

B. ACTION PLANS TO ADDRESS NPS CHALLENGES

The following action plan provides measurable milestones with specific strategies and actions as implementation steps. The plans define the current **problem**. The **milestone** is the solution to the problem. The **implementation steps** are the specific strategies and actions which will be used to accomplish the milestone. Organizations listed as lead agencies or cooperating agencies volunteered to serve in the specified capacity during the writing of the working draft or during the written public comments period. Progress in solving Problems, meeting Milestones and completing Implementation Steps contained in the Action Plans will be reported.

WATERSHED SUPPORT INITIATIVE

The following watershed support initiative will help in carrying out the other action plans that address specific NPS Category Challenges. The purpose of the Department's focus on watershed management, in part, is to assist with building the capacity of local organizations, governments and citizens to identify and address watershed issues through effective partnerships with local and regional stakeholders and government at all levels.

Problem: In order to maximize environmental protection in the Commonwealth, a holistic approach is needed.

- a. **Milestone:** By 2004, increase by 10 the number of watershed groups implementing protection and restoration of their watershed.

Lead Agencies: DEP, CD, WPCAMR, EPCAMR

Cooperating Agencies: NRCS, DCNR, OSM, USGS

Implementation Steps:

- (1) Conduct outreach activities to assist citizens and local governments with establishing effective watershed groups, assessing watershed conditions, and developing and carrying out watershed management plans for restoration and protection activities. Use a variety of tools and techniques, including written materials, Web-based information, personal contact, and others. Identify and build on existing materials and mechanisms as much as possible.
- (2) Improve opportunities for sharing information and data about activities and environmental conditions in specific watersheds (watershed level networking).
- (3) Improve opportunities for sharing of information and data across watershed boundaries about watersheds and watershed management activities and techniques (statewide or multi-state networking).
- (4) Conduct or support workshops, training sessions and conferences for watershed groups, local governments, and others on effective watershed management.
- (5) Provide or identify sources of technical and financial assistance for watershed management activities.
- (6) Continue the Citizens' Volunteer Monitoring Program, working with individual groups, monitoring support groups, EASI, the Volunteer Environmental Monitoring Panel and other interested parties.
- (7) Continue implementation of Pennsylvania's Stream ReLeaf Plan, which lays out activities for riparian buffer restoration and conservation with the goal of 2010 miles of streams buffered by 2010.
- (8) Develop and carry out a program to provide grants to citizen groups, local governments, and other eligible applicants for watershed restoration and assistance programs (WRAP).

- (9) Develop and maintain Watershed Notebooks on DEP's website to help link groups to information useful for local watershed management activities, and to provide a forum for groups to share information with each other.

1. RESOURCE EXTRACTION

Action plan to address NPS pollution from Resource Extraction

This is a comprehensive list. Not all these tasks can be achieved within the next five years. The pollution prevention initiatives are indicated by this symbol ❖. Pollution prevention is important to nonpoint source management because it involves preventing pollution from occurring at its source, before it is generated and has to be disposed of or cleaned up.

Problem: Past resource extraction activities (abandoned mines and oil and gas wells) have degraded thousands of miles of streams in the Commonwealth. Comprehensive planning is necessary to determine the best course of action to remediate past degradation and to prevent degradation from future resource extraction activities.

- a. Milestone:** Twenty-five new watershed management plans written that incorporate prevention and remediation of pollution from resource extraction activities, and other NPS problems in the watershed over the next five years (five per year).

Lead Agencies: DEP-BWC, BAMR, BOGM, DCNR

Cooperating Agencies: BMR, CDs, PF&BC, PGC, NRCS, OSM, EPA, DOE, USGS, EPCAMR, WPCAMR, SRBC

Implementation Steps:

- (1) Promote active partnerships and establish roles of partners to plan and implement remediation activities.
- (2) Establish policies and incentives to encourage industry involvement and partnerships in planning and remediation activities.
- (3) Create initiatives that facilitate remining activities.
- (4) ❖Encourage practices that ensure proper oil and gas waste disposal and plugging of abandoned wells.
- (5) Encourage more coordination and cooperation among DEP bureaus, other state agencies, federal agencies, county and local agencies, etc. for remediation activities.
- (6) ❖Coordinate the new NPS plan with BAMR's Comprehensive Plan for Abandoned Mine Reclamation, BMR's Comprehensive Mine Reclamation Strategy.
- (7) Develop a standardized format for watershed restoration plans that include the six categories of NPS by 2001.
- (8) By 2003, create an accurate GIS map of all resource extraction impacted lands and waters.
 - Create maps based on known discharges on BAMR problem area maps identifying streams and unnamed tributaries impacted by AMD.
 - Characterize streams by categories based on impact; e.g. acidic, alkaline, iron precipitant, aluminum precipitant, etc.
 - Locate sources of impacts and types of pollution sources; (e.g. underground mine, surface mine, coal refuse piles, oil and gas); characterize streams by categories based on types of pollution sources.

- Encourage DEP to complete mapping of historical permit areas with mined-out areas identified, problem area maps, underground mine workings, completed reclamation sites with types of problems addressed, etc.
 - Provide GIS maps to watershed groups.
 - Identify all post SMCRA discharges with responsible parties for future planning purposes.
- (9) By 2002, create and maintain an accurate GIS map of all completed passive treatment projects with associated databases (attributes).
 - (10) Encourage reclamation incentives, including reclamation on public lands to increase recreation potential on reclaimed lands.
 - (11) Subdivide state water plan basins into smaller assessment units.
 - (12) Standardize water quality data collection for AMD project assessment.
- b. **Milestone:** Continue monitoring passive treatment projects quarterly for two years after completion of construction; then once per year for life of project.

