

A New Approach to Fund Watershed Management: An Evaluation of Funding Mechanisms

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Macatawa Area Coordinating Council
Grand Valley Metropolitan Council
West Michigan Shoreline Regional Development Commission

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Executive Summary

WATERSHED MANAGEMENT FUNDING

Watershed management is a collaborative, comprehensive process to assess conditions and implement land use and water management practices for protecting and improving the quality and quantity of the water and other natural resources within a watershed. While the watershed management process seeks to develop sustainable management solutions, a sustainable source of funding to support these activities does not currently exist in Michigan. The cost to implement watershed plans varies for each watershed depending on its size and the severity of its problems, but on average, the estimated annual cost across West Michigan is approximately \$470,000 for each watershed. The total estimated needs to adequately fund watershed management activities across the region is \$13.6 million annually (MACC 2016). The lack of consistent and adequate funding limits the effectiveness of watershed management activities not only in West Michigan but across the entire state.

To address this issue and continue to advance watershed protection and restoration goals, the project team, comprised of representatives from the Macatawa Area Coordinating Council (MACC), Grand Valley Metropolitan Council (GVMC), and the West Michigan Shoreline Regional Development Commission (WMSRDC), seeks to develop an innovative and sustainable funding mechanism to support watershed management activities within the 13-county region.

Public Sector Consultants (PSC) was hired to evaluate four different mechanisms that may have the potential to provide sustainable funding for watershed management, each with its own advantages and disadvantages. The approaches studied were:

- Voter-approved millages
- Flat fees on parcels
- Watershed management districts
- Pay for Success Bonds

VOTER-APPROVED MILLAGES

Voter-approved millages are relatively common and provide communities an opportunity to generate funding for programs and initiatives that reflect the priorities that government may be unable to support without additional resources. This funding mechanism is well established and understood by most voters, as they are often asked to approve or renew millages during elections. For this study, information was collected from the Michigan Department of Treasury for the 13 counties in the region in order to estimate potential revenue that could be generated at three different millage rates (0.05, 0.1, and 0.25) over a term of five years. See Exhibit 1 for the estimated revenue that would be generated under these scenarios.

EXHIBIT 1. Five-year Millage Revenue Projections

Mills	Property Tax per \$100,000 of Taxable Value	5-year Regional Revenue
0.05	\$5	\$14,003,744
0.1	\$10	\$28,007,488
0.25	\$25	\$70,018,720

SOURCE: PSC calculated millage revenues using data from the Michigan Department of Treasury.

Of the methods analyzed, voter-approved millages are the only funding mechanism that could be initiated in the near term because other methods would require new enabling legislation that often takes large

amounts of time to approve and implement. Under existing legislation, it could be possible to place a millage proposal on the ballot within a few years. For the purpose of this study, a county-based millage was analyzed, but other governing bodies (cities and townships) could put forth a millage proposal for watershed management purposes. If a millage is enacted at the county level, the county would serve as the administrator of revenue collected. If a township or city enacted a millage, that entity would serve as the administrator.

FLAT FEES ON PARCELS

Assessing a flat fee on parcels is another potential method of generating funding to support community initiatives, including watershed protection. Project partners coordinated with representatives of each of the 13 counties to identify the number of parcels by county and then used this information to estimate potential revenue that could be generated at three different flat-fee rates (\$10, \$20, and \$30) over a term of five years. See Exhibit 2 for the estimated funding that would be generated using this approach.

EXHIBIT 2. Five-year Flat-fee Projections

Fee	5-year Regional Revenue
\$10	\$36,022,100
\$20	\$72,044,200
\$30	\$108,066,300

SOURCE: PSC calculated flat-fee projections using data from county equalization offices.

In tax and regulatory policy, a distinction exists between a fee and tax that adds a layer of complexity to this potential approach. Taxes may be used for a variety of purposes concurrently and are not required to directly benefit the person or entity on which the tax is levied. Fees, however, serve a regulatory purpose and must be restricted to a specific focus, rather than simply serving to raise general revenue to fund government services. When fees are assessed, they must be proportionate to the costs of the service imposed and applied only to those benefiting from the service. Furthermore, fees must be voluntary in the sense that a user has some discretion and the ability to modify or limit their use of the service, allowing users to decrease the fees levied against them. In terms of generating funding to support watershed management, flat fees would need to be carefully constructed to reflect a property's relative contribution to watershed impairments in order to pass these criteria. Absent this, a flat fee may be challenged legally under the Headlee Amendment and ruled a tax, in which case it would require approval by voters.

Finally, under existing legislation there is not a mechanism that would enable a local unit of government such as a county to levy a parcel-based fee for watershed management purposes. To utilize this approach, new legislation would be required, and the fee would need to be structured so as to pass the regulatory tests. Two potential approaches to accomplish this are 1) including an opt-out clause where property owners could decline to pay the fee or 2) specifically seeking voter approval.

WATERSHED MANAGEMENT DISTRICTS

The West Michigan Prosperity Region (Region 4) is comprised of 13 counties that include a variety of land use types which results in significant diversity in water quality conditions both among and within the watersheds through the region. As a result, the needs of each watershed vary significantly. Developing a mechanism that would enable communities to raise revenue based on the specific needs of a watershed versus individual municipal boundaries could establish a sustainable and equitable mechanism to support watershed management. Under this scenario, property owners would be assessed proportionally based upon

their relative contribution to water quality impairments and the benefits received from having healthy waterways.

Unlike county-based millages or flat fees, using a watershed as the basis for assessment rather than a municipal boundary may require a new governance framework to collect and administer funding, which could be established through the creation of watershed management districts.

The Watershed Alliances Act may provide a strong foundation to build from because it establishes a framework for communities to work collaboratively on a watershed basis rather than using political boundaries. This act, however, does not create a funding mechanism by giving watershed alliances the authority to raise revenue. Giving these entities the ability to levy assessments based on a property's contributions to water quality issues would address issues of equity that were consistently identified as a concern through stakeholder interviews.

This approach, however, would be more complex than the others that were analyzed. It would require new legislation granting watershed alliances the authority to establish special assessment districts and necessitate the development of assessment models for each watershed to determine the rate that each property owner would pay. The method would also require detailed parcel inventories (e.g., lot size, percent impervious surface, etc.) in order to establish the inputs to an assessment model. While this approach may be complex, a similar one has been successfully used to fund stormwater management activities in Ann Arbor, Michigan.

Any discussion of new legislation should thoroughly engage key stakeholder groups to achieve relative consensus. Stakeholders should consider the governance structure for decision making, the scale at which implementation can be most effective and efficient, a fee-based funding formula, the purposes for which funds may be used, and how to integrate a new framework with existing frameworks.

PAY FOR SUCCESS BONDS

Unlike the other mechanisms analyzed, Pay for Success (PFS) Bonds are a financing mechanism rather than a funding mechanism. In other words, these bonds are a method that allows the government to borrow money in a new way. PFS Bonds are a different financing mechanism than traditional government bonds. Through this instrument, government essentially repays and compensates investors for assuming the risk of trying a new or innovative approach that carries risk and uncertainty. If the project is successful and reaches established benchmarks, investors are repaid and given an agreed-upon rate of return. If the project is unsuccessful and does not reach established benchmarks, investors risk losing some or all of their investment. The market for these bonds will likely be dominated by private foundations and philanthropically minded, wealthy individuals. Philanthropy often invest in environmental programs without the expectation of receiving any of the investment back. If a foundation invests in a PFS Bond and the program is successful, it can receive its money back plus a rate of return, enabling the foundation to reinvest these funds in other programs, which allows the foundation to increase its overall impact.

In the context of watershed management, PFS Bonds may provide an opportunity to finance new and innovative projects that have the potential to achieve cost savings or better environmental outcomes than traditional approaches which might not otherwise be implemented. For example, PFS Bonds could be used to finance newer, untested green infrastructure projects when there may be uncertainty regarding the outcomes, though they could be significant. This is a particularly attractive outcome of this approach. Another potential outcome is the achieved cost savings, which results in lower project costs overall and when compared to traditional approaches.

This method would require a series of legal arrangements between several involved parties, however, and thus it may be best suited for large-scale investments where the costs to establish these arrangements is reduced relative to the total project costs.

STAKEHOLDER INPUT

A series of stakeholder interviews was conducted with leaders from the philanthropic and business communities as well as other sectors throughout West Michigan in order to gain a better understanding of their current funding priorities and opinions regarding new approaches to funding watershed management activities. Throughout the stakeholder interviews, respondents consistently suggested that a particular millage rate or fee was not the driving force behind the success of a new funding initiative. Rather, demonstrating that communities will receive value from their investments and that resources would be deployed wisely will ultimately determine whether a new funding initiative is successful and accepted by society. According to stakeholders, matters of equity—both on a parcel basis and individual basis—should also be considered when evaluating the funding approaches.

A PATH FORWARD

The project team should continue to engage with watershed management organizations and other stakeholder groups from the community to review the funding mechanisms analyzed and to determine a desirable and achievable path forward. Regardless of which approach is ultimately selected, partners should consider a community engagement strategy that helps demonstrate why additional funding is necessary for watershed management, as well as the potential benefits from additional investments. This engagement strategy should consider the economic, social, and environmental benefits of developing a sustainable funding approach to support watershed plan implementation.

Two of the funding mechanisms evaluated would require new legislation, yet this should not be seen as an insurmountable barrier. The West Michigan Prosperity Alliance represents a large region of the state and includes a diverse group of stakeholders and opinion leaders. If the alliance is able to reach consensus on these challenging issues faced by all areas of the state, the region could play a pivotal role in developing a new statewide model to provide sustainable funding to support watershed management.

Introduction

BACKGROUND

Water resources are inseparable from Michigan's identity. They define our state geographically, fuel Michiganders' love of outdoor recreation, and are integral to our economy in numerous ways, from agriculture to tourism and manufacturing sectors.

Recognizing that preserving Michigan's ecosystems and natural resources is critical to long-term vitality, the project team seeks to develop an innovative and sustainable funding mechanism to support watershed management activities within the 13-county region. This effort will advance the goals of restoring, enhancing, and protecting West Michigan's watershed resources for future generations.

This project was coordinated by the project team, comprised of representatives from the MACC, GVMC, and the WMSRDC, with guidance from a steering committee including representatives of watersheds from within the region. The West Michigan Watershed Collaborative (WMWC), which includes representatives from 25 watershed organizations within the region, also provided input on the project, with an ongoing goal of encouraging and facilitating greater collaboration at the regional scale.

Public Sector Consultants (PSC) was hired to evaluate alternative funding mechanisms that could be used to generate a sustainable source of funding for watershed management. Dr. Alan Steinman, Grand Valley State University Annis Water Resources Institute, supported the project team by providing strategic counsel and insight on the region.

As part of the project, PSC conducted 16 telephone interviews with leaders from the philanthropic and business community, as well as other sectors throughout the West Michigan Regional Prosperity Alliance. The primary purpose of the interviews was to gain a better understanding of their current funding priorities and opinions regarding new approaches related to funding watershed plan implementation. The interviews are confidential and agreement was reached that this report will not attribute responses to individuals. Interview participants are provided in Appendix B.

WATERSHED MANAGEMENT

Watershed management is the process of studying, planning, and implementing activities that will protect, restore, and enhance water resources through land and water management practices as well as educational activities. Watershed plans are developed and implemented collaboratively through diverse partnerships working toward common goals, and their elements are defined by state and federal requirements that help provide a consistent method of assessing watershed conditions.

Challenges of Watershed Management

Watershed management provides a robust framework for developing strategies to address existing and prevent future water quality and quantity problems. The success of watershed management is largely driven by the availability of resources to develop and implement plans. Under the current framework, the majority of watershed management funding is supported through a limited amount of competitive state and federal grants. Many watershed organizations are largely supported by dedicated volunteers that donate their time and energy to advance watershed management goals. These efforts are laudable yet sometimes do not provide the same level of expertise or consistent focus as professional staff.

The cost to implement watershed plans will vary for each watershed group depending on the size of the region and the severity of their problems; however, the average estimated annual cost across West Michigan is approximately \$470,000 for each watershed (MACC 2016). This includes staffing and administrative

expenses, restoration and protection activities, information and education campaigns, and equipment and monitoring needs. The MACC estimates that in order to adequately fund watershed plan implementation across the region, funding needs are approximately \$13.6 million annually (MACC 2016). Under the current grant-funded model, few watersheds are able to fully implement their management plans.

A New Approach to Watershed Management Funding

To address these challenges, the West Michigan Prosperity Alliance seeks to develop new, sustainable sources of funding to support watershed management. Developing a sustainable funding source could enable watershed management groups to implement plans more effectively and strategically by focusing on the highest-priority actions rather than developing workplans that chase grant funding. Furthermore, developing a source of local funding would enable community partners to further leverage their resources as local matching funds, which can be a critical and limiting factor when pursuing state and federal grants.

Four methods of generating funding to support watershed management planning were analyzed to determine their potential for use in West Michigan. The approaches studied are:

- Voter-approved millages
- Flat fees on parcels
- Watershed management districts
- Pay for success bonds

Project partners coordinated with representatives of all 13 counties within the region, the Michigan Department of Treasury, and other sources to obtain information and data necessary to develop potential revenue projections under alternative scenarios. Additionally, a series of stakeholder interviews was conducted with leaders from the philanthropic and business communities as well as other sectors throughout West Michigan in order to gain a better understanding of their current funding priorities as well as their opinions regarding new approaches to funding watershed management activities.

West Michigan Watersheds

While watersheds can be neatly divided into consistent hydrologic scales, social dynamics play a key role in their management. Because of different social, economic, geographic, and other factors, watershed management organizations embark on watershed planning and implementation activities at a range of hydrologic scales. As a result, there is not a one-size-fits-all scale that reflects how watershed management organizations are formed. To better determine these factors, project partners coordinated with representatives of watershed groups within the 13-county region to identify the watersheds that would better reflect how people organize around the management and protection of water resources. This approach identified 54 watersheds across the 13-county region at various HUC scales, which are identified below and shown in Exhibit 3. These 54 watersheds were used as the unit of analysis for the sustainable funding approaches analyzed. Using geographic information systems (GIS) software, partners identified the portion of each watershed within the region by county¹.

- Bass River
- Bear Creek (Kent)
- Bear Creek/Lake (Muskegon)
- Bellemy Creek
- Big Sable River
- Black River
- Buck Creek
- Cedar Creek
- Coldwater River
- Crockery Creek
- Deer Creek
- Direct Drainage Lake MI
- Duck Lake/Creek
- Fall Creek
- Fish Creek
- Flat River
- Glass Creek
- High Bank Creek
- Indian Mill Creek
- Kalamazoo River
- Lake Creek
- *Lake Huron Drainage Coldwater River Chippewa River
- *Lake Huron Drainage Honeyoey Creek—Pine River
- *Lake Huron Drainage West Branch Chippewa River Libhart Creek
- Lincoln River
- Looking Glass River
- Lower Grand River (Mainstream)
- Lower Thornapple River
- Macatawa
- Manistee River
- Maple River
- Mill Creek
- Mona Lake-Black Creek
- Mud Creek
- Muskegon Lake
- Muskegon River
- Pentwater Lake
- Pentwater River
- Pere Marquette River
- Pigeon River and Little Pigeon Creek
- Pine Creek—Maple River
- Plaster Creek
- Prairie Creek
- Rogue River
- Rush Creek
- Sand Creek
- Sebewa Creek—Grand River
- Silver Lake
- Spring Lake—Norris Creek
- Stony Creek
- Upper Thornapple River
- White Lake
- White River

¹ Some counties within the study area include portions of watersheds that flow to Lake Huron. These watersheds were included within the study because some funding mechanisms were analyzed at a county level that would include these land areas.

Voter-approved Millages

Voter-approved millages provide communities an opportunity to generate funding for programs and initiatives reflecting the priorities that communities may not otherwise have financial resources to support. Millages are commonly used to fund facilities and initiatives—such as libraries, schools, and parks systems—that improve the quality of life of local communities. When voters are asked to consider a millage, they are asked to approve a certain mill rate over a defined period. One mill is equal to one-tenth of one cent of a property’s taxable value, which means that for every \$100,000 in taxable value, one mill would generate \$100 of revenue.

