

Chapter 2 – Strategy and Action Plan

This chapter describes the objectives and strategies that the NPS program will follow for the next five years to protect surface and groundwater from nonpoint sources of pollution. This strategy is aligned with the Division and with the Watershed Program (Program) overarching strategy and will guide the implementation of the NPS program. It will also support the Division and the Program in realizing the goals of restoring and protecting water quality. This chapter describes the action plan that will implement the NPS program, the milestones and outputs expected from the implementation of each strategy and the desired outcomes expected at the end of this planning period.

This update to Colorado’s Nonpoint Source Management Program (the Plan) is, in part, to position the program to address more fully the national performance expectations. In addition, the program has moved from the targeting provided by the Unified Watershed Assessment to priorities linked specifically to a state’s List of Waters Still Needing Total Maximum Daily Loads (TMDLs), also known as the 303(d) list. More than half of the funds allocated to Colorado in the past three years can be used only to implement watershed-based plans in watersheds where streams are identified on the 303(d) list.

The long-term goal of the Colorado’s nonpoint source program is to restore to full use those waters, both surface and groundwater, impaired by nonpoint sources, and to prevent future impairments to Colorado’s waters, using an effective, efficient and open process that fully involves the public and brings together the necessary regulatory and non-regulatory authorities, agencies and programs.

A short-term goal for this update is to reposition the Colorado Nonpoint Source program from one focused on implementation based on pollutant categories and demonstration projects to one where the focus is restoration of impaired waterbodies.

2.1 Background

2.1.1 History of the Colorado Program

2.1.1.1 1987 - 2000

The 1987 amendment to the Clean Water Act authorized the creation of Section 319, which addresses Nonpoint Source Management Programs. In order for a state to be given authority to implement a NPS program and receive federal grants, two major activities were required: an assessment report that described the impact of nonpoint sources on the water resources of a state, and a management program that outlined how the state proposed to address the impacts identified in the assessment report.

Colorado’s Nonpoint Assessment Report was originally approved in 1988 and updated in November 1989. Since then, the nonpoint assessment reports have been incorporated in the *Status of Water Quality in Colorado* 305(b) reports, which are generated biennially.

Colorado’s Nonpoint Source Management Program was originally approved in 1989 and updated in October 1990. The Division was given primary responsibility to administer the nonpoint source program.

2.1.1.2 2000 - 2010

In 1998, the Clinton administration announced a major Clean Water Initiative to achieve clean water by strengthening public health protections, targeting community-based watershed protection efforts at high priority areas, and providing communities with resources to control polluted runoff. The Clean Water Action Plan (CWAP), as it became known, built on existing clean water programs and proposed actions to strengthen efforts to restore and protect water resources by: 1) Supporting locally led partnerships that included a broad array of Federal agencies, States, tribes, communities, businesses, and citizens to meet clean water and public health goals; 2) Increasing financial and technical assistance to States, tribes, local governments, farmers, and others; and 3) Helping States and tribes restore and sustain the health of aquatic systems on a **watershed basis**.

Unified Watershed Assessments (UWA) - The CWAP re-established the watershed as the organizational unit for focusing water quality restoration activities. The *Colorado Unified Watershed Assessment (11/98)* identified 42 8-digit hydrologic unit watersheds as Category 1 - watersheds in need of restoration. Of those, 18 were identified as priorities for the first two years. A key feature of the CWAP prescribed that any new NPS funds appropriated by Congress were to be used only in high priority Category 1 watersheds.

Watershed Approach, Local leadership and Empowerment - One of the most significant characteristics of water quality management in the 1990s was a renewed emphasis on watersheds as the preferred administrative unit. Also notable was the formation of numerous local watershed initiatives to address water quality and other resource issues. In 1996, for example, there were six stream-based local watershed initiatives in Colorado (plus the various basin authorities); in 1998 there were 40 stream-based local watershed initiatives, and the number increased yearly.

Emphasis on Targeting Tools – During this period, the UWA and CWAP emphasis on Category 1 watersheds constituted significant targeting tools. Additionally, the Colorado 1998 list of impaired and threatened stream segments constituted another targeting tool. The 303(d) listed segments required development of TMDLs and helped identify specific water quality improvement strategies to be implemented.

Programmatic Updates - During this period, the NPS program updated the Nonpoint Source Management Program (the Plan) twice: once in 2000 and again in 2005. The 2000 document was a significant update to the original document developed in 1990 and included the CWAP new requirements and the watershed approach strategies. The 2005 document was a minor update, only addressing significant modifications from the 2000 plan.

2.1.1.3 2010 - current

Renewed Emphasis on Targeted Watershed Approach - The reorganized Watershed Program in the Division has in fact formalized the targeted watershed approach. The Nonpoint Source program priorities are now aligned with the results from water quality assessments that identify impaired segments and with the consequent development of TMDL studies. This alignment has resulted in NPS incremental funds being used to restore impacted priority watersheds.

EPA Nine Elements - as guidelines from EPA require, the NPS program is ensuring that new watershed plans address the EPA Nine Elements of a watershed plan and that older watershed plans are updated with those elements. Restoration projects are identified, prioritized and implemented in the context of a watershed-based plan.

Measurable Results Project (MRP) – EPA guidelines also require that NPS programs report on results; the Colorado NPS program has developed a process to evaluate projects, gather data and thus, report on measurable results from the implementation of the NPS program.

2.1.2 Past Accomplishments and Major Trends of the NPS Program

2.1.2.1 1987 - 2000

During the initial years, Colorado's NPS program was successful in addressing both the milestones and priority watersheds identified in the original management program. Many NPS projects were best management practices demonstration projects. The following examples highlight the accomplishments during this period:

- A memorandum of understanding was developed between the Bureau of Land Management (BLM) and the Division for addressing nonpoint sources on BLM lands.
- The U.S. Forest Service (USFS) revised its Watershed Conservation Practices to provide guidance on how to accomplish water quality goals during the various activities on federal lands.
- The Natural Resources Conservation Service (NRCS) developed standards and specifications for nutrient and best management, as well as a soil/pesticide interaction table.

- Projects to demonstrate techniques for controlling NPS in urban areas or construction sites were initiated on Shop Creek, Soda Creek and others.
- The Denver Regional Council of Governments (DRCOG) developed NPS control strategies for various basins within the metropolitan Denver area.
- BMPs were demonstrated on a number of abandoned or inactive mine sites, including Peru Creek, Gamble Gulch, Chalk Creek, and the Animas River.

Nearly all watersheds identified in the original management program had some level of activity. The level of activity ranged from full-scale watershed remediation efforts, to additional assessments to better define the NPS problem, to the establishment of stakeholder organizations.