Lead Agencies: DEP-BWC, BAMR, BOGM

Cooperating Agencies: BMR, DMO, USGS, DOE, PF&BC, NRCS, RC&Ds, USACOE, watershed groups, educational institutions

Implementation Steps:

- (1) By 2004, establish plans for long term monitoring of completed remediation treatment facilities.
- (2) Continuing gathering information on types and locations of passive treatment facilities in place or in planning stages; if facility is functioning as expected, if any innovative design features were incorporated into the facility to increase efficiency of removal. Map facilities using GIS/GPS.

Problem: The restoration of resource extraction impacted watersheds depends on the successful implementation of accepted innovative best management practices. Present remediation activities are not being addressed comprehensively.

- c. **Milestone:** Begin implementation of watershed restoration plans based on local priorities and recommendations as funding becomes available.

Lead Agencies: WPCAMR, EPCAMR, BAMR, BMR

Cooperating Agencies: DCNR, BWC, BMR, BOGM, NRCS, USACOE, CDs, watershed groups

Implementation Steps:

- (1) Develop new organizations that focus on resource extraction remediation in highly impacted (high priority) watersheds.
- (2) By 2004, establish policies and incentives to encourage industry involvement and partnerships in remediation activities.
- (3) ❖ Continue to encourage policies that facilitate remaining activities.
- (4) By 2004, establish standardized guidelines for implementation of remediation projects.

Problem: The development of new technology for the prevention and remediation of resource extraction pollution is needed.

- d. **Milestone:** ❖ Develop one new treatment or prevention technologies and/or combination of technologies for NPS from resource extraction per year.

Lead Agency: DEP-BMR, BWC, BOGM, DOE

Cooperating Agencies: NRCS, USGS, BAMR, OSM, private consultants, educational institutions.

Implementation Steps:

- (1) ❖ Promote use of best technology for determination of likelihood of post-mining acid discharges on new permit applications for both surface and underground mining.
 - (2) ❖ Encourage use of technological advances for prevention of post-mining breakouts of underground mines.
 - (3) ❖ Assist oil and gas industry operators to develop economically and environmentally acceptable methods or technology for brine disposal.
 - (4) ❖ Encourage policy changes to prevent future mine drainage formation by addressing mining technology and closure design associated with underground mining.
 - (5) ❖ Continue to support or conduct demonstration projects that promote environmentally safe alternative oil and gas management practices.
 - (6) ❖ Establish regular technology transfer meetings to discuss technology issues.
 - (7) ❖ Encourage technological advancements in passive treatment technology.
 - (8) ❖ Encourage the concept of resource recovery.
 - (9) ❖ Identify nontraditional industry technologies that may be transferable to reclamation activities.
 - (10) By 2004, develop Web page for disseminating new technological advances or solutions to solve current problems.
- e. **Milestone:** ❖ Number of innovative policies and procedures adopted to prevent degradation from future resource extraction activities

Lead Agencies: DEP-BMR, BOGM, OSM

Cooperating Agencies: DMOs, DOE

Implementation Steps:

- (1) ❖ Establish and encourage research programs to develop new technology or refine existing technology for remediation and prevention of pollution from resource extraction activities.
- (2) ❖ Encourage policy changes to prevent degradation from future resource extraction activities
- (3) ❖ Promote proper oil and gas brine management and plugging of abandoned wells.

Problem: There is a lack of consistency in administering Chapters 102 and 105 on non-coal mining sites.

- f. **Milestone:** By 2004, incorporate conservation districts in the permit review process for non-coal mining sites.

Lead Agency: DEP

Cooperating Agencies: Conservation Districts

Problem: Funding of restoration activities is inadequate to make major improvements in watersheds affected by resource extraction activities.

g. **Milestone:** Secure one new funding source in the next five years.

Lead Agencies: EPCAMR, WPCAMR, watershed groups

Cooperating Agencies: Conservation Districts, DEP, NRCS, OSM, EPA, USACOE, DOE

Implementation Steps:

- (1) Encourage and locate sources of funding for long term monitoring of treatment facilities' effectiveness.
- (2) ❖Secure continuing sources of funding for the development of new technologies in the treatment and prevention of resource extraction pollution.
- (3) Assist watershed associations in writing grants and finding sources of funding for remediation activities.
- (4) ❖Encourage additional funding for DEP program to plug abandoned and orphan oil and gas wells.
- (5) Promote funding for addressing high volume abandoned underground mine and oil and gas discharges.
- (6) Encourage Congress to reauthorize SCMRA (expires in 2004).
- (7) Establish long-term maintenance funds for AMD treatment projects.
- (8) Establish long-term funding mechanism to address discharges being treated "perpetually", planning for companies going bankrupt in the future.

h. **Milestone:** The percent increase in the amount of funding from AMR Fund used for Reclamation Projects in Pennsylvania from 1999 levels.

Lead Agencies: EPCAMR, WPCAMR, watershed groups

Cooperating Agencies: Conservation Districts, DEP, NRCS, OSM, EPA, USACOE, DOE

Implementation Steps:

- (1) Encourage Congress to allocate the remaining balance within the AMR Fund for the purposes it was collected.
- (2) Encourage Congress to spend what is collected annually in the Abandoned Mine Reclamation Fund as outlined in the Surface Mining Control and Reclamation Act.

Problem: The public, both within and outside the resource extraction regions, are generally unaware of both the extent of stream degradation from resource extraction and the treatment technologies available to remediate the pollution.

i. **Milestone:** Five public awareness activities on NPS resource extraction information annually.