In West Michigan, there are many examples of voter-approved millages that support community priorities. For example:

- In 2012, Oceana County voters approved a new 0.1 mill to support veteran services.
- In 2013, Grand Rapids voters approved a new 0.98 mill for seven years to support city parks.
- In 2014, Kent County voters renewed a 0.5 mill for eight years to support senior citizen services.
- In 2016, Ottawa County voters approved a new 0.3 mill to support mental health services, which is the first of its kind approved in Michigan.

Most recently, in August 2016, Ottawa County voters renewed and increased a parks millage by an overwhelming 72 percent. In other regions of the state, millages have been used to provide sustainable funding for parks and trail systems. For example, the Huron-Clinton Metroparks that serve Southeast Michigan are primarily funded through a property-tax levy of up to 0.25 mills (HCMA 2016). While there is substantial precedent throughout the state for authorizing millages to support public services, few, if any, communities have authorized a jurisdiction-wide or multijurisdiction millage to support the implementation of watershed management plans. However, there are indications that Michigan voters may be receptive to such a millage.

In 2014, through the August primary elections, voters throughout the state were asked whether they would raise their own taxes through 786 local ballot proposals. Of these proposals, 267 sought to establish new taxes, while 519 sought to renew existing taxes. Approximately 80 percent of new initiatives and 99 percent of continuation funding requests were approved (Bach 2014). In November of 2014, an additional 398 ballot proposals seeking approval of taxes were put before voters. Of these proposals, 83 percent passed and 17 percent were declined by voters (MIRS 2014). While there were no proposals that sought funding for watershed management, 18 proposals were put forth to support park improvements, which may be the most closely related to watershed management. These proposals were placed on ballots in communities across the state, including both urban and rural areas, those relatively wealthy, and those facing financial hardships. The requested millage rates ranged from 0.15 to 2.0 mills and ranged in duration from four to 20 years. Of these 18 proposals, 16 were approved and two were declined (one in each election). Exhibits 4 and 5 provide the outcome of each park millage proposal.

EXHIBIT 4. August 2014 Park Millage Proposal Results

County	Jurisdiction	Type	Amount	Mills	Years	Results
Barry	Woodland Village	Millage (renewal)	\$13,251	2	4	Pass
Ingham	Meridian Charter Twp.	Millage (new)	\$1,042,000	0.6667	12	Pass
Iosco	Iosco County	Millage (new)	\$165,000	0.15	4	Fail
Oakland	Clawson City	Bonding	\$3,810,000	0.89	20	Pass
Oakland	Waterford Charter Twp.	Millage (new)	\$952,024	0.5	10	Pass
Oakland	Springfield Charter Twp.	Millage (renewal)	\$420,000	0.75	10	Pass
Oakland	Commerce Charter Twp.	Millage (renewal)	\$665,892	0.3939	10	Pass
Saginaw	Saginaw County	Millage (renewal)	\$1,459,000	0.2942	6	Pass
Sanilac	Sanilac County	Millage (renewal)	\$301,706	0.2	4	Pass

SOURCE: PSC compiled data from MIRS.

EXHIBIT 5. November 2014 Park Millage Proposal Results

County	Jurisdiction	Type	Amount	Mills	Years	Results
Charlevoix	Charlevoix County	Millage Increase	\$298,486	0.15	4	Pass
Genesee	Genesee County	Millage Increase	\$6,443,358	0.75	10	Pass
Genesee	Atlas Twp.	Millage Increase	\$33,292	0.125	5	Pass
Ingham	Ingham County	Millage Increase	\$3,519,041	0.5	6	Pass
Iosco	Iosco County	Millage Increase	\$165,000	0.15	4	Fail
Oakland	Pleasant Ridge	Millage increase	\$99,300	0.75	10	Pass
Ontonagon	Ontonagon Twp.	Millage increase	\$17,357	0.25	4	Pass
Ontonagon	Interior Twp.	Millage renewal	\$3,140	0.3	4	Pass
Washtenaw	Washtenaw County	Millage increase	\$3,400,000	0.25	10	Pass

SOURCE: PSC compiled data from MIRS.

Furthermore, Michigan voters have repeatedly demonstrated overwhelming support for environmental initiatives at the statewide level, such as the bottle deposit bill, establishment and protection of the Michigan Natural Resource Trust Fund, and the Clean Michigan Initiative (CMI), all of which were approved by voters with approximately a two-to-one margin. The CMI may provide the best example of voter approval for watershed funding. In 1998, voters were asked whether they would approve the CMI that authorized the state of Michigan to borrow up to \$675 million to “finance environmental and natural resources protection programs that would clean up and redevelop contaminated sites, protect and improve water quality, prevent pollution, abate lead contamination, reclaim and revitalize community waterfronts, enhance recreational opportunities, and clean up contaminated sediments in lakes, rivers, and streams,” which would be repaid through the state’s general fund. The proposal received broad bipartisan support and was approved by the electorate with 63 percent of the vote. Of this funding, \$50 million was to be directed to nonpoint source pollution control grants (Katz 2002; Monsma 1998). This suggests that, at least at the statewide level, voters are receptive to environmental initiatives.

WEST MICHIGAN MILLAGE REVENUE PROJECTIONS

West Michigan communities have an opportunity to develop a model that could be used throughout the state to enhance, protect, and preserve watershed resources, as they are critical factors to Michigan’s quality of life and economic vitality. Projections of revenue that could be generated from county-based millages were developed using property tax information obtained from the Michigan Department of Treasury for each of the West Michigan Regional Prosperity Alliance counties.

When assessing property taxes in Michigan, three valuations are analyzed:

- **Assessed value** reflects the municipal assessor’s valuation of the property’s fair market value. State law requires this figure to be estimated at 50 percent of the estimated open market value.
- **State equalized value** reflects the adjusted assessed value after review by the county and state.
- **Taxable value** reflects the value upon which a property is actually taxed. State law caps increases in this amount to the rate of inflation or 5 percent, whichever is lower. Because of this requirement, there can be differences in the assessed and taxable values of a property. Multiplying the taxable value by the millage rate provides the tax rate for individual properties or units of government.²

Three mill rates (0.05, 0.1, and 0.25) were analyzed over a five-year period using the taxable value of properties to estimate potential revenue that could be generated to provide a sustainable source of funding for watershed management.³ The projections show that these millage rates would generate substantial revenue to support the watershed management activities. Exhibit 6 shows the revenue that would be generated for each mill rate across the 13-county region and the relative contribution from each property owner. Exhibit 7 shows the revenue that would be generated from each of the counties over the five-year period.

EXHIBIT 6. Mill Rates

Mills	Property Tax per \$100,000 of Taxable Value	5-year Regional Revenue
0.05	\$5	\$14,003,744
0.1	\$10	\$28,007,488
0.25	\$25	\$70,018,720

SOURCE: PSC calculated millage revenues using data from the Michigan Department of Treasury.

² Tax-exempt properties such as religious facilities and government-owned buildings are not required to be assessed for millages. Similarly, tax-abated properties, such as businesses receiving property tax breaks, can be assessed at a discounted rate.

³ Millage revenue projections assume a 2.37 percent average annual rate of growth for the taxable value of properties. This figure was derived from the state’s anticipated property tax revenue growth in the January 2016 Consensus Revenue Estimating Conference between the Michigan House and Senate Fiscal Agencies.

EXHIBIT 7. County Millage Projections

County	Scenario A:	Scenario B:	Scenario C:
	0.05 mills (5 years)	0.1 mills (5 years)	0.25 mills (5 years)
West Michigan Regional Prosperity Alliance Total	\$14,003,744	\$28,007,488	\$70,018,720
Allegan	\$1,154,089	\$2,308,178	\$5,770,445
Barry	\$525,747	\$1,051,494	\$2,628,734
Ionia	\$732,730	\$1,465,460	\$3,663,651
Kent	\$5,506,830	\$11,013,659	\$27,534,149
Lake	\$143,632	\$287,265	\$718,162
Mason	\$447,099	\$894,197	\$2,235,493
Mecosta	\$326,838	\$653,676	\$1,634,190
Montcalm	\$453,034	\$906,067	\$2,265,168
Muskegon	\$1,140,605	\$2,281,209	\$5,703,023
Newaygo	\$385,392	\$770,785	\$1,926,962
Oceana	\$304,995	\$609,990	\$1,524,975
Osceola	\$183,409	\$366,818	\$917,044
Ottawa	\$2,699,345	\$5,398,690	\$13,496,726

SOURCE: PSC calculated millage projections using data from the Michigan Department of Treasury.

Watershed Allocations

Collecting millage revenue from each of the counties could provide a sustainable source of funding to support watershed management. If revenue collected from each county were allocated proportionally to each of the county's watersheds based on their geographic extent, it would provide substantial funding to support watershed implementation activities stretching across the region. For example, the direct drainage of the Lower Grand River extends from Ionia County, through Kent County, and into Ottawa County where it reaches Lake Michigan. If revenue generated from each of these counties were allocated to the direct drainage of the Lower Grand River watershed based on the portion of those counties covered by the watershed, a 0.05 mill would generate \$1,819,163 over five years. The millage projections for the Lower Grand River watershed showing the contribution from each county are shown in Exhibit 8.

EXHIBIT 8. Lower Grand River (Direct Drainage) Revenue Projections

County	Sq. KM	% County	0.05 mills (5 years)	0.1 mills (5 years)	0.25 mills (5 years)
Ionia	358.19	23.85%	\$174,735	\$349,470	\$873,676
Kent	444.97	19.71%	\$1,085,545	\$2,171,089	\$5,427,723
Muskegon	0.28	0.02%	\$233	\$465	\$1,164
Ottawa	309.00	20.70%	\$558,651	\$1,117,301	\$2,793,253
Total			\$1,819,164	\$3,638,326	\$9,095,816

SOURCE: PSC calculated revenue projections using data from the Michigan Department of Treasury. Totals may vary due to rounding.

Exhibit 9 shows the millage revenue for each of the 54 watersheds in West Michigan identified by regional watershed groups. A full list of the relative contribution to each watershed by each county is included in Appendix C.

EXHIBIT 9. Watershed Millage Projections

Watershed	Scenario A:	Scenario B:	Scenario C:
	0.05 mills (5 years)	0.1 mills (5 years)	0.25 mills (5 years)
Total	\$14,003,959	\$28,007,917	\$70,019,793
Bass River	\$234,254	\$468,508	\$1,171,271
Bear Creek (Kent)	\$200,794	\$401,588	\$1,003,969
Bear Creek/Lake (Muskegon)	\$36,125	\$72,250	\$180,624
Bellemy Creek	\$40,784	\$81,569	\$203,922
Big Sable River	\$124,807	\$249,615	\$624,037
Black Creek—Mona Lake	\$185,185	\$370,370	\$925,924
Black River	\$172,051	\$344,101	\$860,253
Buck Creek	\$315,843	\$631,685	\$1,579,214
Cedar Creek	\$42,202	\$84,404	\$211,011
Coldwater River	\$435,581	\$871,162	\$2,177,904
Crockery Creek	\$501,114	\$1,002,228	\$2,505,570
Deer Creek	\$161,769	\$323,538	\$808,845
Direct Drainage Lake MI	\$169,819	\$339,638	\$849,096
Duck Lake/Creek	\$48,039	\$96,078	\$240,195
Fall Creek	\$22,608	\$45,216	\$113,041
Fish Creek	\$119,487	\$238,974	\$597,435
Flat River	\$1,292,316	\$2,584,633	\$6,461,582
Glass Creek	\$33,492	\$66,984	\$167,461
High Bank Creek	\$31,072	\$62,144	\$155,359
Indian Mill Creek	\$108,402	\$216,804	\$542,011
Kalamazoo River	\$1,196,458	\$2,392,916	\$5,982,289
Lake Creek	\$35,893	\$71,785	\$179,463
Lake Huron Drainage Coldwater River Chippewa River	\$14,410	\$28,820	\$72,051
Lake Huron Drainage Honeyoey Creek—Pine River	\$64,569	\$129,139	\$322,846
Lake Huron Drainage West Branch Chippewa River	\$51,574	\$103,148	\$257,869
Libhart Creek	\$69,487	\$138,974	\$347,434
Lincoln River	\$88,999	\$177,997	\$444,993
Looking Glass River	\$13,399	\$26,797	\$66,993
Lower Grand River (Mainstream)	\$1,819,163	\$3,638,326	\$9,095,815
Lower Thornapple River	\$575,456	\$1,150,912	\$2,877,281
Macatawa	\$602,091	\$1,204,181	\$3,010,453
Manistee River	\$102,649	\$205,298	\$513,244
Maple River	\$31,527	\$63,054	\$157,635
Mill Creek	\$125,145	\$250,290	\$625,725
Mud Creek	\$36,141	\$72,283	\$180,706
Muskegon Lake	\$341,195	\$682,389	\$1,705,973
Muskegon River	\$617,823	\$1,235,647	\$3,089,117
Pentwater Lake	\$79,629	\$159,257	\$398,143
Pentwater River	\$45,008	\$90,017	\$225,041
Pere Marquette River	\$363,287	\$726,574	\$1,816,434
Pigeon River and Little Pigeon Creek	\$324,889	\$649,777	\$1,624,443
Pine Creek—Maple River	\$108	\$217	\$541
Plaster Creek	\$359,904	\$719,808	\$1,799,520
Prairie Creek	\$103,191	\$206,381	\$515,953
Rogue River	\$1,317,971	\$2,635,943	\$6,589,857
Rush Creek	\$305,314	\$610,627	\$1,526,569
Sand Creek	\$274,904	\$549,809	\$1,374,522

Watershed	Scenario A:	Scenario B:	Scenario C:
	0.05 mills (5 years)	0.1 mills (5 years)	0.25 mills (5 years)
Sebewa Creek—Grand River	\$57,978	\$115,957	\$289,892
Silver Lake	\$13,769	\$27,538	\$68,845
Spring Lake—Norris Creek	\$142,544	\$285,087	\$712,718
Stony Creek	\$13,230	\$26,459	\$66,149
Upper Thornapple River	\$30,662	\$61,324	\$153,310
White Lake	\$42,694	\$85,388	\$213,469
White River	\$467,155	\$934,309	\$2,335,773

SOURCE: PSC calculated millage projections using data from the Michigan Department of Treasury.

POTENTIAL LEGAL CONSIDERATIONS

Of the methods analyzed, special purpose millages are the most well-established form of raising revenue to fund community priorities, and it may be the easiest approach to implement considering that other approaches analyzed would require either new legislation or complex legal arrangements.

IMPLEMENTING A MILLAGE

In Michigan, local units of government can collect revenue through two types of millages: general operating mills and special purpose mills. General operating mills are used to support basic governmental services and are not tied to a specific program or outcome. Special purpose millages, however, are used to raise revenue for a specific purpose, such as watershed management, and must be approved through an election.

To enact a special purpose millage on a county basis, the board of county commissioners must approve a proposal to place the millage on the ballot. The General Property Tax Act (PA 206 of 1893) outlines the following requirements that must be included on the ballot proposal:

- The millage rate to be authorized
- The estimated amount of revenue that will be collected in the first year that the millage is authorized and levied
- The duration of the millage in years
- A clear statement of the purpose for the millage
- A clear statement indicating whether the proposed millage is a renewal of a previously authorized millage or the authorization of a new millage

Revenue raised from a special purpose millage must be spent for the purposes outlined in the ballot proposal and are subject to the procurement processes of the governing body that presented the proposal. While these processes provide the framework for how funds may be allocated, within the context of a potential watershed millage, revenue could be used for administrative purposes, including staffing, developing, and updating watershed plans; implementing information and education activities, and on-the-ground or in-the-water restoration projects; as well as carrying out monitoring and evaluation activities. These allocations are possible provided that the millage proposal language does not preclude any of the tasks.

Successful Millage Proposals

The number of millages considered by voters in 2014 as well as the high approval rate, demonstrates that voters are largely willing to raise their own taxes when the revenue will be used to support local priorities. The success of a millage campaign does not appear to be significantly influenced by whether it appears on a primary or general election ballot. The success of a campaign, is largely determined by the extent to which

the funding request reflects the community's priorities relative to the proposed mill rate, and whether the electorate has a clear understanding of how the taxes will be spent. For watershed management purposes, this may require a higher degree of outreach and education compared with other millage requests that have a physical component, such as a park or library that can be easily visited and understood.