2.1.2.2 2000 - 2010

A number of significant trends began to take shape in the 1990s culminating in 1998 with a year of dramatic change for Colorado's NPS program. The major influences for change were:

A) Regulatory Expansion - Historically the NPS program has been a voluntary program. While it is still predominantly a voluntary program, several categories of pollution traditionally considered to be nonpoint sources were impacted by the regulatory processes, making it clear that the management of NPS pollution encompasses both voluntary and regulatory approaches. For example:

A.1 Stormwater Management in Colorado:

On November 16, 1990, EPA issued a final regulation on the control of stormwater from municipal and industrial stormwater discharges. The regulation (40 CFR122.26) is meant to reduce the amount of pollutants entering streams, lakes and rivers as a result of runoff from residential, commercial and industrial areas. The regulation was implemented in two phases: phase I regulated specific types of industries and storm sewer systems for municipalities with more than 100,000 population. Municipalities develop a Stormwater Management Program, which in general addresses controls on cross-connections and illicit discharges to the storm sewer system, developing policy on such things as street sweeping, roadway deicing, erosion control during construction, and establishing long-term monitoring programs. Stormwater Management Plans also involve developing educational programs, such as one to raise the awareness level of residents about where their used oil or antifreeze goes if they dump it in the storm drain.

Since March 2001, municipalities with less than 100,000 population and meeting certain other criteria have been brought in under Phase II of the program, but with simpler application and permit requirements than for the large municipalities. Some municipalities are required to have permit coverage, while others must be evaluated by the Division to determine whether permit coverage is needed.

Industrial facilities which discharge industrial stormwater either directly to surface waters or indirectly, through municipal separate storm sewers, must be covered by a permit. The industries covered by the program include most manufacturers, mining, transportation facilities, power plants, landfills, auto recyclers, and construction projects that disturb five or more acres of land. The regulations allow all industrial categories except construction to opt out of permit coverage if they do not have any industrial materials or activities exposed to stormwater. The "no exposure" waiver includes a requirement for certification of "no exposure".

Since July 1st, 2002, construction projects disturbing one acre or more need permits. There is provision for the waiver of a permit for small (under five acres) construction sites, if the rainfall erosivity factor is less than 5 (usually short-term projects in dry areas). More details on the various options under this section, such as a description of the waiver, and a discussion on Qualifying Local Programs, are in the Division's guidance document entitled "Stormwater Fact Sheet – Construction." It is available at www.cdphe.state.co.us/wq/PermitsUnit or by calling 303-692-3517.

Nexus with the NPS program:

The NPS program requires that all necessary and applicable permits be secured before a project is implemented; as such, stormwater construction permits are required for projects disturbing one acre or more. The types of projects include streambank restoration projects.

The NPS program will continue to consider eligible a) stormwater-related projects that do not require a permit and b) watershed-based plans that might include stormwater permitted areas (for example urban areas under an MS4 permit).

A.2 Animal Feeding Operations Management in Colorado:

Animal Feeding Operations (AFOs) are places where animals are kept and raised in confined situations. AFOs that meet the regulatory definition of a concentrated animal feeding operation (CAFO) may be regulated under EPA's National Pollution Discharge Elimination System (NPDES) permitting program. This program helps ensure that animal waste and wastewater are properly managed and do not enter water bodies from spills or breaks of waste storage structures and the non-agricultural application of manure to crop land.

An AFO is defined as a lot or facility where the following conditions are met: 1) Animals have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period, and 2) Crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility. AFOs that meet the regulatory definition of a CAFO may be regulated under the NPDES permitting program.

CAFOs are defined as point sources of pollution under the Colorado Water Quality Control Act. As such, CAFOs in Colorado are required to have a discharge permit prior to discharging pollutants to waters of the U.S (Colorado Water Quality Control Commission Regulation No. 61). A CAFO that decides not to apply for a permit is required to protect surface water by adhering to the surface water protection elements of Regulation No. 81 and register with the Environmental Agriculture Program at CDPHE. All CAFOs in Colorado, whether permitted or not, are required to adhere to the groundwater protection elements of Regulation No. 81.

Nexus with the Nonpoint Source Program

The NPS program considers eligible activities related to AFOs but not with CAFOs. The program will continue to support activities related to education and outreach, information dissemination, capacity building and technical assistance with implementation of best management practices.

B) EPA Nine Key Elements - The Nine Key Elements are major considerations in developing new or updated NPS management programs. They were developed jointly by the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA) and EPA. All elements are reflected in the update of Colorado's 2012 Nonpoint Source Management Program.

The Nine Key Elements describe broad expectations for nonpoint source management, in particular:

1. Explicit short- and long-term goals, objectives and strategies to protect surface and groundwater.
2. Strong working partnerships and collaboration with appropriate State, interstate, Tribal, regional, and local entities (including conservation districts), private sector groups, citizens groups, and Federal agencies.
3. A balanced approach that emphasizes both State-wide nonpoint source programs and on-the ground management of individual watersheds where waters are impaired or threatened.
4. The State program (a) abates known water quality impairments resulting from nonpoint source pollution and (b) prevents significant threats to water quality from present and future activities.
5. An identification of waters and watersheds impaired or threatened by nonpoint source pollution and a process to progressively address these waters.
6. The State reviews, upgrades and implements all program components required by section 319 of the Clean Water Act, and establishes flexible, targeted, iterative approaches to achieve and maintain beneficial uses of water as expeditiously as practicable.
7. An identification of Federal lands and objectives which are not managed consistently with State program objectives.

8. Efficient and effective management and implementation of the State's nonpoint source program, including necessary financial management.
9. A feedback loop whereby the State reviews, evaluates, and revises its nonpoint source assessment and its management program at least every five years.

2.1.2.3 2010 - current

Nine Elements of a Watershed Based Plan – The NPS program is actively working with watershed groups to incorporate these elements in watershed plans. The latest effort is the development of specific guidance for watershed groups on the development of complete and satisfactory plans that address all these elements.

“Legacy Mining”- The NPS and the TMDL programs have collaborated on defining priority watersheds for the state. Priority watersheds are defined as areas where the NPS program has had some type of activity, ideally an active watershed group with a watershed plan addressing all EPA Nine Elements and where the TMDL program has an EPA approved TMDL study. Priority watersheds are areas with the greater opportunity for success for both Division programs, and identify areas where the impaired water quality can be returned to meeting standards if the NPS program can fund implementation of the TMDL. During the process of defining priority watersheds, it became apparent that most of these areas were impacted by mine-related pollution, such as metals and low pH; also, most of the TMDL studies developed to date by the TMDL program are related to legacy mining impacts. As a consequence, the NPS program will be focusing on implementation of BMPs that address implementation of legacy mining related TMDLs, in partnership with DRMS.

