

Chapter 19

Measuring Watershed Plan Success

19.1 Evaluating Plan Performance

In order to justify the expenditure of funds involved with implementing a watershed management plan, as well as to add to the collective knowledge of the relative success or failure of specific project components, it is necessary to establish a framework by which these types of evaluations can be made. This framework typically involves establishing “milestones”, target dates or thresholds which document whether certain recommended management practices or other control actions are being implemented and /or achieved.

For watershed planning, milestones are usually organized into three relative time scales:

- Short-term Milestones (1-2 years)
- Mid-term Milestones (2-5 years)
- Long-term Milestones (5+ years)

The milestone selected for any given watershed plan recommendation will obviously be dependent on the nature of the recommendation. Short-term projects may involve an educational or outreach type of effort that can be implemented fairly quickly, assuming that a person is available to implement that recommendation.

Mid-term projects may involve restoration projects with cooperating project partners, such as the McHenry County Conservation District and the Land Conservancy of McHenry County, who already own or manage the project site location, have an eagerness to implement projects, and have staff dedicated towards managing and enhancing these lands.

Long-term projects will likely involve recommendations that involve construction, retrofits, or acquisition / easements, as these can require a much longer timeframe to implement, and require a larger commitment of upfront personnel time and funding. For example, if a watershed plan recommendation is to conduct minor grading / scraping work to restore a three acre degraded wetland along a stream corridor, a number of steps must first occur.

- 1) Approach landowner / Gain approval
- 2) Conduct data / information for design, wetland determination study, etc.
- 3) Finalize project design / plans / cost estimate
- 4) Identify source of 40% local cost share match. If from local governmental source coordinate with budget cycle / account for potential project funding lag.
- 5) Apply for regulatory permits / clearances
- 6) Select contractor / complete necessary contractual paperwork
- 7) Receive regulatory permits / begin work

In a region such as northeastern Illinois, where there are a multitude of regulatory programs, accomplishing the project tasks listed above could easily take 12 to 18 months, not including seasonal considerations for construction, or coordination with the USEPA Section 319 funding cycle to provide the remaining 60% of the project budget. More importantly, the amount of effort and upfront funding required to accomplish tasks 1 through 7 can also be considerable.

Unfortunately, there is often an expectation in watershed planning that these tasks can be performed by existing governmental staff. The reality is that any staff time and funding is almost always consumed by the need for day to day operation and maintenance of the traditional municipal infrastructure (the “gray infrastructure” – roads, sewers, etc.)

The same holds true for natural resource agencies and non-for-profit groups working for resource protection and enhancement, where staffs have their hands full simply trying to keep up with their existing workload, and again, surplus funds are a rarity.

Given that there are over 150 recommended projects in the Nippersink Creek Watershed Plan, the only way the implementation phase of this plan will achieve a critical mass is to have a watershed manager in place. It is anticipated that seeking and acquiring funding to hire a part-time Nippersink Creek watershed manager will jump-start this process, but still will still anticipate a one to two year lag time before project funding coordination and implementation reaches critical mass. The watershed manager could make the initial contact / outreach with landowners or units of governments included in subwatershed project recommendation areas, prepare project designs, permit applications, and grant applications, and oversee implementation of the project.

Moving the implementation phase towards a critical mass will allow much more detailed and accurate milestones to be determined.

As a result, given the overall size of the Nippersink Creek watershed, and the large number of recommended projects, a longer implementation timeframe will be required. An adapted milestone timeframe schedule for Nippersink Creek watershed is presented below:

Table 19.1 Nippersink Creek Watershed Plan Milestone Timeframes

- Short-term Milestones (1 to 3 years)
- Mid-term Milestones (2 to 7 years)
- Long-term Milestones (5 to 12 years)

19.2 Measuring Success

The most commonly used measure of success in watershed implementation projects is to quantify a predicted Pollutant Loading Reduction (PLR) resulting from the installation and appropriate maintenance of a particular Best Management Practice (BMP). In the watershed planning phase, the existing condition pollutant loading for a particular watershed is calculated by spreadsheet or computer modeled to determine the current pollutant loading rate. Based upon these predicted loading rates, specific BMP's, most appropriate for dealing with the pollutant of concern are identified, and recommended for implementation in the watershed plan. A subsequent calculation is made to predict the degree of success that will be achieved if some or all of the recommended BMP's are installed.