Flat Fees

Flat fees offer an alternative method to support community initiatives. This approach has been used in Michigan communities to fund single-stream curbside recycling programs, which is enabled through Public Act 69 of 2005. This legislation enables each county to work with local units of government within their jurisdiction to establish a recycling program and assess each household a \$25 annual fee to support the program once approved by the city or township. The fee can be raised to as high as \$50 annually and extended to commercial properties, subject to a vote of the people. Within West Michigan, Allegan County has used this approach to support its recycling programs. A similar approach could be used to support watershed management activities.

FLAT FEE REVENUE PROJECTIONS

To develop projections of revenue that could be generated from a parcel-based flat fee, the number of parcels for each county was collected by property class for each of the 13 counties within the West Michigan Prosperity Alliance region.⁴

Three potential flat-fee rates (\$10, \$20, and \$30) were analyzed to estimate potential revenue that could be generated over a five-year period to provide a sustainable source of funding for watershed management. The projections show that these rates would generate substantial revenue to support the watershed management activities. Exhibit 10 shows the revenue that would be generated for each flat-fee rate across the 13-county region.

EXHIBIT 10. County Flat-fee Projections

County	Scenario A:	Scenario B:	Scenario C:
	\$10/parcel/year (5 years)	\$20/parcel/year (5 years)	\$30/parcel/year (5 years)
Total	\$36,022,100	\$72,044,200	\$108,066,300
Allegan	\$3,115,200	\$6,230,400	\$9,345,600
Barry	\$1,593,550	\$3,187,100	\$4,780,650
Ionia	\$1,495,950	\$2,991,900	\$4,487,850
Kent	\$10,837,500	\$21,675,000	\$32,512,500
Lake	\$1,228,250	\$2,456,500	\$3,684,750
Mason	\$1,175,450	\$2,350,900	\$3,526,350
Mecosta	\$1,465,700	\$2,931,400	\$4,397,100
Montcalm	\$1,966,750	\$3,933,500	\$5,900,250
Muskegon	\$3,910,600	\$7,821,200	\$11,731,800
Newaygo	\$1,786,850	\$3,573,700	\$5,360,550
Oceana	\$1,206,300	\$2,412,600	\$3,618,900
Osceola	\$1,035,400	\$2,070,800	\$3,106,200
Ottawa	\$5,204,600	\$10,409,200	\$15,613,800

PSC calculated flat-fee projections using 2015 data from county equalization offices.

⁴ Parcel information was collected from each of the county equalization offices and includes real property only. Personal property parcels are excluded from the analysis.

Watershed Allocations

Collecting flat fees through each of the counties could provide a sustainable source of funding to support watershed management. If fees collected from each county were allocated proportionally by geographic extent to each of the county's watersheds, it would provide substantial funding to support watershed implementation activities stretching across the region. If fees collected from each of the counties along the mainstream of the Lower Grand River were allocated to the Lower Grand River watershed based on the portion of those counties it covers, a \$20 parcel fee would generate \$7,142,070 over five years.

Exhibit 11 shows the fees that would be collected for each of the 54 watersheds in West Michigan identified by regional watershed groups. A full list of the relative contribution to each watershed by each county is included in Appendix D.

EXHIBIT 11. Watershed Flat-fee Projections

	Scenario A:	Scenario B:	Scenario C:
Watershed	\$10/parcel (5 years)	\$20/parcel (5 years)	\$30/parcel (5 years)
Total	\$36,022,583	\$72,045,167	\$108,067,750
Bass River	\$451,665	\$903,330	\$1,354,995
Bear Creek (Kent)	\$395,164	\$790,329	\$1,185,493
Bear Creek/Lake (Muskegon)	\$123,855	\$247,711	\$371,566
Bellemy Creek	\$83,266	\$166,532	\$249,798
Big Sable River	\$401,621	\$803,242	\$1,204,864
Black Creek—Mona Lake	\$624,123	\$1,248,247	\$1,872,370
Black River	\$464,411	\$928,823	\$1,393,234
Buck Creek	\$623,316	\$1,246,633	\$1,869,949
Cedar Creek	\$127,916	\$255,831	\$383,747
Coldwater River	\$928,237	\$1,856,473	\$2,784,710
Crockery Creek	\$1,239,963	\$2,479,926	\$3,719,889
Deer Creek	\$314,358	\$628,715	\$943,073
Direct Drainage Lake MI	\$462,504	\$925,007	\$1,387,511
Duck Lake/Creek	\$164,704	\$329,407	\$494,111
Fall Creek	\$68,526	\$137,052	\$205,578
Fish Creek	\$467,411	\$934,822	\$1,402,233
Flat River	\$3,047,832	\$6,095,663	\$9,143,495
Glass Creek	\$101,515	\$203,031	\$304,546
High Bank Creek	\$94,179	\$188,359	\$282,538
Indian Mill Creek	\$213,337	\$426,673	\$640,010
Kalamazoo River	\$3,150,592	\$6,301,184	\$9,451,776
Lake Creek	\$73,279	\$146,558	\$219,836
Lake Huron Drainage Coldwater River Chippewa River	\$64,622	\$129,245	\$193,867
Lake Huron Drainage Honeyoey Creek—Pine River	\$282,952	\$565,904	\$848,857
Lake Huron Drainage West Branch Chippewa River	\$241,844	\$483,688	\$725,532
Libhart Creek	\$141,865	\$283,730	\$425,595
Lincoln River	\$233,983	\$467,966	\$701,949
Looking Glass River	\$27,355	\$54,709	\$82,064
Lower Grand River (Mainstream)	\$3,571,035	\$7,142,070	\$10,713,105
Lower Thornapple River	\$1,253,321	\$2,506,643	\$3,759,964

	Scenario A:	Scenario B:	Scenario C:
Watershed	\$10/parcel (5 years)	\$20/parcel (5 years)	\$30/parcel (5 years)
Macatawa	\$1,229,577	\$2,459,155	\$3,688,732
Manistee River	\$689,963	\$1,379,927	\$2,069,890
Maple River	\$64,366	\$128,732	\$193,098
Mill Creek	\$245,956	\$491,912	\$737,868
Mud Creek	\$103,521	\$207,041	\$310,562
Muskegon Lake	\$1,178,547	\$2,357,094	\$3,535,642
Muskegon River	\$2,963,214	\$5,926,429	\$8,889,643
Pentwater Lake	\$314,943	\$629,886	\$944,830
Pentwater River	\$118,330	\$236,659	\$354,989
Pere Marquette River	\$1,634,645	\$3,269,290	\$4,903,934
Pigeon River and Little Pigeon Creek	\$626,417	\$1,252,834	\$1,879,250
Pine Creek—Maple River	\$470	\$940	\$1,410
Plaster Creek	\$708,295	\$1,416,589	\$2,124,884
Prairie Creek	\$271,614	\$543,229	\$814,843
Rogue River	\$2,663,461	\$5,326,923	\$7,990,384
Rush Creek	\$593,356	\$1,186,712	\$1,780,067
Sand Creek	\$532,843	\$1,065,686	\$1,598,528
Sebewa Creek—Grand River	\$118,369	\$236,738	\$355,108
Silver Lake	\$54,459	\$108,917	\$163,376
Spring Lake—Norris Creek	\$394,526	\$789,052	\$1,183,578
Stony Creek	\$27,010	\$54,020	\$81,030
Upper Thornapple River	\$92,937	\$185,875	\$278,812
White Lake	\$146,377	\$292,754	\$439,131
White River	\$1,810,635	\$3,621,271	\$5,431,906

PSC calculated flat-fee projections using 2015 data from county equalization offices.

Alternatively, fees collected on a per-parcel basis could be allocated to the watershed in which a property is located. Additional GIS analysis would be required to determine how many parcels are located within each of the 54 watersheds of the 13-county region. However, both approaches demonstrate that a per-parcel fee could provide a source of sustainable funding to support nonpoint source pollution control and watershed management.

POTENTIAL LEGAL CONSIDERATIONS

Two significant factors emerge that may affect the ability to implement a property-based flat fee to support watershed management, including a lack of enabling legislation and the interrelationship between the *Bolt v. City of Lansing* decision by the Michigan Supreme Court and the Headlee Amendment.

Enabling Legislation

All local units of government obtain their authority from the Michigan Constitution and Michigan Compiled Laws, which define actions that can and cannot be taken by counties, cities, townships, and villages. To pass a policy at the local level, there must be a piece of legislation that enables such action. While there are policies that enable counties and local units of government to enact flat fees for other purposes such as curbside recycling there is not a similar piece of legislation that enables local units of government to do so

for watershed management. Thus, to enable counties to enact a flat fee for watershed management purposes, new statewide enabling legislation would be required.

Bolt v. City of Lansing and Headlee Amendment

In tax policy a distinction exists between a fee and a tax. Taxes may be used for a variety of purposes and do not need to directly benefit the person or entity on which the tax is levied. Additionally, in Michigan, the Headlee Amendment requires all local taxes to be approved by a majority vote of the electorate that would be subject to the tax.

Fees serve a different function, which was affirmed through a court case between a Lansing resident named Alexander Bolt and the City of Lansing that progressed to the Michigan Supreme Court. Bolt challenged a fee that was assessed to all properties within the city to support stormwater management infrastructure. Bolt contested the flat fee that did not reflect the individual contribution of each property to stormwater runoff or the benefits received by each property from spending on stormwater management. As an outcome of the case, the Michigan Supreme Court established three criteria for instituting a fee:

- The fee must serve a regulatory purpose rather than a revenue raising purpose.
- A user fee must be proportionate to the necessary costs of the service and imposed on those benefiting from the service.
- A user fee must be voluntary—users must be able to refuse or limit their use of the commodity or service.

The court concluded that Lansing’s property-based stormwater fee was a tax because it did not pass these tests, and because voters had not approved the levy as required by the Headlee Amendment, the court overruled. Similarly, establishing a flat fee on parcels to support watershed management activities may not pass these tests and thus could be considered a tax subject to voter approval under the Headlee Amendment.

Following the decision, Lansing stopped levying its stormwater management fee and few other communities have continued to directly charge property owners for stormwater management purposes. The City of Ann Arbor is one community that has continued to charge property owners a fee for stormwater management purposes. However, after the *Bolt v. City of Lansing* decision, it changed its approach from levying a flat fee on all properties to an assessment based on the percentage of impervious surface on each property. While Ann Arbor’s approach complies with the ruling, there is not currently enabling legislation granting the city the authority to do so. Absent enabling legislation, the city could face legal challenge, a concern which has prevented most Michigan communities from utilizing a similar approach.

IMPLEMENTING A FLAT FEE

New legislation would be required to implement a flat fee to support watershed management. The structure of the law could follow Public Act 69 of 2005. This law enables the county board of commissioners to establish a surcharge of up to \$25 per household for the purpose of collecting recyclable materials without a direct vote of the electorate. Furthermore, the county may raise the rate up to \$50 per year and extend the surcharge to commercial properties with voter approval on a municipal basis. The act has a provision that prevents the surcharge from being levied on communities that have already passed a millage to support recycling programs. Many communities that have implemented a recycling surcharge that has not been directly approved by voters include an opt-out provision, likely to comply with the Headlee Amendment. New enabling legislation that empowers counties to institute a surcharge to parcels for watershed management purposes would provide a mechanism to develop a sustainable source of funding to protect and enhance watershed resources but would need to be carefully constructed to comply with the Headlee Amendment and *Bolt v. City of Lansing* decision.

Watershed Management Districts

The West Michigan Regional Prosperity Region is comprised of 13 counties with a variety of land use types, including rural farmland, pristine forestland, and suburban and urban communities. This diversity is reflected in water quality conditions of the watersheds throughout the region—some watersheds are pristine, while others have significant degradation.

Given the diversity in watershed conditions throughout the region, the funding needs for each watershed are similarly diverse. Developing a mechanism that enables local communities to raise funds based on the specific needs of a watershed could establish a sustainable and equitable funding mechanism for watershed management. One approach to achieve this goal could be through new legislation that would enable the creation and implementation of special assessment districts for watershed management purposes at a watershed rather than municipal scale. Unlike county-based millages and flat fees, shifting to using watersheds as the unit of assessment may require a new governance framework to collect assessments and administer funding. This could be established through the creation of watershed management districts.

BUILDING FROM THE CURRENT WATER RESOURCE MANAGEMENT FRAMEWORK

A few key pieces of legislation that currently provide mechanisms for water resource management may help inform how watershed management districts could be structured. These include, but are not limited to:

- Inland Lake Improvements Act—Natural Resources and Environmental Protection Act (PA 451 of 1994), Section 309, as amended
- Public Improvements Act 188 of 1954, as amended
- Watershed Alliance Act—Natural Resources and Environmental Protection Act (PA 451 of 1994), Section 324.31202, as amended
- Michigan Drain Code—Public Act 40 of 1956, as amended

Each of these pieces of legislation provide communities with different tools to manage water resources, and each has its relative advantages and disadvantages.

Inland Lake Improvements Act

The Inland Lake Improvements Act creates a framework to establish lake management boards that have the ability to levy property assessments and carry out lake management projects for inland lakes that extend over multiple municipalities. Lake management boards may be established directly by residents who would be affected by and benefit from creating the body. Alternatively, the governing body of the local units of government, including a county, township, city, or village may also choose to establish a lake management board. The boards are legal entities that provide oversight and management of inland lakes and have the ability to levy an assessment on parcels in the vicinity of a lake for management purposes through a special assessment district (SAD)⁵. SADs are geographically defined areas in which an assessment is levied on real property for a specific public improvement purpose on the parcels that benefit from the improvement. In other words, the landowners who would benefit from improved lake conditions are assessed through their property tax bill to support lake management activities that may include pollution reduction and flood reduction; an increase in the value or use of property; improvement of the lake for conservation of fish and

⁵ Many of Lake Michigan's coastal communities are located along drowned river mouths that can be considered inland lakes under the Inland Lake Improvement Act.

wildlife; and recreational, agricultural, or other conservation uses. SADs are a commonly used tool to generate revenue for specific and well-defined purposes. Under Michigan's current laws, however, this approach is limited to lake management and does not enable communities to establish SADs for watershed management purposes.

This legislation creates a framework for multijurisdictional management boards and specifies how the governing body must be structured. These boards must include:

- One county commissioner from each of the counties included within the lake management district
- One member of each local unit of government included within the lake management district
- The county drain commissioner, his or her designee, or a member of the county road commission in counties without a drain commissioner
- One member elected by the lake management board representing lakefront property owners

Topics for Consideration

- Because the organization effectively has taxing authority, the board is primarily composed of elected public officials. This structure helps ensure accountability to the public but sometimes underrepresents the interests of residents.
- The geographic area of the management district does not reflect watershed boundaries and is frequently limited to parcels abutting the lake or in the immediate vicinity.
- While local units of government have the authority to establish lake management districts, most emerge through a petition process of residents that live in the district. Because watersheds can cover large geographic areas it may be more efficient to lower the threshold for a petition and place the proposal on the ballot as is done for many other elections.

Public Improvements Act

The Public Improvements Act provides townships a mechanism to establish SADs for a variety of purposes, including lake management activities similar to the Inland Lakes Improvement Act. In addition, as with the Inland Lakes Improvement Act, there are two mechanisms to create and implement a lake improvement district: the township board may institute a SAD through a resolution or residents may petition to establish one.

Topics for Consideration

- This act is limited for use by a single jurisdiction, and since the vast majority of watersheds extend across multiple jurisdictions, it may not be the best model when working at the watershed scale.
- When seeking to establish an assessment district through a petition, this act requires 51 percent approval by acreage rather than 51 percent of the affected people. However, when assessments are levied, they are frequently carried out on a parcel basis. In other words, people who own more land can have a greater say in the creation of a SAD but, when assessed, they could pay the same rate as those who own less land. This approach also excludes nonlandholders from participating in the decision-making process.

