

Southwest Michigan Land Conservancy
Paw Paw River Watershed Project

Overview/Scope of Work

In early 2006, the Southwest Michigan Land Conservancy (SWMLC) was contracted by the Southwest Michigan Planning Commission (SWMPC) under the authority of the Michigan Department of Environmental Quality (MDEQ) to initiate educational outreach for landowners within the Paw Paw River Watershed in pursuit of private land conservation objectives. SWMLC assembled a land protection subcommittee and started developing criteria for a geographic information systems (GIS) model that would identify priority areas for land protection in the Paw Paw River Watershed (PPRW). Properties that exhibited high conservation values, based on the existence of natural resources that sustain the functionality of the PPRW, were then targeted for the educational outreach program. SWMLC held several educational workshops in 2007 and drew approximately 150 interested landowners. Using the model as a guide, SWMLC will continue outreach efforts and will pursue leads with the goal of protecting valuable lands within the watershed in perpetuity.

Background

The Paw Paw River Watershed encompasses 400 square miles and has been identified by the MDEQ as one of the most ecologically diverse areas in all of southern Michigan. In addition, it is home to at least five known federally endangered plant and animal species. SWMLC focused its efforts on the identification of land parcels containing ecologically significant riparian habitat -- the forested wetlands, prairie fens, marshes and swamps that provide valuable habitat and ensure the continuation of a viable watershed ecosystem.

Land Protection Subcommittee Work

A group of citizen volunteers, government officials, and regional experts was asked to assist SWMLC in formulating a list of criteria, based on property attributes, to use in the development of a GIS model. Over the course of the last two years, twelve meetings were held with the Land Protection Subcommittee to coordinate the model, develop and distribute outreach materials, and engage citizens in the pursuit of PPRW objectives during educational workshops. The subcommittee played a major role in the identification of sites within the watershed in need of priority consideration and the development of detailed criteria that would enable the model to be a success. Participants on the subcommittee included:

Gaye Blind, Berrien County Conservation District
Tom Cross, City of Lawrence Planning Commission
Dave Foerster, Van Buren County Farmland
Preservation Board
Kevin Haight, Van Buren citizen, SWMLC volunteer
Chuck Nelson & Mindy Walker, Sarett Nature Center
Connie Selles, Van Buren County Planning Board
Matt Meersman, Southwest Michigan Planning
Commission
Marcy Colclough, Southwest Michigan Planning
Commission

Don Main, Van Buren County citizen
Sue Devries, The Nature Conservancy
Kelly Getman-Disette, Michigan State University
Extension
Gary Stock, Van Buren County citizen
Dick Schinkel, Berrien County Parks Board
Doug Stiles, Almena Township Supervisor
Peter Ter Louw, Southwest Michigan Land
Conservancy
Peter DeBoer, Southwest Michigan Land Conservancy

Priority Conservation Areas GIS Model

The model itself contains 5 “priority” tiers based on conservation value. In total, 104 quarter acre by quarter acre units (Q-Q’s) were identified as highest priority. The model was constructed by adding numerical ratings for a number of different conservation criteria to each quarter-quarter section (Q-Q) in the Paw Paw River Watershed. Combining the values for each criterion allowed for the ranking of the Q-Q sections on the basis of conservation priority. The procedure for creating the model comprised the following steps:

- Creation of a quarter-quarter section base layer dataset.
- Creation and classification of a dataset for each conservation criterion.
- Addition of data for each criterion as attributes to the base layer dataset.
- Classification (if necessary) of each criterion attribute in the model’s database file (DBF) table.
- Weighting of each criterion class for each Q-Q section.
- Computation of the conservation value of each quarter-quarter section.
- Testing of outcomes against DOQ (aerial imagery), parcel data and other digital resources.
- Classification and symbolization of the outcome for display in a map.

To date, the model has been accurate where highest-priority areas have been ground-truthed for verification. The attached map shows the final priority layer or “dataset” composed of priority Q-Q’s and identifies the resulting SWMLC target areas which are circled. The following section summarizes the conservation attributes of each of the circled conservation target areas as determined using the GIS model.

