



**Michigan Department of Environmental Quality  
Water Resources Division  
Nonpoint Source Program  
Measures of Success**

**Vision**

The vision of Michigan's Nonpoint Source (NPS) Program is to protect high-quality waters and restore waters impaired by NPS pollution. The NPS Program's approach to achieve this vision is centered on watershed management and is outlined through strategies and short term actions in the Michigan NPS Program Plan. Forming the foundation of the plan are seven goals (listed below) which guide the efforts of program staff and our partners, creating a thorough approach to managing NPS pollutants.

**Goals**

- I. Develop and implement watershed management plans (WMPs) to restore and protect priority watersheds.
- II. Eliminate or reduce NPS pollutants and causes of impairments.
- III. Increase public awareness of NPS pollutants and causes of impairment and encourage individuals to adopt behaviors to reduce NPS pollutants and causes of impairments.
- IV. Efficiently manage pass-through grants and help stakeholders identify funding sources to restore and protect watersheds.
- V. Support compliance and enforcement efforts to restore and protect priority watersheds.
- VI. Focus monitoring to document impairments and threats to high-quality waters, and assess the effectiveness of efforts to restore and protect priority watersheds.
- VII. Efficient program operations.

These goals focus on restoring and protecting priority waters, educating stakeholders, and supporting efforts to eliminate NPS impairments. A comprehensive evaluation is used to ensure that NPS pollution issues are being addressed in an efficient manner.

**Measures**

To evaluate the progress of Michigan's NPS Program, a set of metrics is used to highlight where progress to restore and protect Michigan waters from NPS pollution has been made, and where improvement is still needed. These measures of success (MOS) determine if goals outlined in the NPS Program Plan, and ultimately the NPS program vision, are met. While designed to track how well NPS program work is improving the environmental health of Michigan, these measures also:

- Provide measurable goals for staff to work toward.
- Guide strategy, outcomes, and priorities of the program by highlighting where past approaches have been successful or fallen short.
- Clearly communicate achievements to lawmakers, partners, and other stakeholders.

As outlined in the Michigan NPS Program Plan, the following measures of success have been selected to evaluate the accomplishments of the program. Each measure has its own timeframe from which data is analyzed, most of which are five-year intervals. Along with each measure is a description of the progress made, as well as an outline for future efforts.

## Restoration of Impaired Waters

### MOS-1

Between October 1, 2012, and September 30, 2017, the NPS Program, in collaboration with other programs, will target restoration of ten water bodies (impaired by pollutants other than mercury or polychlorinated biphenyls [PCBs]) included on the state's nonattainment list in 2006.

#### *Progress*

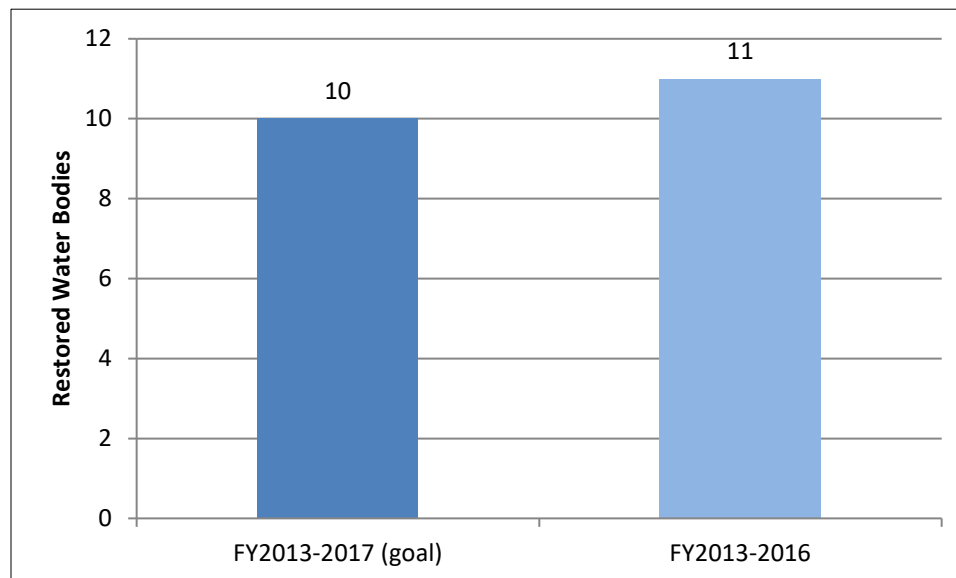
From 2007 to 2012, 34 water bodies with designated use impairments due to NPS pollutants other than mercury or PCBs were restored. More progress has been made to restore water bodies in Michigan since. Between 2012 and 2014, seven water bodies were removed from the nonattainment list and between 2014 and 2016, an additional four water bodies were removed. This brings the total number of water bodies removed from the nonattainment list between 2012 and 2016 to 11. This measure is further described in **Figure 1**.