Watershed Alliances Act

The Watershed Alliance Act creates a framework for two or more municipalities and other public institutions, such as regional agencies or institutions of higher education, to voluntarily form watershed alliances for the purpose of studying watershed conditions, as well as planning and implementing activities to address issues of water quality and quantity. The act provides significant latitude for communities to

develop a governance framework that reflects local priorities; however, it requires watershed alliances to identify the following:

- The structure of the organization and decision-making process
- The geographic boundaries of the watershed
- The entities that may be eligible to become members of the alliance
- The basis for assessing costs to member organizations
- A mechanism for the adoption of an annual budget
- Equitable basis for participation among all public institutions within the watershed

This framework is used by communities in Southeast Michigan to carry out watershed management activities for the Rouge River. In this watershed, 35 municipalities have voluntarily joined the alliance, including cities, townships, and villages in Wayne, Oakland, and Macomb counties. The collaborative structure of the alliance has proven to be an effective method of working regionally to address watershed concerns that extend across a large number of political jurisdictions. For example, the Alliance of Rouge Communities have achieved significant results for the Rouge watershed, including the following successes:

- Established a model for cooperative watershed approaches to storm water management that resulted in a new statewide watershed permit option for meeting federal and state stormwater discharge requirements.
- Funded technical support and facilitation for seven subwatershed advisory groups that developed and implemented individual subwatershed management plans which have become state and national models for cooperative stormwater management.
- Prepared and distributed materials/information/ideas among members that have reduced the cost and increased the effectiveness of pollution control efforts.
- Reduced the cost of compliance with stormwater permits through the development of templates for required reports, and support of joint activities among partner organizations, including the development and distribution of informational and educational materials.
- Supported extensive and cooperative river monitoring to determine the effectiveness of various pollution control activities (the river monitoring program is the most extensive in the state and perhaps one of the most extensive in the nation).
- Completed three comprehensive surveys of watershed residents to evaluate the effectiveness of public information and education efforts.
- Provided training for agency employees on required illicit discharge detection and elimination efforts
- Received over \$150 million in federal grants to support combined sewer overflow and sanitary sewer overflow corrective actions in Southeast Michigan (ARC n.d.).

Topics for Consideration

- While the Watershed Alliance Act creates a strong framework to address watershed concerns at a regional scale, the organization does not have the ability to directly levy property assessments but relies on member funding and grants to carry out its mission.

Michigan Drain Code

The Michigan Drain Code establishes another form of special assessment districts for water resource management. Drainage districts are established on a subwatershed basis, often at relatively small scales. Within the districts, property owners are assessed proportionally for the cost of maintaining drainage systems.

The drain code is implemented by a county drain commissioner or water resources commissioner. The drain commissioner's role, as defined in the Michigan Drain Code, is to support planning and development of ways to correct drainage and flooding issues and purify the flow of drains. This includes providing petitions, convening required public hearings, and overseeing planning and design stages of petitioned new drains or reconstruction of existing drains in a timely, responsible manner. A county drain commissioner is responsible for maintaining account expenditures and assessment collections, allocating special assessments, and maintaining records of the establishment and operation of each drain, especially for routine maintenance.

The drain commissioner is responsible for the maintenance of all legally established county drains and serves as a member of boards that jointly manage intercounty drains. Drains include natural and constructed infrastructure such as swales, streams, underground pipe, and retention ponds that convey stormwater to an open ditch. This includes management and financing of drain construction projects. The drain commissioner is also charged with the responsibility of reviewing external and internal drainage of preliminary and final plats for subdivisions and residential developments as governed by the Michigan Subdivision Control Act.

Some of the standard projects undertaken by the drain commissioner include widening, dredging, and straightening rivers or streams or other projects to increase their output and flow. This often involves removal of vegetation, live trees, and shrubs from the sides of streams and may involve considerable excavation.

Topics for Consideration

- The scope of drain commission activities is primarily focused on managing water quantity rather than water quality.
- Spending for drain maintenance is limited to \$5,000 per mile per drain per year, which can limit the effectiveness of management activities.
- The drain code places limits on the ability to use special assessments for planning and feasibility studies.
- While drain commissioners are elected officials in most Michigan counties, there are limited opportunities for public input in the design and implementation of drain management projects.
- The drain code primarily uses small geographic assessment districts which can help ensure that the assessments are equitable to property owners and other stakeholders in the watershed; however, this framework can limit holistic approaches to watershed management.
- The authority of drain commissioners is limited to designated county drains and does not include rivers (although some rivers are also designated as drains) or municipal systems. Disjointed management framework places barriers to effective watershed management.

A NEW FRAMEWORK TO SUPPORT WATERSHED MANAGEMENT

Developing new legislation to create and implement watershed management districts would create an opportunity for a new framework to establish a sustainable funding mechanism supporting watershed management. This approach has been used in other states such as Florida, which uses large-scale administrative districts to manage watershed resources on a watershed basis. Florida's watershed management districts collect revenue from properties within the region through ad valorem taxes, which are based on property value.

Any discussion of new legislation should thoroughly engage key stakeholder groups to achieve relative consensus. Stakeholders should consider key elements that would be critical to the design of watershed management districts, including the governance structure, the scale of watersheds to establish the districts, appropriate mechanisms to raise funds, the purposes for which funds are raised, and how to integrate a new model with existing frameworks. The following sections summarize topics for stakeholders to consider.

Governance Structure

Developing an equitable, accountable, and effective governance structure for watershed management districts would be a critical component to their success. If watershed management districts would have the ability to raise revenue through special assessments under Michigan law, they would need to be established by units of government.

The Watershed Alliance Act framework provides a robust governance structure that enables local communities to ensure that all stakeholders are represented in the decision-making process. Furthermore, the legislation provides important flexibility that enables communities to develop locally driven approaches reflecting the unique differences of communities and watersheds. This framework is also established as an opt-in model which provides communities the option of using the mechanism if it reflects community priorities.

Watershed Scale

The scale at which watershed management districts should be established is an important question. From a hydrologic perspective, it may make sense to use a standard unit (e.g., HUC 8, 10, or 12) when establishing these districts. However, hydrology rarely reflects the important social dynamics that effect how organizations develop to manage watersheds. It may be appropriate to enable local stakeholders to determine the appropriate scale to establish a district without prescribing a particular HUC scale that should be used. The watershed unit selected would become the boundaries for a special assessment district that would enable the watershed management district to levy an assessment.

Special Assessment-based Funding

A special assessment-based funding approach would need to be developed to address the tests established through the *Bolt v. City of Lansing* decision and demonstrate that the assessments are comparable with the benefits received. While more complicated than a flat fee or a millage, such an approach may be more equitable than others because it would tailor the assessment based on a property's impact to water resources and benefits received from watershed management. Specific components that could be integrated into a special assessment may include:

- **Acreage:** The size of a parcel influences its relative contributions to and benefits from watershed management.
- **Land use type:** The type of land use is another factor that can significantly influence a parcel's impact on water quality.
- **Proportion of impervious surface:** The relative impact that a property will have on water quality is significantly influenced by the proportion of greenspace and impervious surfaces.
- **Distance to a waterbody:** Properties that adjoin waterways have both greater influence on water quality and arguably receive greater benefits from watershed management.
- **Land use practices:** How properties are used and managed significantly influence their contributions to watershed impairments. Furthermore, to meet the *Bolt v. City of Lansing* criteria, a mechanism where a property owner could demonstrate that it has no contribution to watershed issues needs to be included in the assessment model.

To further establish the connection between assessments and the benefits received by individual property owners, it may be appropriate to evaluate needs and focus implementation dollars at a subwatershed scale.

Funding Purposes

New legislation that establishes a mechanism to raise funds through a special assessment should specify the purposes for which the funds may be used. The existing Watershed Alliance legislation provides a comprehensive description that could be a starting point for further evaluation. This act specifies that watershed alliances may be used for the following:

- Preparation of watershed management plans and other required documents as part of state or federal requirements to obtain water discharge permits or grant funding.
- Monitoring, sampling, and analyzing data necessary to manage the watershed, including, but not limited to, surface water quality, water quantity and flows, ecosystem health, recreational use, and the publication of results.
- Conducting public surveys, preparing and distributing informational and educational materials, and organizing activities involving the public.
- Designing and implementing projects and conducting activities to protect or enhance water quality and related beneficial uses or to manage flows to protect or reduce damage to riparian property and aquatic habitat.
- Designing and implementing other actions consistent with watershed management plans adopted by a watershed alliance or required to protect public health, and maintain and restore beneficial public uses of the surface water resources of the watershed.

Integrating with Existing Frameworks

Michigan's existing framework for managing water resources is a complicated system involving many stakeholders. Watershed management districts could become a new framework to help integrate these systems. Given the overlap of this approach with the existing drain code, it may make sense to involve county drain commissioners, in conjunction with other stakeholders, in the governance of watershed management districts. Further evaluation with individual drain commissioners and the Michigan Association of County Drain Commissioners would be necessary to review how these systems could complement and augment each other.

WATERSHED MANAGEMENT DISTRICTS REVENUE PROJECTIONS

Developing a sustainable watershed management and funding mechanism using a special assessment district approach would enable watershed organizations to raise funds to meet the unique needs of their watershed. Individual property assessments could be based on the implementation budget for each watershed. For example, if a watershed had an annual management budget of \$100,000, the assessments could be dispersed proportionally to properties using a weighted scale that reflects a property's contribution to watershed impairments (such as size, percent impervious surface, etc.). Additional GIS analysis would be necessary to illustrate a potential funding scenario for specific watersheds.

Muskegon Lake Watershed Management District

To implement a watershed funding model using special assessment districts, each property would need to be assessed based on its contributions to watershed impairments and the benefits received from watershed management activities. An assessment formula would need to be developed for each watershed that takes into account watershed impairments and necessary management activities, as well as the individual contributions from each property.

Similar approaches have been used in other areas of the state, such as Ann Arbor and Van Buren County, which provide examples of how an assessment formula could be developed. Ann Arbor uses the percent of impervious surface for each property as well as the total parcel size to determine an individual property

owner’s assessment. The Van Buren County Drain Commissioner has developed a more complex model that takes into account land use type (agricultural, residential, natural areas, etc.), soil types, and land use management practices. This approach may be more applicable for watersheds that encompass rural areas comprising a large portion of the land area in West Michigan.

Many elements could be incorporated into an assessment formula. To develop a hypothetical assessment model for West Michigan, criteria were selected based on their use in assessment formulas by water management agencies in other parts of Michigan and the Great Lakes. The assessment formula establishes a base assessment rate for each acre of land with various credits applied that account for land use, soil types, and management practices. Inputs into the hypothetical model are summarized in Exhibit 12. A hypothetical assessment formula is:

$$\text{Assessment} = \text{Base Assessment} * \text{Land Use} * \text{Soil Type} * \text{Management Practices} * \text{Acreage}$$

EXHIBIT 12. Example Watershed Management District Assessment Formula

Assessment Criteria	Assessment/Credit Coefficient ⁶	Rationale
Base Assessment	\$75 per acre	The base funding amount assumes high contributions—credits based on specific property use decrease the assessment
Land Use Credits (used by the Van Buren County Drain Commissioner in a pilot project)		
Natural Areas (Forest, Shrub, Wetland, Grassland, etc.)	0.35	Natural areas have a much lower impact on water quality than developed land
Low-intensity Agriculture	0.5	Low-intensity agriculture has greater impact on water quality than natural areas but a lesser impact than high-intensity agriculture and urbanized lands
High-intensity Agriculture	1	High-intensity agricultural lands have higher impacts on water quality than natural areas
Developed (Commercial, Industrial, Residential)	1	Residential, commercial, and industrial properties have higher impacts on water quality than natural areas
Soil Type Credits (used by the Van Buren County Drain Commissioner in a pilot project)		
Hydric	1	Hydric soils have greater amounts of surface water runoff
Nonhydric	0.7	Nonhydric soils allow greater infiltration and have lower amounts of runoff
Management Practices (Used by Ann Arbor, Michigan)		
Commercial, Industrial, Residential	Total impervious surface/acreage	Adjusts the base rate to account for the amount of green space on a property—properties with more green space receive a higher credit
Agricultural Management Practices (Used by the Northeast Ohio Regional Sewer District)		
Conservation management plan; forest management plan	0.85	Conservation management plans help ensure that water quality impacts are reduced
Comprehensive Nutrient Management Plan	0.75	Comprehensive Nutrient Management Plans help ensure that nutrients remain on the field and out of surface waters.
Other	TBD	Additional credits for use of best management practices could be developed

⁶ Credit confident represents the inverse of the credit in the hypothetical funding formula. In other words, a 25 percent credit would use a 0.75 scaler for a property assessment.

These inputs are by no means the only factors that could be used to determine an individual property's assessment. While many other factors are included, however, some factors could be excluded. Each additional input to a model increases the complexity but may better reflect each property's contributions to water quality concerns.

PSC used information provided by WMSRDC regarding the total number of parcels by land use class (residential, commercial, etc.) and parcel size for the Muskegon Lake watershed to illustrate how the funding formula could be used.

Some assumptions were necessary due to the limited availability of GIS data, such as the percent of impervious surface for each parcel. These assumptions may oversimplify the results; however, the estimates illustrate how an assessment formula could be developed and hypothetical resources that could be directed to watershed management. Using this assessment formula and assumptions detailed below; it was estimated that \$890,976 could be raised from parcels within the Muskegon Lake watershed. Exhibits 13 through 17 illustrate potential scenarios for assessments for residential, commercial, industrial, and agricultural properties within the region.

The majority of parcels within the Muskegon Lake watershed are residential properties. Exhibit 13 estimates assessments and revenue that could be generated using the assessment formula from residential properties.

EXHIBIT 13. Example Residential Property Assessments

Property Type	Hypothetical Average	Annual Assessment	Muskegon Lake Watershed Parcels	Total
Very small residential (0.1 acres or less)	0.1 acres with 50 percent impervious surface in hydric soils	\$3.75	2608	\$9,780
Small residential (0.11 to 0.25 acres)	0.15 acres with 40 percent impervious surface in hydric soils	\$4.50	12254	\$55,143
Average residential (0.26 to 5 acre)	1 acre with 35 percent impervious surface in nonhydric soils	\$18.38	108	\$185,735
Large residential (5.01 to 20 acres)	10 acres with 10 percent impervious surface in nonhydric soils	\$52.50	1311	\$68,828
Very large residential (20.01 to 100+ acres)	50 acres with 4 percent impervious surface in hydric soils	\$150.00	405	\$60,750
Total				\$380,235

NOTE: Totals may not sum due to rounding.

Commercial properties represent the second highest number of parcels within the watershed. Exhibit 14 estimates assessments and revenue that could be generated using the assessment formula from commercial properties.

EXHIBIT 14. Example Commercial Property Assessments

Property Type	Hypothetical Average	Annual Assessment	Muskegon Lake Watershed Parcels	Total
Very small commercial (0.1 acres or less)	0.1 acres with 80 percent impervious surface in hydric soils	\$6.00	171	\$1,026
Small commercial (0.11 to 0.25)	0.2 acres with 75 percent impervious surface in nonhydric soils	\$7.88	408	\$3,213
Average commercial (0.26 to 1)	0.5 acres with 75 percent impervious surface in hydric soils	\$28.13	661	\$18,591
Large commercial (1.01 to 5)	2.5 acres with 75 percent impervious surface in nonhydric soils	\$98.44	322	\$31,697
Very large commercial (5.01 to 173)	10 acres with 70 percent impervious surface in nonhydric soils	\$367.50	105	\$38,588
Total				\$93,114

NOTE: Totals may not sum due to rounding.

Industrial properties represent the third highest number of parcels within the watershed. Exhibit 15 estimates assessments and revenue that could be generated using the assessment formula from industrial properties.

EXHIBIT 15. Example Industrial Property Assessments

Property Type	Hypothetical Average	Annual Assessment	Muskegon Lake Watershed Parcels	Total
Very small industrial <0.1	NA	NA	0	\$0
Small industrial (0.51 to 1 acre)	0.75 acres with 80 percent impervious surface in hydric soils	\$45.00	33	\$1,485
Average industrial (1.01 to 5 acre)	2.5 acres with 80 percent impervious surface in nonhydric soils	\$105.00	112	\$11,760
Large industrial (5.01 to 20 acres)	10 acres with 75 percent impervious surface in hydric soils	\$562.50	28	\$15,750
Very large industrial (20 to 178)	50 acres in with 70 percent impervious surface in nonhydric soils	\$1,837.50	14	\$25,725
Total				\$54,720

NOTE: Totals may not sum due to rounding.