Lead Agencies: DEP-BAMR, BWC, BOGM, WPCAMR, EPCAMR

Cooperating Agencies: BMR, USGS, NRCS, DMOs, CDs, OSM, EPA, DCNR, SRBC, watershed groups

Implementation Steps:

- (1) Provide information on the extent and effects of degradation from resource extraction and effects of remediation activities.

- (2) Actively involve the public in the education process through outreach to schools, watershed associations, senior citizens and others.
- (3) Provide information on treatment technology and roles of private and public groups in remediation efforts.
- (4) ❖ Promote technology transfer to public and private groups.
- (5) Provide an annual report to proper Pennsylvania legislative committees on the status of reclamation progress.

Resource Extraction Management Partners

USACOE	United States Army Corps of Engineers
CD's	County Conservation Districts
DCNR	Department of Conservation and Natural Resources, Bureau of Recreation and Conservation, Division of Conservation Partnerships
DEP	Department of Environmental Protection
BMR	DEP, Bureau of Mining and Reclamation
BAMR	DEP, Bureau of Abandoned Mine Reclamation
BWC	DEP, Bureau of Watershed Conservation
DMOs	DEP, District Mining Offices
BOGM	DEP, Bureau of Oil and Gas Management
DOE	United States Department of Energy, Federal Energy Technology Center
EPA	United States Environmental Protection Agency
EPCAMR	Eastern Pennsylvania Coalition for Abandoned Mine Reclamation
NRCS	United States Department of Agriculture, Natural Resources Conservation Service
OSM	United States Department of the Interior, Office of Surface Mining
PTU	Pennsylvania Trout Unlimited
PF&BC	Pennsylvania Fish and Boat Commission
PGC	Pennsylvania Game Commission
SRBC	Susquehanna River Basin Commission
USGS	United States Geological Survey, Water Resources Division
WPCAMR	Western Pennsylvania Coalition for Abandoned Mine Reclamation

2. AGRICULTURE

Action Plan to address NPS from Agriculture

This is a comprehensive list. Not all of these tasks can be achieved within the next five years. The pollution prevention initiatives are indicated by this symbol ❖. Pollution prevention is important to nonpoint source management because it involves preventing waste from occurring at its source, before it is generated and has to be disposed of, or cleaned up.

PROBLEM: Many concentrated animal operations (CAOs) do not have nutrient management plans. Excessive nutrients from pastures, wastewater, manure applications, and nitrogen volatilization may pollute surface and groundwaters.

- a. **Milestone:** By 2004, 50% of all existing CAOs, based on local estimates will have nutrient management plans, and/or all CAOs will have nutrient management plans by 2015.

Lead Agencies: CDs, PSCE, DEP, NRCS, PDA, SCC

Cooperating Organizations: Commodity groups, consultants, PACD, PAIA, PFB

Implementation Steps:

- (1) ❖ Adjust feed rations to reduce the amount and nutrient content of manure.
 - Livestock and poultry feed should utilize components that reduce the amount of nutrients excreted.
 - (2) ❖ Promote manure testing to redefine book values to include new manure handling systems, new feeding systems and alternative livestock and poultry enterprises.
 - (3) Form focus groups to address strategic issues in nutrient management.
 - (4) Encourage private sector and other nongovernment entities to write nutrient management plans.
 - Promote training and certification
 - Promote cost share for plan development
 - (5) Revise and publish the PA Manure Management for Environmental Protection, Section of the Manure Management Manual by 2000.
 - (6) Promote the cost-effectiveness and environmental benefits of nutrient management via news media especially magazines and newspapers such as *Lancaster Farming*.
 - (7) Promote proper use of organic matter such as manure and compost to improve soil health and reduce runoff.
 - (8) Distribute the Chesapeake Bay video on calibration of manure spreaders and promote its use.
 - (9) Publicize and distribute fact sheets on calibrating manure spreaders by 2000.
 - (10) Put farmers in communication with other farmers who have implemented good nutrient management plans (i.e. field days, rainy day or twilight meetings).
 - (11) Require nutrient management plans on farms with a high potential for nutrient pollution (CAOs and CAFOs).
 - (12) Develop and promote alternative uses of excess manure.
- b. **Milestone:** Assess the potential to discharge manure from existing manure storage facilities of existing CAFOs over 1,000 AEUs by 2015.
- (1) Facilities in HQ and EV watershed will be assessed first.
 - (2) Nutrient Management Plans on farms with a high potential for nutrient pollution (CAFOs) will be required.
- c. **Milestone:** BMPs will be installed to reduce the impacts of nutrients upon surface and groundwater by 2015. Pollutant load reductions can be estimated from implementation of BMPs.

Lead Agencies: CDs, DEP, FSA, NRCS, PSU, SCC

Cooperating Agencies: SRBC

Implementation Steps:

- (1) ❖ Implement stream bank fencing, stream crossings and in-pasture watering systems on riparian areas in all priority watersheds by 2015.
- (2) ❖ Manage nutrients on pasture for optimum forage production and environmental protection.