The NPS program continues to focus on restoration of impaired waters, and these will be a priority for the next five years. The primary focus will be addressing impacts from legacy mine-related activities, but the program will continue to consider other restoration activities, especially ones that support TMDL implementation. The program will also continue to implement activities related to protection of water quality. For more discussion on this, consult Part III – Nonpoint Source Program Strategy.

2.1.3 Water Quality in Colorado

The IR provides a current assessment of all surface waters of the state that have been assessed. The CWA at Section 101(a)(2) requires that all waters be suitable for the protection and propagation of fish, shellfish and wildlife and for recreation in and on the water unless it is demonstrated that the use is not attainable. Classified use classifications have been assigned to waterbodies based upon the actual, and anticipated, uses occurring in the waterbody. Water quality standards are then assigned based on those assigned uses. In Colorado, when a narrative or numeric standard is exceeded, the associated use is determined to be in non-attainment and the cause and source affecting the water body are determined. The cause is the pollutant that contributes to the non-attainment. For example, if the aquatic life standard for zinc is exceeded, then the aquatic life use would be in non-attainment and the cause would be zinc. The source is the activity or facility that contributes the pollutant. An example of a source is resource extraction when metal exceedances are found in a historic mining district.

The table excerpted below from the 2010 IR summarizes the *sources of impairments* in Colorado.

Source Categories	Colorado Rivers (miles affected)	Colorado Lakes (acres affected)
Agriculture Related Sources	1,835.30	216
Contaminated Groundwater	29.90	5.49
Highway/Roads/Bridge Runoff (non-construction related)	16.30	0
Mining Related Sources	565.26	141.60

Table 2.1 - Summary of Sources Affecting Water Bodies Not Fully Supporting Classified Uses		
Source Categories	Colorado Rivers (miles affected)	Colorado Lakes (acres affected)
Natural Sources	19.08	141.60
Sources Unknown	7,884.11	48,327.58
Upstream Sources	47.17	0
Notes: 1) Source means the activities, facilities or conditions that contribute pollutants or stressors 2) Sum of acres or miles affected does not equal the total non-attained acres or miles since non-attainment may have more than one cause.		

A summary of the causes of impairments, also derived from the 2010 IR, indicates that the main pollutant causing water quality impairment in Colorado rivers and streams is selenium, followed by metals (if adding all metals impairments, with copper, iron, zinc and cadmium the highest) and followed by pathogens. In lakes, the causes are mercury, selenium and low levels of dissolved oxygen.

Dissolved metals and acidity (pH) from legacy mining AML and background sources comprise 89% of the total number of impaired stream segments where a TMDL has been written in Colorado (Fig. 1). These impairments are considered nonpoint sources because they are related to runoff and drainage from AML sites for which there are no remaining financially viable responsible party.

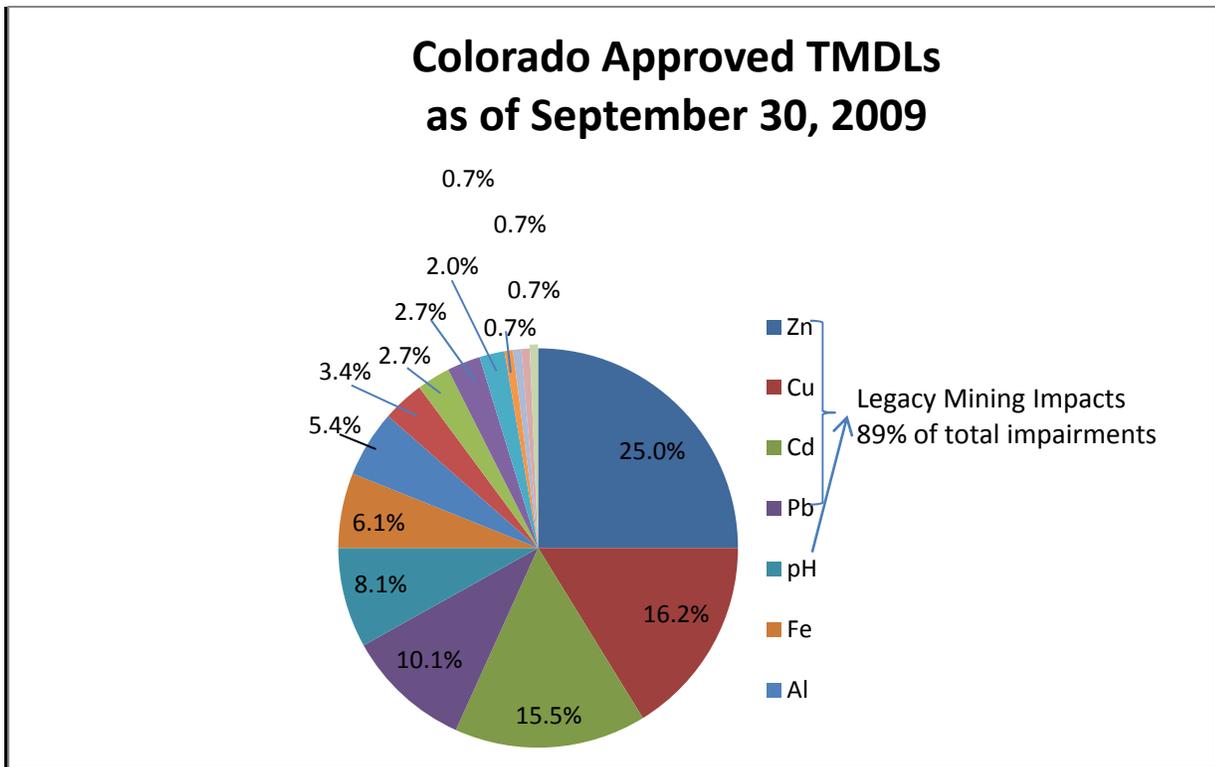


Figure 2.1 – Colorado Approved TMDLs – 09/30/2009

The water quality impairments in Colorado have provided the basis for the strategic approach to implementing the updated NPS program priorities. In addition to addressing the impaired segments, the NPS program will continue to address the more traditional nonpoint sources of pollution, namely nutrients and sediment.