Agricultural properties represent the fewest number of parcels within the watershed. Available GIS data did not indicate whether individual parcels were low- or high-intensity agriculture. These estimates assume that half the properties are in low-intensity agricultural use and half are in high-intensity agricultural use. Exhibits 16 and 17 estimate assessments and revenue that could be generated using the assessment formula from agricultural properties.

EXHIBIT 16. Example Low-intensity Agriculture Assessments

Property Type	Hypothetical Average	Annual Assessment	Muskegon Lake Watershed Parcels	Total
Very small agriculture (5 or less acres)	4 acres (assume half have a nutrient management plan) in hydric soils	\$131.25	2	\$263
Small agriculture (5.01 to 25 acres)	20 acres (assume half have a nutrient management plan) in hydric soils	\$656.25	17	\$11,156
Average agriculture (25.01 to 50 acres)	40 acres (assume half have a nutrient management plan) in nonhydric soils	\$918.75	36	\$33,075
Large agriculture (50 to 75 acres)	60 acres (assume half have a nutrient management plan) in hydric soils	\$1,968.75	7	\$18,375
Very large agriculture (75 to 300+ acres)	160 acres (assume half have a nutrient management plan in nonhydric soils)	\$3,675.00	15	\$55,125
Total				\$117,994

NOTE: Totals may not sum due to rounding.

EXHIBIT 17. Example High-intensity Agriculture Assessments

Property Type	Hypothetical Average	Annual Assessment	Muskegon Lake Watershed Parcels	Total
Very small agriculture (5 or less acres)	4 acres (assume half have a nutrient management plan) in hydric soils	\$262.50	3	\$788
Small agriculture (5.01 to 25 acres)	20 acres (assume half have a nutrient management plan) in hydric soils	\$1,312.50	18	\$23,625
Average agriculture (25 to 50 acres)	40 acres (assume half have a nutrient management plan) in nonhydric soils	\$1,837.50	36	\$66,150
Large agriculture (50 to 75 acres)	60 acres (assume half have a nutrient management plan) in hydric soils	\$3,937.50	7	\$36,750
Very large agriculture (75 to 300+ acres)	160 acres (assume half have a nutrient management plan) in nonhydric soils	\$7,350.00	16	\$117,600
Total				\$244,913

NOTE: Totals may not sum due to rounding.

POTENTIAL LEGAL CONSIDERATIONS

The most significant legal considerations for this approach include designing legislation and a fee structure to address the criteria established under the *Bolt v. City of Lansing* decision. To accomplish this, any fee must serve a regulatory purpose rather than a revenue raising purpose, be proportionate to the necessary costs of the service, and must be imposed on those benefiting from the service. Additionally, users must be able to refuse or limit their use of the commodity or service.

IMPLEMENTING A WATERSHED MANAGEMENT DISTRICT

New legislation would be required to develop watershed management districts and grant these entities the authority to levy fees to support watershed management. A substantial body of legislation currently exists that could inform the development of these districts. The Watershed Alliance Act provides a sound foundation to develop effective governance structures that are responsive to the unique needs of different watersheds. The Inland Lake Improvements Act and the Michigan Drain Code provide a strong foundation to build from to support the use of special assessment districts that collect fees from property owners based on the contributions to water resource issues and the benefits they receive from watershed management. To implement this approach, stakeholder engagement would be necessary to further evaluate how watershed management districts could complement existing water resource management frameworks.

Pay for Success Bonds

Pay for Success bonds,⁷ or PFS Bonds, are an emerging mechanism to finance innovative initiatives to achieve social or environmental outcomes. PFS Bonds are an arrangement where private investors and/or philanthropic interests provide the funding for a new public service. If the new service produces agreed-upon outcomes, the government repays the investors for the full program cost plus a rate of return. PFS Bonds are ideal for funding proof of concept or demonstration projects for new approaches to solve environmental problems when a government entity may be risk averse. For example, a group of investors could invest in green infrastructure projects with less certain outcomes than traditional approaches for addressing stormwater pollution. If the project reaches agreed-upon outcomes, such as decreased sewer overflows, investors would be repaid from savings the project achieves through lowering stormwater management costs.

Because PFS Bonds are a financing mechanism to borrow money, the method actually increases total project costs because investors need to be repaid. Once a program has been proven successful, project partners may find it less expensive to fund a program directly through traditional means such as general fund dollars or, if borrowing is necessary, traditional bonds. After a program achieves effective cost savings or enhances environmental outcomes, project partners should continue to fund the effort through traditional means.

PFS Bonds have recently been implemented in the United States' social sectors. For example, the State of New York used PFS Bonds to support programs that seek to decrease prison recidivism rates. The philosophy behind the effort is that it will ultimately be less expensive to support social programs that prevent people from returning to prison than it is to incur the costs of incarcerating the same person.

For natural resource management, in some western states, PFS Bonds like the Forest Resilience Bond are being used to fund activities that mitigate the risk of wildfire in order to decrease expenses of firefighting and the economic loss of property destruction. The initiative emerged in response to the increasing intensity and frequency of forest fires and drought. A group of entrepreneurs developed Blue Forest Conservation, a for-profit company that serves as the intermediary between the many organizations partnering to implement the Forest Resilience Bond.

Fighting forest fires has become a large part of the U.S. Forest Service's (USFS) budget and continues to grow. In 1995, fire management represented 16 percent of the USFS budget, and by 2015, fire management represented 52 percent of the agency's budget (Blue Forest Conservation 2016). During this time, the USFS's resources have largely been dedicated to fighting fires rather than taking proactive forest management measures to decrease their frequency and intensity.

Blue Forest Conservation worked to secure financing from the Rockefeller Foundation and Packard Foundations for the bond that funds on-the-ground forest management activities administered through organizations such as the National Fish and Wildlife Foundation. If successful, as demonstrated through fewer and/or less-severe forest fires and enhanced water quantity and quality, the bonds will be repaid over

⁷ Pay for Success Bonds are sometimes referred to as Social Impact Bonds or Environmental Impact Bonds, which are the terms that the project team used at the onset of this project. Through stakeholder interviews, we learned that the term "Environmental Impact Bond" was too similar to the environmental bonds that many in the natural resource community are familiar with (such as the Clean Michigan Initiative) despite the significant differences among the financing mechanisms. As a result, project partners decided to use the term "Pay for Success Bond" to enhance clarity throughout this report.

a ten-year period by organizations—such as the USFS, water utilities, and insurance companies—that will reap the benefits of fewer fires and less-severe drought.

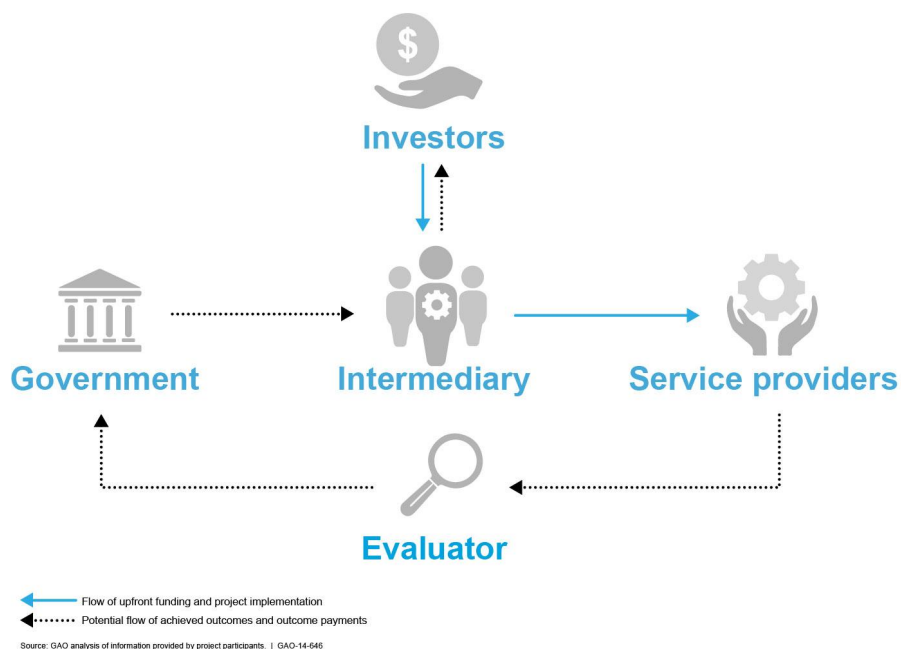
HOW ARE PFS BONDS STRUCTURED?

Implementing a program financed through a PFS Bond requires partnerships and agreements between many parties to fund, implement, and evaluate the project. There are five primary roles in a PFS Bond program, including:

- **Investors:** Entities or individuals that provide the funding for the program—generally private foundations or philanthropically minded, wealthy individuals that support the outcomes of the program.
- **Intermediaries:** Organizations that help connect investors, private service providers, and government entities.
- **Service providers:** Organizations that deliver the public service funded by PFS Bond. The service provider can be a public or private entity, such as a conservation district or nongovernment organization.
- **Governmental units:** The agency that contracts with either the service provider or the intermediary that will benefit if the program is successful. The contracts include specified outcomes to be achieved prior to the bonds being repaid.
- **Evaluators:** Neutral third parties that determine whether or not the outcomes have been successfully achieved.

The relationships of these parties and the flow of funding is shown in Exhibit 18.

EXHIBIT 18. Pay for Success Partners



SOURCE: Urban Institute n.d.

In West Michigan, many organizations have the potential to serve in or more of these roles depending upon the nature of the project. Potential roles for different organizations are summarized in Exhibit 19.

EXHIBIT 19. Pay for Success Bonds: Potential Roles for West Michigan Organizations

Investors	Intermediaries	Service providers	Governmental units	Evaluators
<ul style="list-style-type: none"> • Foundations • Philanthropically minded individuals • State of Michigan • Federal government 	<ul style="list-style-type: none"> • WMSRDC • GVMC • MACC • Private companies • Government • Nonprofit organizations 	<ul style="list-style-type: none"> • Watershed management groups • Conservation Districts • Engineering and construction firms 	<ul style="list-style-type: none"> • Counties • Townships • Cities • Villages • Regional authorities 	<ul style="list-style-type: none"> • GVSU • MSU • U-M • Other colleges and universities • Conservation Districts • Consultants

PFS Bonds frequently begin with entrepreneurial intermediaries that recognize a business and environmental opportunity and that can coordinate the many parties involved in such an effort. These intermediaries work to establish the relationships between the investors who will provide the financing and the government agencies that stand to benefit from taking a new approach to solving an environmental or social problem.

WHY WOULD INVESTORS BE INTERESTED IN FUNDING PFS BONDS?

Compared to traditional investments, PFS Bonds can be risky. If a program does not meet agreed-upon objectives, investors can lose their entire investment. Private investors generally require a relatively high rate of return before they are willing to invest in an instrument that could lose its full value. Governments, on the other hand, may be unwilling to pay a high rate of return on PFS Bonds.

Given that the rate of return for PFS Bonds is likely to be low relative to the risk, the market for these bonds will likely be dominated by private foundations and philanthropically minded, wealthy individuals. Philanthropy often invests in environmental programs without the expectation of receiving any of the investment back. If a foundation invests in a PFS Bond and the program is successful, it can receive its money back plus a rate of return. This enables the foundation to reinvest these funds in other programs allowing the foundation to increase its overall impact. It also provides a way for private philanthropy to obtain government funding for promising programs. Furthermore, some investment portfolios are required to invest in sustainable or environmental causes. PFS Bonds may serve as an additional investment vehicle for organizations that align their investments with their principles.

WHY WOULD THE GOVERNMENT BE INTERESTED IN PFS BONDS?

PFS Bonds may seem like an easy way for units of government to generate revenue with little or no risk. Conceptually, private investors put up the funds for programs by buying a bond, and then the government makes the bond payment using the savings produced when the programs meet certain outcomes. However, the method is not quite that simple. For successful programs, PFS Bonds may actually cost the government *more* money in terms of real dollars than funding a program with a direct appropriation. This is because if the program is successful, the governmental unit pays for the full cost of both the program *and* the rate of return promised to investors. In essence, the government is asking private investors to demonstrate program success prior to paying for the program. Demonstrations are often a difficult sell to legislative bodies, so PFS Bonds help to remove that barrier and mitigate risk in the event that the programs fail to meet outcomes.

PFS Bonds are like derivatives in which the government is selling its risk to investors. The governmental body pays a fee to insure against the risk of investing in an unsuccessful program. Investors are willing to buy this risk, because they believe that the program will be successful.

The question remains, however, as to why PFS Bonds are a good deal for government. The answer is simply the potential for long-term benefits. These benefits can include things like improved environmental quality or increased property values from restoration activities. These long-term benefits often significantly exceed the costs of the programs, but investment in these programs requires legislative bodies to take a leap of faith that promised outcomes will actually materialize. PFS Bonds greatly reduce the risk of making a bad investment.

Because PFS Bonds actually cost government more money than directly funding an initiative, they should not be used as a long-term financing strategy. They are best suited for demonstrating that a new approach can provide better outcomes than the standard way of doing business.

HOW COULD PFS BONDS WORK IN WEST MICHIGAN?

PFS Bonds are a new and emerging method of financing innovative environmental approaches. Unfortunately, there are no examples of environmental projects in Michigan that have been financed through this approach. However, there are examples of projects where the approach could have been used if private investors or foundations were willing to finance a project.

Muskegon Lake Restoration and PFS Bonds

In 2009, \$10 million in restoration funding was provided by the National Oceanic and Atmospheric Administration through the American Recovery and Reinvestment Act to remove over 180,000 tons of fill material from the lake bottom, as well as to restore 27 acres of shoreline wetlands and 10,000 feet of shoreline habitat at Muskegon Lake. This investment by the federal government resulted in significant environmental outcomes and also yielded substantial economic benefits for the region. The economic outcomes of the project were evaluated by Dr. Paul Isely of Grand Valley State University. Isely used a series of models and surveys to evaluate the economic outcomes of the restoration project, including an assessment of changes to property values and recreation-related economic activity. The results of the study showed that the \$10 million environmental investment resulted in:

- \$12 million of increased property values
- \$600,000 of increased property tax revenue annually
- \$1 million of increased recreational spending annually
- \$66 million in increased economic benefits over ten years (Isely, Isely, and Hause 2011)

Furthermore, these outcomes may be considered conservative because they do not fully capture the economic value of the ecosystem services provided by wetland and shoreline restoration.

The Muskegon Lake restoration project was made possible through a large grant from the federal government. The \$10 million investment is a significant amount of funding that local units of government may be unlikely to provide due to limited budgets and uncertainty regarding the project outcomes. This presents an opportunity for innovative funding approaches such as a PFS Bond.

If local organizations were interested in using PFS Bonds, the project could theoretically have been arranged through the following partnerships:

- **Service providers** such as the Muskegon Lake Watershed Partnership and other watershed groups could establish restoration goals, receive public input, and help to identify individual projects and landowners for on-the-ground restoration activities.
- **Investors** such as private foundations and philanthropically minded individuals could provide the initial capital to finance the restoration activities.
- **Intermediaries** such as the WMSRDC could serve as coordinators of activities connecting watershed management groups, investors, government, landowners, and evaluators.
- **Governmental units** such as the City of Muskegon could enter into agreements to restore the shoreline and repay the investors if predetermined outcomes like water quality improvements and increased property values are met.
- **Evaluators** such as Grand Valley State University could monitor the project results and help determine whether project outcomes are met.

Under this hypothetical scenario, private investors would provide \$10 million in capital to conduct the restoration activities. They would work with intermediaries such as WMSRDC to develop agreements with local government and evaluators for defining project outcomes. Once the performance metrics are established and agreed upon, WMSRDC would coordinate the service providers to complete the restoration activities.

Muskegon Lake Restoration Investment Scenario

The following list summarizes the investment scenario that could have been used to finance and repay a PFS Bond to conduct the restoration activities at Muskegon Lake.

- Initial investment: \$10 million
- Example return on investment: 10 percent
- Total return to investors: \$11 million
- Net return on investment: \$1 million
- Potential performance metrics: Water quality conditions and property value
- Return to local government: \$600,000 of increased tax revenue annually, which can be used to repay investors (18.3 years to repay \$11 million bond).

