

The Token Creek Ecosystem Restoration Project

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The Token Creek watershed is a 27 square mile area that extends north to the Dane-Columbia County border, east to Sun Prairie, and south to Cherokee Marsh. Token Creek is the single largest source of water to Lake Mendota, flowing into the Yahara River through Cherokee Marsh. The headwaters of Token Creek are located at the Town of Windsor's Elmer and Edna Culver Springs Conservancy and consist of a series of several large springs and boils, with the creek meandering some 7 miles into the Dane County Token Creek Park. These are the largest natural springs in southern Wisconsin, and they discharge pure cold water at a flow rate of 3300 gallons per minute and, as such, provide an ideal habitat for brook trout if allowed to flow unimpeded. In 1861 Token Creek was dammed to power a grist mill to grind wheat for area farmers, and the mill was closed in 1945. The dam broke in 1994, and as a result of the dedication of many local and state wide stakeholders, the restoration project was planned, funded and partially executed. The extensive spring fed cold water base flow from this previously glaciated area made the Token Creek, with its many ecological, recreational and aesthetic values, a prime candidate for restoration. At one point the Army Corps of Engineers and the DNR jointly developed an extensive restoration plan, but the plan broke down due to a pullback in promised federal funds. The leaking dam and drained mill pond area was purchased using \$1 Million provided by the state, county and several environmental groups. Restoration of Token Creek continues today in part with the help of State of Wisconsin Inland trout stamp fees.

Planning for this project followed Ray White and Oscar Brynildson's Guidelines for Management of Trout Stream Habitat in Wisconsin (<http://digital.library.wisc.edu/1711.dl/EcoNatRes.DNRBull39>). This widely used manifesto establishes the essential collaboration of fisheries biologists, vegetation specialists, and stream geomorphologists for successful stream habitat improvement.

The initial stages of the Token Creek restoration project involved removing the dam from Token Creek to eliminate the fish barrier, and re-meandering the stream over a 5 year period to establish an active brook trout fishery. It is likely that German brown trout were a resident population in the grist mill days, as they are a species that does not require as much a cold water source than brook trout. The creation of the dam and mill pond destroyed the original meandering route of Token Creek, and the resultant sediment accumulation prevented the creek from returning to its pre-grist mill structure. The restoration project also funded work on re-directing the Token Creek headwater spring flow of Culver Springs from its impounded state to a free-flowing cascade into Token creek via re-shaping of existing berms. In 2004, numerous site visits were conducted by the DNR and others to evaluate dam removal options, channel reconstruction logistics, and placement of the essential sediment traps. The work also entailed an analysis of the spring melt and runoff breaching aspects of this portion of the watershed, an important issue to the quality of any trout habitat where deep water holes are essential to the aquatic ecosystem. Subsequently, breach of the spring ponds in Culver Springs took place after stabilization of the banks in order to direct the spring flow to Token Creek. In 2005, work began at Culver Springs to remove the pond berms around the springs and in 2006, the Culver Spring pond and embankment complex was rehabilitated through removal of existing pond berms. This has resulted in free flowing spring water discharge at the headwaters of Token Creek (see photos). The headwaters site was cleared of scrub trees and extensive undergrowth, and the banks were stabilized, seeded, and mulched. A 3000

cubic yard capacity silt trap was created within the Dane County Token Park in order to capture sediment that was mobilized from dam removal. Polymer stations were also established above the silt trap to act as stimuli for particle deposition within the trap. Pond sediments above the previous dam were about ten feet thick, consisting largely of silt and peat-like organic vegetative matter. In 2006 and 2007, the channel was dug to a depth of about five feet for a distance of a several hundred feet, with channel deepening that followed the newly formed meanders. The stream bed was dug down to the level of the glacial sand and gravel deposits now forming the bottom of the creek. This provides a home for insects and other aquatic life, re-establishing a food chain that was lost under the 5 feet of sediment. Also, new stream banks were sloped at a four to one ratio, seeded, and mulched (see photos of creek banks).

At this year's Annual Meeting of the Token Creek Watershed Association (TCWA) held on April 22, Scot Stewart, fisheries biologist from the WI DNR, reviewed the history of the restoration project and provided an update on recent activity. From a fisheries biology perspective, the restoration project has already been a success as there is a significant brook trout population that arose from 10 years of planting of fish hatchery brook trout brood stock. Brook trout spawn in the spring channels near the headwaters, and brook and German brown trout both feed on encased caddis fly larva and other insects that are now present in Token Creek. After the caddis fly egg hatches, the larvae cover themselves with sticky silk and encase themselves in sand, small rocks and sticks. Creek water temperature control remains crucial for the maintenance and continued expansion of the habitat and its flora and fauna. The sloping of banks, seeding, and mulching continue upstream from the original mill pond. Additional bank shrub and other vegetative growth will provide essential creek shade at and further upstream from the newly dredged portion of the creek. Storm water runoff and sediment control are key for the future of the Token Creek Watershed. Additional habitat restoration is important as well. In 2011, the County of Dane prepared a Master Plan for Token Creek County Park (http://danedocs.countyofdane.com/webdocs/pdf/lwr/parks/05_02_11DCPReport.pdf) (7 year horizon) that involves creek and habitat improvement and other park upgrades, citing an opportunity to "remove dredge ponds and narrow stream near entrance" to enhance this portion of Token Creek. Currently there is no open water access to Token Creek from Cherokee Marsh due to the dredge pond and the small diameter culverts present in the Park.

The Token Creek Watershed Association has worked with the Wisconsin Department of Natural Resources, Dane County and several municipalities in and around the surrounding area to remove dams and establish conservancies along Token Creek. This purchase of and repurposing of land is crucial for a suburban watershed that impacts the water quality of Lake Mendota and our other Madison area lakes. Further, these protected areas of Token Creek allowed for the restoration of its trout fishery habitat and German brown and brook trout populations. These extended protected areas throughout the Token Creek watershed also act as buffers to commercial development. Collaborative efforts like these by several environmental and other interested groups throughout the Madison area promote the value of the entire Madison Lakes watershed to landowners, other stakeholders and to the general public. Several organizations have contributed financial resources to the restoration project, and include the Wisconsin Dept. of Natural Resources, the Town of Windsor, the USDA Natural Resources Conservation

Service, the US Fish and Wildlife Service, Dane County, Trout Unlimited (Southern WI, Green Bay WI, and Oakbrook IL Chapters), Natural Heritage Land Trust, Dane County Conservation League, Madison Fishing Expo, Wisconsin River Alliance, Research Products Inc., Mr. John Hutchinson, National Fish and Wildlife Foundation, Partnership for Wildlife, Wildlife Forever, Token Creek Watershed Association, along with the many Wisconsin sports enthusiast via WI Inland Trout Stamp fees.

Photo 1.



Panoramic view of the headwaters of Token Creek at the Culver Conservancy. (Photo by Jim Krause)

Photo 2.



One of a series of boils and springs immediately south of the Token Creek headwaters, overlooking an extensive wetlands as viewed in spring prior to the new seasonal vegetative growth. (Photo by Jim Krause)

Photo 3.



Token Creek in 2015 above the original grist mill location. The picture on the left shows a portion of the restoration project where the creek banks were recently reconstructed and the picture on the right shows the native vegetative growth along the stream in a more mature area. The embankment shrubs and trees help to maintain the cold water habitat by allowing shade along this local meander. These areas are above and below the pedestrian bridge at the DNR Ponds entrance to the Token Creek Conservancy. (Photos by Jim Krause)