2.1.3.1 Waterbody Impairments and TMDLs

The Division, through the biennial 303(d) list (Regulation № 93), identifies those waterbodies within the State that are not attaining the standards associated with an assigned use. These waterbodies are consequently considered impaired. A single waterbody can, and often has multiple impairments that result from more than one standard being exceeded. In preparing the 303(d) list, the Division also identifies those waterbodies that have data that indicate a potential problem exists, but direct evidence of an actual impairment is lacking. These waterbodies are then placed on the Monitoring and Evaluation list, which lists those waterbodies that are potentially impaired but additional data are needed before an actual impairment can be determined. Once a waterbody is identified as impaired on the 303(d) list, the Division, in most cases, is required to complete a TMDL that identifies the pollutant reduction that would be necessary to once again have that waterbody meet the assigned standards. Once a TMDL has been submitted by the Division for EPA approval, that waterbody is removed from the 303(d) list, but is still considered impaired until water quality data demonstrate that the standard(s) associated with the assigned uses are met.

Completed TMDLs and the most recent 303(d) list (effective date: April 30, 2010) provide a summary of the universe of currently impaired waters in Colorado. In general, most of the impaired waterbodies are impacted by NPS related pollutants, or by a combination of both NPS and point-source pollutant sources. Therefore, a summary of impairments based on the 303(d) list and completed TMDLs provides a starting point for characterizing NPS categories that are producing impairments in Colorado.

The current 303(d) lists (effective date: April 30, 2010) list a total of 338 waterbodies and a total of 489 impairments due to multiple standards being exceeded on the same waterbody. Broad categorization of these impairments indicates that 49% are due to exceedences of the metals standards, or low pH, associated with legacy mining impacts. The next largest category involves selenium impairments accounting for 17% of the 303(d) listed impairments. Impairments due to pathogens (*Escherichia coli*) accounted for 10% of the total. Similarly, 10% of the impairments involved low dissolved oxygen levels (DO), nitrates, or pH on lakes throughout the state. Fish consumption advisories issued due to high levels of mercury and other identified aquatic life impacts accounted for 6% of the impairments. All other impairments (e.g. uranium, temperature, sediment) accounted for 10% of the impairments. Review of the completed and approved TMDLs indicates that approximately 90% are addressing legacy mining issues. Of this total, approximately 55% have been written to address cadmium, copper and zinc impairments, all of which is associated with legacy mining impairments. The remaining 10% of completed TMDLs have addressed a range of issues, including such impairments as sediment, nitrates and mercury related fish consumption advisories.

From a national perspective, EPA continues to focus on restoration of impaired waterbodies. A number of TMDL and NPS Performance Partnership Agreement (an agreement between EPA and the Division regarding ongoing work priorities) objectives specifically address this overarching goal. Restoring impaired waterbodies is also a key Division strategic planning objective. In Colorado, based on impairments identified within Regulation № 93 and completed TMDLs, legacy mining issues are clearly the main contributor to impairments, and thus, are a primary restoration goal.

When a TMDL is completed, the contributions of point sources and various nonpoint sources are identified. Upon EPA approval, the Division is required to ensure that all permit requirements are consistent with any point sources identified in the TMDL. Thus, any TMDLs that are due solely to point source discharges are addressed by the implementation of permit conditions. In cases where combinations of point and nonpoint sources are included in the TMDL, the Divisions again address the point source contributions through implementation of permit conditions. For TMDLs that are solely the result of nonpoint sources, the Division has no regulatory authority to address the issue, and thus the voluntary approach of the NPS program. Therefore, for cases where TMDLs have been approved and the waterbody still does not attain standards, the vast majority of these is awaiting some type of nonpoint source controls.

Other waterbody impairments include a number of different pollutants, and many of these involve localized, site-specific assessments. The NPS program will continue to prioritize restoration activities within the context of all

statewide impairments, the degree of interest of local communities or watershed groups, and potential impacts to human health or aquatic life.

2.2 Nonpoint Source Program Strategy

Two of the Division strategic goals have direct bearing on the 2012 NPS Management Plan: protection of all designated uses and restoration of impaired water quality to assigned standards. These two strategic goals parallel EPA's intended use of the section 319 grant funds to implement NPS activities. The 319 grant, awarded to the State to address NPS pollution issues, is divided into two components. The first component is the base allocation which is available to broadly address multiple NPS categories. The incremental allocation consists of additional funding created in the 1990s, under the CWAP to be utilized addressing restoration activities on impaired waterbodies that have been identified in a watershed plan meeting all EPA Nine Elements. The intent of the 2012 NPS Management Plan is to identify those activities that lead to the protection of assigned uses, and thus eligible for 319 grant base funding, and prioritize the utilization of 319 grant incremental funding to address the restoration of impaired water quality.

Colorado's NPS program is implemented at two levels: 1) The program level identifies and prioritizes NPS issues, coordinating resources and partners to address these issues, and tracking progress in water quality improvement and 2) The project level addresses state program priorities through on-the-ground watershed restoration efforts and information/educational campaigns to broaden public awareness of NPS issues. Colorado's NPS program aims to achieve the greatest public health and environmental benefit using the limited resources available. The 2012 Management Plan recognizes this and describes the strategy to prioritize and target resources.

Nationally, the first 20 years of the NPS program were activity-based, with many projects involving a BMP demonstration but with little emphasis on achieving or reporting on measurable results. Since then, there has been an increasing expectation to documenting and reporting actual water quality improvements and environmental results. EPA has also modified the criteria for how 319 grant funds can be used, creating a stronger emphasis on implementation projects that address impaired waters. Approximately one-half of each year's 319 grant funds is reserved for addressing impaired segments or watersheds containing impaired segments. The other half can be used in development of watershed plans, implementation projects in non-impaired water bodies, and other statewide nonpoint source protection and/or restoration activities.

In response to EPA's changes to 319 grant funds, this NPS Management Plan is shifting the emphasis of the program from an activity-based strategy to an outcome-based approach. This shift to environmental outcomes aligns with the Division strategic plan and places the focus squarely on restoring impaired waters but recognizing that protecting existing high quality waters is also vital.

The NPS program is closely connected to other Division watershed programs and related documents such as the IR with its associated list of impaired waters (i.e. 303(d) list), TMDL reports, Source Water Protection Plans and the SWQMP. The SWQMP provides a watershed framework for water quality planning. Comprehensive information about current *statewide* water quality is presented to assist water policymakers, managers, and others in setting priorities, developing strategies, and evaluating the progress of water quality protection and restoration efforts. The SWQMP provides a comprehensive information resource for water policymakers and managers to serve as a foundation for setting priorities, developing strategies, and evaluating the progress of water quality restoration, maintenance, and protection activities previously undertaken. Data generated from the NPS implementation projects are incorporated in the IR. The list of impaired segments and TMDL reports guide the identification of priority watersheds for NPS project implementation projects. Source Water Protection Plans are a key watershed plan link for the protection of raw drinking-water supplies and for associated contingency planning. All of these reporting and planning mechanisms have public notice and participation processes built into their procedures. Results of these assessments, updated regularly, guide program management strategies and serve as initial references for NPS project sponsors.