Identifying Projects for Using PFS Bonds

It's relatively easy to look back at a project that has already been completed and say that a PFS Bond could have been used because the outcomes have already been demonstrated. Proactively identifying projects that may be well suited for financing through PFS Bonds is more complex because risk and uncertainty remain. The following criteria can help all the parties involved in a project evaluate whether PFS Bonds are an appropriate financing tool:

- **Leadership and entrepreneurship.** Because the financing mechanism is relatively unknown in Michigan and projects carry some level of risk, PFS Bonds will require leadership and entrepreneurship to make them a reality.
- **High but unproven potential.** A central premise of PFS Bonds is that they reduce the risk for government of trying a new approach to achieve an outcome. If there is a high degree of certainty that an alternative approach will reach the desired outcome, then government should use that approach and finance the project directly. PFS Bonds compensate investors for assuming risk and increase the overall project cost and complexity. Conversely, for investors to reach a level of comfort to finance a project, the approach needs to have a high potential for achieving the desired outcomes. Reconciling these two key principles may be one of the more challenging elements in finding projects well suited for PFS

Bonds. There must be enough uncertainty for government to be too risk averse to take the action while enough certainty for an investor to assume that risk.

- **Source of revenue.** After a project has been completed, if agreed-upon metrics have been reached, investors need to be repaid. PFS Bonds are well suited to projects that address issues the government already spends money to address. For example, local units of government spend money to convey and treat stormwater. PFS Bonds could be used to finance green infrastructure projects that may be less expensive than traditional infrastructure by retaining and treating stormwater at its source.
- **Well-defined metrics.** PFS Bonds require well-defined metrics to evaluate whether the project has been successful. Nonpoint source pollution projects are well suited for PFS Bonds because water quality parameters such as nutrient levels, dissolved oxygen content, turbidity, and temperature are well established and frequently monitored.
- **Large scale projects.** PFS Bonds involve complex legal arrangements between government, investors, intermediaries, service providers and evaluators. The resources spent to develop and implement these agreements and conduct program evaluation are not insignificant. Because of these factors, PFS Bonds may be better suited to large-scale projects where these expenses have a lower marginal cost or become a proportionally lower part of the project budget.

PFS Bonds have the potential to support many different stormwater management projects when there is a source of revenue available to repay the bond. Examples of the types of projects that may be well suited for this approach include: wetland restoration, shoreline restoration, green roofs, rain gardens, and waterway buffers such as filter strips that reduce nutrient and sediment inputs.

POTENTIAL LEGAL CONSIDERATIONS

PFS Bonds are an emerging method of financing innovative projects, and at this point, they have not been used in Michigan. The bonds would require complex agreements between multiple parties to secure financing, implement projects, evaluate success, and repay investors. Because the approach has not yet been utilized, it may require additional work to fully evaluate such agreements and how they may be used to address environmental problems. However, the State of Michigan is beginning to use PFS Bond funding in social sectors, issuing its first request for proposal in 2015, and is working through the agreements to implement the model. The frameworks and legal arrangements established as a result of this effort may serve as a model that can be used to expand the use of PFS Bonds in West Michigan.

IMPLEMENTING A PAY FOR SUCCESS BOND

The first step in utilizing a PFS Bond is recognizing whether a project would lend itself to the PFS framework. Using the criteria described above, one should evaluate whether a project has necessary leadership and entrepreneurship, high but unproven potential, sources of revenue to repay the PFS Bond, and metrics that can be evaluated to determine whether the project was successful. If the project meets these primary criteria, then leadership and entrepreneurship are necessary to garner support, raise capital, and establish institutional relationships among the parties involved in a PFS Bond.

Once a project has been proposed, the following steps must be taken to operationalize the project. This process can be facilitated through the intermediary.

- Build awareness and support for the project.
- Identify the anticipated project outcomes and how they are better than the current strategies used to address the problem (e.g., better outcomes for the same cost or comparable outcomes for a lower cost).
- Identify the source (or sources) of revenue that would be used to pay the PFS Bond if the project is successful.

- Gain support and approval from the governmental entity that would enter into agreements.
- Determine the metrics that will be used to evaluate whether the project has been successful.
- Establish baseline conditions and develop an evaluation strategy.
- Negotiate outcome-based repayment plans. (How much will be repaid if performance metrics are met? Are the rates scaled based on level of performance?)
- Negotiate appropriate project management expenses for intermediaries.
- Raise capital from private investors.
- Enter into agreements between the governmental entity and private investors.
- Intermediary serves as the hub.
- Intermediary receives the funding from private investors.
- Intermediary hires service providers to carry out the work.
- Evaluators monitor and evaluate success of the project.
- Private investors are repaid if agreed-upon outcomes are reached.
- Scale the project up using traditional funding approaches if the project demonstrates the new approach is better than the previous way of doing business.

Summary and Conclusion

Watershed management is a means of protecting a lake, river, or stream by managing the entire watershed that drains into it. Clean, healthy watersheds depend on an informed public to make the right decisions when it comes to the environment and actions made by the community, including the support of watershed management plans. These decisions must also include an understanding that sufficient financial resources are necessary to implement these plans.

Recognizing that preserving Michigan's ecosystems and natural resources is critical to long-term vitality, the project team seeks to help educate the public and develop sustainable funding sources to support watershed management within the 13-county region. Three funding and one financing mechanisms were evaluated regarding the potential to provide sustainable funding in West Michigan. The four mechanisms analyzed were:

- Voter-approved millages
- Flat fees on parcels
- Watershed management districts
- Pay for Success Bonds

Project partners coordinated with representatives of all 13 counties within the region, the Michigan Department of Treasury, and other sources to obtain information and data necessary to develop potential revenue projections under alternative scenarios. In addition, a series of stakeholder interviews was conducted with leaders from the philanthropic and business communities as well as other sectors throughout West Michigan in order to gain a better understanding of their current funding priorities as well as their opinions regarding new approaches to funding watershed management activities.

SUMMARY OF ALTERNATIVES

Each approach analyzed has relative advantages and disadvantages that community leaders and watershed organizations will need to consider as they pursue methods to establish sustainable funding mechanisms for watershed management. Perhaps more important than the specific approach, however, will be educating and convincing citizens as well as businesses that they should support a new fee or tax to provide new funding for watershed management. Throughout the stakeholder interviews, respondents consistently suggested that a particular millage rate or fee was not the driving force behind the success of a new funding initiative. Rather, demonstrating that communities will receive value back from their investments and that resources would be deployed wisely will ultimately determine the success of any new funding initiative. Matters of equity should also be considered when evaluating the alternative approaches.

Voter-approved Millages

Voter-approved millages are a well-established method of generating revenue to support community priorities. Of the methods analyzed, it is the only approach community leaders could begin to initiate in the near term. The approach has other benefits as well; by seeking voter approval, potential legal concerns regarding the *Bolt v. City of Lansing* decision and the Headlee Amendment are overcome. Additionally, the funding mechanism is relatively simple and fairly well understood by voters. Furthermore, the approach may be more equitable than a flat fee, which some considered a regressive assessment, but less equitable than a funding approach that levies fees based on a property's individual contribution to water quality issues.

Under current legislation, a millage could be placed on the ballot of each county for approval. If voters approve the millages, counties could have the option of pooling their resources on a multicounty basis through interlocal agreements using the Urban Cooperation Act of 1967 (PA 7 of 1967). However, doing so may raise concerns from taxpayers if resources are deployed in a different political jurisdiction. Further education and outreach efforts may be necessary to help demonstrate the importance of acting on a watershed scale.

If the project team and other community partners choose to pursue this funding approach, they may want to consider the following activities to implement an initiative.

- Build support among the public and stakeholder groups for additional funding to support watershed management.
- Coordinate with local elected officials such as city and township officials as well as county commissioners, county administrators, and drain commissioners to determine what information they would want before considering a ballot proposal. Continue to work with these officials to build support for a millage campaign until they are comfortable in putting forth a proposal.
- Determine a proposed millage rate that would be acceptable to the public and local elected officials.
- Work with county officials and other stakeholders to develop millage proposal language.
- Continue community engagement efforts in concert with partner organizations to demonstrate why additional funding to support watershed management is needed and how funds would be used.

Flat Fees

Establishing a flat fee for watershed management purposes would require new legislation. The approach may be relatively simple in the sense that all parcels could be assessed a specific amount on an annual basis through a property tax bill. However, this approach could be considered regressive as lower-income property owners would face the same fee as higher-income property owners. Additional issues of equity emerge if the fee structure does not reflect the relative contribution of a property to watershed impairments. Finally, this approach would need to be structured in such a way as to pass the criteria outlined by the *Bolt v. City of Lansing* decision and the Headlee Amendment. Two options to achieve this critical component are including an opt-out clause that may undermine the effectiveness of the funding mechanism or seeking voter approval. If the project team and other community partners decide to pursue this funding approach, they may want to consider the following activities:

- Build support among the public and stakeholder groups for additional funding to support watershed management.
- Coordinate with local elected officials such as city and township officials as well as county commissioners, county administrators, and drain commissioners to determine what information they would want to become supportive of implementing a flat fee for watershed management. Work with these official to build support for a flat fee.
- Engage members of the Michigan Legislature to build their support for a flat fee for watershed management.
- Work with stakeholder groups to develop a legislative framework that would enable counties to implement a flat fee that establishes a fee structure in compliance with the *Bolt v. City of Lansing* decision and the Headlee Amendment.
- Coordinate with members of the Michigan Legislature to introduce a bill(s) that would enable counties to enact a flat fee for watershed management.

Watershed Management Districts

Establishing watershed management districts that enable communities to levy a special assessment on properties would require new legislation. This approach may be more complex than others analyzed but it has potential to better address issues of equity and potential legal constraints stemming from the *Bolt v. City of Lansing* decision. There are many similar funding models currently in place, such as lake management districts and drainage districts that can help demonstrate the rationale for the approach. Furthermore, the Watershed Alliance Act provides a sound foundation to establish a multijurisdictional governance structure to allocate resources and carry out watershed activities. Given the intersection of these existing funding frameworks, stakeholder engagement would be a critical component to ensure that a new approach complements these mechanisms. If the project team and other community partners decide to pursue this funding approach, they may want to consider the following activities:

- Review the forthcoming report, *Assessing the Feasibility of Integrated Watershed Commissions in Michigan*, being prepared by the Grand Valley State University Annis Water Resources Institute that evaluates the feasibility of establishing a similar approach to watershed management.
- Build support among the public and stakeholder groups for additional funding to support watershed management.
- Coordinate with local elected officials such as city and township officials, as well as county commissioners, county administrators, and drain commissioners to determine what information they would want to become supportive of developing watershed management districts and work with these officials to gain their support for the approach.
- Engage members of the Michigan Legislature to build their support for the development of watershed management districts.
- Work with stakeholder groups to develop a legislative framework that outlines the proposed governance structure, a process for forming watershed management districts, the geographic scale at which the districts would be formed, and the approach to determine individual property assessments.
- Coordinate with members of the Michigan Legislature to introduce a bill(s) that would enable the formation of watershed management districts.

Pay for Success Bonds

Unlike the other mechanisms analyzed, PFS Bonds are a financing mechanism rather than a funding mechanism. This instrument has the potential to demonstrate that new approaches to address an environmental issue can be more effective than the conventional way of doing business. While PFS Bonds require complex arrangements among multiple parties, they can remove the risk to government and achieve more sustainable and desirable outcomes. Because the bonds require success for repayment at the risk of losing the full investment, PFS Bonds will likely cater to foundations and philanthropically minded individuals. When PFS Bonds are successful, they enable donors to increase their overall impact by reinvesting in new environmental projects. Due to the complexity of these arrangements, however, PFS Bond funding will likely be more effective with large-scale initiatives.

- Because PFS Bonds actually cost government more than simply funding a project directly, they may be best suited to funding initiatives that carry some risk or demonstrating that new, more cost-effective ways of addressing problems are available that would ultimately save tax dollars and enhance fiscal and environmental sustainability. If the project team and other community partners decide to pursue this financing approach, they may want to consider the following activities:
- The first Pay for Success program in Michigan was initiated in the fall of 2016 in Kent County to expand the Strong Beginnings program which seeks to reduce infant mortality and improve health and development for high-risk families (Dewey 2016). While this program focuses on social outcomes, the underlying principles and business arrangements are the same if the approach was to be applied for

watershed management purposes. Project partners should continue to monitor the success of this program and, if possible, use the business agreements established to guide the development of similar arrangements for watershed management purposes.

- Engage philanthropic organizations and individuals to build support for Pay for Success initiatives.
- Work with these funders and entities that would serve as intermediaries to identify specific projects that could be funded using this approach, and develop an implementation framework.
- Engage governmental entities that would repay the investors if the projects are successful in order to build their support for the initiative.
- Once investors have been established, projects selected, and governmental entities are supportive, develop legal arrangements to carry out the project(s).

NEXT STEPS

The project team should continue to engage with watershed management organizations and other stakeholder groups from the community to review the alternative funding mechanisms analyzed and determine a desirable and achievable path forward. Regardless of which approach is ultimately selected, partners should consider a community engagement strategy that helps demonstrate why additional funding is necessary for watershed management, identify the potential benefits from additional investments, and provide specific examples of how funding would be used. This engagement strategy should consider the economic, social, and environmental benefits of developing a sustainable funding approach to support a sustainable environment. Furthermore, to help inform the implementation strategy, the project team should consider conducting a public opinion survey to gauge the public's perception of environmental conditions within the watershed and their willingness to support new funding initiatives for watershed activities. After developing a community engagement strategy, the specific approaches to implement each approach would differ.

Two of the funding mechanisms evaluated would require new legislation, yet this should not be seen as an insurmountable barrier. The West Michigan Prosperity Alliance represents a large region of the state and includes a diverse group of stakeholders. If the alliance is able to reach consensus on these challenging issues that vex all areas of the state, the region could have an influential voice in Lansing and has the potential to develop a new statewide model to provide sustainable funding to support watershed management.

References

- Alliance of Rouge Communities (ARC). n.d. "ARC—History." *Alliance of Rouge Communities*. Accessed October 12, 2016. <http://www.allianceofrougecommunities.com/history.html>
- Bach, Matt. August 6, 2014. "Michigan Cities, Villages Highly Successful in Getting Voter Approval on New Local Tax Proposals, Renewals." *Inside 208*. Accessed September 22, 2016. <http://blogs.mml.org/wp/inside208/2014/08/06/michigan-cities-villages-highly-successful-in-getting-voter-approval-on-new-local-tax-proposals-renewals/>
- Blue Forest Conservation. July 2016. "Introduction to the Forest Resilience Bond." *Blue Forest Conservation*. PowerPoint presentation. Accessed September 20, 2016. <http://blueforestconservation.com/#frb>
- Dewey, Charlise. October 7, 2016. "Strong Beginnings to Pilot Pay-for-Success Model." *Grand Rapids Business Journal*. Accessed October 14, 2016. <http://www.grbj.com/articles/86316-strong-beginnings-to-pilot-pay-for-success-model>
- Huron County Metropolitan Authority (HCMA). 2016. "About Us." *Metroparks*. Accessed September 22, 2016. <http://www.metroparks.com/about-us/about-metroparks/>
- Isley, Paul, Elaine Sterrett Isely, and Carrie Hause. 2011. *Muskegon Lake Area of Concern Habitat Restoration Project: Socio-Economic Assessment*. Allendale: Grand Valley State University. Accessed September 22, 2016. ftp://geoportal.wri.gvsu.edu/awri_website/final%20socio%20economic%202.pdf
- Katz, Diane. October 2002. "The Clean Michigan Initiative: An Assessment." *The Mackinac Center Report*. Accessed September 22, 2016.- <https://www.mackinac.org/archives/2002/s2002-05.pdf>
- Macatawa Area Coordinating Council (MACC). n.d. *West Michigan Watershed Summary*. Holland: West Michigan Watershed Collaborative.
- Meersman, Matt, John Kerr, Mary Fales, and Erin Fuller. 2015. "Smart Assessments: Reduced Maintenance, Cleaner Water, and Fewer Complaints." *Pipeline* 24 (2): 26–31. Accessed October 14, 2016. http://www.vbco.org/downloads/pipeline2015_2q_smartassessmentarticle.pdf
- Michigan Department of Treasury. 2016. "2015 Taxable Valuations." *Michigan Department of Treasury*. Accessed September 22, 2016. https://www.michigan.gov/treasury/0,4679,7-121-1751_2228_21957_45819-285567--,00.html
- MIRS. November 2014. "Ballot Final." *MIRS*. Accessed September 22, 2016 <https://mirsnews.com/pdfs/BallotFinal.pdf>
- Monsma, J. Chris. October 16, 1998. "Michigan Ballot Proposal C: Clean Michigan Initiative." *Public Sector Consultants Inc.* Accessed September 22, 2016. <http://www.pscinc.com/Portals/0/Publications/PSR/Periscop/1998/101698.html>
- Northeast Ohio Regional Sewer District. July 7, 2016. *Stormwater Fee Credit Policy Manual*. Accessed October 14, 2016. http://www.neorsd.org/I_Library.php?SOURCE=library/CreditManual_ALL_12182012.pdf&a=download_file&LIBRARY_RECORD_ID=4699
- Spencer, Danny and Jerry Mathews. 2015. "Solving Storm Water Challenges: Groesbeck Municipal Golf Course." *American Society of Golf Course Architects*. Accessed September 22, 2016. <http://www.asgca.org/case-studies/210-solving-storm-water-challenges-groesbeck-municipal-golf-course>

Urban Institute. n.d. "What is Pay for Success (PFS)?" *Pay for Success*. Accessed September 22, 2016.
<http://pfs.urban.org/pfs-101/content/what-pay-success-pfs>

Appendix A:

Selected Acronyms and Definitions

WMPA: West Michigan Prosperity Alliance. The WMPA is a 13-county region in West Michigan, Region 4, that was formed in January 2014 as part of Gov. Rick Snyder’s Regional Prosperity Initiative. It is guided by a 30-member steering committee that represents economic development, workforce development, and infrastructure expertise from around the region. It is one of the largest regions in the state, with 130 miles of Lake Michigan shoreline, over 90 school systems, 13 colleges and universities, 431 units of government, and a geography roughly the size of New Jersey. The population exceeds 1.5 million residents. Over 10,000 employers create \$5.7 billion in economic output.