- (3) Locate and manage “sacrifice areas” or high use corridors within pastures.
- (4) Promote grazing practices such as intensive and rotational grazing when environmentally and economically justified.
- (5) Promote environmentally sound agricultural land utilization of wastewater.
- (6) Promote constructed wetlands for environmentally sound treatment of wastewater.
- (7) ❖ Explore impact of composting of manure on volatilization.
- (8) ❖ Encourage incorporation of manure where economically and environmentally feasible.
- (9) ❖ Promote manure storage management practices such as covers, anaerobic digestion, and methane digesters.
- (10) ❖ Research manure storage structure design alternatives
- (11) Promote use of cost-sharing practices through the CBP, NMA, EQIP, S. 319, and DEP Wetland Replacement Program and Streambank Fencing Program that minimize and control manure runoff from barnyards (i.e., curbs, roofing, filter areas, constructed wetlands, hard surfaces and other BMPs.) Divert clean water away from barnyard, lanes and walkways.
- (12) Promote education programs for industry and farmers related to management of runoff from barnyards and walkways.
- (13) Adopt statewide standards for planning, design and construction of manure management systems in the PA Manure Management for Environmental Protection Manual by 2000.

PROBLEM: Nonprotective agricultural practices and inadequate riparian buffers/stream corridor stabilization, increase erosion and soil loss, degrade surface water quality and diminish aquatic habitat and food sources for aquatic life.

- d. ❖ **Milestone:** It is estimated that 50-60% of Pennsylvania farms have written conservation plans and are implementing them. Increase this number by 4% annually through 2004.

Lead Agencies: CDs, DEP, FSA, NRCS, PSU

Cooperating Agencies: SRBC

Implementation Steps:

- (1) Continue agency technical assistance for conservation planning and implementation.
- (2) Continue cost-sharing programs for implementing conservation plans.
- (3) ❖ Promote best management practices (BMPs) to minimize soil erosion:
 - (a) vegetative practices (cover crop)
 - (b) management practices (crop rotations, residue management, conservation buffers)
 - (c) run-off controls (diversions, terraces, waterways)
- (4) Put farmers in touch with other farmers who have implemented good conservation plans (field days, rainy day or twilight meetings).
- (5) Promote training and certification programs for conservation planning to interested individuals.

- (6) Promote cost sharing for the development of conservation plans approved by the conservation district.
- e. **❖Milestone:** Twenty five additional miles of riparian buffers will be implemented annually through 2004 to minimize nutrient and sediment impacts on streams.
- Lead Agencies:** CDs, DEP, NRCS, PennDOT, PF&BC, PGC
- Cooperating Agencies:** watershed groups
- Implementation Steps:**
- (1) Continue to promote agricultural stream crossings via General Permit, technical assistance, and cost sharing procedures.
 - (2) Provide technical and financial assistance for in-field livestock water systems.
 - (3) Study alternative riparian buffer designs for their potential to return economic gains to farmers.
 - (4) Conduct educational effort to promote forest and grass riparian buffers.
 - (5) Investigate or research phosphorus uptake by vegetation in riparian buffer areas.
 - (6) Compile and disseminate information on funding sources for riparian buffers.
- f. **Milestone:** Ten percent annual increase per year in the Conservation Reserve Enhancement Program (CREP) enrollment through 2010.
- Lead Agencies:** DCNR BOF, DEP, DU, FSA, PDA, PGC, Pheasants Forever, NRCS, SCC
- Cooperating Agencies:** watershed groups
- Implementation Steps:**
- (1) Establish CREP program in Pennsylvania by 2000.
 - (2) Develop and provide public outreach for farmers and landowners on CREP.
- g. **Milestone:** Install 10 (or more) additional miles of stream bank fencing in pasture land annually through 2004.
- Lead Agencies:** CDs, DEP, NRCS, PGC, FSA
- Cooperating Agencies:** watershed groups
- Implementation Steps:**
- (1) Continue to cost share installation of stream-bank fencing
 - (2) Continue to promote agricultural stream crossings via General Permit and cost sharing.
 - (3) Provide technical and financial assistance for in-field livestock water systems.
 - (4) Promote stream-bank fencing with riparian buffers in pasture land.
- PROBLEM:** Agricultural related pathogens, wastewater contaminants, and pesticides can lead to surface and groundwater contamination.
- h. **Milestone:** Increase the number of ag conservation technicians by 25% by 2004 to assist the ag community in implementing BMPs to reduce the environmental impacts from agricultural related pathogens, wastewater contaminants and pesticides.
- Lead Agencies:** CDs, PSCE, DEP, PACD, PDA

Cooperating Agencies: watershed groups

Implementation Steps:

- (1) Determine the nonnutrient chemicals of concern.
 - (2) Identify and promote nutrient management practices that reduce pathogens and nonnutrient chemical contamination of surface and groundwater.
 - (3) Promote all pesticide use in the context of an Integrated Pest Management System.
 - (4) Promote Chemsweep PDA's waste pesticide collection program, and other programs that reduce the hazard from unused crop protection products.
 - (5) Promote rinsate management, the use of containment facilities and in-line sprayer cleaning systems through education and cost sharing.
 - (6) Continue recycling of clean, empty plastic crop protection product containers.
- i. **Milestone:** Conduct 10 awareness activities annually through 2004 to promote composting and/or other innovative environmentally safe disposal methods for dead livestock and poultry.

Lead Agencies: PDA

Cooperating Agencies: CDs, DEP, NRCS, FSA

Implementation Steps:

- (1) Update requirements and standards for composting dead livestock and poultry.
- (2) Provide technical and financial assistance for composting dead livestock and poultry.

PROBLEM: The delivery of NPS programs and assistance to landowners and operators is not consistent statewide.

- j. **Milestone:** A state-wide system of conservation districts with trained staff to implement programs at the local level to minimize nonpoint source water quality impacts by 2004.

