

3.0 VALLEY WOODS WETLAND RESTORATION PROJECT

3.1 INTRODUCTION

The Valley Woods Wetland Restoration Project, located in Southfield, Michigan, is part of a larger project titled, “Transforming the Rouge AOC from Mowed Down to Grown Up,” (*Transforming the Rouge*) which restored and installed native areas in the City of Detroit and Wayne County Parks. The project was funded by a Great Lakes Restoration Initiative (GLRI) Grant to the Alliance of Rouge Communities (ARC) in 2010. The City of Southfield provided matching funds to pay for the project design. This phase of the project consisted of the design, permitting, development of construction documents and construction of the Valley Woods Wetland Restoration Project.



Valley Woods Wetland prior to project implementation – February, 2011

Prior to implementation of the project the site consisted of large phragmite communities and a monoculture of reed canary grass. Additionally, three existing ditches had formed as a result of erosive storm water forces, which were affecting the wetland's hydrology, as well as discharging sediment into the Rouge River. The main goal of the project was to restore the Valley Woods Wetlands by removing invasive species, reintroducing plant diversity and restoring wetland hydrology. This was achieved through the following activities:

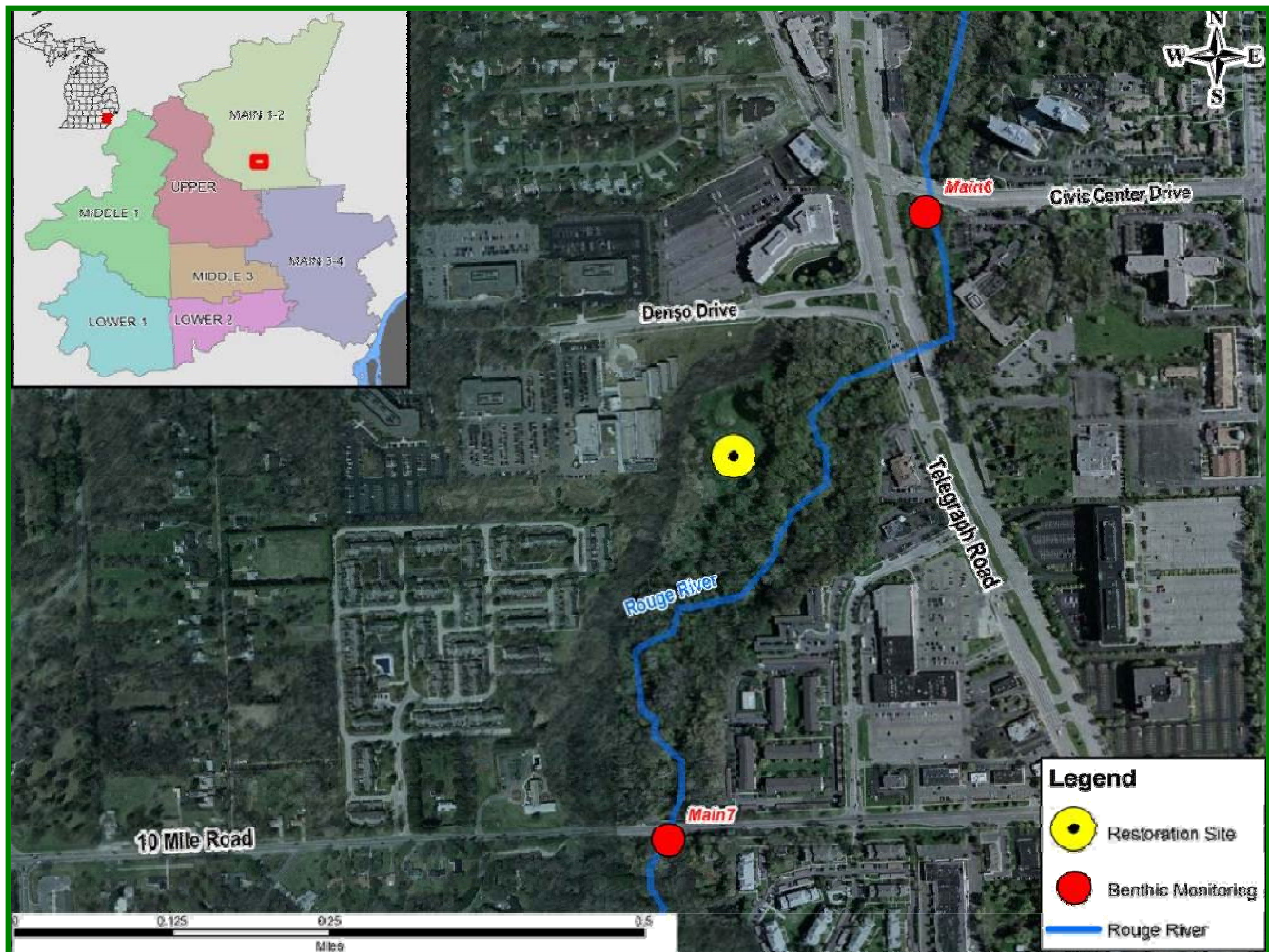
- The phragmite communities were chemically treated and partially excavated.
- The open wetland area was burned and re-vegetated.
- Two ditches in the south west area of the site were filled and their outlets were stabilized with riprap.
- Two segments of a storm water outfall ditch in the northeast area of the site were filled to slow erosive velocities.