#### *What's Next*

The goal of restoring all NPS-related designated use impairments in ten water bodies by September 30, 2017, has been met and surpassed. The NPS Program will continue to administer pass-through grants, as well as provide technical support to other initiatives working to restore impaired waterbodies. To protect current and recently restored waterbodies, efforts by local stakeholders, such as education and outreach initiatives, can help ensure that designated uses are maintained in high-quality watersheds going forward. Informing compliance staff of any violations will also help protect these waterbodies from new sources of NPS pollution.

**Figure 1.** Number of water bodies restored from NPS impairments.

### NPS Restored Water Bodies



### MOS-2

Between October 1, 2012, and September 30, 2017, the NPS Program will target restoration of 20 specific causes of water body impairment included on the state's nonattainment list in 2006.

*Progress*

Between 2012 and 2014, 25 specific causes of designated use impairment were restored. Between 2014 and 2016, 29 specific causes of designated use impairment were restored.

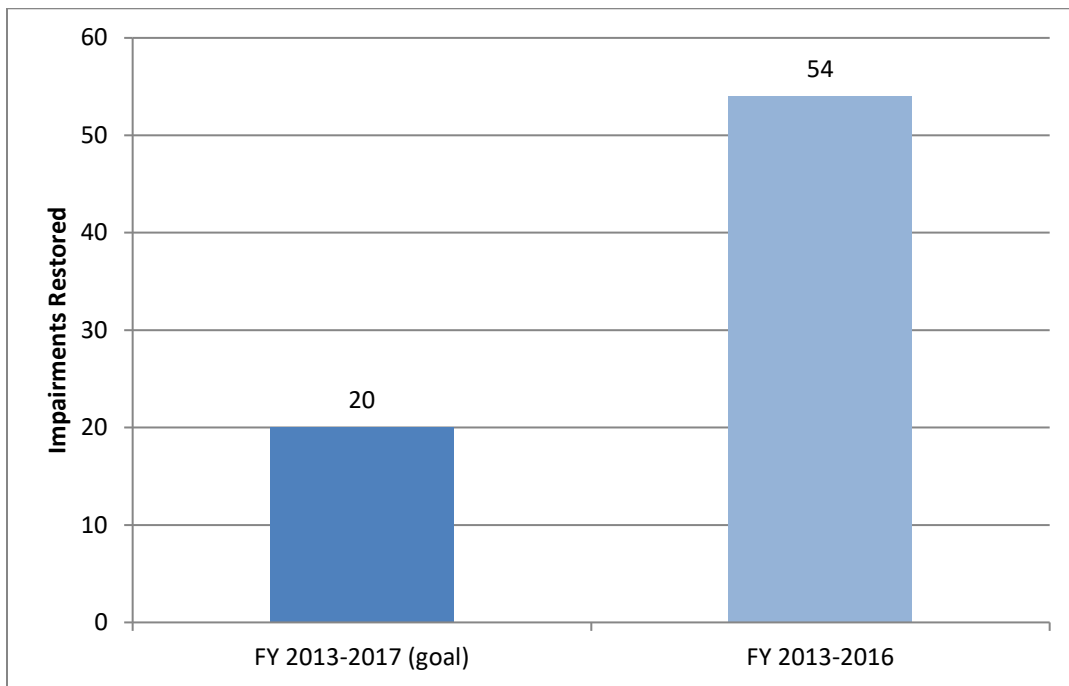
**Figure 2** compares the progress made in 2013-2016 to the set goal for 2013-2017.

*What's Next*

This measure of success has been met and surpassed ahead of schedule. While this is great progress, these water bodies remain partially impaired due to other sources of NPS pollution. Developing projects with local partners informed by approved WMPs, continuing to monitor and assess watersheds, and supporting compliance and enforcement efforts will assist in rectifying unresolved water quality problems and ultimately remove water bodies from the nonattainment list.