Full list of steering committee members:

- Metropolitan Planning Organization and Planning Commissions
 - Grand Valley Metropolitan Council—John Weiss
 - Macatawa Area Coordinating Council—Steve Bulthuis
 - West Michigan Regional Planning Commission—Dave Bee
 - West Michigan Shoreline Regional Development Commission—Erin Kuhn
- Economic Development Agencies
 - Barry County Economic Development Alliance—Open
 - Lakeshore Advantage—Jennifer Owens
 - Muskegon Area First—Ed Garner
- Workforce Development
 - West Michigan Works!—Jacob Maas
 - Michigan Works! West Central—Paul Griffith
- Higher Education
 - Muskegon Community College—Dan Rinsema-Sybenga
 - Grand Rapids Community College—Bill Pink
 - West Shore Community College—Crystal Young
- Adult Education
 - Allegan Adult and Alternative Ed—Brenda Nyhof
 - Zeeland/Holland Adult Education—Michael O’Connor
 - Orchard View Public Schools—Doug Wood
- Community Development
 - EightCAP Inc.—Dan Peterson
 - Open
 - Muskegon-Oceana Community Action Partnership—Kiesha Guy
- Other Members
 - Michigan Department of Transportation—Roger Safford
 - Padnos Inc.—Jim Fisher
 - Model Communities Initiative—Linda Brand
 - Talent 2025—Kevin Stotts
 - West Michigan Chamber Alliance—Andy Johnston
 - GVSU—Simone Jonaitis
 - Ludington/Scottville Chamber of Commerce—Kathy Maclean

- Mecosta County Development Corporation—Jim Sandy
- The Right Place Inc.—Rick Chapla
- Philanthropic
 - Barry Community Foundation—Bonnie Hildreth
 - Frey Foundation—Steve Wilson
 - Community Foundation for Muskegon County—Bob Chapla

WMWC: West Michigan Watershed Collaborative. Formed in 2015, this group includes representatives from 25 watershed management groups within the West Michigan Prosperity Alliance. The group was assembled in order to better network and collaborate on watershed restoration and protection in West Michigan. WMWC is providing input on the sustainable funding study and will continue to work with the project team to implement funding mechanisms in the region.

Participating watersheds:

- Bass River and Deer Creek (Ottawa Conservation District)
- Bear Creek—Grand (Cannon Township)
- Bear Creek—Muskegon (Muskegon Conservation District)
- Big Sable/Hamlin Lake (Big Sable Watershed Council)
- Mona Lake/Black Creek (Mona Lake Watershed Council)
- Black River (Van Buren Conservation District)
- Buck Creek (Friends of Buck Creek, City of Wyoming)
- Coldwater River (Coldwater River Watershed Council, City of Kentwood)
- Duck Creek (Duck Creek Watershed Partnership)
- Flat River (Kent Conservation District)
- Gull and Augusta Creeks (Four Townships Water Resources Council)
- Rabbit River and Gun River (Allegan Conservation District)
- Kalamazoo River (Kalamazoo River Watershed Council)
- Lake Creek (Ionia Conservation District)
- Lower Grand River (Grand Valley Metropolitan Council, Lower Grand River Organization of Watersheds)
- Macatawa (Macatawa Area Coordinating Council)
- Maple River (Clinton Conservation District)
- Middle Grand River (Tri-County Regional Planning Commission, Middle Grand Organization of Watersheds)
- Muskegon Lake (Muskegon Lake Watershed Partnership)
- Muskegon River (Muskegon River Watershed Assembly)
- Pere Marquette River (Pere Marquette Watershed Council)
- Pere Marquette Lake (Pere Marquette Lake Watershed Council)
- Plaster Creek (Calvin College, Plaster Creek Stewards)
- Rogue River (Rogue River Watershed Partners, Rogue River Watershed Council, Trout Unlimited)
- Sand Creek (Sand Creek Watershed Partners, Ottawa County Water Resources Commissioner)
- Thornapple River (Thornapple River Watershed Council, Barry Conservation District, Village of Middleville)

- White Lake (Muskegon Conservation District)
- White River (White River Watershed Partnership)

Project Team: This group secured the funding and developed the request for proposals that was necessary for this project. Representatives on the team include: Steve Bulthuis, executive director of the Macatawa Area Coordinating Council and WMPA steering committee member; Kelly Goward, Macatawa Watershed project manager at the Macatawa Area Coordinating Council; Wendy Ogilvie, director of environmental programs at the Grand Valley Metropolitan Council; and Kathy Evans, environmental planning program manager at the West Michigan Shoreline Regional Development Commission.

Steering Committee: The steering committee for this project included all members of the project team plus representatives from several West Michigan watersheds: Nichol De Mol, Trout Unlimited (Rogue River Watershed); Tom Tissue, White River Watershed Partnership; Anne Pawli, White River Watershed Partners; and Greg Mund, Muskegon River Watershed Assembly.

Region 4: As defined by the Governor’s Regional Prosperity Initiative, Region 4 is the West Michigan Prosperity Alliance and includes the following 13 counties: Mason, Lake, Osceola, Oceana, Newaygo, Mecosta, Muskegon, Montcalm, Ottawa, Kent, Ionia, Allegan, and Barry.

MACC: Macatawa Area Coordinating Council. The MACC is the designated metropolitan planning organization for the Holland/Zeeland urbanized area. The MACC also houses the Macatawa Watershed Project and is responsible for implementing the Macatawa Watershed Management Plan.

GVMC: Grand Valley Metropolitan Council. The GVMC is the designated metropolitan planning organization for the Grand Rapids urbanized area. The GVMC houses the Lower Grand River Organization of Watersheds and provides coordination of and assistance to watershed groups within the Lower Grand River watershed.

WMSRDC: West Michigan Shoreline Regional Development Commission. The WMSRDC is a federal and state designated regional planning and development agency serving 120 local governments in Lake, Mason, Muskegon, Newaygo, and Oceana Counties. WMSRDC is responsible for the management and administration of the homeland security program for the counties of Clare, Ionia, Isabella, Kent, Lake, Mason, Mecosta, Montcalm, Muskegon, Newaygo, Oceana, Osceola, and Ottawa. WMSRDC is the planning agency for the metropolitan transportation planning program for Muskegon and Northern Ottawa Counties.

Appendix B: Stakeholder Interviews

A series of stakeholder interviews was conducted with leaders from the philanthropic and business communities as well as other sectors throughout West Michigan in order to gain a better understanding of their current funding priorities and opinions regarding new approaches to funding watershed management activities. The interviews were confidential and agreement was reached that this report will not attribute responses to individuals. Interview participants are provided below.

Interviewee Name	Role	Organization
Rick Baker	President/CEO	Grand Rapids Area Chamber of Commerce
Nora Balgoyen-Williams	Director	Allegan County Economic Development Commission
Jim Brooks	Philanthropist	Brooks Family
Jane Clark	President	Michigan West Coast Chamber of Commerce
Robert Collier	President/CEO	Council of Michigan Foundations
Bonnie Gettys	President/CEO	Barry Community Foundation
George Heartwell	Former Mayor	City of Grand Rapids/Muskegon River Watershed Assembly board member/GVSU faculty member (Sustainability Institute)
Mike Kelly	Executive Director	Saginaw Bay Watershed Initiative Network
Jennifer Owens	President	Lakeshore Advantage
Spence Riggs for Kathryn Maclean	President/CEO	Ludington Chamber of Commerce
Christine Robere	President	United Way of the Lakeshore
Dan Schoonmaker	Executive Director	West Michigan Sustainable Business Forum
Diana Sieger	President	Grand Rapids Community Foundation
Mark Van Putten	President/CEO	Wege Foundation
Travis Williams	Executive Director	Outdoor Discovery Center
Steve Wilson	President/CEO	Frey Foundation

Appendix C:

Millage Revenues by County and Watershed

Millage Scenarios

County Region 4	Watershed	SQKM	%County	Scenario A:	Scenario B:	Scenario C:
				0.05 mills (5 years) \$14,003,744	0.1 mills (5 years) \$28,007,488	0.25 mills (5 years) \$70,018,720
Allegan				\$1,154,089	\$2,308,178	\$5,770,445
	Black River	325.10	14.91%	\$172,051	\$344,101	\$860,253
	Buck Creek	4.48	0.21%	\$2,372	\$4,744	\$11,860
	Lower Thornapple River	10.08	0.46%	\$5,334	\$10,668	\$26,669
	Direct Drainage Lake MI	60.88	2.79%	\$32,221	\$64,442	\$161,104
	Lake Macatawa	168.30	7.72%	\$89,069	\$178,139	\$445,347
	Kalamazoo River	1612.13	73.93%	\$853,165	\$1,706,331	\$4,265,827
Barry				\$525,747	\$1,051,494	\$2,628,734
	Fall Creek	64.25	4.30%	\$22,608	\$45,216	\$113,041
	Mud Creek	85.40	5.72%	\$30,052	\$60,105	\$150,262
	Upper Thornapple River	87.13	5.83%	\$30,662	\$61,324	\$153,310
	High Bank Creek	88.30	5.91%	\$31,072	\$62,144	\$155,359
	Glass Creek	95.18	6.37%	\$33,492	\$66,984	\$167,461
	Cedar Creek	119.93	8.03%	\$42,202	\$84,404	\$211,011
	Coldwater River	170.07	11.38%	\$59,848	\$119,695	\$299,238
	Lower Thornapple River	312.55	20.92%	\$109,987	\$219,973	\$549,933
	Kalamazoo River	471.23	31.54%	\$165,823	\$331,646	\$829,115
Ionian				\$732,730	\$1,465,460	\$3,663,651
	Stony Creek	27.12	1.81%	\$13,230	\$26,459	\$66,149
	Looking Glass River	27.47	1.83%	\$13,399	\$26,797	\$66,993
	Fish Creek	45.74	3.05%	\$22,315	\$44,629	\$111,573
	Maple River	64.63	4.30%	\$31,527	\$63,054	\$157,635
	Sebewa Creek - Grand River	118.85	7.91%	\$57,978	\$115,957	\$289,892
	Mud Creek	12.48	0.83%	\$6,089	\$12,178	\$30,444
	Lake Creek	73.58	4.90%	\$35,893	\$71,785	\$179,463
	Bellemy Creek	83.60	5.57%	\$40,784	\$81,569	\$203,922
	Libhart Creek	142.44	9.48%	\$69,487	\$138,974	\$347,434
	Prairie Creek	157.21	10.47%	\$76,692	\$153,383	\$383,459
	Flat River	184.90	12.31%	\$90,201	\$180,402	\$451,006
	Coldwater River	205.83	13.70%	\$100,411	\$200,822	\$502,054
	Lower Grand River	358.19	23.85%	\$174,735	\$349,470	\$873,676
Kent				\$5,506,830	\$11,013,659	\$27,534,149
	Crockery Creek	22.98	1.02%	\$56,069	\$112,137	\$280,343
	Sand Creek	28.76	1.27%	\$70,157	\$140,315	\$350,787
	Kalamazoo River	29.53	1.31%	\$72,046	\$144,092	\$360,231
	Indian Mill Creek	44.43	1.97%	\$108,402	\$216,804	\$542,011
	Mill Creek	47.90	2.12%	\$116,859	\$233,718	\$584,294
	Rush Creek	48.08	2.13%	\$117,283	\$234,565	\$586,413
	Bear Creek (Kent)	82.31	3.65%	\$200,794	\$401,588	\$1,003,969
	Coldwater River	112.86	5.00%	\$275,322	\$550,645	\$1,376,612
	Buck Creek	128.49	5.69%	\$313,471	\$626,942	\$1,567,354
	Plaster Creek	147.53	6.54%	\$359,904	\$719,808	\$1,799,520
	Lower Thornapple River	188.61	8.36%	\$460,136	\$920,272	\$2,300,679
	Flat River	407.08	18.03%	\$993,087	\$1,986,174	\$4,965,436
	Lower Grand River	444.97	19.71%	\$1,085,545	\$2,171,089	\$5,427,723
	Rogue River	523.76	23.20%	\$1,277,738	\$2,555,476	\$6,388,690

Millage Scenarios

County Lake	Watershed	SQKM	%County	Scenario A:	Scenario B:	Scenario C:	
				0.05 mills (5 years) \$143,632	0.1 mills (5 years) \$287,265	0.25 mills (5 years) \$718,162	
Lake	Muskegon River	63.57	4.28%	\$6,147	\$12,295	\$30,737	
	Big Sable River	128.40	8.64%	\$12,410	\$24,820	\$62,049	
	Manistee River	552.63	37.17%	\$53,388	\$106,776	\$266,941	
	Pere Marquette River	742.03	49.91%	\$71,687	\$143,374	\$358,434	
Mason				\$447,099	\$894,197	\$2,235,493	
	Manistee River	43.73	3.31%	\$14,810	\$29,619	\$74,048	
	Direct Drainage Lake MI	107.40	8.14%	\$36,375	\$72,749	\$181,873	
	Pentwater River	132.90	10.07%	\$45,008	\$90,017	\$225,041	
	Lincoln River	262.79	19.91%	\$88,999	\$177,997	\$444,993	
	Big Sable River	331.87	25.14%	\$112,398	\$224,795	\$561,988	
	Pere Marquette River	441.41	33.44%	\$149,496	\$298,991	\$747,478	
Mecosta				\$326,838	\$653,676	\$1,634,190	
	Flat River	57.46	3.89%	\$12,698	\$25,395	\$63,488	
	Lake Huron Drainage Coldwater River						
	Chippewa River	65.21	4.41%	\$14,410	\$28,820	\$72,051	
	Lake Huron Drainage Honeyoey Creek - Pine River	83.37	5.64%	\$18,424	\$36,848	\$92,119	
	Lake Huron Drainage West Branch Chippewa River	192.20	13.00%	\$42,475	\$84,951	\$212,377	
	Muskegon River	1080.67	73.07%	\$238,823	\$477,647	\$1,194,117	
				\$453,034	\$906,067	\$2,265,168	
	Montcalm	Pine Creek - Maple River	0.45	0.02%	\$108	\$217	\$541
		Fish Creek	400.35	21.45%	\$97,172	\$194,345	\$485,862
Rogue River		9.06	0.49%	\$2,200	\$4,400	\$11,001	
Prairie Creek		109.17	5.85%	\$26,499	\$52,998	\$132,495	
Lake Huron Drainage Honeyoey Creek - Pine River		190.12	10.19%	\$46,145	\$92,291	\$230,727	
Muskegon River		348.37	18.66%	\$84,558	\$169,115	\$422,788	
Flat River		808.87	43.34%	\$196,330	\$392,661	\$981,652	
				\$1,140,605	\$2,281,209	\$5,703,023	
Muskegon		Lower Grand River	0.28	0.02%	\$233	\$465	\$1,164
		Deer Creek	1.96	0.14%	\$1,634	\$3,268	\$8,169
	Rogue River	2.40	0.18%	\$2,006	\$4,011	\$10,029	
	Muskegon River	5.16	0.38%	\$4,311	\$8,622	\$21,555	
	Bear Creek/Lake (Muskegon)	43.24	3.17%	\$36,125	\$72,250	\$180,624	
	Direct Drainage Lake MI	47.55	3.48%	\$39,723	\$79,445	\$198,614	
	White Lake	51.11	3.74%	\$42,694	\$85,388	\$213,469	
	Duck Lake/Creek	57.51	4.21%	\$48,039	\$96,078	\$240,195	
	Spring Lake - Norris Creek	95.49	6.99%	\$79,769	\$159,538	\$398,844	
	Crockery Creek	201.56	14.76%	\$168,379	\$336,758	\$841,895	
	Black Creek - Mona Lake	211.81	15.51%	\$176,945	\$353,891	\$884,727	
	White River	247.61	18.14%	\$206,849	\$413,699	\$1,034,247	
	Muskegon Lake	399.75	29.28%	\$333,950	\$667,901	\$1,669,752	