Priority Target Areas- *Please see map below for reference*

(1) The **Lower Branch** target area encompasses over 2,200 acres of emergent marsh land and floodplain forest with areas of residential development. The marsh area is in close proximity to the city of Benton Harbor and provides prime fish spawning areas utilized by State-threatened fish species as well as migratory and breeding bird habitat. The floodplain forests that line the lower branch of the river extend the prime habitat for breeding and migratory birds. In addition, populations of the Federally-endangered Mitchell’s Satyr butterfly have been found along the river’s prairie fens. Nearly the entire priority area has a high Michigan Natural Features Inventory (MNFI) rating for species rarity and diversity.

The area contains several protected properties, including Sarett Nature Center and its Brown Sanctuary, as well as additional protected properties managed by local townships and Sarett Nature Center. Conservation targets include the Mitchell’s Satyr, swamp rose mallow, Blanding’s turtle and eastern box turtle. Mitchell’s Satyr, spawning fish and migratory bird habitat are the priority focus. Identified threats to the area include invasive species, sedimentation, nutrient loading, wetland fill for development expansion, development pressure, and harmful e-coli levels from an illicit storm water connection that have caused the MDEQ to list Blue Creek as impaired for total and partial body contact. Land acquisition, low impact development and invasive species control in particular will help to abate these threats.

(2) The **Watervliet Floodplain** target cluster encompasses about 825 acres which includes an estimated 44 parcels. The area is characterized by floodplain and riverine forest and includes multiple MNFI-designated zones for high-species rarity. The area is a priority target for restoration due to habitat destruction, channel modification, and wetland filling in an extensive wetland area east of Watervliet.

Regional industrial and agricultural pollution has impaired both Mill Creek and Pine Creek and affected regional wildlife habitat and coldwater fisheries. A few priority conservation targets include the American burying beetle, spotted turtle, swamp cottonwood and few-flowered nut-rush. Abatement strategies include brownfield restoration, wetland restoration and riparian corridor acquisition to stem increased stormwater discharge.

(3) The **Brush Creek** target cluster encompasses about 737.76 acres of land composed of approximately 46 individual parcels. The area is characterized by floodplain forests and agricultural land. The floodplain forest community provides crucial habitat for migratory and breeding birds. Conservation targets include Cerulean warbler, Prothonotary warbler, and the wood thrush. Brush Creek is a coldwater stream that supports a substantial population of brown trout. Threats to this area include sedimentation from agricultural runoff in the headwaters of Brush Creek, invasive species and habitat fragmentation due in part to development pressure from the Village of Lawrence.

(4) The **Mainstem Basin** target area encompasses approximately 1,900 acres of forested and non-forested wetlands of varying types that naturally regulate the level of flow into the Paw Paw River mainstem. Conservation targets include diverse populations of migratory and breeding birds, including the Cerulean warbler, Prothonotary warbler, wood thrush and prairie vole. Identified threats to the basin include habitat fragmentation from encroaching agricultural expansion, invasive species, increased flows from agricultural drainage ditches, ongoing issues with aging and poorly maintained sewer infrastructure, and loss of native plant cover. Abatement strategies include land acquisition/protection, low-no impact planning regulations for wetland areas, restoration of the river corridor, infrastructure improvements, and drain management with manmade culverts and diversions. The area currently includes one large protected area, the Paw Paw River Preserve, owned and managed by SWMLC.

(5) **Almena Swamp** target cluster encompasses nearly 3,000 acres. The area is an example of a tillplain wetland complex characterized by forested and non-forested wetlands which act to level the flow into the river throughout the wet and dry seasons. Area soils are highly conducive to groundwater recharge. This cluster also includes several protected sites including the old fish hatchery site and Wolf Lake Fish Hatchery.

Priority conservation targets include the Eastern massasauga, Kirtland's snake, king rail, Blanding's turtle and other reptile and amphibian species. Threats to this area include increased runoff volume, reduced groundwater infiltration with increasing development, and agricultural runoff which dominates the areas north of Almena Swamp. Abatement strategies include land acquisition/protection, drainage infrastructure improvements, and responsible management of development to ensure low impervious levels and responsible environmental design.

(6) The **North Branch** headwaters target cluster encompasses approximately 1,610 acres and is characterized by forested wetlands and woodlots. Priority conservation targets include various reptile and amphibian species including the Eastern massasauga. Threats to these natural features are primarily from development, which has been rapid in Texas Township over the past five to ten years. The lands can be further described as having a high propensity for groundwater recharge. Abatement strategies include low impact development and protection of natural and working lands that increase groundwater infiltration. Currently, there is one protected property within this target area, the Anderson Conservation Easement, which is held by SWMLC.