**Figure 2.** Number of specific causes of water body impairment restored.

Specific Causes of Water Body Impairment Restored



### **MOS-3**

Between October 1, 2012, and September 30, 2017, the NPS Program will improve water quality conditions in 5 12-digit Hydrologic Unit Code (HUC) watersheds in Michigan.

#### *Progress*

Between 2007 and 2012, 2 12-digit HUC watersheds in Michigan were restored for all NPS designated use impairments and an additional 3 saw a 40 percent improvement in water quality. Between 2013 and 2016, 5 12-digit HUC watersheds were restored for all NPS designated use impairments and 2 additional 12-digit HUC watersheds also saw a 40 percent improvement in water quality.

#### *What's Next*

Water quality improvements in 7 12-digit HUC watersheds were observed between 2013 and 2017, meaning this measure of success has been met. The NPS program will continue working to improve conditions at the 12-digit HUC scale with a focus on restoring all designated uses impaired by NPS sources. NPS staff will also continue developing success stories documenting NPS-related improvements.

### **MOS-4**

Between October 1, 2012, and September 30, 2017, the NPS monitoring coordinator and NPS district staff will develop 20 environmental success stories.

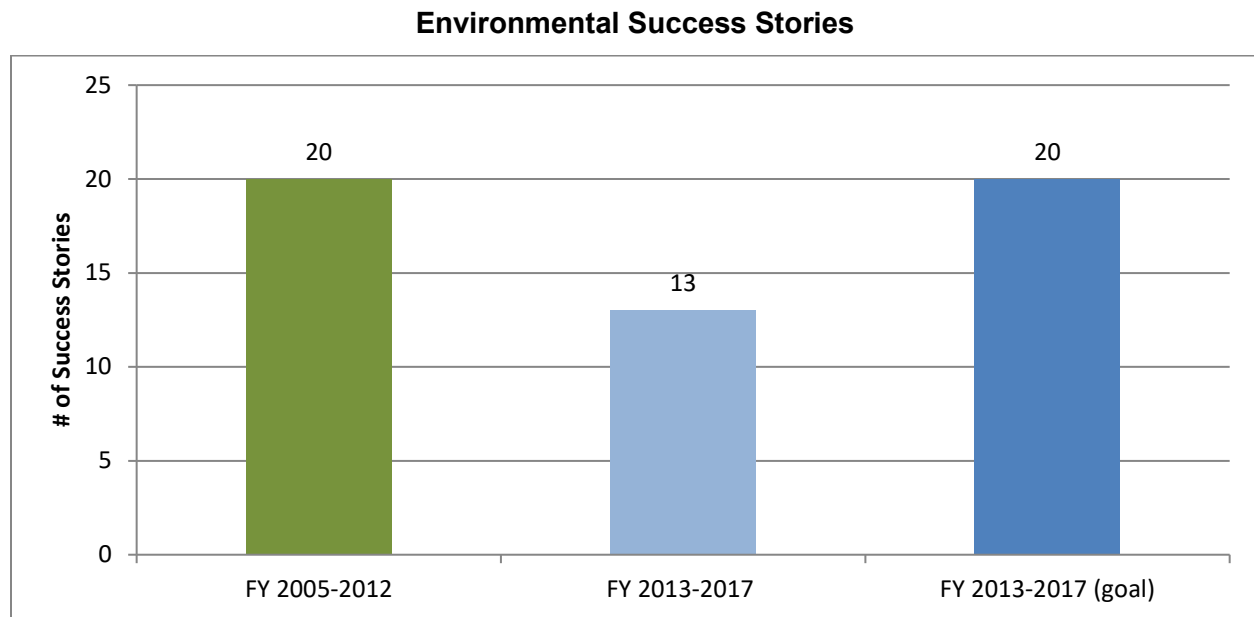
#### *Progress*

Michigan's NPS Program defines an environmental success story as work resulting in measurable improvement in water quality or in-stream habitat. Monitoring water quality, in-stream habitat, and stream morphology parameters (pre- and post-implementation) enable water quality improvements and reductions in NPS pollutants to be tracked. Between 2005 and 2012, the Michigan NPS Program developed 20 environmental success stories. Continuing that success, 9 environmental success stories were developed between 2013 and 2015, and 4 additional success stories were developed between 2016 and 2017, resulting in a total of 33 environmental success stories between 2005 and 2017. **Figure 3** tracks the progress made toward this measure.

