

appendix b

mechanisms for watershed protection

Task 8. Mechanisms for Watershed Protection

Task 4, Prioritization of Concerns, resulted in a subwatershed scoring technique which ranked each of the major drainage units and the 217 delineated subwatersheds for their preservation and mitigation potentials. The next step after identifying areas prioritized for various activities is to identify the mechanisms to encourage those activities. Because the watershed is so large, site specific information cannot be gleaned for the entire basin. Instead, land cover data and other spatial data were relied upon to model the watershed at its broad scale. Similarly, protection mechanisms and identification of practices already in place are largely broad, as the identification of specific land use planning activities and ordinances in every municipality was not possible under the scope of this project. Identification of those mechanisms were gleaned from stakeholder interviews and internet research. Therefore, they are not inclusive. Further, the identification of geographic regions to apply these measures are also not inclusive. This chapter should be viewed as an introduction to additional needed work in the implementation phase.

(Links to additional information are provided on the [attached table](#).)

Preservation of forests and wetlands

The subwatersheds were scored based on the percentage of wetland and forest land cover in each. The highest average scores were identified in the northwest portions of the watershed, which include the Paw Paw River, Dowagiac River and Rocky River Watersheds. Beebee Creek in Hillsdale County also scored high. However, this does not indicate that preservation is not important in the Indiana portions of the watershed. An isolated wetland was identified in the Turkey Creek Watershed in the southern portion of Elkhart County. This score was lost in the major drainage unit scoring, but was identified in the scoring of the 217 subwatersheds.

The Steering Committee identified sediments, nutrients, habitat loss, wetland loss and animal waste as the top five watershed concerns. The preservation of intact forest, prairie and wetland areas can prevent an increase in the occurrence of those concerns, and other techniques discussed in this chapter can reduce those pollutants at the source.

In the Watershed...

Fabius Township, in the Rocky River Watershed, developed a Greenprint, which identified natural resources, such as wetlands and priority rural views, in the township and laid out a plan to preserve them through zoning. This includes protection of wetlands smaller than 5 acres.

Lands identified for preservation can be protected through a variety of mechanisms. Private landowners can voluntarily choose to protect their land. However, development pressures, which are moving further and further from urban cores, are making it difficult to preserve these lands.

Lands can be donated to each state's Department of Natural Resources to be incorporated into its parks systems. Each state has a trust fund established for the purchase of such lands. The Indiana Heritage Trust was established in 1992 to acquire land with "examples of outstanding natural resources and habitats or have historical or archaeological significance". Sales of special license plates (blue eagle and sun) contribute to the fund. For example, the Fawn River Nature Preserve in LaGrange County was acquired in 1999. It is composed of 135 acres of upland beech and maple woods and a rare lowland oak forest. The preserve protects riparian habitat bordering more than a mile of the Fawn River.

(The Indiana Heritage Trust link in the [attached table](#) includes additional information about preserved lands in the watershed.)

The Michigan Natural Resources Trust Fund, established in 1976, provides grants to local governments and the state to purchase lands for outdoor recreation and for preservation of open space. It is supported by revenues from state-owned mineral interests.

Many land conservancies are active in the watershed. The Southwest Michigan Land Conservancy owns approximately twelve preserves in the St. Joseph River Watershed in Van Buren, St. Joseph, Cass and Berrien Counties. Land can be donated to the conservancy by interested landowners. Volunteers help manage the lands by performing activities such as removal of invasive species.

In the Watershed...

In October 2003 the Michigan Chapter of the Nature Conservancy acquired 139 acres of prairie fen habitat in the headwaters of the East Branch of the Paw Paw River. The fen is included in one of only 15 remaining locations in the world which provide habitat for the federally endangered Mitchell's satyr butterfly.

The Trillium Land Conservancy works to protect land in Elkhart County. The Wawasee Lake Conservancy Foundation has acquired over 419 acres of wetlands around the Wawasee Lake in Noble County. Townships can establish partnerships with land trusts to provide matching funds for fee simple ownership of lands or to purchase conservation easements or development rights.