All of these tasks were completed with the main objective of creating and improving habitat and increasing the water quality in the river while making progress toward eliminating the Benthos and Fish and Wildlife Habitat Beneficial Use Impairments (BUIs) for the Rouge River Area of Concern (AOC). The project also aimed to fulfill local and subwatershed goals by improving the quality of the ecosystem and restoring approximately seven acres of vital wetland habitat.

3.2 PROJECT LOCATION

The project is located within the City of Southfield and is bounded by Denso Drive on the north, Telegraph Road on the east, commercial and residential development on the west, and the Rouge River on the south and southeast and is shown in Figure 3-1. This portion is located in the Rouge River Main 1-2 Subwatershed. Prior to project implementation, the existing wetland was in need of corrective measures to restore the plant diversity and hydrology. A monoculture of reed canary grass governed the site with large communities of phragmites.

Figure 3-1: Project Location Map



3.3 PROJECT IMPLEMENTATION

As indicated above, the proposed project activities included:

- Chemically treating and excavating the phragmites.
- Conducting a prescribed burn in the open wetland area and re-vegetating.
- Filling of two ditches in the south west area of the site and
- Filling two segments of a storm water outfall ditch in the northeast area of the site to slow erosive velocities

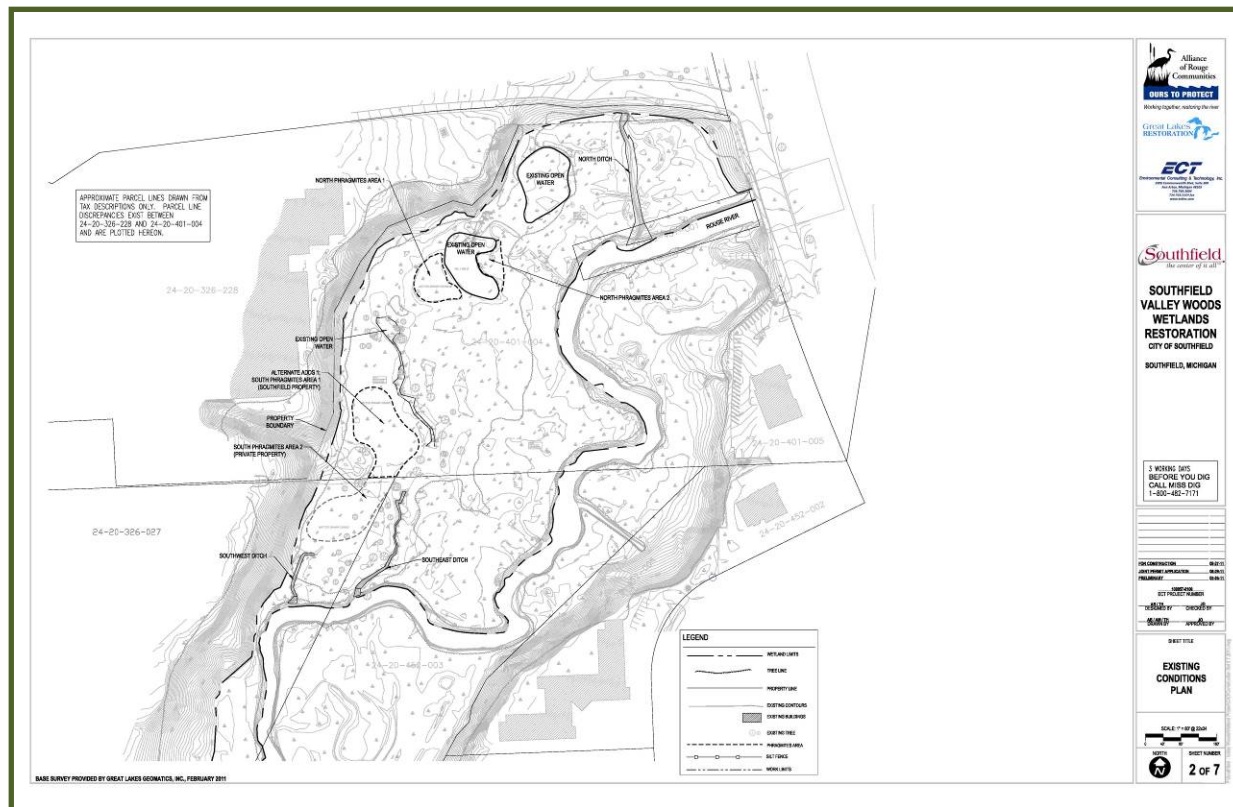
After the grant was awarded in late September, 2010, a Quality Assurance Project Plan (QAPP) was developed for the project. Once that was approved, project implementation began with field reconnaissance and data collection.