#### *What's Next*

While much progress has been made, this measure of success has not be met. NPS staff will continue to evaluate work restoring and protecting Michigan's waters for potential environmental success stories. Current implementation and monitoring efforts underway once completed could demonstrate additional successes to report going forward.

**Figure 3.** Number of environmental success stories developed compared to set goal for 2013-2017.



### **Protect and Restore Natural Hydrology**

#### **MOS-5**

Between 2012 and 2017, the number of streams in Michigan showing increased flashiness as measured by the Richards-Baker Flashiness Index (R-B Index) will not increase. Gauged streams will be divided into three categories: 1. increasing flashiness, 2. decreasing flashiness, and 3. no change. The number of streams with increasing flashiness in 2017 will not increase compared to the number with increasing flashiness in 2012. The number of streams with decreasing flashiness will increase between 2012 and 2017. The 2012 baseline for this measure of success is 39 streams with increasing flashiness and 31 streams with decreasing flashiness.

#### *Progress*

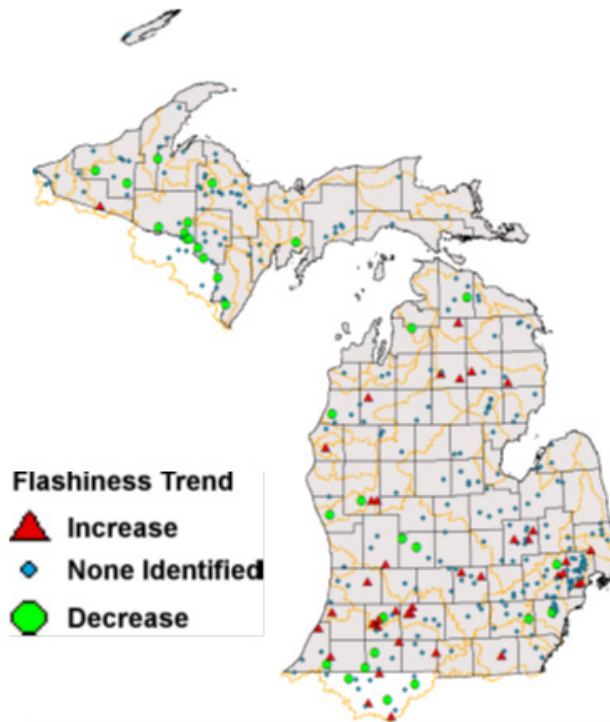
The R-B Index is an indicator of stream flashiness. Using information collected from United States Geological Survey stream gauges, this index was developed to measure how stream flashiness is changing over time. Using information gathered from this index, watersheds experiencing alterations in hydrology, excessive erosion, and degraded habitat can be identified.

The R-B Index analysis was last completed in 2012. See **Figure 4** below for the flashiness trend analysis done for 2007-2012. Between 2007 and 2012, 72 stream gauges were analyzed. Flashiness increased in 29 streams, decreased in 14 streams, and remained stable in 29 streams.

#### *What's Next*

The next R-B Index analysis update was planned for 2017. Due to staffing changes, this has been delayed, but work to update the index is planned for 2018.

**Figure 4.** Flashiness Trend by Gage, 2007-2012.



## Protection of High-Quality Waters

### MOS-6

The NPS Program will target long-term protection of 5,000 acres in priority watersheds between January 1, 2013, and December 31, 2017. Conservation easements are the primary form of long-term protection.