Private landowners can receive tax incentives to protect their own land through conservation easements. A landowner may wish to sell the land to a buyer who has conservation goals for the land. However, it is expensive and time consuming to advertise these lands for sale through special avenues to find buyers. Similarly, it may be difficult for buyers to find large tracts of undisturbed land. A network of buyers and sellers interested in conservation is needed. This network should be used to conserve agricultural lands, as well.

Land use planning and zoning can be used to protect natural resources within a municipality. A natural features inventory is a good way to identify those lands. However, many townships do not have any planning mechanisms in place. This may occur in townships where municipal officials are employed in a part-time capacity, as the tax base is low. For example, Branch County has several townships, five of the sixteen, which are not zoned. These townships are rural and not located along a major transportation corridor. Therefore, it may be felt that development does not threaten the current land uses. However, these areas have many valuable natural resources. Further these townships with many natural resources have less tax revenue available for the development of a land use plan or natural features inventory. Townships should pool their resources to develop plans, especially within a watershed or where they share contiguous natural resources.

Sherwood Township in Branch County is unzoned and 95% agricultural. The St. Joseph River flows through the township and is primarily wooded along its banks. Protection measures should be implemented to help these buffers remain intact. Perhaps downstream property owners or municipalities who could be adversely affected by sedimentation could purchase these lands or easements on them to assure that the buffers remain intact.

In Indiana, zoning is implemented at the county level. Michigan law allows comprehensive planning to be conducted at the county, city, village or township level (Sea Grant, 2002). There are regional commissions in the watershed including the Michiana Area Council of Governments

(MACOG; St. Joseph, Elkhart, Marshall Counties) and the Southwest Michigan Commission. These organizations operate by county boundaries, not watershed boundaries. MACOG deals primarily with transportation issues. However, it has a water quality department and has been awarded some grants to fund St. Joseph River Watershed projects in Indiana.

Identification of areas to apply conservation measures

Agricultural land

Lands were identified for application of conservation measures and BMPs based on the percentage of agricultural and urban land cover and on the presence of identified impaired waters. This is not to imply that agricultural land uses are not desired in the watershed, quite the contrary. Numerous surveys have identified preservation of agricultural land uses as a high priority. In addition to the obvious benefits of food and fiber production, agricultural land uses provide an aesthetic characteristic to the watershed. A visual preference survey conducted by the Michigan Farmland and Community Alliance, Michigan State University and the Michigan Association of Realtors (2004), identified farmland, which provides wide, open green space, as highly desirable in Michigan. A 1998 “Examination of Challenges and Opportunities” in Hillsdale County recommended land use planning and a diversification of agricultural products as necessary to protect farmland. A 2000 resident survey in the county identified the loss of farmland as a critical problem.

The watershed is largely agricultural (70%). Agriculture occupies over 80% of the land use (by subwatershed) in the Pigeon and Elkhart River Watersheds (Indiana). Agricultural products include hogs, cattle, corn, soybeans, wheat and hay. Some fruits and vegetables are grown in the western portions of the watershed. Traditional farming methods are practiced by Amish communities in the eastern and central portions of the watershed.

The Farm and Ranch Land Protection Program, administered by the Indiana Natural Resources Conservation Service provides matching funds (up to 50% of the easement fair market value) to help eligible entities purchase development rights to keep productive farm and ranch land in agricultural use. The Farmland and Open Space Preservation Program, administered by the Michigan Department of Agriculture, has five programs to aid in preservation. One of these programs, the Agricultural Preservation Fund provides grants to local governments to purchase conservation easements through Purchase of Development Rights programs. Participating land owners commit to at least ten years.

In the Watershed...

In St. Joseph County (IN) agricultural land identified as prime land may not be split into parcels smaller than 20 acres nor have less than 600 feet of road frontage when the land use is changed from agricultural to residential. Prime agricultural land is found in the southern portions of the county. Similar ordinances are also found in Calvin and Wayne Townships in Cass County (MI.)

There are also programs to acknowledge farmers who employ practices to protect water quality and conserve soil. The Indiana River Friendly Farmer program is sponsored by the Indiana Association of Soil and Water Conservation Districts (and other organizations). A farmer who meets each of nine environmental criteria on his land can be nominated for the award. Winners are recognized annually

at the Indiana State Fair. The Michigan Agriculture Environmental Assurance Program certifies farming practices under three program areas: Livestock, Farmstead and Cropping. Certification is available currently for the Livestock program, which includes implementation of a Comprehensive Nutrient Management Plan.