County	Watershed	SQKM	%County	Millage Scenarios		
				Scenario A: 0.05 mills (5 years)	Scenario B: 0.1 mills (5 years)	Scenario C: 0.25 mills (5 years)
Newaygo				\$385,392	\$770,785	\$1,926,962
	Black Creek - Mona Lake	3.36	0.15%	\$581	\$1,162	\$2,905
	Crockery Creek	40.36	1.81%	\$6,974	\$13,947	\$34,868
	Muskegon Lake	41.93	1.88%	\$7,244	\$14,489	\$36,221
	Rogue River	134.56	6.03%	\$23,249	\$46,498	\$116,246
	Pere Marquette River	565.36	25.35%	\$97,679	\$195,358	\$488,395
	White River	610.82	27.38%	\$105,535	\$211,070	\$527,674
	Muskegon River	834.17	37.40%	\$144,123	\$288,246	\$720,616
Oceana				\$304,995	\$609,990	\$1,524,975
	Direct Drainage Lake MI	57.45	4.06%	\$12,397	\$24,794	\$61,984
	Silver Lake	63.81	4.51%	\$13,769	\$27,538	\$68,845
	Pere Marquette River	205.89	14.57%	\$44,425	\$88,851	\$222,126
	Pentwater Lake	369.03	26.11%	\$79,629	\$159,257	\$398,143
	White River	717.27	50.75%	\$154,770	\$309,541	\$773,851
Osceola				\$183,409	\$366,818	\$917,044
	Lake Huron Drainage					
	West Branch Chippewa River	73.59	4.96%	\$9,098	\$18,197	\$45,492
	Manistee River	278.65	18.78%	\$34,451	\$68,902	\$172,256
	Muskegon River	1131.24	76.26%	\$139,861	\$279,721	\$699,303
Ottawa				\$2,699,345	\$5,398,690	\$13,496,726
	Black Creek - Mona Lake	4.24	0.28%	\$7,658	\$15,317	\$38,292
	Mill Creek	4.58	0.31%	\$8,286	\$16,572	\$41,431
	Rogue River	7.07	0.47%	\$12,778	\$25,557	\$63,892
	Spring Lake - Norris Creek	34.72	2.33%	\$62,775	\$125,549	\$313,874
	Direct Drainage Lake MI	27.16	1.82%	\$49,104	\$98,209	\$245,522
	Kalamazoo River	58.31	3.91%	\$105,423	\$210,847	\$527,117
	Deer Creek	88.57	5.93%	\$160,135	\$320,270	\$800,675
	Rush Creek	104.00	6.97%	\$188,031	\$376,062	\$940,155
	Sand Creek	113.25	7.59%	\$204,747	\$409,494	\$1,023,735
	Bass River	129.57	8.68%	\$234,254	\$468,508	\$1,171,271
	Crockery Creek	149.17	9.99%	\$269,693	\$539,386	\$1,348,465
	Pigeon River and Little Pigeon Creek	179.70	12.04%	\$324,889	\$649,777	\$1,624,443
	Lake Macatawa	283.76	19.01%	\$513,021	\$1,026,042	\$2,565,106
	Lower Grand River	309.00	20.70%	\$558,651	\$1,117,301	\$2,793,253

Appendix D:
Flat Fee Revenues by County and Watershed

Flat Fee Scenarios

County	Watershed	SQKM	%County	Scenario A:	Scenario B:	Scenario C:
				\$10/parcel/year (5 years)	\$20/parcel/year (5 years)	\$30/parcel/year (5 years)
Region 4				\$36,022,100	\$72,044,200	\$108,066,300
Allegan				\$3,115,200	\$6,230,400	\$9,345,600
	Black River	325.10	14.91%	\$464,411	\$928,823	\$1,393,234
	Buck Creek	4.48	0.21%	\$6,402	\$12,805	\$19,207
	Lower Thornapple River	10.08	0.46%	\$14,397	\$28,795	\$43,192
	Direct Drainage Lake MI	60.88	2.79%	\$86,973	\$173,945	\$260,918
	Lake Macatawa	168.30	7.72%	\$240,423	\$480,846	\$721,268
	Kalamazoo River	1612.13	73.93%	\$2,302,925	\$4,605,850	\$6,908,775
Barry				\$1,593,550	\$3,187,100	\$4,780,650
	Fall Creek	64.25	4.30%	\$68,526	\$137,052	\$205,578
	Mud Creek	85.40	5.72%	\$91,090	\$182,179	\$273,269
	Upper Thornapple River	87.13	5.83%	\$92,937	\$185,875	\$278,812
	High Bank Creek	88.30	5.91%	\$94,179	\$188,359	\$282,538
	Glass Creek	95.18	6.37%	\$101,515	\$203,031	\$304,546
	Cedar Creek	119.93	8.03%	\$127,916	\$255,831	\$383,747
	Coldwater River	170.07	11.38%	\$181,400	\$362,799	\$544,199
	Lower Thornapple River	312.55	20.92%	\$333,372	\$666,743	\$1,000,115
	Kalamazoo Rlver	471.23	31.54%	\$502,613	\$1,005,226	\$1,507,839
Ionia				\$1,495,950	\$2,991,900	\$4,487,850
	Stony Creek	27.12	1.81%	\$27,010	\$54,020	\$81,030
	Looking Glass River	27.47	1.83%	\$27,355	\$54,709	\$82,064
	Fish Creek	45.74	3.05%	\$45,558	\$91,115	\$136,673
	Maple River	64.63	4.30%	\$64,366	\$128,732	\$193,098
	Sebewa Creek - Grand River	118.85	7.91%	\$118,369	\$236,738	\$355,108
	Mud Creek	12.48	0.83%	\$12,431	\$24,862	\$37,293
	Lake Creek	73.58	4.90%	\$73,279	\$146,558	\$219,836
	Bellemey Creek	83.60	5.57%	\$83,266	\$166,532	\$249,798
	Libhart Creek	142.44	9.48%	\$141,865	\$283,730	\$425,595
	Prairie Creek	157.21	10.47%	\$156,575	\$313,149	\$469,724
	Flat River	184.90	12.31%	\$184,156	\$368,311	\$552,467
	Coldwater River	205.83	13.70%	\$205,000	\$409,999	\$614,999
	Lower Grand River	358.19	23.85%	\$356,741	\$713,482	\$1,070,224
Kent				\$10,837,500	\$21,675,000	\$32,512,500
	Crockery Creek	22.98	1.02%	\$110,344	\$220,687	\$331,031
	Sand Creek	28.76	1.27%	\$138,071	\$276,141	\$414,212
	Kalamazoo River	29.53	1.31%	\$141,788	\$283,575	\$425,363
	Indian Mill Creek	44.43	1.97%	\$213,337	\$426,673	\$640,010
	Mill Creek	47.90	2.12%	\$229,979	\$459,959	\$689,938
	Rush Creek	48.08	2.13%	\$230,814	\$461,627	\$692,441
	Bear Creek (Kent)	82.31	3.65%	\$395,164	\$790,329	\$1,185,493
	Coldwater River	112.86	5.00%	\$541,837	\$1,083,675	\$1,625,512
	Buck Creek	128.49	5.69%	\$616,914	\$1,233,828	\$1,850,742
	Plaster Creek	147.53	6.54%	\$708,295	\$1,416,589	\$2,124,884
	Lower Thornapple River	188.61	8.36%	\$905,552	\$1,811,104	\$2,716,656
	Flat River	407.08	18.03%	\$1,954,406	\$3,908,812	\$5,863,219
	Lower Grand River	444.97	19.71%	\$2,136,363	\$4,272,727	\$6,409,090
	Rogue River	523.76	23.20%	\$2,514,602	\$5,029,204	\$7,543,806

Flat Fee Scenarios

County	Watershed	SQKM	%County	Scenario A:	Scenario B:	Scenario C:
				\$10/parcel/year (5 years)	\$20/parcel/year (5 years)	\$30/parcel/year (5 years)
Lake	Muskegon River	63.57	4.28%	\$1,228,250	\$2,456,500	\$3,684,750
	Big Sable River	128.40	8.64%	\$52,569	\$105,138	\$157,707
	Manistee River	552.63	37.17%	\$106,121	\$212,242	\$318,362
	Pere Marquette River	742.03	49.91%	\$456,541	\$913,081	\$1,369,622
Mason				\$613,020	\$1,226,039	\$1,839,059
	Manistee River	43.73	3.31%	\$1,175,450	\$2,350,900	\$3,526,350
				\$38,935	\$77,871	\$116,806
	Direct Drainage Lake MI	107.40	8.14%	\$95,631	\$191,262	\$286,893
Mecosta	Pentwater River	132.90	10.07%	\$118,330	\$236,659	\$354,989
	Lincoln River	262.79	19.91%	\$233,983	\$467,966	\$701,949
	Big Sable River	331.87	25.14%	\$295,500	\$591,001	\$886,501
	Pere Marquette River	441.41	33.44%	\$393,033	\$786,066	\$1,179,099
				\$1,465,700	\$2,931,400	\$4,397,100
	Flat River	57.46	3.89%	\$56,942	\$113,885	\$170,827
	Lake Huron Drainage Coldwater River					
	Chippewa River	65.21	4.41%	\$64,622	\$129,245	\$193,867
	Lake Huron Drainage Honeyoey Creek - Pine River	83.37	5.64%	\$82,621	\$165,242	\$247,864
	Lake Huron Drainage West Branch Chippewa River	192.20	13.00%	\$190,480	\$380,960	\$571,440
Montcalm	Muskegon River	1080.67	73.07%	\$1,071,000	\$2,142,000	\$3,212,999
				\$1,966,750	\$3,933,500	\$5,900,250
Muskegon	Pine Creek - Maple River	0.45	0.02%	\$470	\$940	\$1,410
	Fish Creek	400.35	21.45%	\$421,853	\$843,707	\$1,265,560
	Rogue River	9.06	0.49%	\$9,551	\$19,103	\$28,654
	Prairie Creek	109.17	5.85%	\$115,040	\$230,079	\$345,119
	Lake Huron Drainage Honeyoey Creek - Pine River	190.12	10.19%	\$200,331	\$400,662	\$600,993
	Muskegon River	348.37	18.66%	\$367,089	\$734,178	\$1,101,267
	Flat River	808.87	43.34%	\$852,327	\$1,704,655	\$2,556,982
				\$3,910,600	\$7,821,200	\$11,731,800
	Lower Grand River	0.28	0.02%	\$798	\$1,596	\$2,394
	Deer Creek	1.96	0.14%	\$5,602	\$11,203	\$16,805
Rogue River	2.40	0.18%	\$6,877	\$13,753	\$20,630	
Muskegon River	5.16	0.38%	\$14,781	\$29,561	\$44,342	
Muskegon	Bear Creek/Lake (Muskegon)	43.24	3.17%	\$123,855	\$247,711	\$371,566
	Direct Drainage Lake MI	47.55	3.48%	\$136,191	\$272,381	\$408,572
	White Lake	51.11	3.74%	\$146,377	\$292,754	\$439,131
	Duck Lake/Creek	57.51	4.21%	\$164,704	\$329,407	\$494,111
	Spring Lake - Norris Creek	95.49	6.99%	\$273,490	\$546,980	\$820,471
	Crockery Creek	201.56	14.76%	\$577,293	\$1,154,585	\$1,731,878
	Black Creek - Mona Lake	211.81	15.51%	\$606,663	\$1,213,326	\$1,819,989
	White River	247.61	18.14%	\$709,190	\$1,418,380	\$2,127,570
	Muskegon Lake	399.75	29.28%	\$1,144,960	\$2,289,919	\$3,434,879

Flat Fee Scenarios

County	Watershed	SQKM	%County	Scenario A:	Scenario B:	Scenario C:
				\$10/parcel/year (5 years)	\$20/parcel/year (5 years)	\$30/parcel/year (5 years)
Newaygo				\$1,786,850	\$3,573,700	\$5,360,550
	Black Creek - Mona Lake	3.36	0.15%	\$2,694	\$5,388	\$8,082
	Crockery Creek	40.36	1.81%	\$32,332	\$64,665	\$96,997
	Muskegon Lake	41.93	1.88%	\$33,588	\$67,175	\$100,763
	Rogue River	134.56	6.03%	\$107,794	\$215,587	\$323,381
	Pere Marquette River	565.36	25.35%	\$452,883	\$905,767	\$1,358,650
	White River	610.82	27.38%	\$489,306	\$978,612	\$1,467,918
	Muskegon River	834.17	37.40%	\$668,219	\$1,336,438	\$2,004,657
Oceana				\$1,206,300	\$2,412,600	\$3,618,900
	Direct Drainage Lake MI	57.45	4.06%	\$49,031	\$98,063	\$147,094
	Silver Lake	63.81	4.51%	\$54,459	\$108,917	\$163,376
	Pere Marquette River	205.89	14.57%	\$175,709	\$351,417	\$527,126
	Pentwater Lake	369.03	26.11%	\$314,943	\$629,886	\$944,830
	White River	717.27	50.75%	\$612,139	\$1,224,279	\$1,836,418
Osceola				\$1,035,400	\$2,070,800	\$3,106,200
	Lake Huron Drainage West Branch Chippewa River	73.59	4.96%	\$51,364	\$102,727	\$154,091
	Manistee River	278.65	18.78%	\$194,487	\$388,975	\$583,462
	Muskegon River	1131.24	76.26%	\$789,557	\$1,579,113	\$2,368,670
Ottawa				\$5,204,600	\$10,409,200	\$15,613,800
	Black Creek - Mona Lake	4.24	0.28%	\$14,766	\$29,532	\$44,299
	Mill Creek	4.58	0.31%	\$15,977	\$31,953	\$47,930
	Rogue River	7.07	0.47%	\$24,638	\$49,276	\$73,914
	Spring Lake - Norris Creek	34.72	2.33%	\$121,036	\$242,072	\$363,107
	Direct Drainage Lake MI	27.16	1.82%	\$94,678	\$189,356	\$284,034
	Kalamazoo River	58.31	3.91%	\$203,267	\$406,533	\$609,800
	Deer Creek	88.57	5.93%	\$308,756	\$617,512	\$926,268
	Rush Creek	104.00	6.97%	\$362,542	\$725,084	\$1,087,627
	Sand Creek	113.25	7.59%	\$394,772	\$789,544	\$1,184,316
	Bass River	129.57	8.68%	\$451,665	\$903,330	\$1,354,995
	Crockery Creek	149.17	9.99%	\$519,994	\$1,039,988	\$1,559,983
	Pigeon River and Little Pigeon Creek	179.70	12.04%	\$626,417	\$1,252,834	\$1,879,250
	Lake Macatawa	283.76	19.01%	\$989,155	\$1,978,309	\$2,967,464
	Lower Grand River	309.00	20.70%	\$1,077,133	\$2,154,265	\$3,231,398