Lead Agencies CDs, DEP, SCC, NRCS, PDA

Cooperating Agencies: All, PSACC

Implementation Steps:

- (1) Develop and maintain a strong working partnership with conservation districts, improve working relations, and develop new opportunities to improve the partnership.
- (2) Build the capacity of conservation districts, define and develop core capabilities, support locally driven capacity development, and provide technical training and support services.
- (3) Develop adequate funding for conservation district programs, promote existing programs and successes, develop new program opportunities, and develop new revenue sources.
- (4) Utilize group conferencing capability to address technical questions and share information.
- (5) Continue the activities of the Agricultural NPS Liaison network to help implement the NPS Program at the local watershed level through the conservation districts.

- (6) Encourage federal, state, and local agencies/organizations to coordinate and communicate their programs to help implement Pennsylvania's Nonpoint Source Program at the local watershed level through the conservation districts.
- (7) Encourage funding for BMPs in special protection watersheds to maintain water quality.

PROBLEM: Funding for both BMP implementation and technical assistance is inadequate to address all nonpoint source problems and prevention of NPS pollution.

- k. **Milestone:** Develop and implement new funding sources for addressing agricultural NPS through 2004.

Lead Agencies DEP, PDA, SCC, USDA FSA, NRCS

Cooperating Agencies: US EPA

Implementation Steps:

- (1) Achieve Enhanced Benefits State status to increase Section 319 funding allocations from Clean Water Act.
- (2) Develop and implement a delivery system for the Growing Greener Initiative.
- (3) Secure state and federal budget allocations for technical assistance and planning assistance for agricultural BMP implementation, biosolids education and other agricultural programs.
- (4) Promote local and private efforts to secure additional funds.
- (5) Implement AGRI-LINK to provide funding for a broad base of agricultural BMPs to address NPS challenges.
- (6) Support legislation and new initiatives, such as Conservation Reserve Enhancement Program (CREP), to promote low interest loans, grants, and increased incentive payments for specific agricultural BMPs.

PROBLEM: Communicating new technologies to the general public, as well as within the agricultural community, is a challenge.

- l. **Milestone:** Outreach, education and technology transfer opportunities will increase 5% annually through 2004.

Lead Agencies: PSCE, CDs, PACD

Cooperating Agencies: DEP, PDA, USDA, RI, PASA

- (1) Develop manure and compost exchange and transportation directories for regions of the state with high animal numbers by 2004.
- (2) Define incentives that are needed to encourage manure and compost exchange and transportation.
- (3) Publicize and promote the manure and compost exchange and transportation directories through the Internet and other sources.
- (4) Research feed additives' effect on nitrogen volatilization.
- (5) Promote innovative best management practices to prevent and/or minimize nonpoint source pollution from agricultural activities.

Agricultural Nonpoint Source Management Partners

ACB	Alliance for the Chesapeake Bay
CBF	Chesapeake Bay Foundation
CDs	Conservation Districts
DVC	Delaware Valley College of Science and Agriculture
PSCE	Penn State Cooperative Extension
CMA	Crop Management Associations
EPA	U.S. Environmental Protection Agency
FSA	Farm Services Agency
NRCS	Natural Resources Conservation Service
PADH	Department of Health
PACD	Pennsylvania Association of Conservation Districts
PADEP	Pennsylvania Department of Environmental Protection
PAIA	PennAg Industries Association
PASA	Pennsylvania Association for Sustainable Agriculture
PDA	Pennsylvania Department of Agriculture
PENNVEST	Pennsylvania Infrastructure Investment Authority
PFB	Pennsylvania Farm Bureau
PF&BC	Pennsylvania Fish and Boat Commission
PFU	Pennsylvania Farmers' Union
PGC	Pennsylvania Game Commission
PSACC	Pennsylvania State Association of County Commissioners
PSG	Pennsylvania State Grange
PSU	Pennsylvania State University - College of Agricultural Sciences
PTU	Pennsylvania Trout Unlimited
RI	Rodale Institute
SCC	State Conservation Commission
SRBC	Susquehanna River Basin Commission
U of P	University of Pennsylvania
USDA	United States Department of Agriculture

3. CONSTRUCTION, DIRT AND GRAVEL ROAD, AND URBAN RUNOFF

Action Plan to address NPS from Construction and Urban Runoff

This is a comprehensive list. Not all of these tasks can be achieved within the next five years. The pollution prevention initiatives are indicated by this symbol ❖. Pollution prevention is important to nonpoint source management because it involves preventing pollution from occurring at its source, before it is generated and has to be disposed of, or cleaned up.

PROBLEM: Accelerated erosion and sedimentation impacts to our waterways is a leading cause of water quality impairment and reduces the productivity and utilization of our soil resource.

- a. ❖**Milestone:** Annual Report on Chapter 102/105 program activities which indicates that effective best management practices to minimize accelerated erosion and prevent sediment pollution are being implemented for earthmoving activities. The report summarizes agency and conservation district accomplishments including plan review, technical assistance, permitting, compliance and enforcement activities, program hours/costs and inspections.

Lead Agencies: CDs, DEP

Cooperating Agencies: NRCS, PennDOT, PF&BC, PACD

Implementation Steps:

- (1) ❖ Seek and obtain new and increased levels of funding assistance for conservation districts' continued administration of the E&SPC Program.
- (2) ❖ By 2000, complete revisions to the Department's Chapter 102 Erosion Control Regulations..
- (3) ❖ Update and revise existing program guidance documents and reference manuals to reflect regulatory changes.
- (4) ❖ Publicize, distribute and provide training for the use of The Best Management Practices Handbook for Developing Areas publication which integrates runoff planning and design for construction and permanent storm water management.
- (5) ❖ Continue and enhance yearly technical training sessions and conduct 20 program evaluations to ensure consistent, technically sound program administration by county conservation districts and DEP regional offices.
- (6) Encourage flexibility and new technology and require the use of performance based criteria for BMPs.