The Wood-Land-Lakes RC&D Council works to protect farmland in Northeast Indiana. It holds conservation easements on farms in Elkhart, LaGrange and Steuben Counties. Tax Incremental Funding has been used in Elkhart County to provide a rebate on tax increases for the purchase of development rights on agricultural land. The use of this mechanism for agricultural protection was unique because the funds are typically used for industry. The Land Information Access Association (Traverse City, MI) has developed websites for Hillsdale and VanBuren Counties and an informational CD for the Dowagiac River Watershed Project. These resources all contain valuable information on zoning methods to protect farmland including exclusive use zoning, slide scale zoning, open space (cluster) zoning and the requirement of buffers between agricultural land and residential development.

(More information on these and other zoning techniques can be found on the Hillsdale County web link in the [attached table](#).)

Land use ordinances including agricultural land protection measures are developed on a township basis. Some Michigan townships have received assistance from the Dowagiac River Watershed Project to prepare new Master Plans. Calvin, Wayne and Marcellus Townships (Cass County) were noted as examples of municipalities with good land use planning in the interview process. Agricultural lands in these townships are zoned as prime or general. Prime agricultural land sold in the townships may only have one residence constructed on every forty acres. (Prime agriculture is defined by the USDA as land best suited to grow food, feed, forage, fiber and oilseed crops. Prime agriculture produces the best yields with minimal economic input and the least environmental damage.) In contrast, general agricultural areas allow smaller parcel divisions. Many of these forty-acre plots are being used for small horse farms. This ordinance has prevented the development of small residential lots in the Christiana Creek Watershed. In contrast, Newburg Township in Cass County has no land use zoning. Agricultural lands can also be protected with open space zoning, which uses cluster development to concentrate homes and leave the remainder of the property undeveloped.

Indiana has a filter strip law which allows for a \$1/acre assessment for property taxes for farms having filter strips of a particular size. It appears that this would serve as a good incentive for landowners to use this practice. However, many still do not use them. One suggested reason is a reluctance to use federal funding, as the use of funds may include restrictions on property rights. It may be a good idea to incorporate a mechanism to provide mini-grants from the Friends of the St. Joe River Association for the installation of BMPs. Therefore, the direct connection in the funding is from a nonprofit agency, creating a buffer and alleviating potential concerns about infringements on private property rights through federal restrictions.

The Noble County Drain Surveyor distributes free seeds for replanting buffer strips on agricultural lands following work on drains that disrupt the buffer. According to the Soil and Water Conservation District, the program is quite popular within the county and helps to reduce sediment and nutrient loading to the watershed.

Lake communities

Lake communities located in rural areas face unique issues. They are typically in areas of lands valued for preservation (agricultural, forest, wetland) and are usually not connected to a regional sewer system. The remote beauty of the

In the Watershed...

In Cass County, sewers have been installed around Donnell Lake, the subject of a past Section 319 grant. This has reduced nitrate levels in the groundwater in that area. Sewers have also been constructed around Indian Lake, Barren Lake, Diamond Lake, Eagle Lake, Lake Garver, Paridixie Lake, the Sisters Lakes and in the Village of Vandalia. The Diamond Lake Association monitors coliform levels and has not found high levels since the construction of the sewer. Sewer construction is also planned or occurring around Baldwind-Long-Coverdale Lakes, Shavehead Lake, Birch Lake and Juno-Painter-Christiana Lakes.

lakes draws residents and summer visitors. Waterfront properties get disproportionate development compared to upland areas. However, the concentration of septic systems around the lakes can take a toll on surface water quality. The need for regional treatment systems or connections to a sanitary sewer system has been identified in many areas of the watershed.