The program rotates incremental funds around the state, one river basin per year, so that it takes 5 years to complete a full cycle. This rotation follows the schedule for water quality standards triennial review defined by the Water Quality Control Commission. During the fifth year the Commission reviews Statewide Basic Standards and Methodologies and the program does not define a target basin for the incremental funds (see Appendix A for the Target Basin Rotation Plan table). This strategy ensures that the NPS program is using the most updated information and latest assessments to address impaired waters while focusing the use of limited resources.

2.3 Tools for Implementing the Nonpoint Source Program

One of the primary tools that the NPS program utilizes to address water quality issues on a watershed scale is the development of a watershed plan that meets the EPA Nine Key Elements. These watershed plans are critical water quality management tools because they engage stakeholders within the watershed to generate local support for water quality planning and the associated priorities needed to restore or maintain a healthy watershed. Development of a watershed plan that meets EPA Nine Key Elements within an impaired watershed is also a prerequisite for qualifying for incremental funds.

Ideally, watershed plans should naturally lead to implementation projects that address the prioritized issues. The NPS program funds implementation of BMPs that control nonpoint sources of pollution so that water quality can be protected or restored. During this planning period, the NPS program, in conjunction with project sponsors and program partners, will be developing a library of existing BMPs (See Appendix E for the Colorado NPS program BMP Library) to adapt the BMPs to Colorado hydro-geomorphic characteristics and to ensure that the best practices are being used to address the NPS categories.

The NPS program works collaboratively with many program partners to promote outreach and education activities to raise awareness of pollution generated from nonpoint sources and its impact on water quality. These partners vary from Federal land management agencies to locally organized watershed groups. Chapter five describes the various partnerships with whom the NPS program works in greater detail.

2.3.1 The Watershed Approach in Colorado

2.3.1.1 -- Watershed Groups

The Watershed Approach is one of the major environmental trends of the 1990s and which continues to this day. As an example, in 1996 in Colorado there were six stream-based local initiatives (in addition to the basin authorities). Currently, there are over 70 watershed groups in Colorado, with different degrees of organization. The focus for many of these groups, and the reason they were started, is often water quality.

The formation of these local watershed groups reflects current social and technological trends: local leaders are demanding more control in planning and implementing the environmental agenda, and the technology, including both GIS and the Internet, provide ready access to a wide range of information, including technical information.

2.3.1.2 -- Programs

The ramifications of the watershed approach are observed in the NPS program in several ways:

- **Targeting:** with the historical Unified Watershed Assessment of the 2000's, the NPS program started the informational tool providing information about what areas of the state are likely to be targeted for restoration activities. Over time, this has developed into an outreach program that delivers focused information at the local level.
- **Stakeholder involvement:** the establishment of local stakeholder groups is usually a critical part of generating the local support needed to implement a voluntary watershed improvement plan. The watershed approach provides a defined framework that works with the natural systems and allows the stakeholders to focus on a workable land unit.
- **Watershed Partnerships:** the NPS program champions the collaboration of key organizations and agencies to address environmental issues that include nonpoint source water quality impacts by promoting and implementing BMP systems. For example, the NPS program partners with lead agencies in responding to

wildfire area treatment, especially in implementing BMPs to protect public water systems source water areas. Additionally, the NPS program works closely with the DRMS in addressing nonpoint source pollution resulting from AMLs.

- With GIS tools and water quality information being updated to include precise latitude/longitude locations, targeting tools are being developed and refined. Examples include: the IR with the 303(d) list, TMDL scheduling, and the Priority Watersheds (See Appendix B for the Colorado NPS program Priority Watersheds) outreach effort. These tools help identify impaired segments and watersheds in need of restoration.
- NPS Requirements and Funding: new NPS opportunities and requirements have been initiated to reflect the targeting of problem areas. One example is the Watershed Restoration Action Strategy (WRAS) which required that projects proposed for NPS Section 319 funding identify their issues within the context of their local watershed. The Unified Watershed Assessments and Watershed Restoration Action Strategies represent the early history of watershed planning and led to the watershed-based plan requirements used today.
- Another example is the additional funding made available through the CWAP which essentially doubled the Section 319 appropriation available to invest in NPS projects. This funding is still available and is referred to as incremental money and is used in implementing watershed-based plans and TMDLs.

The watershed approach has increased in significance in water quality management. US EPA has issued various pieces of guidance in the past five years that promote a watershed approach, including:

- [Watershed-based National Pollutant Discharge Elimination System Permitting Implementation Guidance, December 2003, including NPDES Permitting for Environmental Results Strategy, August 2003](#)
- [US EPA Final Water Quality Trading Policy, January 2003](#)
- [Nonpoint Source Program and Grant Guidelines for States and Territories, October 2003](#)
- Handbook for Developing Watershed Plans to Restore and Protect Our Waters, 2008
http://water.epa.gov/polwaste/nps/handbook_index.cfm

2.3.1.3 -- Watershed Planning

The emphasis on watershed-based plans in US EPA's NPS program activity measures has raised the awareness and increased the need for a coordinated effort to manage the resources of a geographic locale. Watershed planning has been a major component of NPS activity since the 1999/2000 CWAP, which required the development of a watershed restoration action strategy prior to using incremental NPS funds.

A watershed plan is a living document, developed in an iterative process that includes a wide variety of watershed stakeholders, such as land owners and managers, local governments and special interest groups, as well as land users such as recreationists. The planning process usually begins with a group of concerned citizens who come together around a particular resource issue.

Watershed planning is not new. Planning for water quality purposes was established with Section 208 of the CWA in 1972. The US Department of Agriculture has used watershed planning for years in its Small Watershed Program. There are many similarities between the minimum NPS planning elements and other planning efforts. Those efforts can compliment planning for nonpoint source purposes.

2.3.2 Monitoring

The NPS program requires determination of measurable results for all on-the-ground activities funded with NPS funds. Measurable results enable the NPS program to evaluate the success of on-the-ground activities by comparing pre- and post-restoration conditions. Coordination between the NPS program and project proponents is important in collecting the appropriate data to obtain measurable results, as well as determining what the measurable results of the project are. Whenever practical, monitoring should be conducted through a cooperative arrangement among the various local stakeholders, state and federal agencies. In some cases, state or federal agencies may have data that could supplement data collected per requirements in a project implementation plan.

