and will be applicable to similar wetland restorations basin-wide.

Restoration Efforts

New Strategy Lake Erie water levels are very dynamic. Short-term (e.g., 12 hr.) water-level fluctuations are common due to the shallow depth of the lake and wind forces. Wetland plants are adapted to and thrive in these conditions. Longer-term (annual) low water levels expose mudflats and allow plants to grow from seeds. This new growth is the fundamental basis for the overall reconstruction of habitat for aquatic plants and wildlife. To enhance this effect and test new potential methods for wetland restoration, scientists are creating conditions similar to a low water-level year by temporarily installing a portable cofferdam (AquaDam®) in a near-shore coastal section of Crane Creek. The dam creates a 1.8 -m (6-ft) tall barrier that hydrologically isolates a 10-ha (25-ac) section of the wetland. By drawing down levels in the enclosed section similar to what would occur naturally in a low water year, the seeds in the sediment have the opportunity to germinate and reestablish emergent vegetation. After maintaining moist soil conditions for two growing seasons, the dam will be removed, thereby reconnecting the marsh with Crane Creek and Lake Erie.

Hydrologic Evaluation

Crane Creek lies on the eastern-most edge of the former Great Black Swamp, a 121,400 ha (300,000 ac) expanse of swamp forest and coastal marsh stretching from eastern Indiana to Lake Erie. Since the last 150 years have seen nearly complete development of this area and high degrees of degradation to original wetland areas along the U.S. coast of Lake Erie, resource managers have used several unnatural methods to preserve the remaining habitat. Earthen dikes were built to protect vulnerable habitat from wave action and high water levels and to promote management for migratory birds. These dike complexes support wetlands and pools that are hydrologically isolated from Lake Erie and therefore do not perform many of the necessary ecological functions of natural coastal wetland ecosystems.

The second research component of this project is evaluating the potential to reestablish a hydrologic connection between these diked units with other wetland habitats, while maintaining the managers' ability to achieve management goals. Reestablishing a hydrologic connection would effectively return large plots of coastal wetland to Lake Erie, as well as make habitat available to fish and other aquatic wildlife that would otherwise be inaccessible.