The actual measurement of the exact PLR does not usually result from in-situ water quality testing of the installed BMP. Instead, for many of the most commonly utilized BMP's, academic research has determined specific pollutant loading reductions expected for target pollutants, such as Total Suspended Solids, nutrients, or fecal coliform, to name but a few. These loadings are correlated to size of the BMP, such as the reduction in phosphorus expected from a "wet-basin" stormwater detention basin. For example, by plugging in the phosphorus PLR number and multiplying it by the "size" of the wet-basin BMP, a PLR can be calculated.

These PLR calculations are done for all of the BMP's installed in a given portion of the watershed, and a cumulative pollutant loading reduction can be generated. When this number is compared to the pre-project pollutant loading rate that was determined to be occurring within that area, the difference is the degree of PLR success achieved.

However, it should also be noted that in watershed plans developed for more heavily urbanized watersheds, the primary emphasis is often on "retro-fit" Best Management Practices, such as streambank stabilization, or naturalizing stormwater detention ponds, which can be easily quantified in terms of linear feet, or acres, respectively, of BMP practice proposed. Milestones can then be measured by the quantities of these practices implemented over a given period of time.

In contrast, in a still largely rural watershed, such as Nippersink Creek, numerous opportunities still exist to guide future urban development away from sensitive natural areas, or to protect and manage them through acquisition or the use of conservation easements before land prices escalate.

For this reason, the Nippersink Creek Watershed Plan focuses predominantly on agricultural / rural "preventative" practices, with far fewer "urban retrofit" practices. However, if the units of government in the watershed fail to adequately protect the remaining natural areas, or sensibly incorporate them into proposed development activities, the long-term trend will shift to "urban retrofit" practices.

For these reasons, for the Nippersink Creek watershed, it is recommended that a number of means be used to gauge the success of the implementation phase, rather than strict reliance on the Pollutant Loading Reduction approach.

1) Pollutant Loading Reductions

Track the implementation of recommended water quality Best Management Practices, and maintain a running total of expected pollutant loading reductions throughout the duration of the watershed plan implementation. Where feasible, update the predicted Pollutant Loading Rates calculated within Chapter 3 of this report, to reflect large scale changes in land use in critical subwatersheds; acquisition / permanent protection of environmentally sensitive land; or the implementation of water quality BMP's not identified in this plan.

2) Nutrient Management Planning

The Environmental Quality Incentive Program (EQIP) is a voluntary U.S. Department of Agriculture conservation program that provides assistance to farmers who face threats to soil, water, air, and related natural resources on their land. Through EQIP, the Natural Resources Conservation Service (NRCS) provides assistance to agricultural producers in a manner that will promote agricultural production and environmental quality as compatible goals, optimize environmental benefits, and help farmers to meet Federal, State, Tribal, and local environmental requirements. EQIP offers financial and technical help to assist eligible participants install or implement structural and management practices on eligible agricultural land. A major element of the EQIP effort is Nutrient Management Planning, as discussed in Chapter 4. Tracking the enrollment of watershed land owners in the EQIP program, as well as the pollutant loading reductions resulting from implementation EQIP plans, should be considered a key indicator in measuring success.

3) Expanded Water Quality Monitoring / Stream Gauging

Implement an expanded water quality monitoring program throughout the watershed to increase the baseline water quality data, which will allow comparisons to be made during and after watershed plan implementation. Also reestablish USGS stream gauging stations to allow the effects of BMP implementation on reducing peak flow discharges during frequent interval storms to be measured, and in turn, allowing another means of determining Pollutant Loading reductions.