#### *Progress*

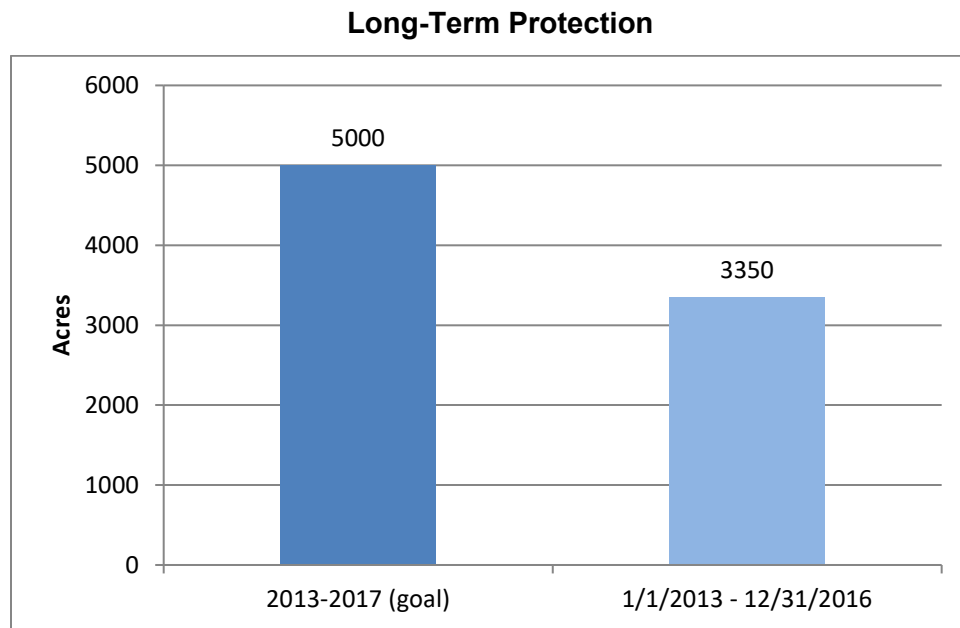
Michigan's NPS Program has been very successful in implementing long-term protection in watersheds across the state. Using conservation easements as the primary mechanism for protection, between 2007 and 2012, 10,788 acres and 166,817 linear feet of river, lake, and wetland were protected through 119 individual conservation easements. Building upon this success, 3,350 acres and 125,872 linear feet of river, lake, and wetland were protected by permanent conservation easements between January 1, 2013, and December 31, 2016.

**Figure 5** compares the number of acres protected in in this time frame to the total goal for 2013-2017.

#### *What's Next*

67 percent of the 5,000-acre goal for long-term protection has been met. An additional 1,650 acres will need to come under long-term protection prior to December 31, 2017, in order to meet this measure of success. Data collection for NPS projects is still being compiled for 2017. This measure will be updated to reflect 2017 data during the next Measures of Success update. Going forward, Michigan's NPS Program will continue to fund protection-based pass-through grant projects to ensure long-term protection of water quality.

**Figure 5.** Five-year goal and actual number of acres under **long-term** protection practices.



#### **MOS-7**

The NPS Program will target sediment, nitrogen, and phosphorus reductions of 760 tons; 14,000 pounds; and 2,300 pounds, respectively, from long-term protection practices implemented at priority watersheds between January 1, 2013, and December 31, 2017.