The NPS program has developed a template for Sampling and Analysis Project Plans (SAPPs) which template will form the basis for all data collection efforts. The NPS program and stakeholders need to collaborate on selecting monitoring approaches, measurement and sampling methods, and overall monitoring design, including frequency and locations of sampling and measurements to evaluate success. It is recommended that project sponsors consult with the NPS program prior to submitting an on-the-ground project proposal to improve project objectives, design, and monitoring guidelines and ensure the approach is appropriate for the watershed and follows the Watershed Program's overall sampling guidelines.

The NPS program also coordinates monitoring efforts with other entities. For example, the River Watch program works with local volunteers, teachers and schools to monitor water quality and other indicators of watershed health. Local watershed groups are able to coordinate their monitoring efforts with River Watch volunteers to collect data and assess the water quality results from implementing BMPs. The NPS program also works collaboratively with the Environmental Data Unit (EDU) gathering and sharing data. EDU collects environmental data following the schedule described in Appendix A; depending on available resources, EDU includes NPS site locations in the yearly sampling schedule. NPS and River Watch data are incorporated in basin water quality assessments.

2.3.3 Information and Education

NPS Information and Education (I&E) efforts to date have been successful in increasing the awareness and knowledge of the general public. More citizens know that pollution from diffuse sources can impair waterways just as pollution from a point source can. However, at the same time a survey conducted by the League of Women Voters of Colorado Education Fund (2008) found less than 25% of urban residents knew they lived in a watershed. Clearly, additional efforts are needed.

It takes time for awareness to evolve into action or behavior change, which in turn will result in a direct water quality improvement. Many changes are generational, that is, the small changes take a full generation or more to have a cumulative, measurable impact. This is difficult to measure in a 5 to 10 year time span.

As Colorado's NPS program moves toward an integrated watershed approach to NPS management, new I&E work will be focused on achieving NPS program goals. The core I&E program activities will be retained, for instance, the coordination of outreach activities, information dissemination, and website maintenance. New I&E activities will be integrated within implementation projects activities, so that local community involvement can be leveraged to include not only implementation activities but also all the associated education and information activities as well. This is predicated on the thinking that as stakeholders get involved at the local level implementing projects within their watershed, it results in a higher level of awareness and also a change in behavior toward a more desired and educated approach to protection and restoration of water quality and habitat integrity.

2.3.4 The NPS Alliance

The Colorado Nonpoint Source Alliance (Alliance) is a main component of the Colorado NPS program's effort to collaborate with and engage local and government entities in its efforts. This voluntary group fulfills some of the consultation requirements of the CWA and provides opportunities for public input concerning the program to both the Division and the WQCC. The Alliance meets quarterly to provide the NPS program technical advice and coordination with NPS efforts from other agencies such as US Geological Survey, US Department of Agriculture, BLM, Colorado agencies and local and regional entities like Pikes Peak Council of Governments, Colorado River Water Conservation District and North Front Range Water Quality Planning Association. These efforts promote NPS activities and reduce redundant efforts. As of December 2010, over 61 participants were involved in the Alliance, from over 50 organizations including federal, state and local government, nonprofit organizations, universities and private citizens.

The Alliance developed outreach matrices to assist in the identification of appropriate projects likely to be successful in each priority river basin. Members, with NPS program staff, populate these matrices and target selected areas for project promotion in the priority established by the WQCC.

Each year the Alliance meets for consultation day to discuss abstracts of proposal ideas and offer technical advice to project proponents. The Alliance also meets each year to review proposals submitted during the yearly grant cycle to provide comments to the Division and to the WQCC.

2.4 NPS Program Strategy for Managing Certain Waterbodies

2.4.1 Lakes and Reservoirs

Colorado's IR references more than 1,500 lakes and reservoirs in Colorado that are over 10 surface acres in size. These lakes are classified for beneficial uses such as aquatic life, recreation, water supply and agriculture. Many lakes and reservoirs are impacted by nonpoint sources, to one degree or another. The pollution sources of concern include nutrients (phosphorus and nitrogen), sediment, acidity, and in some cases, toxics such as metals or organics, which may affect fish or human health.

Lake protection and restoration activities are eligible for nonpoint source funding to the same extent, and subject to the same criteria, as activities to protect and restore other types of waterbodies from nonpoint source pollution. In particular, the Environmental Protection Agency has established guidance that limits the amount of Section 319 grant funds used for all assessment activities in a state, including lakes assessments, to no more than 20% of a state's total 319 allocation. In using the watershed approach, NPS Program recognizes all surface waters, and the same set of targeting tools may be applied to streams, rivers, lakes or reservoirs.

2.4.2 Wetland & Riparian Areas

Wetlands cover about 1 million acres of Colorado, approximately 0.1 percent of the State's land cover. Wetlands occur in all ecoregions and climatic zones, from the high mountains to the arid plains and plateaus. Wetland types in Colorado include forested wetlands, willow carrs, fens, marshes, alpine snow glades, and wet and salt meadows. Wetlands are vital to wildlife in the State, particularly in the arid regions. Colorado's wetland area has decreased by about one-half over the last two centuries, and losses are continuing due to a variety of land-development pressures. However, irrigation and changes in land-use practices have resulted in the formation of new wetlands.

Wetlands and riparian areas typically occur as natural buffers between uplands and adjacent water bodies. They act as natural filters of nonpoint source pollutants, including sediment, nutrients, pathogens, and metals, to waterbodies, such as rivers, streams, and lakes. The preservation and restoration of damage to wetlands and riparian areas is important because these areas can play a significant role in managing adverse water quality impacts. Wetlands and riparian areas help decrease the need for stormwater and flood protection facilities.

The NPS program addresses protection and restoration of wetlands and riparian corridors in the context of many types of implementation projects. These projects can be streambank restoration, aquatic habitat improvement, sediment load control projects and education and outreach projects.

2.4.3 Groundwater

Groundwater quality in Colorado varies significantly, depending on geography and geology. Shallow, unconfined aquifers in Colorado are susceptible to contamination from surface activities. Overall, groundwater provides 18% of the water beneficially used in the state. However, in some localities it is the sole source of domestic and irrigation water.

The Colorado Agricultural Chemicals and Groundwater Protection Act (SB90-126) took effect on July 1, 1990, and established the Groundwater Protection Program. The goal is to prevent groundwater contamination before it occurs by improving agricultural chemical management. Agricultural chemicals covered under this legislation include commercial fertilizers and all pesticides. The program employs three primary functions to protect groundwater in Colorado: a) program oversight and regulation; b) groundwater monitoring; and c) education and training.

