

## 6 Plan Development Process

This PPRW Management Plan was developed utilizing the best available data along with input from stakeholders. The planning process included

- soliciting public input
- reviewing previous studies and reports
- conducting a volunteer inventory to identify problem sites and areas
- conducting research on topics of concern such as wetland functions, floodplain forests, agricultural concerns and hydrology
- developing models to determine priority areas

### 6.1 Public Input

Public participation was relied upon heavily during the planning process to solicit input on all stages of plan development. The results from previous public forums and meetings were utilized to identify watershed concerns. Further, during the planning process, several methods were used to engage stakeholders and solicit input. These methods included steering committee meetings, sub-committee meetings, a website with feedback opportunities, and extensive email communications to interested citizens and groups.

Steering committee and sub-committee participants were instrumental in identifying and commenting on designated uses, desired uses, pollutants, sources and causes of pollutants, priority or critical areas and in developing goals, objectives and an action plan.

A list of steering committee participants can be found

in Appendix 6. Many partners were instrumental in providing information, completing modeling efforts, organizing and implementing the volunteer inventory and providing feedback on early versions of the plan. The key governmental and non-profit partners included the Michigan Department of Environmental Quality, Michigan Department of Natural Resources, the Berrien and Van Buren Conservation Districts, Southwest Michigan Land Conservancy, Sarett Nature Center, The Nature Conservancy, Pokagon Band of Potawatomi Indians, the Paw Paw Lake Association, Van Buren County Drain Commissioner, Hamilton Township, Village of Paw Paw and Almena Township.

Public participation methods included steering committee meetings, sub-committee meetings, a website with feedback opportunities, and extensive email communications to interested citizens and groups.

The Internet was used throughout the plan development process. An email communication list containing over 150 addresses was used to keep stakeholders informed and to offer the opportunity to comment on the information being presented. The PPRW website contained information relating to the development of the plan including all steering committee meeting summaries. An on-line forum allowed individuals to submit comments throughout the process.

The media assisted in alerting watershed stakeholders and residents about the PPRW Management Plan and encouraged them to comment on the draft plan either on-line, by phone or in person. In May 2008, SWMPC held an open house for stakeholders to

review and comment on the plan. Channel 3 News announced the open house and several concerned citizens came to the open house to learn about the watershed and the management plan.

### Stakeholder Concerns

Paw Paw River Watershed Stakeholders have identified known or perceived impairments and problems within the PPRW at Steering Committee meetings from 2006 to 2008 and in a public watershed forum held in November of 2004. Stakeholders expressed concerns about several issues in the PPRW. One issue that united the stakeholders was preservation of the connected forested floodplain corridor along the Paw Paw mainstem. Including the Paw Paw River in the state's Natural Rivers Program was discussed as an option for protecting the floodplain corridor. Another issue was large-scale wetland filling or draining for proposed projects such as the Paw Paw Wal-Mart, Harbor Shores in Benton Harbor and the Hartford - Watervliet Area Development Corridor along Red Arrow Highway. Specific pollution concerns included discharge from the Coca-Cola/Minute Maid facility near Paw Paw, bacteria and pathogens from the Hartford Dairy CAFO and groundwater contamination in Coloma and Oshtemo Townships. Sedimentation was a concern for all water bodies, but is especially noticeable in Maple and Paw Paw Lakes. Stakeholders were also concerned about the potential negative impacts on natural resources from increased recreational use. A full list of stakeholder concerns have been compiled and organized by topic in Appendix 7.



Wetlands are often filled to create roads, driveways, and building sites.

### **6.2 Previous Studies/Reports**

Several studies and reports pertaining to the PPRW were reviewed during the development of this management plan. The information contained in these reports provided much of the background information and also helped to prioritize protection and management areas. A list of known studies and reports pertaining to the PPRW are listed in the Appendix 8.

### **6.3 Volunteer Inventory**

A volunteer inventory project was conducted in the PPRW throughout the summer of 2006. The purpose of the inventory project was to establish a baseline characterization of the watershed and identify potential or existing problem sites. Volunteers completed a riparian survey form at 217 road/stream crossing sites within the PPRW. The survey assessed stream bank erosion potential using Rosgen's Bank Erosion Hazard Index (BEHI) methodology. The survey also addressed other riparian criteria, such as stream width, canopy coverage and vegetation type. Volunteers took several photographs at each survey location. A database was used to store survey results, calculate erosion potential (based on BEHI criteria) and organize photographs taken during the survey.