4) Community Assessment

Work closely with town governments and residents to enhance the natural resource-based 'quality of life' and to encourage behaviors that are supportive of a healthy watershed (determined by water quality measures, control of non-point source pollution, and community satisfaction with the ecological health of the watershed)

This will be accomplished through a three stage community assessment effort that will include the following activities:

1. Initial survey of Nippersink Creek watershed residents to determine baseline information on values, attitudes, knowledge, and behaviors of watershed residents.
2. Utilization of these findings and additional expert knowledge to assist in the implementation of the watershed plan as well as the design and delivery of education and outreach programs designed to maintain water quality. Programs may include (but are not limited to) such things as technical seminars related to land use management, natural resource protection and water quality; involvement of local schools in water monitoring programs; and additional educational and outreach activities to engage and educate residents of the Nippersink Creek watershed. Outreach activities will also be designed to increase a "sense of place" and attachment among stakeholders and residents within the watershed.
3. Follow-up scientific survey of Nippersink Creek watershed residents to determine the effects of the educational programs and outreach on their values for the watershed, understanding of stewardship principles, changes in residents' use of environmentally responsible behaviors, and changes in residents' perceived barriers to and benefits of adopting environmentally responsible behaviors.

19.3 Suggested Milestones

The following section describes project milestones that should be pursued to help ensure a logical progression of Watershed Plan implementation, and to help ensure that the objectives of the Plan are met. This information includes a proposed timeframe, the recommended action, and where applicable, the corresponding General Watershed Recommendation (GWR), as discussed in Chapter 4.

19.3.1 Plan Implementation

Short-term Milestones (Plan Implementation Year 1):

- Apply for Section 319 or other funding to allow the hiring of a part-time watershed manager to begin the outreach / management component of watershed plan implementation. Meets General Watershed Recommendation (GWR-9).
- Apply for Section 319 or other funding to initiate expanded water quality to begin collection of water quality samples at designated locations throughout the watershed to create a baseline of data, and to augment existing data sources. Meets General Watershed Recommendation (GWR-1).

- Apply for Section 319 or other funding to initiate first phase of social science research of watershed stakeholder views of the Nippersink. Meets General Watershed Recommendation (GWR-10).
- Apply for Section 319 or other funding to initiate acquisition / database creation of existing Nutrient Management Planning information from USDA/NRCS files. Meets General Watershed Recommendation (GWR-2).
- Coordinate with project partners McHenry County Conservation District and the Land Conservancy of McHenry County on applying for Section 319 or other funding to implement one or more subwatershed specific recommended BMP project on land that they own or manage. Each year, at least one Habitat Restoration project should be completed by each responsible party. Meets General Watershed Recommendation (GWR-3).
- Through watershed plan implementation period, continue regular meetings of the Nippersink Creek Watershed Planning Committee, and maintain the www.nippersink.org webpage with current information on stakeholder participation opportunities, and watershed plan documents as appropriate updates / revisions are completed. Meets General Watershed Recommendation (GWR-8).

Mid-term Milestone (Plan Implementation Year 2 – Completion):

- NCWPC / watershed manager will assist in the preparation and submittal of grant applications for projects that advance the objectives of the Nippersink Creek Watershed Plan. For each Plan Implementation Year (starting at Year 2), the Goal is to have a minimum of one Nippersink Creek Watershed Plan recommendation project for each subwatershed in progress for Section 319 funding, regulatory permits, etc. by the Section 319 funding cycle deadline of each Plan Implementation Year.
- NCWPC / watershed manager will conduct educational outreach to watershed units of government to encourage ordinance adoption / revision to incorporate Conservation Design / Green Infrastructure concepts. Meets General Watershed Recommendation (GWR-4).
- NCWPC / watershed manager will contact private landowners identified as potential participants in site Restoration projects and provide them with information on technical guidance and possible funding sources to assist them with management of their privately owned natural areas along the stream corridor. Meets General Watershed Recommendation (GWR-3)
- NCWPC / watershed manager will conduct discussions with units of government within both the Illinois and Wisconsin portions of the watershed about requiring additional water quality enhancements as part of the construction or expansion of any wastewater treatment plants discharging to Nippersink Creek. Meets General Watershed Recommendation (GWR-6).