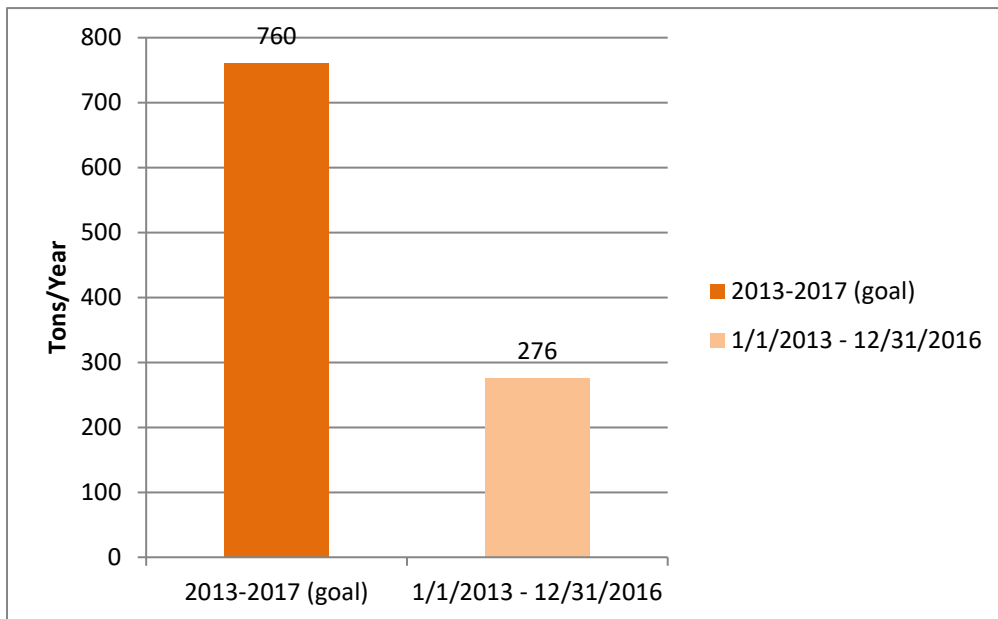
#### *Progress*

From 2007 to 2012, 119 conservation easements were implemented in Michigan resulting in an estimated reduction of 4,776 tons per year of sediment; 33,117 pounds per year of nitrogen; and 8,349 pounds per year of phosphorus. Between January 2013 and December 2016, long-term protection practices led to a reduction in 276 tons of sediment (36 percent of goal); 9,577 pounds of nitrogen (68 percent of goal); and 1,044 pounds of phosphorus (45 percent of goal) in Michigan waterways. **Figures 6, 7, and 8** chart the progress made toward the 2017 goals respectively for sediment, nitrogen, and phosphorus reductions stemming from long-term protection practices.

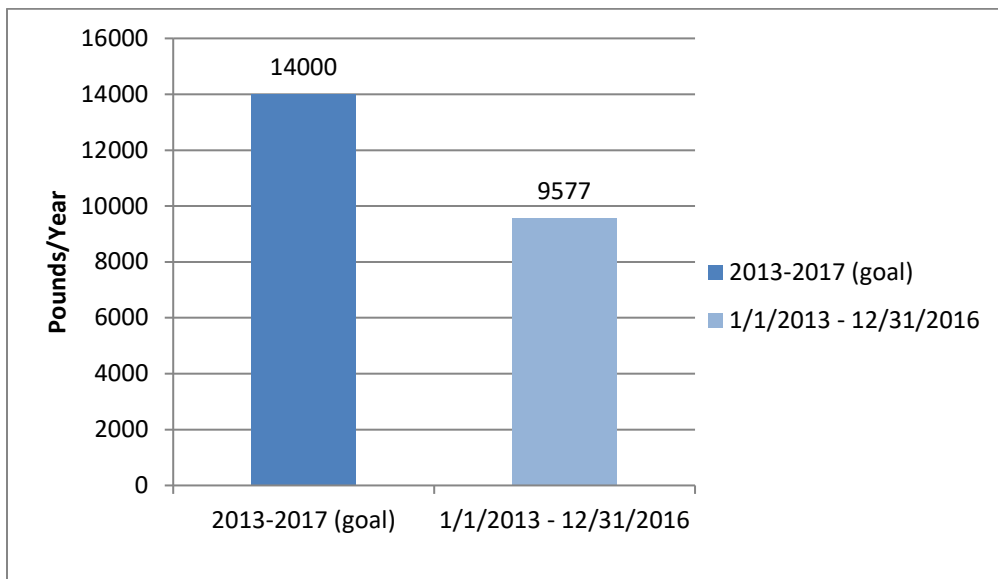
#### *What's Next*

As of January 2018, there are 11 open NPS Program funded grant projects featuring a conservation easement component. Efforts are ongoing to purchase these easements. In addition, staff and grant applicants will focus on identifying priority properties to protect. Once these properties are identified, building positive relationships with landowners through education and outreach activities will be instrumental to obtaining stakeholder buy-in, and ultimately reaching the goal of reducing NPS pollutants. Grantees will be encouraged to act promptly to secure landowner commitment for easements.