For example, LaGrange County has several lakes and a large influx of visitors each summer. Some lake communities, such as Fish Lake and Stone Lakes in LaGrange County, Klinger Lake in St. Joseph County and part of Palmer Lake near Colon have been sewerred recently. A comparison of aerial photographs of Klinger Lake illustrates the reduction in algal blooms following sewerred, and improvements have been observed in Fish and Stone Lakes. Citizens groups around Fisher Lake near Three Rivers are interested in sewer installation and have approached the Branch-Hillsdale-St. Joseph District Health Agency to request an assessment of the lake. The cost of connection to the sewer system is a major drawback to resident buy-in at many lakes. When sewer connection is not plausible, septic pretreatment has been suggested. A sewer use assessment was recommended to fund maintenance of pretreatment equipment for lake residents.

Other requirements to protect lake resources can include a restriction on the installation of septic systems in new developments, which should only be constructed where they have access to the sanitary sewer. The Kalamazoo Metropolitan County Planning Commission recommends this in its policy statements. When a property with a septic system is sold, an inspection should be required. Further, information on proper septic system maintenance should be provided to the new property owner. The Michiana Council of Governments has produced a free educational video titled "Septic Systems 1-2-3". It has been distributed to title companies within the jurisdiction. Wider distribution of this video throughout the watershed to Realtors and title companies should be sought.

The Indiana Office of the Commissioner of Agriculture Land Resource Council identified rural wastewater management as a priority for 2003 and hence established a Rural Wastewater Task Force. The task force met nine times in 2003 to recommend eight activities for facilitating proper wastewater treatment in rural areas. Recommendations included a tracking system to document system failures and a training and certification program for inspectors and regulators. The Elkhart County Commissioners received a Section 319 grant to identify problematic septic systems in the county. That project led to the development of a Watershed Management Plan for the Lower Yellow Creek Watershed.

Some states allow Clean Water Fund Revolving Loans to be used for nonpoint source pollution reduction projects, including maintenance of septic systems. Funds are traditionally used for upgrades and construction of wastewater treatment plants. This could include the construction of new plants for lake communities. Indiana funds may be used for wetland protection, erosion control, stormwater Best Management Practices and conservation easements. Michigan Revolving Fund monies may only be used for publicly owned facilities, which may include stormwater facilities. The state has created a Strategic Water Quality Initiatives Fund which can be use for the upgrade or replacement of failing on-site systems, or the removal of stormwater or groundwater from sewer leads.

According to "Funding Opportunities: A Directory of Energy Efficient, Renewable Energy, and Environmental Protection Assistance Programs" published by the U.S. EPA State and Local Capacity Building Branch (2004), Drinking Water State Revolving Funds can be used in some instances to support green infrastructure activities such as permeable pavement, rooftop gardens and other measures that help reduce the urban heat island effect and save energy. Grants are

awarded to states to provide low-cost loans to public water systems to finance the costs of infrastructure projects. States are also authorized to use a portion of their funds for set-aside activities such as source water protection.

Urban land

The Baugo Creek, Elkhart River and Juday Creek Subwatersheds scored highest for implementation of conservation measures and BMPs. This is due to the developed nature (urbanized and agriculture) of the area, the presence of impaired water bodies and county-level agricultural statistics and population data. These scores are primarily based on land cover data, and not on field-scale characteristics of the subwatershed units.

The Juday Creek Subwatershed overlaps the South Bend/Mishawaka urban area. These cities are experiencing rapid suburban growth which spans the two cities, especially along the Grape Road and Main Street corridors. Juday Creek scored high for mitigation, however the scoring does not take into account the socio-economic factors at play in this watershed. First, Juday Creek flows through the Notre Dame campus and is, consequently, one of the most studied creeks in Indiana. The university's golf course was redesigned to incorporate trees to shade parts of the creek. Biological studies have also been performed on the areas along the golf courses to assess restoration projects.

In the Watershed...

The Riverfront Park in Niles, MI provides recreational access to the St. Joseph River, which includes a 5-mile hiking trail and a boat launch.

Further, the Juday Creek Task Force is active in protecting the creek from the impacts of new development. This includes requirements for infiltration of stormwater and riparian setbacks. The drain code in St. Joseph County (IN) also plays a large role in the protection of Juday Creek. In this and some other Indiana counties, property taxes assessed by the drain surveyor are kept within the watershed they were collected. Therefore, watersheds with a large

amount of development and high property values also have more funds for drain projects. This allows funds to offset the impacts of development. Conversely, in Elkhart County, for example, drain funds are placed in a county-wide pool. This however, can benefit watersheds with a low tax base needing improvements.