PROBLEM: Local land use decisions often impact NPS pollution to water resources, resulting in an immediate threat to special protection waters.

- b. **Milestone:** Track and summarize the percent increase in the total reimbursement dollars for regional planning at county and municipal levels to implement nonstructural, proactive NPS pollution control strategies from 1999 levels.

Lead Agencies: Municipal and county planning commissions

Cooperating Agencies: CDs, DEP, DCED, watershed associations, river basin commissions and PennDOT

Implementation Steps:

- (1) Develop and implement a delivery system for Growing Greener Initiative.
- (2) Promote adoption and implementation by municipalities of model ordinances that promote water quality protection.
- (3) Develop more flexible design criteria and standards that promote water quality protection.
- (4) Encourage planning and implementation of zoning strategies which are compatible with environmentally sensitive areas.
- (5) Develop workshops and curricula addressing the interrelationship between land use decision-making and NPS pollution prevention.

PROBLEM: Pending new federal regulations to permit stormwater discharges will affect the regulated community, imposing potentially duplicative state and federal requirements.

- c. **Milestone:** Phase II NPDES Stormwater Permit Requirements are integrated into ongoing state programs.

Lead Agencies: CDs, DEP

Cooperating Agencies: PennDOT, PF&BC

Implementation Steps:

- (1) Revise manuals and information.
- (2) Train CDs on new procedure.

- (3) Train cooperating agencies, engineers, municipalities, etc. on new procedure.

PROBLEM: There are 28,000 miles of unpaved roads in the Commonwealth. Dust and sediment from these roads cause environmental impacts.

- d. ❖**Milestone:** Number of identified problem sites corrected with BMPs funded from the Dirt and Gravel Road Program and project funding by county and year.

Lead Agencies: SCC, PennDOT, CDs, Municipalities

Cooperating Agencies: DEP, NRCS, PF&BC

Implementation Steps:

- (1) ❖ Continue demonstration projects to show erosion control benefits, new drainage methods, and demonstrate new technologies for controlling erosion and sedimentation.
- (2) ❖ Continue education and training initiatives for local officials and road maintenance personnel.
- (3) ❖ Prepare technical guidance materials for local Quality Assurance Boards and conservation district staff, to ensure efficient administration of the grant program and adherence to environmentally sensitive standards.

PROBLEM: A clearinghouse is needed to share information on innovative approaches and new cost-effective technologies to minimize environmental impacts from dirt and gravel roads.

- e. ❖**Milestone:** By 2003 create a Center for Dirt and Gravel Road Maintenance to serve as a permanent clearinghouse and resource to identify, coordinate and fund appropriate research.

Lead Agencies: SCC, PennDOT, PSU

Cooperating Agencies: DEP, NRCS, PF&BC, CDs, Municipalities

Implementation Steps:

- (1) Develop outreach programs to publicize new approaches and technologies.

PROBLEM: Since passage of the Storm Water Management Act, the Commonwealth has conducted stormwater planning for only 17 percent of its designated watersheds.

- f. ❖**Milestone:** By 2004, develop and approve an additional 25 Act 167 stormwater management plans.

Lead Agencies: Municipalities, Watershed Associations, CDs

Cooperating Agencies: DEP, DRBC, ICPRB, NRCS, ORSANCO, PennDOT, PF&BC, SRBC, USACOE, USGS

Implementation Steps:

- (1) ❖ Approve five stormwater management plans and adopt 50 municipal ordinances annually through the Act 167 watershed planning process.
- (2) ❖ Encourage all other municipalities, not part of a watershed plan, to adopt a stormwater management ordinance. Promote adoption of model ordinances that include planning and water quality requirements.
- (3) ❖ Educate land developers, municipal authorities and the general public on stormwater management techniques, watershed wide implementation of stormwater management and the relationship between land use changes and stormwater runoff.

In particular, educate these individuals about providing stormwater management controls throughout parcels being developed that would not adversely impact groundwater recharge and would maintain good water quality.

- (4) By 2004, use PENNVEST low interest loans to construct, improve, rehabilitate or retrofit an additional 16 public stormwater facilities.

PROBLEM: Past and present stormwater planning efforts have concentrated primarily on addressing stormwater quantity impacts. Urban runoff and resulting water quality impairment continue to be significant problems that require additional attention.

- g. ❖ **Milestone:** Beginning in 2000, each Stormwater Management Plans incorporate water quality design and pollutant reduction.

Lead Agencies: DEP, Municipalities, Counties

Cooperating Agencies: CDs, PACD, SWCS, PennDOT

Implementation Steps:

- (1) ❖ Promote use of Section 319 funded Best Management Practices Handbook for Developing Areas through training programs, workshops and news releases.
- (2) ❖ Incorporate structural and nonstructural water quality BMP components into local municipal ordinances developed through the Act 167 watershed planning process.
- (3) Recommend that municipalities, prior to granting final approval, require the review and approval of the stormwater components of development drainage plans by individuals trained and certified in the design and implementation of BMPs. In addition, early coordination meetings between developers and individuals trained and certified to review plans, should be encouraged as a means of minimizing the number of changes that would be necessary to site development plans.
- (4) ❖ Create additional funding sources to accelerate the pace of watershed planning for both stormwater quantity and quality.
- (5) For each municipality participating in Stormwater Planning distribute a copy of BMP Handbook and provide a workshop for all participants involved in SWP process.

PROBLEM: Stormwater management systems and programs at the municipal level are underfunded and need more financial and technical assistance.