**Figure 6.** Five-year goal and actual sediment reductions from **long-term** protection practices.

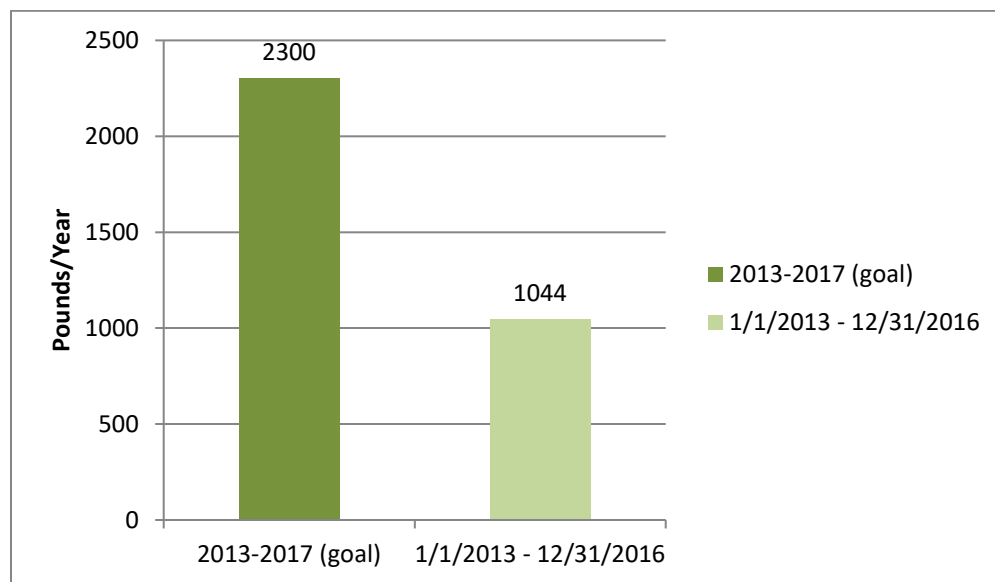


**Figure 7.** Five-year goal and actual nitrogen reductions from **long-term** protection practices.





**Figure 8.** Five-year goal and actual phosphorus reductions from **long-term** protection practices.



**MOS-8**

No water bodies or reaches in “healthy watersheds” covered by nine-element WMPs, and identified as attaining water quality standards in the 2012 Integrated Report, will be moved to the nonattainment list due to NPS causes of pollution. “Healthy Watersheds” are defined by the NPS Program as those with high ecological capacity and low stressor scores as determined by the NPS Program’s watershed prioritization process.

*Progress*

Using the NPS Program’s watershed prioritization process, a list of “Healthy Watersheds” was generated. This list includes 129 10-digit HUC watersheds from across the state. Of these 129 watersheds, there were 5 reaches that were covered by a 9-element approved WMP, were previously meeting water quality standards, and that are now on the nonattainment list. One reach is in the Platte River Watershed, a pristine watershed in the northern Lower Peninsula. An impaired reach in the Huron River Watershed was added after failing to meet its other indigenous aquatic life and wildlife designated use, however the cause was unknown. Both reaches were added between 2012 and 2014. Three other impairments were added between 2014 and 2016. These additions were located in the Cedar River Watershed in Gladwin County, the Betsie River Watershed in Benzie County, and the Lincoln River Watershed in Mason County. All impairments were for total body contact recreation and were either previously not assessed or had insufficient information, indicating that the new impairment designation does not indicate a new water quality problem.

*What’s Next*

The NPS Program will continue to focus efforts on activities that will help protect “healthy watersheds” and maintain high-quality waters in Michigan.

**MOS-9**

Using the draft 2012 Integrated Report as the baseline, no water bodies or reaches will be moved to the nonattainment list in watersheds covered by a Michigan Department of Environmental Quality (MDEQ) approved WMP administered by “very active” watershed groups. Very active watershed groups are defined by NPS District Staff and have the following characteristics: regularly advance polices promoting a healthier watershed, continually engage stakeholder through information and education (I&E) activities, have active monitoring

programs, are economically supported by their stakeholders, are acknowledged as local experts, and are viewed as critical participants in discussion and decisions related to the watershed.

#### *Progress*

NPS staff identified 61 “very active” watershed groups working to implement approved WMPs. Two reaches in two watersheds with approved WMPs where “very active” watershed groups are present were moved to the nonattainment list between 2014 and 2016.

#### *What's Next*

This measure of success has not been met. New sources of impairment include partial body contact recreation (caused by *E. coli*) and other indigenous aquatic life and wildlife (cause unknown).

Watersheds with very active watershed groups have and continue to benefit from these dedicated groups that are committed to improving water quality. NPS Program staff will continue to work with stakeholders, watershed groups, and other partners, to restore impaired waters and protect high-quality waters in Michigan.

### **Elimination or Reduction of NPS Pollution**

#### **MOS-10**

For the years 2013 through 2017, the annual sum of pollutant load reductions from NPS pass-through grant funded projects will be at least two percent of the United States Environmental Protection Agency’s (USEPA) 2010 annual national goal for NPS pollutant load reduction. Pollutant reduction estimates will be reported to the USEPA.

#### *Progress*

Michigan’s annual average reduction goal for sediment, phosphorus, and nitrogen is 14,000 tons per year; 90,000 pounds per year; and 170,000 pounds per year, respectively. Between 2007 and 2012, NPS Program pass-through grants achieved approximately 80,400 tons per year of sediment load reductions; 69,700 pounds per year of phosphorus load reduction; and 142,000 pounds per year of nitrogen load reductions.