Groundwater protection in Colorado has been delegated to the Department of Agriculture, the Colorado State University – Extension and the Department of Public Health and Environment through legislation and statutory responsibilities. The agencies and several other members, also form the Groundwater Protection Program Advisory Committee. The groundwater standards and classifications adopted by the Water Quality Control Commission are implemented through the rules and regulations of the individual agencies.

The NPS Program interaction with groundwater issues is primarily through the Agricultural Chemicals and Ground Water Protection Program of the Colorado Department of Agriculture, through participation in an advisory committee, supporting education and outreach efforts and recommending or implementing the best management practices developed or recommended by the Groundwater Protection Program.

a) Program oversight

The mission of this program is *"To protect groundwater and the environment from impairment or degradation due to the improper use of agricultural chemicals while allowing for their proper and correct use..."* The Colorado Department of Agriculture, Colorado State University - Extension and CDPHE are cooperating agencies in the implementation of this program.

b) Monitoring

The Groundwater Protection Program monitoring program's purpose is to evaluate possible impacts to groundwater quality from current and past use of agricultural chemicals and provide accurate data to: determine if agricultural chemicals are present; determine if trends in water quality exist; provide monitoring data in an annual report to help the Commissioner of Agriculture to identify potential agricultural management areas; evaluate the effectiveness of BMPs; and assess groundwater vulnerability. The program has developed a database that holds all groundwater quality data collected by this program since monitoring began in 1992. It provides groundwater quality monitoring results by year and geographic location for pesticides and inorganic compounds including nitrate–nitrogen. All queried reports are printable summaries of the requested information.

c) Education and training

Colorado State University - Extension is required to work with the Colorado Department of Agriculture to develop best management practices for Colorado farmers, landowners and commercial agricultural chemical applicators. Because of the site-specific nature of groundwater protection, chemical users must ultimately select the BMPs appropriate for their situations. The local perspective is necessary to evaluate the practices' feasibility and economic impact. For these reasons, the Groundwater Protection Program Advisory Committee recommends a significant level of local input be solicited before BMPs are accepted. Numerous educational materials, extensive groundwater monitoring, and BMP demonstrations have been accomplished within the Groundwater Protection Program.

2.4.4 Source Water Assessment and Protection

The 1996 Safe Drinking Water Act Amendments required each state to develop a Source Water Assessment and Protection (SWAP) Program. The SWAP program uses a two-phase process.

The assessment phase involves understanding where each public water system's source water comes from, what contaminant sources potentially threaten the source, and how susceptible each water source is to potential contamination. A source water assessment consists of delineation of source water assessment areas, inventory of potential sources of contamination, susceptibility analysis and reporting the assessment results to the public. The assessment methodology may be found at

http://www.cdph.state.co.us/wq/sw/pdfs/SW_SWAPAssessmentMethodology_v6.pdf

The protection phase is a voluntary, ongoing process where the public water system and local community initiate preventive measures to protect the water supply from the potential sources of contamination. State and federal law do not require the development or enforcement of source water protection measures, though some protection measures may fall under other existing state or federal laws.

Source water protection is an important consideration in any watershed plan, as nonpoint sources have the potential to impact drinking water. NPS funds may be used for on-the-ground activities that reduce potential sources of contamination, within the context of other program priorities. Source Water Protection and nonpoint source planning activities contain similar components, which make them candidates for a coordinated development and implementation approach. Because of this nexus, NPS project coordinators and the SWAP program work together disseminating information and providing outreach to local watershed groups and to local groups involved in source water protection about the 2 programs. In many cases and whenever possible, the tasks to address implementation of both programs are addressed in the documents and in the related activities, using the watershed approach.

2.5 NPS Priorities for the Next Five Years

The NPS program addresses protection and restoration of water quality and aquatic habitat under the influence of nonpoint sources of pollution. This naturally encompasses a large universe of issues and priorities, and requires much more funds than are currently available to the program, even with available funds being leveraged with several partners. This situation has necessitated a system of prioritization of issues and of the funds available. The following describes how the program will be implemented during the next 5 years and presents a rationale for the years following that. Even though the priorities have been defined very clearly, that does not imply that the program will not take into consideration implementation of other projects that also address nonpoint sources of pollution. The program will continue to address the NPS categories that are described in Chapter 3 and that define the universe of the national program.

Due to the preponderance of mining related impairments and to the limited resources available to the program, the NPS program intends to focus efforts over the coming five years toward addressing these issues. Since the majority of completed TMDLs address legacy mining impairments, the focus of the NPS program efforts will be directed toward implementing activities that address the NPS-related load (load allocation) reductions. NPS-related implementation efforts can also be directed toward addressing priority watersheds and segments (see Appendix B for the Nonpoint Source program Priority Watersheds) even in places where a TMDL may not have been developed yet. To further address legacy mining situations, the NPS program will work closely with the Inactive Mine Reclamation Program of the DRMS to identify priorities regarding restoration and implementation activities. The NPS program will also work with local watershed groups that have identified legacy mining impacts in approved watershed plans, with extra emphasis toward priority basins and watersheds.

Throughout the process, the NPS program will weigh these priorities with available funding and adjust the project solicitation process to address demands in the most efficient manner. It is important to note that although the focus of the program for the next five years will be implementation of mine-related TMDLs, this does not preclude funding for other types of projects that also address impairments and that show merit and potential for success.

The NPS program has several ongoing projects (Chapter 6) designed to assess various approaches to addressing selenium impairments. Since selenium impairments occur in a wide variety of settings, the NPS program plans to assess each major river basin separately. This approach allows the program to tailor future restoration efforts to those unique circumstances of a particular river basin. For example, in the Gunnison and Uncompaghre River basins the NPS program has worked with local water providers to pipe open irrigation channels thus reducing water loss and subsequent selenium transport to these rivers. This type of approach is not feasible for the lower Arkansas River basin due to Colorado's ongoing river compact requirements. These types of unique situations mandate, at a minimum, a river basin approach to addressing selenium impairments. Over the next five years the NPS program will continue to investigate potential basin-specific selenium restoration efforts in Colorado's major river basins.

2.5.1 Legacy Mining - Metals

Colorado's heritage is mining; it is what has brought many people to the state since 1859, even before Colorado was a state and was an important economic activity for many years. However, all those years of mining have left approximately 1,300 miles of streams impacted by metals from these legacy mines. Legacy mines are sites that were operated prior to 1977 during a time when mining permits were not required and have no pre-existing reclamation responsibility. DRMS has identified more than 3,000 hazardous abandoned mines in Colorado.