3.4 DATA COLLECTION

In February, 2011 a topographic survey of the project area was conducted by a registered land surveyor. ECT visited the site to observe the site and document the location of important features such as the eroded ditches and phragmites stands. The information that ECT collected was added to the

topographical survey base map shown in Figure 3-2. The resulting existing conditions plan played a critical role in the design and development of the contract documents.

Figure 3-2: Existing Conditions Plan from Contract Documents



3.5 DESIGN (FEBRUARY-JUNE, 2011)

Once the data collection was complete, the project design began. The design was paid for by the City of Southfield as matching funds for this grant. The purpose of the project was to restore the Valley Woods Wetlands through the removal of invasive species and restoration of plant diversity and wetland hydrology. To accomplish this, the following activities were proposed:

- *Phragmites Removal*: The phragmites communities were to be chemically treated and partially excavated.
- *Prescribed Burn and Re-vegetation*: The open wetland area was to be burned and re-vegetated.
- *Hydrology*: Two ditches in the south west area of the site were to be filled and their outlets were stabilized with riprap.
- *Erosion Reduction*: Two segments of an outfall ditch in the northeast area of the site were to be filled to slow erosive velocities.

Additionally, temporary construction access would need to be established through the wetland to conduct the proposed work.

3.5.1 PHRAGMITES REMOVAL

The extent of phragmites stands was determined during data collection. Three communities were identified. Based on the amount of phragmites stands and funding available, the areas for treatment

and excavation were determined: the two northern communities were proposed to be chemically treated and excavated. The southern community was proposed to be chemically treated, but not excavated.

It was determined that the areas designated for phragmites control would be treated with a mixture of the active ingredients imazomox and glyphosate in the late summer or fall of 2011. Clearcast herbicide (active ingredient: Imazomox-12.1%) at a rate of 64 oz per acre was proposed to be combined with a 1% solution of AquaPro herbicide (active ingredient: glyphosate-53.8%) and then applied to phragmites foliage at maximum leaf elongation. A non-ionic surfactant (Cygnet Plus) was proposed to be tank mixed at a rate of 1.0 oz of surfactant per gallon of solution to improve herbicide coverage, penetration of the cuticle and entry into foliage. A tracer dye was proposed to be mixed with each tank of solution to allow visible confirmation of uniform and complete herbicide coverage.

This method was chosen due to the understanding that field trials have demonstrated that imazamox in combination with glyphosate provides more effective control than does glyphosate alone. Imazamox has short- term soil residual activity that is only significant for approximately three weeks. Treating with imazamox in the fall of 2011 was expected to provide a greater level of phragmites control without posing a damage risk to native plantings introduced the following spring. Using glyphosate in spring of 2012 was expected to allow for safe plantings of native species seven days after treatment.