The value of the survey results for characterizing erosion potential throughout the watershed was limited due to inconsistency between volunteers. However, data collected for other riparian conditions and the 941 photographs taken during the inventory project were useful for establishing a baseline characterization of the

watershed. Volunteers identified several problem sites during the inventory process. The types of problems included unrestricted livestock access to streams, soil erosion from new construction and soil erosion from road runoff. Some of these problems were corrected after the inventory was completed; the remaining problem sites are included in Figure 26. The volunteer inventory final report is available online at [www.swmpc.org/downloads/pprw\\_volunteer\\_inventory.pdf](http://www.swmpc.org/downloads/pprw_volunteer_inventory.pdf).

#### **6.4 Watershed Research and Modeling**

##### MDEQ Landscape Level Wetland Functional Assessment

Wetlands are critical for providing diverse wildlife habitat, improving water quality and stabilizing stream flows throughout the watershed. In 2007, Michigan Department of Environmental Quality (MDEQ) completed a landscape level analysis to better understand the functions of existing and lost wetlands in the PPRW. The results from this analysis can be utilized to locate wetlands with important functions such as protecting water quality, providing habitat and reducing flood impacts in the watershed. The results can help pinpoint potential restoration, enhancement, and protection activities to appropriate areas of the watershed that are most in need of a particular wetland function. These functions include 1) surface-water detention 2) streamflow maintenance 3) nutrient transformation 4) sediment and other particulate retention 5) shoreline stabilization 6) provision of fish and shellfish habitat 7) provision of waterfowl and waterbird habitat 8) provision of other wildlife habitat, and 9) conservation of biodiversity (rare or imperiled wetland habitats in the local region with regional significance for biodiversity). The final report is available online at [www.swmpc.org/downloads/pprw\\_WetlandFunctionAssmnt.pdf](http://www.swmpc.org/downloads/pprw_WetlandFunctionAssmnt.pdf).

##### TNC Prioritization of Forested Floodplain

The largely intact floodplain forest corridor along the Paw Paw River mainstem from Benton Harbor to Paw Paw Village is one of the greatest assets of the PPRW. The forested floodplain not only provides habitat for several migratory birds and other species, but it also maintains water quality, stabilizes flows and reduces flooding in the Paw Paw River. In 2006, The Nature Conservancy (TNC) completed a report that prioritized six areas of forested floodplain along the Paw Paw River and identified threats to these areas. The results from this report will help to focus TNC's protection and management efforts. Further, the results assisted with the prioritization of protection areas in the PPRW management plan. The TNC report is available online at [www.swmpc.org/downloads/pprw\\_tnc\\_floodplain.pdf](http://www.swmpc.org/downloads/pprw_tnc_floodplain.pdf).

##### TNC Agricultural Assessment

Based on soil types and lack of ground cover (using Google Earth), problem agricultural areas within the PPRW were identified in this assessment. The report recommends which best management practices should be implemented in each problem area. The TNC report is available online at [www.swmpc.org/downloads/pprw\\_tnc\\_ag\\_assmnt.pdf](http://www.swmpc.org/downloads/pprw_tnc_ag_assmnt.pdf).

##### SWAT Model

The Soil and Water Assessment Tool (SWAT) was used in the PPRW because of its ability to simulate agricultural best management practices (BMPs). It was also utilized

in the St. Joseph River Watershed Management Plan. The SWAT model was used to assess sediment and nutrient loads within the PPRW, and to predict load reductions from selected agricultural BMP scenarios. The report is available online at [www.swmpc.org/downloads/pprw\\_swat\\_report.pdf](http://www.swmpc.org/downloads/pprw_swat_report.pdf).

#### Build Out Model

In 2008, Keiser & Associates completed a build out model for the PPRW. The purpose of this effort was to evaluate the impact of future land use changes on water quality, specifically runoff volume, total suspended solids, phosphorus and nitrogen. In the model, land use change was based on the future land use maps from local municipal master plans. This report will be instrumental in working with governmental units on master plan and zoning ordinance updates to improve and/or protect water quality. Further, the results from this effort helped identify areas where future development is expected to threaten water quality. The report is available online at [www.swmpc.org/downloads/pprw\\_buildout\\_report.pdf](http://www.swmpc.org/downloads/pprw_buildout_report.pdf).

#### SWMLC Conservation Priority Model

The PPRW Land Protection Committee assisted the Southwest Michigan Land Conservancy (SWMLC) in the development of a model used to map critical areas for preservation. These areas were identified in order to assist land conservancies, governmental units, and other groups in locating high priority sites for preservation. The model united local knowledge and human values with the best available scientific data. The model was refined throughout the planning process as more data was received. The final report from this modeling effort is available online at [www.swmpc.org/downloads/pprw\\_cp\\_md1\\_report.pdf](http://www.swmpc.org/downloads/pprw_cp_md1_report.pdf).