(7) **Cedar Creek Fen Savanna Complex** encompasses approximately 650 acres including approximately 65 parcels. The area is characterized by high quality natural areas, including both hardwood and tamarack swamp, sedge meadows, dense shrub-carr, high-quality fens, and upland oak forests. Numerous seeps contribute cool alkaline water to Hayden Creek and into Cedar Lake and Lime Lake before flowing into the Paw Paw River. The target area is also conducive to high groundwater recharge. Several areas within the target cluster are designated as high rarity based on MNFI species inventories, including a fen that supports populations of the Federally-endangered Mitchell's Satyr butterfly as well as State-listed species which include the edible valerian, white lady slipper, Eastern massasauga rattlesnake, prairie indian plantain, box turtle, and spotted turtle.

Threats to this area include invasive species, fire suppression, and groundwater withdrawals. These threats have impacted coldwater fisheries and other indigenous wildlife. Restoration objectives include the protection and maintenance of prime fen habitats and the removal of invasive species.

(8) **East Mattawan** target cluster encompasses about 1,200 acres, including several chunks of forest cover and scattered agricultural fields interspersed with isolated wetland and stream features. The area is characterized by excessively drained and well drained soils with high potential for groundwater recharge. Based on USGS maps, the area appears to drain surrounding agricultural uses. The area is also designated as high rarity based on MNFI species inventories.

(9)(a) (Lower) **East Branch-** Oak Savanna/Prairie System target cluster encompasses 2,700 acres, including approximately 724 parcels. This area is characterized by oak barrens, beech-maple forest, and oak-hickory forest interspersed with prairie-fen emergent marsh complex. The fens can be further described as alkaline shrub/herb fens. Major conservation targets include the Federally endangered Mitchell's Satyr butterfly, eastern box turtle, spotted turtle, Great Plains spittlebug, Eastern massasauga, cut-leaved water-parsnip, Blanchard's cricket frog, edible valerian, and other State-listed rare plants.

The area is designated as high rarity based on MNFI species inventories and has a high potential for groundwater recharge. Major threats include invasive species, primary home development, fish passage barriers (small stream impoundments and impaired road/stream crossings), changes in groundwater flow, nutrient loading and fire suppression. Restoration of oak savanna habitat and protection and maintenance of Mitchell's Satyr populations are top priorities in this area. The area includes several protected properties, specifically the TNC Paw Paw Prairie, TNC Lawton Prairie, and the Farris and Stock properties, which are protected with conservation easements.

(9)(b) (Upper) **East Branch** Prairie Fens target cluster encompasses 915 acres. This area includes Paw Paw Lake and serves as the headwaters of the East Branch, which is a high quality coldwater stream. This area is characterized by forested riparian buffers, woodlots and agricultural fields with nearly 100 acres of prairie fen. The fens are exceptional and support a huge diversity of wetland plants and animals. The fens can be further described as alkaline shrub/herb fens. Major conservation targets include the Federally-endangered Mitchell's Satyr, Blanding's turtle, spotted turtle, Eastern massasauga, cut-leaved water parsnip, Blanchard's cricket frog, edible valerian, and Eastern box turtle.

