Plum Creek Riparian Corridor Survey 8/1/2005

A survey of the Plum Creek riparian corridor was conducted June 22nd through July 1st, 2005. The purpose of the survey is to begin to assess factors that affect the functionality of the watercourse, water quality, as well as the biological well-being of the riparian corridor that buffers the creek. The focused survey area currently stretches from Pyle South Amherst road on the west end of Oberlin to Roadside Park at State Route 511 on the east end of Oberlin. In the future the survey should expand to include several of the larger tributaries and ditches that flow into Plum Creek (i.e. the so-called Evans, Hill and Herrick ditches). This would give us further important information about the state of the riparian corridor and the greater Plum Creek watershed.

Survey Methods

The method used for collecting information and observations was walking in the creek bed along the watercourse within the study area. The focus of data collection thus far has been identifying all: bridge crossings; observable storm drains (both piped outlets and open ditches); log/debris jams and areas of heavy siltation and/or erosion; areas of heavy trash; and the general health and functionality of the riparian buffer zone, taking into consideration the width of the buffer zone and representative plant communities.

For each drain pipe and open ditch entering Plum Creek, a GPS point was collected, a digital photo taken, and a size and material description noted for each pipe. For all log/debris/silt jams observed in the creek bed, a GPS point was collected and a digital photo taken. Areas of heavy trash were noted by landmark reference for location. Representative plant communities along the riparian corridor were cataloged and noted by landmark reference for location.

This document should be referenced with the GPS map of the survey area.

Road/Pedestrian Bridges

A total of 27 bridges were identified in the survey. Of these, 10 are road crossings; 5 are public pedestrian crossings; 1 crossing on the bike path; 8 crossings are on the Oberlin golf course; and 1 is a private vehicle crossing (Oberlin Rd.).

Piped Outlets/Storm Ditches

A GPS point was collected, a digital photo taken, and a size and material description provided for every piped outlet observed entering Plum Creek along the surveyed section. GPS points and photos were also taken for all open ditches and tributary channels entering the creek bed along the surveyed section. This information can be layered with the existing aerial and property photos to determine ownership/responsibility for all drains (city, college, private, etc.).

74 piped outlets were located in the survey area. This figure includes all sizes and materials, from 4 inch diameter plastic pipes on private property to 4.5 foot diameter concrete city storm pipes. A margin of error is possible for not finding every pipe in areas where thick vegetation obscures a full view of the banks while walking in the creek bed. Notable among these areas is between the Vine Street and Park Street bridges, where the dense growth of Japanese Knotweed obscured view of the banks; other areas where this was an issue in surveying tended to be the unmanaged, wooded areas away from residential centers, east of Spring Street, where it is already less likely that there would be present-day drainage management.

15 open-ditch storm flood drains were located in the survey area. These include naturally eroded ditch drains, past piped outlets that have weathered and become open drains, as well as engineered culverts such as the one that enters Plum Creek on the west side of the west Morgan Street Reservoir. Also included in this number are two tributaries (so-called Evans ditch and Hill ditch) that, given time, warrant surveying as well, as both "ditches" drain fairly large areas that then enter into Plum Creek.

Log and Debris Jams/Erosion and Siltation

Log and debris jams are numerous along Plum Creek. 65 log and debris jams were observed in the survey area, though these vary greatly in the extent of their blockage of the watercourse—more than half of these sites were designated as jams because they may pose a future problem as they collect more debris. GPS point comments and photos taken will help locate the priority actions to be taken in clearing these jams. Further research and planning should categorize these debris jams as: 1.) useful as wildlife habitat; 2.) jams possibly problematic in the future; 3.) priority situations in which clearing jams would greatly improve normal creek flow, storm flow, etc. A priority list of the 10 most severe debris jams has been designated on the AutoCAD map of the survey area, denoted on the *Log and Debris Jams* layer with a lighter orange color.

Though there are many erosion and possible future erosion sites along Plum Creek, 8 particular sites were noted in the survey. Any actions to be taken at these sites can also be prioritized by photos and/or revisiting the site. Though categorized more explicitly

under another section heading, areas along the corridor with little or no riparian buffer zone pose the threat of current and future erosion. Several such sites are sections of the corridor that run through residential areas, where residents tend to mow much closer to the creek banks. Such human activities—and other natural processes of erosion—can increase the sediment load in the creek channel, which can begin to clog and slow creek flow, as well as negatively affect biotic life.

Trash/Yard Wastes

Trash is present to some extent in Plum Creek along the entire surveyed section of the corridor, but areas of heavy trash are concentrated and observable especially near all bridge crossings—both pedestrian and road crossings. Other places where trash appears in concentration are sections of the creek that course through the city parks (Wright Park, King Memorial Park, Spring St. Park, the bike path crossing between Spring St. and College St., Roadside Park) and trash that is caught in existing major log/debris jams. Any clean-up efforts would best begin in these areas. A good start may be to remove trash from the creek bed 50-100 yards on both sides of each bridge crossing, and to check all creek frontages in the city parks that have narrow buffer strips.

Another concern observed during the survey is yard wastes being dumped either directly into the creek bed, or within reach of the creek in flood stage. Yard wastes referred to are items such as grass clippings, leaves, twigs and branches, and other plant materials. There were 9 observed occurrences of yard wastes being dumped along the creek bank, and these were all along the creek behind private residences (one behind Morgan St., several behind Vine St., one behind College Park Manor, and the rest behind Shiperd Circle and Kimberly Circle). In the future, one way to involve the public on this and other concerns would be to mail a pamphlet with information on healthy riparian management to those residences that have property along the Plum Creek corridor.

