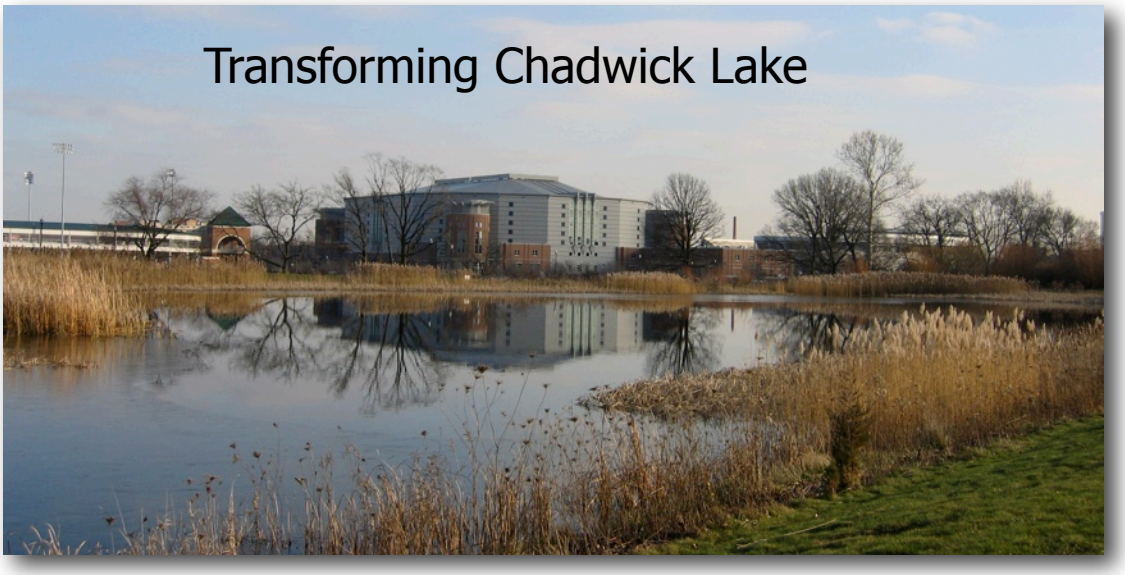
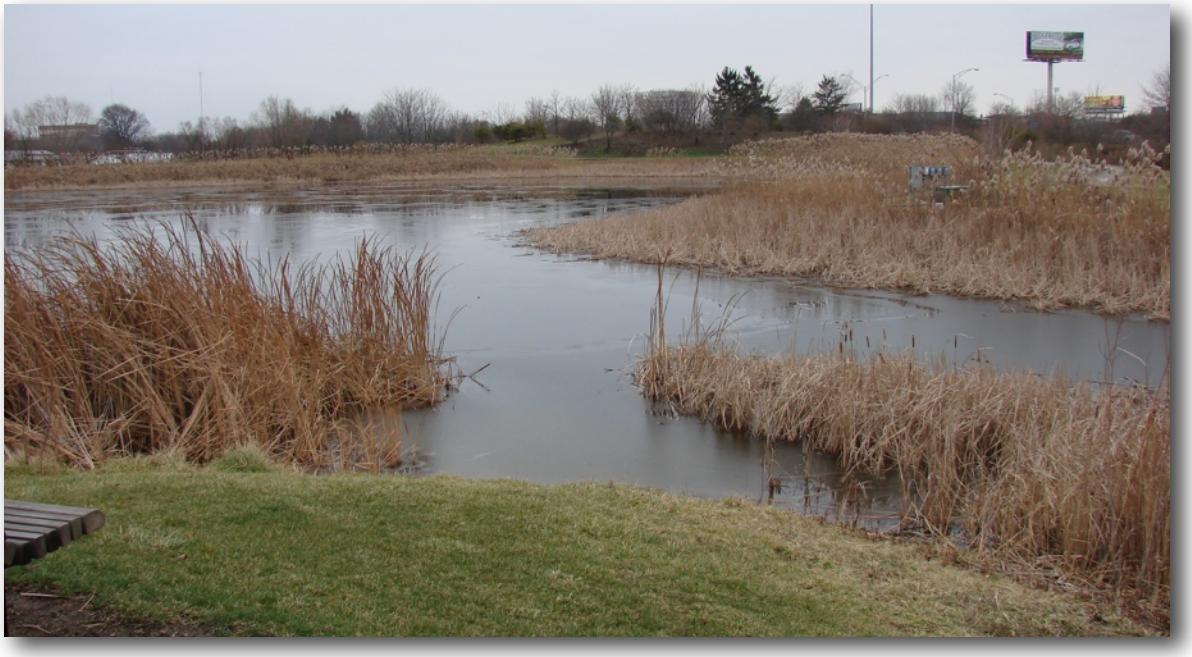
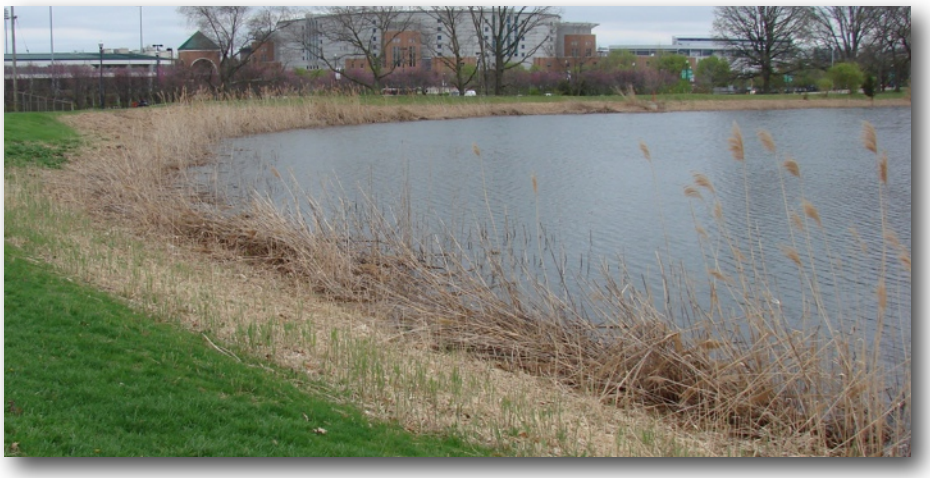