DRMS is responsible for statewide reclamation efforts aimed at reducing hazardous situations and environmental problems associated with past mining activities. The DRMS, in partnership with other entities, provides for the reclamation and restoration of land and water resources degraded by the adverse effects of past mining practices by characterizing environmental problems associated with mine waste, mill tailings, and acid mine drainage and providing reclamation options to address them.

The majority of completed and approved TMDLs is related to legacy mining pollutants (zinc, copper, cadmium, lead, low pH, iron, aluminum and manganese). Very few of these TMDLs have been implemented. The program recognizes the need to address water quality impacts caused by this legacy activity and intends to address those impacts as the highest priority for the next five years. Under this new priority, the program will be partnering with the TMDL program and with DRMS to implement existing TMDLs and address other mining related water quality impairments.

Appendix C – Reclamation of Water Quality Impairments at High Priority Abandoned Hardrock Mine Sites in Colorado - contains a list of priority AML sites and associated work plan. This list is a sub-set of a more comprehensive list of AML sites. The NPS program will be addressing the priority list of AML sites but that doesn't preclude the program from working on the other mine sites as well.

2.5.2. Selenium

Impairments due to selenium represent the second largest impairment category. Selenium impairments occur where there is the presence of Cretaceous-aged geologic formations, such as the Mancos and Pierre shales. Due to this relationship with a geologic source, selenium has broad, statewide impacts and impaired waterbodies occur in both urban and rural portions of the state. Currently, very few TMDLs have been completed that address selenium, so the majority of the impairments remain on the 303(d) list. EPA guidance dictates that once a waterbody is listed on the 303(d) list the Division is required to submit a TMDL within 13 years. As several of these 303(d) listings for selenium have been on the 303(d) list for almost 10 years, the Division will be actively developing TMDLs for these listings. Given the number of selenium impairments, as well as the short term need to address these impairments with TMDLs, the NPS management plan considers these selenium listings as the second priority that will need to be addressed over the coming five years.

2.5.3 Other NPS program priorities

Other impairment categories with NPS components include pathogens (*Escherichia coli*), lake related low dissolve oxygen, nitrates, and pH, aquatic life and mercury-related fish consumption advisories. These categories have been identified in the IR as impacting water quality in rivers, streams and in lakes. Although considered a lower priority for funding purposes in this planning period, projects addressing these impairments will continue to be funded by the NPS program. During this five-year period, the State's primary strategy to address mercury will be to continue to participate in on the CDPHE Multi-media Pollutants Task Force.

The NPS program will continue to fund watershed plans the meet all Nine Elements for Watershed Planning identified in the *Nonpoint Source Program and Grants Guidelines for States and Territories, EPA 2003*. An important benefit of watershed based planning - whether conducted as part of a locally produced watershed action plan or in conjunction with a TMDL study - is that it requires characterizing and evaluating the watershed as a whole. It is also an important tool for identifying and prioritizing the impairments affecting water quality within the watershed. Watershed plans will guide project sponsors and the NPS program in implementing projects that are focused, results oriented, and that realize the best benefit given the limited resources.

The NPS program will emphasize implementation projects with clear results oriented objectives and implementation strategies. Projects will be required to include a methodology to gather and report on measurable results. Ultimately, the NPS program will either develop or adopt a watershed assessment tool that will enhance the program's ability to monitor and assess water quality as it relates to implementation of BMPs.

Sediment and nutrient load reductions are national programmatic priorities. As such, the NPS program will continue to fund implementation projects that address sediment and nutrient load reduction. Emphasis will be given to projects that provide measurable results and supporting data analysis showing load reductions.

Education and outreach is an important component of Colorado's NPS Program. In the past, the NPS program has funded many education and outreach projects that had a statewide or generic approach through the project solicitation process. This has helped the State identify the most important statewide outreach activities for program success, which will now be State programmatic activities and will no longer be competed. These activities are a high program priority, and include the annual NPS Workshop and other training, the development of a watershed assessment tool, and maintenance of the NPS Colorado website and news service. More information about key State outreach activities for this 5-year planning period may be found in the matrix in Appendix D. For this planning period, the NPS program will de-emphasize the generic approach for solicited projects and will primarily be funding education and outreach activities as part of implementation projects. This should help raise awareness of nonpoint source pollution and issues at the local level, with the intent of better results and with a more support of the local community. Statewide outreach and education activities remain eligible for funding, but are a lower priority than other project types and will be considered for funding only after all higher priority projects have been selected.

The NPS program is actively engaged in assisting local governments and watershed groups by providing funding for local watershed planning and restoration projects. Collectively, these efforts result in a united effort to protect and restore rivers and streams, and lakes.

2.6 Lessons Learned

Lessons learned from working with partners in implementing NPS projects are evaluated and applied using an adaptive management approach. Several common themes have emerged and evolved from the more than 150 projects funded thus far.

Lesson 1: Evaluation and monitoring – Projects still struggle with developing a water quality outcomes approach with sufficient monitoring and evaluation. With an increased emphasis on restoration of water bodies, project partners benefit from development and understanding of the common assessment tools ranging from Total Maximum Daily Load reports to pre-and post-project monitoring. Projects with clear methodologies and outcomes are stronger projects.

The NPS program has used this lesson to develop a template for SAPPs, develop and implement the Measurable Results project and improve Section 5.0 of the PIP – Evaluation and Monitoring Plan.

Lesson 2: A capable on-site project manager is critical. Successful projects are those where someone at the local level is dedicated to seeing the project completed. This person does not necessarily need to be a technical expert, but needs to be able to follow the project plan, keep it on track. Having a back-up plan in cases where the project manager departs greatly increases the probability of project completion.

The NPS program continues to encourage and support the presence of a project manager who takes the lead at the local level.

Lesson 3: Established business practices help projects run smoothly. Since it has become more challenging to contract with the state over the years, adequate time tracking, billing, subcontracting, and insurance coverage make a big difference.

The NPS program has developed a Business Ready Checklist and instructions to help project sponsors implement appropriate business practices.

Lesson 4: Adequate technical assistance is necessary to develop technically sound projects. Project managers and local partners will provide valuable assistance, but specialized expertise in assessing water quality data and project evaluation can be very beneficial.

The NPS program continues to partner with several technical experts, mostly via the Alliance members participation in the program.

Lesson 5: The local community must be convinced the project is necessary and will provide benefits not only to the watershed but also to the community itself. Even more importantly, the landowners and other stakeholders impacted by a watershed plan must be included in the process, and given the opportunity to help identify the practices for implementation. Ultimately on-going financial support by local sources is crucial for sustainability and on-going implementation of priority projects.

The NPS program and the Alliance members continue to develop outreach and education materials and presentations to raise awareness and to involve the local community in implementing projects and seeking sustainable long-term solutions.