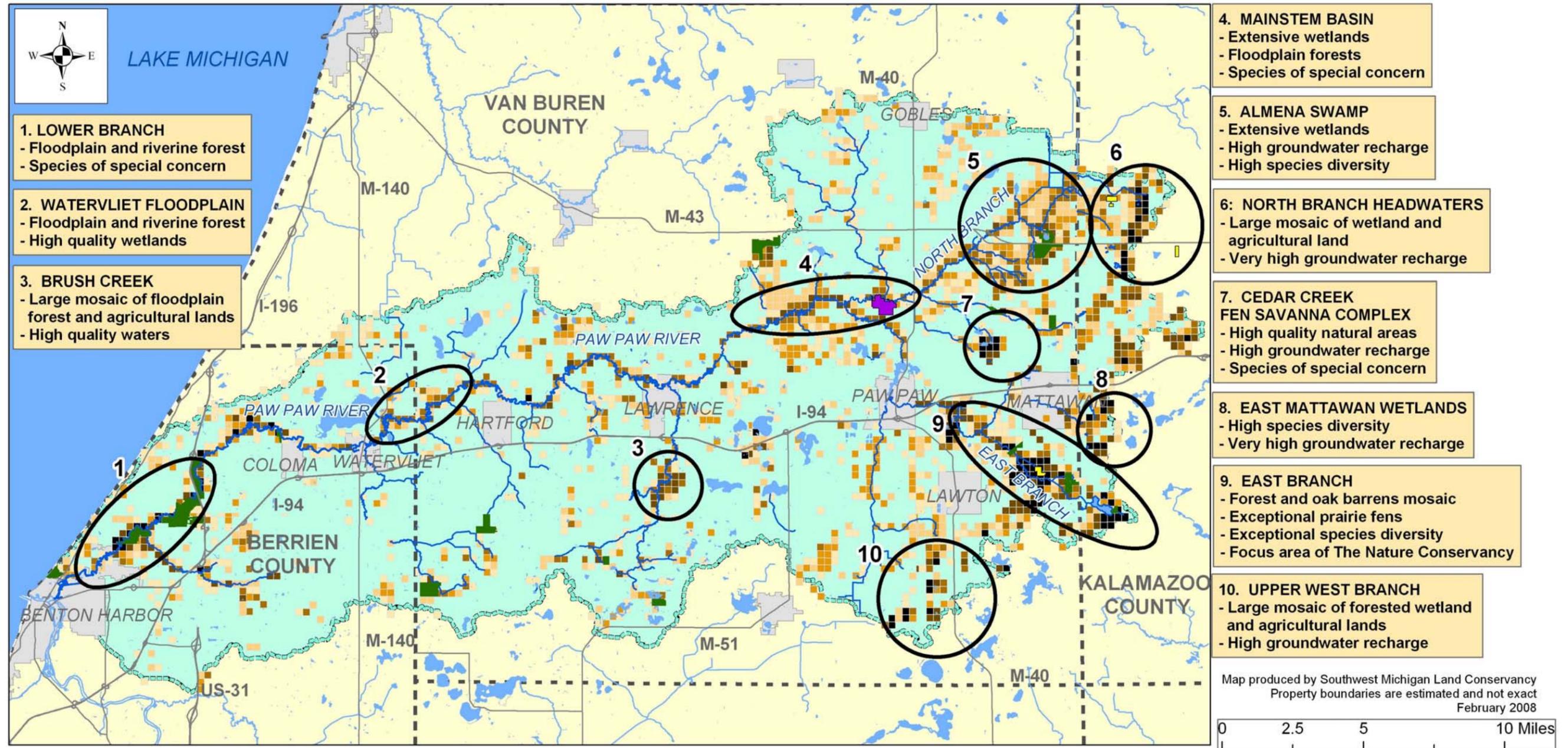
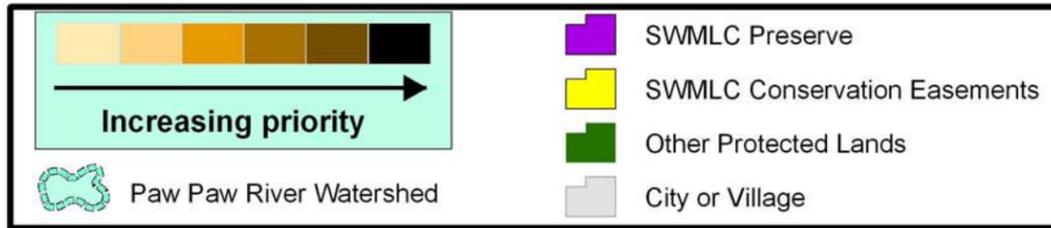
The area is designated as high rarity based on MNFI species inventories and has a very high potential for groundwater recharge. Over 102 species were recorded in the fens, which include large marl pools that

have extensive marl flats with strings of stunted tamaracks. Major threats include increasing residential development, nutrient loading in Paw Paw Lake, fire suppression and subsequent encroachment by woody and invasive species, nutrient loading and polluted runoff, changes in groundwater flow, dredging and ditching projects and groundwater withdrawals. The protection and maintenance of the prairie fens and the establishment of a viable Mitchell Satyr population are top priorities in this area. Based on land characteristics and other factors, the natural areas in this target cluster present great opportunities for unhindered threat abatement. The area includes one protected site, the Michigan Nature Association's Paw Paw Lake Satyr Butterfly Preserve.