From 2013 through 2016 this measure has not been met. The average annual pollutant load reductions for sediment, phosphorus, and nitrogen respectively were 4,600 tons per year; 7,600 pounds per year; and 25,700 pounds per year.

#### *What's Next*

The relatively steep decline in average annual load reductions between 2007-2012 and 2013-2016 was primarily due to two factors. First, the allocation of both Section 319 and Clean Michigan Initiative funds was lower in more recent years resulting in fewer BMPs implemented in 2013-2016. Second, the types of projects funded have shifted over time, with a greater emphasis toward education and outreach projects; protection-oriented projects (such as conservation easements and ordinance development); projects to address other pollutants such as *E. coli* and copper mine wastes; and urban storm water projects to implement low impact development and green infrastructure BMPs. These projects are helping the NPS Program achieve other measures of success but they typically report lower sediment, phosphorus, and nitrogen load reductions than other types of projects. Next, the NPS program will reevaluate this measure of success to determine whether it should be modified or replaced for future Measures of Success updates.

## **Protection and Restoration of Wetlands**

### **MOS-11**

Between October 1, 2012, and September 30, 2017, the NPS Program will create or restore at least 60 acres of wetland using pass-through grants.

#### *Progress*

Between October 1, 2012, and December 31, 2016, 95 acres of wetland have been created or restored using pass-through grant funds.

#### *What's Next*

The NPS Program has met and surpassed the wetland acreage measure. Going forward, the NPS Program will continue to feature wetland restoration and creation as a best management practice. Continued coordination with MDEQ wetlands staff will ensure that projects including wetland restoration meet the technical standards of both programs.

## **Public Outreach Goals**

### **MOS-12**

The NPS Program will develop ten I&E “success stories” by 2017. These “success stories” will be posted on the NPS Web site.

#### *Progress*

Michigan's NPS I&E success stories are projects that have succeeded in showing measurable improvement in knowledge or behavior regarding restoration and protection of Michigan's waters. Conducting social surveys before project implementation and comparing results to post-survey results allows the NPS Program to track progress linked to education and outreach work. Two such I&E success stories have been developed by the NPS Program, but this measure of success has not been met.

#### *What's Next*

Three additional success stories are currently in the process of being developed. Michigan's NPS Program will continue to work to achieve this measure by administering pass-through grants improving knowledge and behavior associated with Michigan's waterways.

## **Administrative Goals**

### **MOS-13**

The NPS Program will continue to make satisfactory progress in meeting the schedule of short-term actions. Satisfactory progress determinations are made by the USEPA after reviewing annual reporting information.

#### *Progress*

The NPS Program made satisfactory progress in Fiscal Year (FY) 2015, FY 2016, and FY 2017.

#### *What's Next*

The NPS Program will continue to meet with the USEPA to discuss program improvement and continue to provide all of the reporting information needed to ensure that the USEPA is able to oversee our program.

## **MOS-14**

The NPS Program will continue to leverage more than the required 40 percent state and local matching funds (total) for 319 grants.

### *Progress*

Since 2012, the NPS Program has successfully leveraged more than 60 percent state and local matching funds for 319 grants. This included 2008, 2009, 2010, 2011, and 2012 Fiscal Year grants.

### *What's Next*

Michigan's NPS Program will continue working to leverage 40 percent state and local matching funds for current and future 319 grants. Below is a breakdown of the match earned on an annual basis:

#### FY 2008

Match required:	\$2,038,991
Match earned:	\$4,441,861

#### FY 2009

Match required:	\$2,395,815
Match earned:	\$3,541,089

#### FY 2010

Match required:	\$1,951,733
Match earned:	\$3,392,148

#### FY 2011

Match required:	\$1,947,964
Match earned:	\$2,139,524

#### FY 2012

Match required:	\$1,696,000
Match earned:	\$1,838,746

Total required:	\$10,030,503
Total earned:	\$15,353,367

## **MOS-15**

The NPS Program will review and approve at least 20 new 9-element WMPs between January 2012 and December 2016.

### *Progress*

Between January 1, 2012, and December 31, 2016, 29 9-element WMPs have been reviewed and approved by Michigan NPS Program staff. Two technical updates were also completed (Kalamazoo River and Bear Creek/Bear Lake).

### *What's Next*

This measure has successfully been met. Four additional WMPs were approved in 2017.