- h. **Milestone:** Total dollars for reimbursement requests from municipalities for implementation of adequate stormwater management systems and programs to protect health and safety and reduce water quality impacts from storm sewer discharges. By 2004, total reimbursement will increase by 50% over 1999 reimbursement rates.

Lead Agency: DEP

Cooperating Agencies: NRCS, PennDOT, PSU, PENNVEST

Implementation Steps:

- (1) Integrate proposed Phase II NPDES Stormwater Regulations for municipalities into existing state watershed planning and permitting programs. Develop process to fund and encourage municipal implementation with Act 167 program resources.
- (2) Continue promotion of PENNVEST funding for municipal stormwater projects. Modify application process and revise program support to help municipalities meet future NPDES stormwater permit requirements.

List of Partnerships for Managing NPS Challenges from Construction, Dirt and Gravel Roads and Urban Runoff

CDs	Conservation Districts
DEP	Department of Environmental Protection
DRBC	Delaware River Basin Commission
ICPRB	Interstate Commission on the Potomac River Basin
Municipalities	Local Municipalities
NRCS	Natural Resources Conservation Service
ORSANCO	Ohio River Valley Sanitation Commission
PACD	Pennsylvania Association of Conservation Districts
PennDOT	Pennsylvania Department of Transportation
PENNVEST	Pennsylvania Infrastructure Investment Authority
PF & BC	Pennsylvania Fish and Boat Commission
PSU	Penn State University
PTU	Pennsylvania Trout Unlimited
SCC	State Conservation Commission
SRBC	Susquehanna River Basin Commission
SWCS	Soil and Water Conservation Society
USACOE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

In addition to the above partners, local watershed groups, local and county associations of homebuilders, planning departments and economic development organizations within the watershed need to be involved.

4. LAND DISPOSAL

Action Plan to Address NPS from Onlot Wastewater Disposal and Other Household Waste Disposal.

This is a comprehensive list. Not all of these tasks can be achieved within the next five years. The pollution prevention initiatives are indicated by this symbol ❖. Pollution prevention is important to nonpoint source management because it involves preventing pollution from occurring at its source, before it is generated and has to be disposed of, or cleaned up.

PROBLEM: About four million people in Pennsylvania rely on groundwater for drinking water. About 1.3 million households in Pennsylvania use onlot systems for sewage disposal. The potential for both surface and groundwater quality pollution exists.

- a. **Milestone:** 1,200 SEOs and 1,000 local government officials attending onlot sewage related training annually.

Lead Agencies: DEP, Municipalities

Cooperating Agencies: ACB, SEO Certification Board, PSATS, PSAB

Implementation Steps:

- (1) Coordinate and distribute technical updates among the DEP regional staff involved with onlot wastewater management.
- (2) Promote consistency among DEP's regional offices involved with onlot wastewater management through electronic group conferencing.
- (3) Facilitate the development of county/regional level onlot sewage management.
- (4) Provide updates to the Sewage Enforcement Officers (SEO) Guidance Manual.

- (5) Continue formalized training for SEOs and emphasize both public health and environmental impacts of onlot wastewater systems.
- (6) Provide required oversight and support of SEOs.

PROBLEM: If onlot systems are not installed and maintained properly, surface and groundwater become polluted.

- b. **Milestone:** By 2004, increase by 50 the number of local governments that adopt sewage management programs. Number of onlot remediation projects funded through PENNVEST.

Lead Agency: DEP

Cooperating Agencies: Municipalities, ACB, PSCE, PSU, DVC, PSATS

Implementation Steps:

- (1) By 1999, complete the Manual for Municipalities (319 Project) on onlot sewage treatment systems. Continue to provide training on onlot systems (including approved alternative systems) management to municipal officials.
- (2) ❖ Encourage municipalities to adopt an ordinance for onlot wastewater system management.
- (3) By 2001, develop fact sheet on denitrification technology available for onlot wastewater. Encourage use of new denitrification technologies for onlot systems where appropriate.
- (4) Encourage further research in denitrification technology and other alternate onlot technologies.
- (5) ❖ By 2001, develop a distribution system for the informational folder for rural homeowners on water conservation and how septic systems and approved alternative systems work, including the economic and environmental consequences of neglecting to maintain them.
- (6) Encourage greater use of demonstrated alternative technologies for individual homeowners and for community systems through additional technical training for SEOs.
- (7) By 2001, develop a builders informational package for care and maintenance of onlot systems to be distributed by septic tank suppliers and installers.
- (8) Continue and expand the use of State Revolving Fund monies for repair or replacement of faulty onlot wastewater systems. Increase publicity and provide application assistance.
- (9) By 2000, develop informational folder on onlot technologies evaluated at DVC.
- (10) By 2000, develop installers' training program for new onlot technologies.
- (11) By 1999, develop maintenance training program for septage haulers.

PROBLEM: Improper handling and disposal of biosolids can generate nonpoint pollution.

- c. **Milestone:** By 2001, certify 400 people for land applying biosolids.

Lead Agency: DEP

Cooperating Agencies: ACB, CDs, PSCE, PDA, WEA, WWTP

Implementation Steps:

- (1) ❖ Continue formal training for sewage plant operators on generating biosolids that can be beneficially used.
- (2) Continue formal training for landowners and haulers of biosolids on the proper land application of biosolids. Training should include emphasis on implementing a nutrient management plan on farms where conservation practices have already been implemented.
- (3) Research and demonstrate the use of biosolids in:
 - (a) Mining, re-mining and reclamation.
 - (b) Timber harvesting and forest plantings.
- (4) Encourage involvement of county conservation districts and cooperative extension (PSCE) in biosolids education.
- (5) Research on environment impacts of land applied biosolids.
 - (a) Do a sewage sludge survey and a statistical analysis of sludge parameters on samples analyzed over the past 20 years and publish findings.
 - (b) Research potential biosolids impact on soil, crop, and water quality parameters and publish findings.
 - (c) Research environmental effects of phosphorus accumulation resulting from land applied biosolids and publish findings.
- (6) By 2000, develop a series of four fact sheets on land application of biosolids in Pennsylvania.