Ordinances regulating the quantity and quality of stormwater can be implemented in urban areas to protect water quality. In Dane County, WI a ban on phosphorus containing fertilizer is being explored to protect sensitive lakes. In 2002, the State of Minnesota passed a bill to allow counties to locally ban phosphorus fertilizers on lawns. In April 2004, The Minnesota House of Representatives voted to make a state-wide mandatory ban. At the time of this writing, the Senate vote was pending.

Storm sewer utility fees are being used by some communities to fund improvement projects. The fees treat the storm sewer system as a utility provided by the municipality, similar to water and sanitary sewer utilities. Fees are paid by users, i.e., property owners, and are based on the level of use. Fees are determined by property size and amount of impervious surface. Reductions in fees can be sought through the use of measures to reduce runoff, such as use of pervious pavement and rain barrels. To distinguish a user fee from a tax, it must meet certain criteria. It must primarily benefit the user of the utility and not the general public. It must be voluntary, that is, the fee payer must be able to choose to not use the utility. It must be proportional to the service actually used. It must be used for the municipality to meet a regulatory requirement and not for generating revenue. Michigan law has allowed stormwater utilities since 1990. However, a 1999 Michigan Supreme Court decision in *Bolt v. City of Lansing* disallowed stormwater utility

fees issued by the city to fund separation of combined sewers. Therefore, municipalities wishing to use a storm sewer utility fee must meet the issues raised by *Bolt v. Lansing*.

(The “Authority for Local Stormwater Fees in Indiana” link in the [attached table](#) provides guidance to Indiana municipalities wishing to explore stormwater fees.)

Post-construction ordinances identify the maintenance practices needed to maintain stormwater utilities. These practices may include street sweeping, cleaning of catch basins and pervious surfaces, visual inspections, monitoring of outflow of retention basins, limits on the use of deicing materials and education of residents regarding stormwater issues. Other suggestions include requiring all general purpose floor drains to be connected to the sanitary sewer.

Ordinances are also used to protect water bodies from streambank degradation and overland runoff. Riparian setback rules exclude development in riparian areas. They typically specify a distance (e.g., 100 feet) from the shorelines and streambanks in which development cannot occur. The ordinances can also specify that native vegetation be maintained in riparian areas to provide habitat and shade the water. Buffer ordinances may also include

protection of steep slopes, floodplains and adjacent wetlands. A process for recording the location of the buffer in legal documents (e.g., land deeds) and the authority who will maintain the buffer should also be included in the ordinance. Buffers can also be labeled in the field with signs, so that their location is delineated and their importance is communicated.

In the Watershed...

The City of South Bend is conducting a river use survey to assess residents’ use of the St. Joseph River and willingness to pay to protect it. The results of this survey can help shape public education campaigns and plan water quality improvement projects.

Combined sewer overflows (CSOs) from 12 cities in Indiana and 2 in Michigan impact the water quality of the St. Joseph River. All Indiana municipalities with CSOs are required to conduct a “Stream Reach Characterization” which assesses the health of the stream flowing through or adjacent to that municipality. The characterization is followed by a “Long Term Plan for Controlling Discharges from CSOs”. The regulations also specify that no new combined sewers may be constructed. Therefore, new developments may connect sanitary sewers to existing combined sewer systems. But the stormwater from the development must be handled in another way. Elkhart County and City of Elkhart policies call for stormwater to be retained on-site. However, these policies are currently not ordinances.

Phase II Stormwater Rules are requiring municipalities and educational institutions in urban areas, as defined by the 2000 U.S. Census, to obtain permits for stormwater discharges. The permit process includes a watershed management plan, education/outreach activities and an illicit connection detection and elimination program. A Lower St. Joseph River Watershed has been delineated and is the subject of a Watershed Management Plan being developed by the municipalities in Berrien and Cass Counties regulated by the Phase II rules. These municipalities are working together and sharing resources to meet their Phase II obligations.