#### SWMPC Models

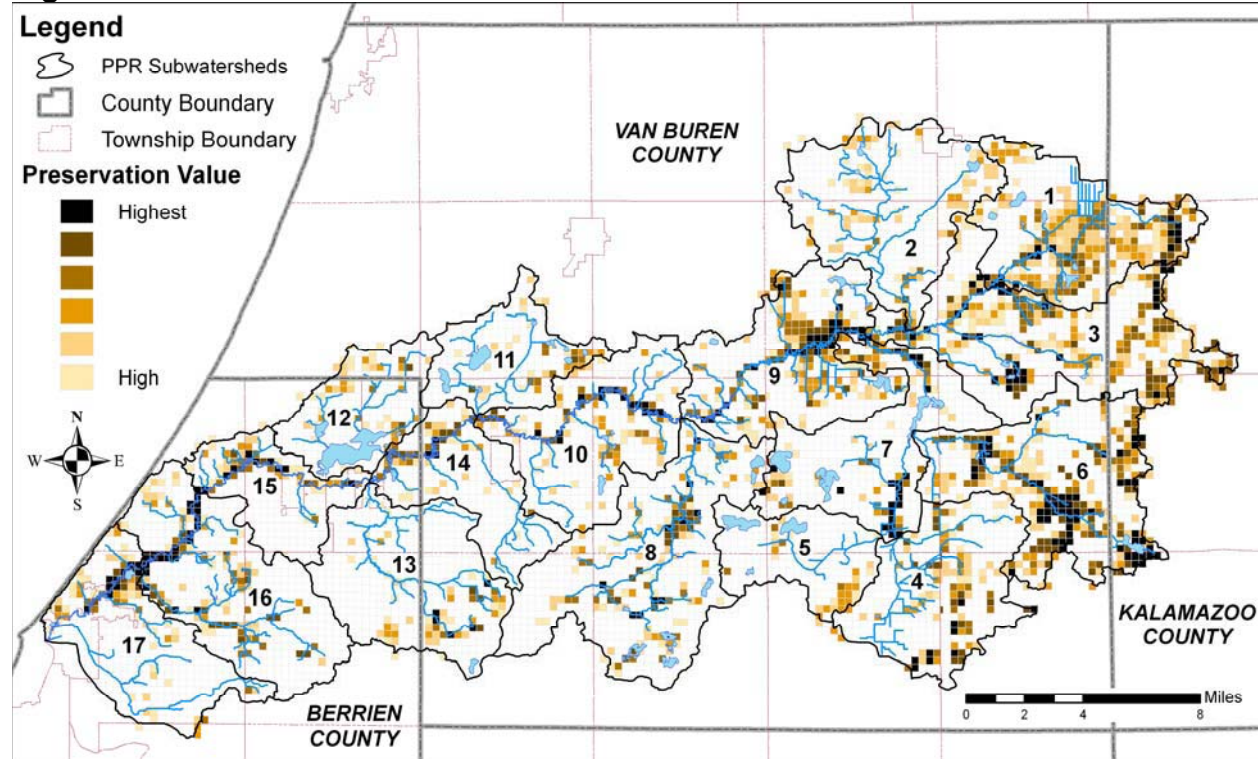
The Southwest Michigan Planning Commission (SWMPC) adapted the methodology used in the SWMLC Conservation Priority Model to create three new models. These models were developed to help understand the significance and geographical distribution of protection and management areas in the PPRW. The models divided the entire watershed into 7605 “squares” known as quarter-quarter sections (QQs). Each “square” or QQ is approximately 40 acres. GIS software was used to calculate a score for each QQ based on the presence, absence or significance of certain criteria. For each model, the PPRW Steering Committee helped determine which criteria were used, as well as how much “weight” or value each criterion was given. Combining the value of each criterion for each QQ allowed for ranking on the basis of preservation or management priority.

##### **1. Preservation**

The preservation area model was developed to help locate high quality natural areas. It can be utilized to influence planning and zoning decisions (such as water body setbacks and low impact development techniques) and also to target the private land protection efforts of land conservancies. The following criteria were considered when calculating the preservation value of each QQ: 1) land cover – percent of natural land cover, 2) hydrology – presence and/or quality of water features, 3) groundwater recharge

potential, 4) proximity to already protected areas, 5) presence of priority floodplain forest areas and 6) presence of wetlands with significant habitat related functions. Figure 20 illustrates the top 25% of all QQs for preservation value. More information on the SWMPC Preservation Area Model is available online at [www.swmpc.org/downloads/pprw\\_pres\\_md1.pdf](http://www.swmpc.org/downloads/pprw_pres_md1.pdf).