Chadwick Lake has been going through a process of renovation over the past two years. Management of the area began with a vision statement of producing an ecosystem comprised of native flora and fauna that will both provide both great ecological benefits and a vast array of aesthetically pleasing and recreationally driven activities. The outlined goals of the initial management plan were: remove invasive plants around the lake and from the surrounding terrestrial landscape, initiate a fish stocking regime that is conducive to maintaining high water quality and providing recreational opportunities prior to officially opening the lake for public fishing, and begin a native planting regime around the lake that will serve the dual purpose of combating and suppressing the homogenous plant community and begin to increase biodiversity



The targeted invasive plant in this case is phragmites (Phragmites australis) which has become an increasingly abundant and widespread threat to biodiversity across the United States. Its range is not affected by typical environmental conditions allowing it to establish from the tropics to the harsh tundra. Studies attempting to remove this plant are numerous, all with varying results. It is highly unlikely that phragmites will be removed from our national landscape, but the work I have been doing is proving that it can be controlled and removed from individual sites. Its range can be controlled and suppressed if managed properly.

The technique used for control of phragmites was herbicidal application followed by subsequent repetitions of cutting back dead growth. The plant was located both on the shoreline and in the lake, so aquatically safe, glyphosphate herbicides were used. The first few initial sprays are extremely important and must be planned and timed correctly. The goal is to wait until the plants are at their naturally most stressed state which is during extremely warm temperatures that occur during their growing season. The process is simple, cut the phragmites to the ground and allow them to grow to full height again. This process can be repeated of number of times initially. The purpose of this re-growth period is as the plant is growing it is depleting the energy stores it has in its rhizomes, which is the reason that phragmites respond very little to cutting alone. After the initial cutting and re-growth periods, the process of using herbicides begins. Herbicidal application entails cutting the phragmites to the ground or water level and applying herbicide immediately after the cut to allow the greatest transmission into the plants massive root systems. The most important component of this method of control is persistence. Initially, phragmites vigorously fought back and rapid growth and re-establishment were observed. This is expected due to the nature of this plant and is why perseverance is a necessity. As cutting and herbicidal treatment were repeated over a year, the phragmites continued to grow weaker and growth stunted to the point where they are barely capable of growing above the soil. If left unmanaged, they would re-establish themselves very frequently and quickly dominate the system again. To assure this is not the case, supplemental cutting and spraying has been utilized where any new growth occurs.



While phragmites removal was in progression, the lake was stocked with numerous species of fish that are common to recreational ponds. Stocking was done in late spring after water temperatures dropped below 65 degrees to ensure greater dissolved oxygen concentrations and decrease the risk of transport stress. 300 largemouth bass (Micropterus salmoides), 300 channel catfish (Ictalurus punctatus), 900 blue gill (Lepomis macrochirus), 350 redear sunfish (Leopomis microlophus), 100 yellow perch (Perca flavescens), 15 white amurs (Ctenopharygodon idella), and 3,500 fathead minnows (Pimephales promelas). Additionally, the OSU aquaculture lab released 15 to 20 tiger muskie (Esox spp.) in 1993, a few of which have survived and provide a great opportunity to catch a "trophy" to the unsuspecting angler. After assessment of emerged aquatic plant abundance, an additional 20 white amur were stocked to begin to decrease the excess vegetation. The growth rates of the fish have been phenomenal and fish are readily available in catchable sizes. The lake is open for public fishing under the condition that all fishing is catch and release only.

The next step in management was to establish native plants around the lake to improve diversity and continue to suppress any phragmites spread or growth. This is essential in fully eradicating an invasive plant of this magnitude. Over 300 plants have been established around the lake and represent the species: buttonbush (Cephalanthus occidentalis), soft-stem bulrush (Juncus effuses), wool grass (Scirpus cypernus), palm sedge (Carex muskingumensis), bearded sedge (Cyperus squarrosus), swamp milkweed (Asclepias incarnata), common milkweed (Asclepias syriaca), coreopsis (Coreopsis grandiflora), and Allegheny monkey flower (Mimulis ringens). Eight bald cypress (Taxodium distichum) were also established around the border of the lake.

Currently there is plenty of work to continue and invasive control is essentially a never ending battle for a number of years. Phragmites will continuously need to be monitored and treated whenever any new growth is observed. Fish populations will have to be assessed to address if there is any possible need for supplemental stocking or if populations have reached sufficient self efficiency. The newly planted vegetation will have to be assessed and decisions concerning additional plantings will have to be made. The lake is essentially in a period of recovery, time and continued management are the only way to see the results that will allow this site to truly become a valuable asset to the Chadwick Arboretum.

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Forestry Fisheries & Wildlife/Environment & Natural Resources