Ordinances for soil erosion and sedimentation are important to minimize runoff from construction sites. The Phase II Stormwater Rules specify that construction activities that disturb one acre or more of land require a stormwater control permit. Noble County adopted a stormwater drainage and erosion ordinance for disturbances greater than one acre in size prior to the update of the Indiana Rule 5, which previously required permits for projects disturbing over five acres, as required by Phase I Stormwater Rules.

Erosion control plans should be adjusted as site conditions change or as observations during construction identify on-site needs. Various drawings for different stages of development should be used, as different erosion control measures will be needed at different times. Exposed soil should be vegetated as soon as possible. This may follow rough grading, as opposed to waiting for the whole project to be completed. In areas with storm sewers, inlet protection should be used to prevent soils from entering area surface waters. Site access should be restricted to a minimum number of entry/egress points to prevent tracking of sediment off-site. These points should have stones to shake soils off of vehicle tires or tire washing stations. Soil stockpiles should be covered at the end of each workday.

The Indiana Department of Natural Resources has guidance for small sites. The guidance indicates that placement of site structures should be based on the lot's natural features. Sensitive areas, such as trees, should be protected during construction. A 20- to 30-foot vegetative buffer, mowed no shorter than 4 inches, should be maintained around the perimeter of the site. Stockpiled soils should be temporarily seeded with annual rye or winter wheat immediately following stockpiling.

(Example language for the ordinances described can be found through the Center for Watershed Protection link in the [attached table](#).)

Total impervious area

Land can also be classified based on the percent of impervious surfaces in a given area. Impervious surfaces are caused by development related items such as roads, buildings, parking, lots and lawns. These surfaces can significantly alter the hydrology of a water body. In the St. Joseph River Watershed, the greatest imperviousness was identified along the river corridor from the mouth upstream to the western side of Elkhart County. These areas are located in the Cities of St. Joseph, Benton Harbor, Niles, South Bend, Mishawaka and Elkhart.

Zoning ordinances typically identify these urban areas as industrial, commercial and residential (single family, multi-family). However, they also allow the surrounding areas to support these land uses. Transportation infrastructure allows this development to move further and further from urban areas into lands previously used for agriculture or supporting valuable habitat. There are many causes and consequences of sprawl that are extensively studied by land planning experts. A Michigan Sea Grant study (2002) of land use planning in coastal communities indicated that Michigan, as a whole, is following a low-density development pattern which is highly land consumptive. The state has one of the highest ratios of urbanized land per person in the country.

Traditional zoning allows sprawl to continue unchecked. One cause is that watersheds lie in multiple political jurisdictions, each with its own zoning code. For example, the St. Joseph River Watershed includes over 170 townships in both states. In Michigan, land use planning and zoning falls to the authority of each township, some of which lack monetary resources to protect their valuable natural features. In Indiana, land use planning is conducted at the county level, which allows more broad recommendations to be implemented. However, site specific details and needs of constituents can be lost, similarly to watershed planning at the large scale.

In the Watershed...

Fabius Township's Ordinance 95 establishes an Open Space Residential Zoning District in which 50-80% of the development must remain as open space or farmland.

Overlay zoning has been used in many communities to add additional restrictions to traditional zoning areas. This can be used where significant natural features, such as riparian areas and wetlands, have been identified. It can also be used to protect cultural resources such as drinking

water or historical features. Overlay zoning based on current imperviousness can also be used. This targets specific types of development to areas already impacted by past and current land uses. For example, areas currently having 20% or greater imperviousness, such as inner city areas, are targeted for redevelopment and highly dense development. Abandoned industrial lands (brownfields) should be redeveloped to suitable uses. If commercial land is built in new areas, it should be clustered with shared drives, as opposed to spread into strips.

Lands with low imperviousness should be targeted to only allow future developments at total low density. This does not imply that houses be constructed on large lots, because when the total density is considered, which includes extensive roads, that development pattern can result in more imperviousness. This zoning technique calls for low impact development or conservation development. This can include clustering homes in a central area and leaving the remaining land for agricultural or preservation purposes. This can include conserving open spaces, clustering buildings and decreasing paved areas by narrowing road widths, placing sidewalks on only one side of roads, installing shared driveways, relaxing setback standards, using pervious paving and reducing cul de sac radii or installing plantings in the centers (to create a donut shape).

In the Watershed...