After the two herbicide applications were completed (fall 2011 and spring 2012), minor re-growth of phragmites was considered to be still possible. Hand treatment of phragmites re-growth in planting areas was assumed to be an important part of the treatment strategy in this project. It was proposed that these treatments use glyphosate, adjuvant and tracer dye only and was assumed to be accomplished on foot with small back-pack sprayers, hand sprayers, or hand wicking equipment.

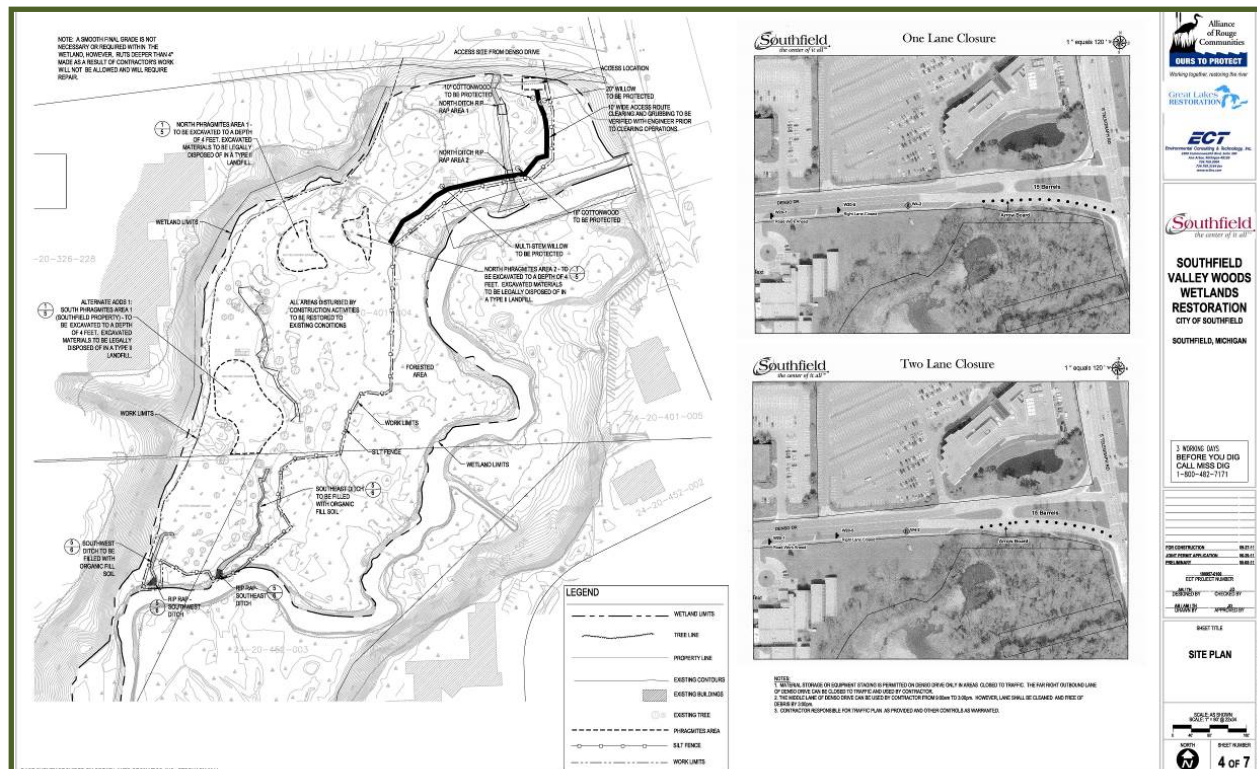
Pockets of open water were proposed to be created to increase habitat diversity in areas originally containing mature and dense aggregations of phragmites. This would be accomplished by excavation of areas some of which to create open water habitat post herbicide application. Excavation to a depth of four feet will eliminate the majority of the root zone and inhibit re-sprouting of phragmites in the newly created open water habitat.