(10) **West Branch** target cluster is broken up into five disconnected areas that collectively encompass 1,025 acres and includes approximately 45 individual parcels. This area is characterized by very well-drained soils with a high capacity for groundwater recharge. The area includes targeted agricultural restoration areas and areas of intact forest cover that filter sediment and nutrient runoff from the adjacent agricultural uses. These forest clusters each include approximately 100 or more intact acres, and several include isolated wetlands. Part of the area drains into Swift Lake Marsh, just south of the target cluster, which is a Great Lakes' type infertile coastal plain marsh.

Paw Paw River Watershed Priority Conservation Areas

SWMLC was contracted in early 2006 by the Southwest Michigan Planning Commission under the authority of DEQ to prepare a computer-generated mapping model identifying priority conservation areas in the Paw Paw River Watershed. The modeling process was facilitated with the assistance and input of other conservation organizations and a land protection subcommittee comprised of interested stakeholders. The watershed was divided into 40 acre quarter quarter sections (QQ's) and priority QQ's were established based on the existing natural resource attributes and conservation value. The model will be used to initiate educational outreach to landowners within high priority QQ's in pursuit of land protection objectives.



Outreach

Three landowner workshops were held -- one in fall 2006, and one each in January and October 2007, to (1) review the model and PPRW management objectives with landowners, (2) present sustainable resource management tools and practices, and (3) discuss options for private conservation easements and land donations available through SWMLC and other organizations. From these discussions, several interested landowners have contacted SWMLC about protection of their property. Several of these contacts are being pursued for potential conservation easements or land donations.

Land Protection

Following is a list of land protection accomplishments and developing agreements for targeted properties within the PPRW from the last two years:

- Completion of Farris Conservation Easement - Protection of 52 acres (East Branch) in December 2005 of headwater prairie fen wetland and upland habitat that contains one of the state's largest populations of Eastern box turtle.
- Watervliet Brownfield Site - SWMLC is currently having discussions with local officials to determine viability of brownfield site and adjacent lands with main stem frontage. The site is characterized by a large natural area within an urban site.
- Webb Site - This property is located a few miles south of the Paw Paw River main stem. SWMLC staff and Land Protection Team have visited the 78 acre property, which contains multiple water resources south of the Paw Paw River. A variety of land protection options are available but will be dependent upon remedial liabilities for an underground storage tank.
- Foerster Property - SWMLC is currently discussing a potential easement on several hundred acres with nearly 23,000 linear feet (4.3 miles) of river frontage.
- Talanda Property - The Talandas are a previous contact of the SWMLC and a neighbor of the Foerster property. The property contains nearly 6,500 linear feet (1.2 miles) of main stem river frontage and comprises nearly 350 acres with a significant amount of acreage in floodplain forest.
- Diget Property - SWMLC is consulting with this landowner to visit the 300 acre (approximate) property with multiple water resources on the North Branch of the Paw Paw River. A variety of land protection options are available and discussions are ongoing.
- Jones Property - This landowner is interested in potentially protecting the property with a purchase of development rights (PDR) conservation easement. If that option does not work, the landowner may look into other land protection options.
- Yuknavage Property - SWMLC visited this 65 acre (approximate) property with multiple water resources at the headwaters of the North Branch, Fish Lake. A variety of land protection options are available and discussions are ongoing.
- Topp Property - SWMLC is talking with the landowner of this 50-acre property located within the Paw Paw River Floodplain with the potential for a conservation easement or a land donation. Discussions are ongoing and a potential deal is being pursued for 2008.

In addition to these successes and leads, SWMLC staff visited several additional sites of interest over the past few years. In total, for 2006, 12 landowner contacts were made and discussions regarding conservation options were pursued. For 2007 and early 2008, at least 18 leads were pursued and hundreds of landowners were educated about PPRW objectives, resource management, and conservation options.

Summary

In summary, SWMLC plans to continue to rely on the model as we focus our conservation efforts within the Paw Paw River Watershed. The model has been a true success in targeting high priority properties as we and the many other project collaborators work to improve water quality within the PPRW and ensure its sustainability in perpetuity. As part of our efforts to ensure continued success with focused land protection outreach, we have created a priority landowner database for use by SWMLC, SWMPC, and other land protection organizations in continuing conservation efforts, staying abreast of ownership changes, and for dissemination of educational resources to all who have a stake in preserving the quality of this watershed.