Longmeadow, a Planned Unit Development in Niles, MI, combines residential living, commercial development and open space.

These communities may also use incentives or requirements for individual on-site measures, such as rain gardens or rain barrels. The community includes open space to be used as parks, stormwater treatment or habitat. For example, long shallow vegetated depressions can be dug in open areas for stormwater infiltration. During dry weather, they appear to be a part of the landscape. Low impact development saves money for developers through a reduction in the amount of roads, sidewalks and storm sewers, which can amount to ½ half the cost of the subdivision.

The Kalamazoo Metropolitan County Planning Commission Policy Statements (1999) encourages Planned Unit Developments and discourages the development of residential property units in rural areas. A municipality can provide density bonuses to developers who protect open space and keep development away from sensitive areas, which should be preserved as assets to the property.

Protection of the watershed as a whole

Watershed management planning should also include mechanisms to consider and protect the watershed as a whole. Currently, the Indiana portion of the watershed is considered in planning decisions through the St. Joseph River Basin Commission, which was established by the Indiana General Assembly in 1988 (Indiana Code 14-30-3). It includes representation from municipalities and counties within the watershed and the Indiana Department of Natural Resources. A formal mechanism within the Michigan portion of the watershed or across the watershed boundaries would be beneficial to the watershed. The watershed also has regional planning commissions, such as MACOG, the Southwest Michigan Commission (Region 4) and the South-Central Michigan Planning Council (Region 3). However, it does not appear that these commissions work together on a watershed basis.

There are examples of multi-state watershed commissions throughout the nation. For one, the Connecticut River Joint Commissions were created in 1989 by combining New Hampshire's Connecticut River Valley Resource Commission, created by legislature in 1987, and Vermont's

Connecticut River Watershed Advisory Commission, similarly created in 1988. The role of the commissions is advisory to assure public involvement in the protection of the river and valley.

(The Connecticut River Joint Commissions can be found at <http://www.crjc.org/>.)

Some multi-state watersheds, such as Lake Champlain, have been assigned special designations. Others, like the Chesapeake Bay Watershed, have become the focus of divisions of the U.S. Environmental Protection Agency (USEPA).

The USEPA has encouraged the use of watershed based NPDES permits to monitor and reduce pollutant loading. These have been done in the context of a TMDL and may have application with the St. Joseph River *E. coli* TMDL. With these permits, point sources are regulated collectively to meet a maximum load to the river. Watershed based permits have been used for nutrients in the Long Island Sound, CT; the Neuse and Tar-Pamlico River, NC; and the Tualatin River, OR. A general stormwater permit is available for all watersheds in the State of Michigan. This process stemmed from the court-mandated cleanup of the Rouge River. The permit is available as an alternative to the traditional six minimum measures permitting option under the Phase II Stormwater Program.

(See the Watershed Based Permit links in the [attached table](#) for more information.)

The Ohio River Valley Sanitation Commission (ORSANCO) was established in 1948 to control and abate pollution in the Ohio River Basin. ORSANCO is an interstate commission representing eight states and the federal government. Member states, including IN, IL, KY, NY, OH, PA, VA, WV, entered into a compact to establish the commission.

(ORSANCO can be found at <http://www.orsanco.org/>.)

The Miami Conservancy District was established in 1913 in response to a devastating flood. It is a political subdivision of the State of Ohio that provides flood protection and water resource monitoring for the Great Miami River Watershed in Ohio and Indiana. The State of Ohio has 23 conservancy districts, all organized at the watershed level.

(More information can be found at <http://www.miamiconservancy.org/>.)

The Tip of the Mitt Watershed Council works to protect watersheds in Northern Michigan. It administers the Great Lakes Aquatic Habitat Network and Fund. The Network has a hub in each Great Lakes state which provides information and assistance on issues within the Great Lakes portion of that state. The Fund provides small grants to grassroots organizations to install BMPs and protect local water resources.

(More information can be found at <http://www.watershedcouncil.org/>.)

Short of a special designation or commission, a permanent watershed coordinator position should be funded to assure continued work to protect the watershed. Funds could come from watershed assessments (as a part of property taxes), membership dues to the Friends organization or grant funding, such as the grant which supported this project.