Plant Communities and Buffer Zone

Land use in the riparian corridor along Plum Creek is varied in the survey area. The relative health and functionality of the riparian buffer zone can be determined, in a simplified manner, by considering the width of a strip of vegetative cover along the creek banks, as well as the type and variety of the representative plant communities. The function of a healthy riparian buffer zone is to hold the soil structure to minimize erosion, to slow the flow of water coming into the creek to reduce siltation, and to maximize the use of plant's ability to sequester chemical and nutrient run-off before it enters the waterway.

The riparian buffer zone through Oberlin varies greatly. The golf course is typified by having minimal or no buffer strip—grass is mown right up to the creek along most of the course, and water is piped directly into the creek. The same is generally true of most of the residential areas adjacent to Plum Creek—the buffer strips tend to be 5ft.-10ft. wide; and in some areas, again, lawns are mown up to the creek banks. This is true behind residences on Professor St., Vine St., Shiperd Circle, Kimberly Circle and Willowbrook.

The buffers are fair in the city parks (15ft.-30ft.), but are too narrowed (0-10ft.) along some sections (specifically Wright Park and one section at Roadside Park). The college field at the southwest corner of Morgan St. and Professor St. has several sections with minimal buffer. The bank next to the Professor St. Bridge has been cut bare of its plant cover. This bank was/is dominated by Ailanthus, or "Tree of Heaven", which is an invasive tree species. Though the root systems still hold the bank, the soil is left exposed and susceptible to erosion by heavy rains. That the invasive Ailanthus has been cleared may present an opportunity to reestablish the ground cover there with native species, or other less invasive naturalized plant communities. Ailanthus is a very aggressive colonizing species, however, and would require considerable effort to exhaust the root systems in preparation for replanting, and the hillside should not be left bare.

There are sections of the Plum Creek corridor that have very healthy buffer zones. Though these may be the subject of a separate report, they should be mentioned here for comparison. The arboretum at the Morgan St. reservoir typifies a mature forest riparian for this region of the country, and is of exceptional width within the city. Exceptional forested buffer also spans from the Spring St. Bridge to Shiperd Circle on the north side

of the creek, and from Spring St. all the way to Roadside Park on the south side of the creek.

The list of invasive plant species cataloged along the corridor during the survey is not a long list, but those exotic and invasive species that do occur are prevalent and dominate sections along Plum Creek. These species are (roughly in order of prevalence): Japanese Knotweed (*Polygonum cuspidatum*); Buckthorn (*Rhamnus sp.*); Privet (*Ligustrum sp.*); Garlic Mustard (*Alliaria petiolata*); Japanese Honeysuckle (*Lonicera japonica*); Multiflora Rose (*Rosa multiflora*); Ailanthus (*Ailanthus altissima*); Autumn Olive (*Elaeagnus umbellata*); English Ground Ivy (*Hedra sp.*); and Purple Loosestrife (*Lythrum salicaria*). Japanese Knotweed is the most dominant invasive species along the corridor. There is one small section of Knotweed behind the Morgan St. reservoir, and several more very small sections between the Morgan St. Bridge and Wright Park. Starting at the Vine St. Bridge (behind City Hall and the Police Station) Japanese Knotweed effectively takes over, and then dominates the banks all the way east to Roadside Park. Again, planning to remove Japanese Knotweed and introduce native species would likely be a several year process of exhausting the root systems with mowing (and perhaps other interventions that will be researched) before trying to establish any native plant communities. Again, it is never advisable to leave ground bare during the transition.

It is extremely important to understand what a problem Purple Loosestrife (*Lythrum sp.*) can become, and to work quickly to eradicate it. It is an extremely adaptable and aggressive invasive. Fortunately, in the survey area, only two small areas of Loosestrife plants were found. This Loosestrife was able to be pulled out just before it went to seed, and the flower heads and plant material were bagged and sent to sanitary landfill—this is a proper disposal method to minimize the risk of spreading seed. This method only makes sense for smaller occurrences of this and other plant species, and would not be a realistic approach for dealing with large areas of an invasive species. These areas of Purple Loosestrife were/are located by the Vine St. Bridge and in the drainage swale along the bike path behind the Oberlin Early Childhood Center. It is very likely that the Vine St. Bridge Loosestrife is correlated with being next to the flower shop—Loosestrife is often used in flower arrangements, and the seed could have come in this way. A revealing follow-up will be to inquire whether the flower shop has used loosestrife in the past. The area of Loosestrife in the drainage swale along the bike path will be very important to monitor and keep suppressed. Drainage ditches are ideal habitat corridors for loosestrife to travel into watercourses and cross watershed boundaries.

The issue of invasive plant species along the Plum Creek corridor is very present and multi-faceted. Though native plant communities are much more desirable and something to work toward, there are sections along the creek corridor where invasive species have taken over, and are now the only plants providing necessary functions like bank stabilization, slowing runoff and filtering pollutants. The key will be to balance the need for an intact buffer at all times with the ideal of planning for an improved buffer that is, in all cases, wider and comprised of a denser plant cover of native species.

Addressing Problems and Further Assessment

The survey of the Plum Creek riparian corridor within the city limits of Oberlin is producing useful information about where and how water flows into the creek, where debris jams are causing flooding and water flow issues, where thrash items in the creek are the biggest nuisance, where the buffer zone is minimal and its function is compromised, and getting a sense of the representative plant communities and where invasive species are out-competing healthy plant diversity along the corridor. These are all issues to be considered. Planning for and prioritizing these considerations will remain a central focus throughout the course of the Riparian Corridor Project.

Given time and resources, the project could benefit from expanding the survey area to include the Evans, Hill and Herrick ditches, as these are sizable tributaries to Plum Creek. As the Riparian Corridor Project and this document are works in progress, comments and suggestions are essential.