3.5.2 PRESCRIBED BURN AND RE-VEGETATION

Prior to project implementation, the wetland area was dominated by reed canary grass and phragmites and it was proposed that restoration efforts incorporate management tools to remove thatch build up from invasive plant material and liberate the remaining native seed bank. Therefore, a controlled burn was proposed to provide optimum conditions for the establishment and restoration of native wetland vegetation. The proposed controlled burn was planned in accordance with methods outlined in a guidance document developed by the Michigan Department of Natural Resources (MDNR), Michigan Department of Environmental Quality (MDEQ), U.S. Army Corps of Engineers (USACE) and others titled *A Guide to the Control and Management of Invasive Phragmites, Second Edition, 2010* and routinely implemented by DNR wildlife biologists in the control of phragmites within Lake St. Clair coastal wetlands. The document specifically sets forth the implementation of controlled burns post herbicide application in July through August or January through March of the following year. Prior to conducting the burn, ARC staff and the City of Southfield developed the burn plan, obtained the necessary burn permit from the local Fire Marshall, notified all necessary parties immediately prior to the burn and prepared burn breaks as needed around the burn unit(s). The controlled burn was proposed to be during March or April of 2012. The timing of the burn was planned to reduce potential impacts to

During the site investigation, potential access route locations were determined and are shown in Figure 3-4. The proposed route was selected to avoid steep slopes, removal of large trees and to avoid large wetland or vernal pool areas within the floodplain.

Figure 3-4: Site Plan Access Route Construction Drawings



3.6 PERMITTING

With the design elements completed, a MDEQ/USACE Joint Permit Application was submitted in June, 2011. The permit was issued in September, 2011.

In addition to the MDEQ/USACE Joint Permit, a burn permit was required from the City of Southfield Fire Marshall. Also, an aquatic nuisance control permit was required for the chemical treatment of the phragmites.

3.7 BIDDING AND CONTRACTOR SELECTION

The ARC entered into an Inter-Agency Agreement (IAA) with the City of Southfield, an ARC member community, to contract for the construction activities associated with the implementation.

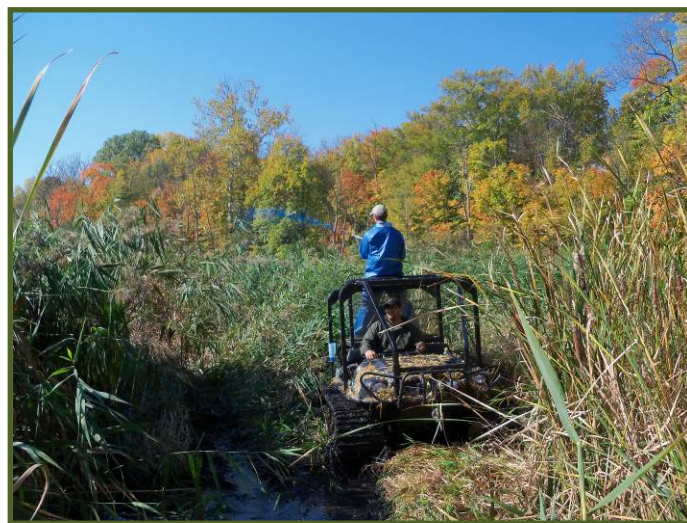
After receipt of the MDEQ/USACE Joint Permit, ECT worked with the City of Southfield to finalize the contract documents. At this point, the project was separated into elements that ECT would complete and elements that would be included in the contract documents to be bid. ECT would conduct the chemical treatment of the phragmites as well as the prescribed burn. All other work was included in the contract documents and bid out. The project was released for bidding in October, 2011, with a mandatory pre-bid conference on October 27, 2011. Bids were due on November 9, 2011. After bids were received, a bid tab was developed and reviewed and the lowest bidder's references were checked.

ECT then issued a contractor recommendation letter to the City. The City of Southfield awarded the contract to Inland Lakes Landscaping Corporation.

3.8 CONSTRUCTION AND CONSTRUCTION OVERSIGHT

While the bidding process was getting started, ECT was onsite October 5-6 2011, to conduct the initial chemical treatment of the phragmites.

Inland Lakes Landscaping Corporation, the selected contractor, began to mobilize on January 3, 2012. Shortly after mobilization the construction fence, soil erosion and sediment controls were installed, as well as the project sign. Site access was established soon after mobilization. The construction work and construction oversight proceeded as follows:



October 6, 2011- Chemical Treatment of Phragmites

3.8.1 JANUARY- MARCH, 2012

In January, the areas of excavation were staked by the contractor and checked by ECT staff. Excavation began in late January and continued through February and March. The most desirable condition for the excavation was below freezing and dry. Throughout the months of January and February there were stretches of days above freezing and raining. Therefore, the excavation work was delayed periodically until cold and dry weather returned. Excavation was complete by the end of March.