- NCWPC / watershed manager will conduct discussions with units of government within the Wisconsin portion of the watershed on jointly developing, funding, and implementing watershed protection / enhancement projects.
- July, 2010: City of Woodstock submits IEPA 319 grant application for funding assistance to install two or more structural BMP devices to capture pollutants from medium to large storm sewer networks in the Silver Creek Subwatershed.
- July, 2010: City of Spring Grove submits IEPA 319 grant application for funding assistance to install two or more structural BMP devices to capture pollutants from medium to large storm sewer networks in the Lower Nippersink Creek Subwatershed.
- July, 2010: McHenry County submits IEPA 319 grant application for retrofit of two stormwater detention basins located at the County complex
- July, 2010: Village of Wonder Lake and Village of Richmond submit IEPA 319 grant application for funding assistance to have each entity install two or more rain gardens on their municipal properties.
- Spring 2011: NCWPC begins process of securing funding and implementing a watershed pollutant loading model update based upon the presumed completion of the McHenry County Year 2030 Land Use Plan, as well as the work completed by the Fox River Study Group, Inc. and the Illinois State Water Survey.
- Spring 2012: Complete watershed loading model project and revise plan recommendation strategies and development guidelines to achieve desired water quality and stream stability goals.

Governmental

- As soon as possible, municipalities will begin working with prospective land developers to incorporate Conservation Design / Green Infrastructure Plan elements into future developments in the watershed.
- By 2nd quarter 2009, McHenry County, and each watershed municipality will pass a resolution adopting the practices and principles of the Nippersink Creek Watershed Plan and pledge to implement the recommendations specified therein as funding for projects becomes available.
- By 1st quarter 2010, McHenry County and local units of governments will adopt and implement a McHenry County Stormwater Ordinance (MCSWO) enforcement audit / review process to help maximize the effectiveness of the portions of the MCSWO that require riparian / wetland buffers, conservation easements, and stormwater Best Management Practices.
- By 1st quarter 2010, each watershed unit of government will adopt a Green Infrastructure Plan.

- By 1st quarter 2011, McHenry County and municipalities agree to contribute to a funding mechanism to allow cost-share of habitat / water quality restoration projects on private lands located within the boundaries of the Nippersink Creek Green Infrastructure Plan, with a higher cost-share ratio provided for landowners that agree to place the restored area into a conservation easement.
- By 1st quarter 2011, IDOT and MCDOT agree to incorporate the design, funding, and implementation of structural or non-structural stormwater quality Best Management Practices as part of the reconstruction of any County or State highway bridges over the Nippersink or its tributaries.
- By 1st quarter 2012, each watershed units of government will update and strengthen existing stormwater, zoning, land use, and/or subdivision ordinances to allow these documents to integrate seamlessly, creating a streamlined process for developers pursuing Conservation Design projects.

Habitat Restoration

- Establish a funding mechanism to allow the legal / survey work fees, and long-term endowment donation associated in establishing a conservation easement to be paid, so that there is little or no out-of-pocket expense to private conservation easement donors.
- Encourage the McHenry County Conservation District and the Land Conservancy of McHenry County to expand their stewardship and management programs on parcels under their control.
- Work with watershed units of governments to have ADID wetlands, oak-hickory woodlands, and MCNAI sites permanently protected and enhanced as part of any proposed site development work on parcels on which they are found.
- Support of any grant initiatives that will allow MCCD to further leverage their land acquisition funds.

Long-Term Milestones (Upon Plan Implementation Completion):

- All Habitat Restoration projects completed by 2019
- All Water Quality projects completed by 2021