**Figure 20. Preservation Area Model Results**

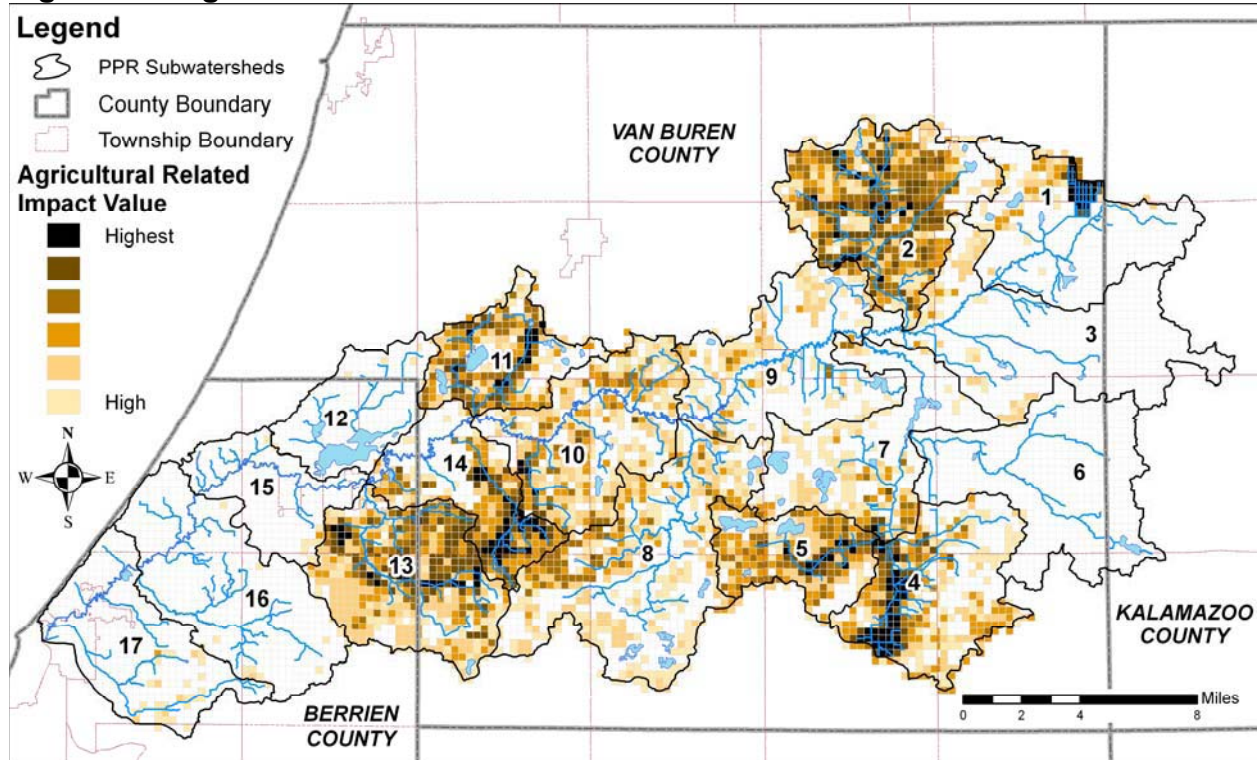


## 2. Agricultural

The agricultural area model was developed to help locate agricultural areas that could have an impact on water quality. It can be used to target best management practices, restoration efforts and outreach to the agricultural community. The following criteria were considered when calculating the impact value of each QQ: 1) land cover – percent of agricultural land cover, 2) impaired water bodies – the presence and severity of water quality impairments, 3) pollutant loading – estimates from SWAT model and 4) lost wetland functionality – absence of historic wetlands with a high significance for nutrient transformation and/or sediment and other particulate retention. Figure 21 illustrates the top 40% of all QQs for agricultural related impact value. More information on the SWMPC Agricultural Area Model is available online at [www.swmpc.org/downloads/pprw\\_ag\\_md1.pdf](http://www.swmpc.org/downloads/pprw_ag_md1.pdf).



**Figure 21. Agricultural Area Model Results**



### 3. Urban/Developing

The urban/developing area model was created to help understand the extent of existing urbanized areas, as well as areas that are expected to develop rapidly in the near future. It can be utilized to influence planning and zoning decisions in developing areas (such as water body setbacks and low impact development techniques) and for targeting existing urban areas for improved stormwater management practices. The following criteria were considered when calculating the impact value of each QQ: 1) land cover – percent of urban land cover, 2) development potential – population trends and future land use plans, 3) hydrology – impaired water bodies and 4) accessibility – proximity to primary road networks. Figure 22 illustrates the top 34% of all QQs for urban/developing impact value. More information on the SWMPC Urban/Developing Area Model is available online at [www.swmpc.org/downloads/pprw\\_urban\\_md1.pdf](http://www.swmpc.org/downloads/pprw_urban_md1.pdf).

**Figure 22. Urban/Developing Area Model Results**