Project Sign



Access Point at Denso Drive



Excavating



Excavated material



Excavating



Staging area



Access route near excavation work area



March 29, 2012 – Open water area after excavation completion view from east side of open water, looking west

April, 2012 - On April 6, 2012, the prescribed burn was conducted on the open wetland area.



May, 2012- In early May, herbicide was applied to grasses establishing after burn.

June, 2012- Plugs were delivered to the site on June 13, 2012. Planting began on June 18, 2012 and continued through the end of June. The water in the existing open water area and the existing ditches was pumped as needed and used for irrigation for the newly installed plants.



Plug plants staged near access route



Planting



Newly planted plugs



Plants being transported from staging area to planting zone



Planting



Generator for pump being used for irrigation



Sprinkler

On June 26, 2012 the western south ditch was filled. First the portion of the ditch to receive the riprap was excavated to remove existing organic material and debris. Geotextile fabric was placed in this area. Riprap was placed over the geotextile fabric. Finally, field stone was placed, at an approximately one- foot thickness, on top of the riprap. With the rock in place, the rest of the ditch was filled with soil.



Western south ditch being prepared for plugging



Geotextile fabric lining ditch



Riprap placed in ditch



Field stone at west ditch

The eastern south ditch was filled on June 28, 2012.



Fill at east ditch



East ditch, fill being smoothed, field stone in place

July, 2012- The plug planting was completed by July 6, 2012. The trees were planted and the access route was restored. A final walk through was held on July 30, 2012.

With the plugging of the ditches completed, it was observed that the hydrology was improved in much of the wetland.



July 6 – south end of wetland, just north of plugged ditches



July 6 – south end of wetland, just north of plugged ditches



Newly installed trees in access route



July 30 – south end of wetland, view looking north



July 30 – walk through

September, 2012- On September 28, 2012, another chemical treatment was completed.

3.9 GRANT ADMINISTRATION AND CLOSEOUT

Throughout the project, the ARC completed status reports and other documentation required by the agency. This document is the final report and was completed under this task.

3.10 RESULTS

The primary goal of this project was to restore the Valley Woods Wetlands by removing invasive species, reintroducing plant diversity and restoring wetland hydrology. This project aimed to support the delisting of the AOC's Benthos and Fish and Wildlife Habitat BUIs. This was achieved through the following activities:

- The phragmites communities were chemically treated and partially excavated.
- The open wetland area was burned and re-vegetated.
- Two ditches in the south west area of the site were filled and their outlets were stabilized with riprap.
- Two segments of a storm water outfall ditch in the northeast area of the site was filled to slow erosive velocities.

The projected outputs were:

- Restore seven acres of wetland habitat

The project restored seven acres of wetland through the implementation of this project.

Aside from the project outputs, one outcome of the implementation of the Valley Woods Wetlands Restoration Project was that it made progress toward eliminating the Benthos and Fish and Wildlife BUIs for the AOC.

The project also fulfilled local and subwatershed goals by improving the quality of the ecosystem and restoring habitat for fish and terrestrial wildlife. This project also fulfilled the following Rouge River Main 1-2 Subwatershed objectives: (1) Minimize the amount of soil erosion and sedimentation; (2) Improve and maintain the river ecosystem for wildlife, and (3) Restore/maintain aesthetically appealing conditions.



Chemical Treatment



Restored Wetland

3.10.1 MEASURING RESULTS

The measurement of progress as it relates to the project outputs was based on successful completion of the construction project. As discussed above, the project outputs were:

- Seven acres of restored wetland habitat

After construction was completed in the fall of 2012, the project was visited on occasion and vegetation establishment and wildlife usage was noted.

Pre and post- Benthic Macroinvertebrate Monitoring results are discussed in Section 5.0 of this report.

Vegetation Establishment

During our visits, it was observed that the cover crop (wild seed oats) and planted plugs were growing fairly consistently throughout the restored area. All planted vegetation will continue to be monitored throughout the warranty period, which will end in the fall of 2013.

Wildlife Usage

After project completion, and even during construction, wildlife usage of the project site was evident. Whitetail deer, great blue herons and coyotes have been observed. Small mammal tracks have been observed. Frogs and toad have also been observed. Wildlife usage will increase as the vegetation grows and matures. The following photographs of whitetail deer and a great blue heron document some of the wildlife use observed.



Whitetail deer



Great blue heron