PROBLEM: The general public needs to understand how to properly dispose of waste and the consequences of improper waste disposal. What we do affects our neighbors and what our neighbor does affects us. The cumulative effect of improper waste disposal can be significant.

- d. **Milestone:** By 2004, complete 350 Chem Sweeps on individual farms. Complete three household hazardous chemical collection days per year. By 2004, have 950 participating collection stations for used oil. By 2015, install pumpout stations and hull maintenance areas at state park marinas with the 6217 management areas. By 2002, develop public service announcement for TV and radio on proper disposal of waste.

Lead Agencies: DEP, Solid Waste Management Authorities, PDA, Watershed Organization

Cooperating Agencies: ACB, DCNR- B of SP, PFBC, PSCE

Implementation Steps:

- (1) ❖ Develop fact sheets, video or 30-second public service announcements to communicate the risk and the cost benefit analysis of waste disposal in order to motivate people to change their behavior. Prepare posters, signs, brochures and fact sheets to point out improper waste management behavior and to recommend proper management techniques. Focus should include the following topics:
 - (a) ❖ Improper disposal of used oil/used oil filters, antifreeze, solvents, or other household chemical wastes by dumping them on the ground, pouring them into a storm sewer drain, or disposing of them in a sink connected to an onlot septic system or municipal sewer system.
 - (b) ❖ Toxicity and sources of run-off, drainage, and leachate and the potential for contaminating water systems/aquifers.

- (c) ❖Types and sources of pathogens from point sources (PS) and nonpoint source (NPS).
 - (d) Environmental impacts of boat cleaners, solvents, waste oils, paints from in-water hull cleaning, changing of engine oil and fueling.
 - (e) ❖Alternatives to home pesticide/herbicide use—such as disease resistant/native species plantings.
- (2) Increase level of grant money for household hazardous waste collection to municipalities.
 - (3) Promote PA's Used Oil/Used Oil Filter Recycling Partnership established for the purpose of recycling used oil and used oil filters.
 - (4) Promote Chemsweep - PDA's waste pesticide collection program to properly dispose of household pesticide products.
 - (5) ❖Hold workshops for automotive service managers, operators and owners to explain economic, as well as, environmental benefits to recycling used oil and used oil filters. Include information on how fleets can lengthen the use of motor oil via sampling.
 - (6) Secure sufficient pumpout stations at state park marinas.

PROBLEM: Pollution is expensive. From an economic and an environmental perspective, preventing the pollution makes the most economic sense.

- e. ❖**Milestone:** Conduct two environmental and energy audits per DEP region per year. By 2001, conduct six Home A-Syst outreach activities statewide. Distribute Farm-A-Syst outreach information to all 67 counties by 2000.

Lead Agencies: DEP, OPPCA

Cooperating Agencies: ACB, PSCE

Implementation Steps:

- (1) ❖Identify and incorporate pollution prevention source reduction opportunities in all programs as a way to reduce nonpoint impacts. Some examples of this would be:
 - (a) water conservation education
 - (b) Farm-A-Syst Program
 - (c) Home-A-Syst Program
 - (d) proper maintenance of septic systems/publicize available loans for repair of faulty systems.
 - (e) role of pollution prevention in generation of "clean" biosolids
 - (f) underground storage tank management/publicize available loans for repair of faulty systems.
 - (g) best management practices/maintenance program for stormwater control
 - (h) proper lawn and garden care to prevent nutrient runoff and incorporate integrated pest management
- (2) ❖Distribute fact sheets and post information on DEP website on household alternatives to hazardous wastes; product substitution such as nontoxic materials, organic/nonpolluting/biodegradable/ "safer" materials. Web site will also provide procedures to minimize hazardous waste stream.

- (3) ❖ Develop Fact Sheet/PSA on water related pollution prevention in and around the home (based on Home-A-Syst).
- (4) ❖ Get information on pollution prevention out to municipalities through the PSATS annual county conventions.

**List of Partners for Managing NPS Challenges from
Land Disposal**

ACB	Alliance for the Chesapeake Bay
DCNR-B of SP	Bureau of State Parks
DVC	Delaware Valley College
PSCE	Penn State Cooperative Extension
NRCS	Natural Resources Conservation Service (USDA)
PSAB	Pennsylvania Sewage Advisory Board
PSATS	Pennsylvania State Association of Township Supervisors
PSU	Penn State University
SEO	Sewage Enforcement Office
USEPA	U.S. Environmental Protection Agency
WEA	Water Environment Association
WWTP	Waste Water Treatment Plan Operators

Municipalities and their Sewage Enforcement Officers (SEOs) and homeowners are key to managing onlot wastewater systems to minimize NPS pollution.

5. SILVICULTURE

Action Plan to Address NPS from Silviculture

This is a comprehensive list. Not all these tasks can be achieved within the next five years. The pollution prevention initiatives are indicated by this symbol ❖. Pollution prevention is important to nonpoint source management because it involves preventing pollution from occurring at its source, before it is generated and has to be disposed of, or cleaned up.

PROBLEM: Pennsylvania has 520,000 forest landowners and 4,000 forest practitioners who affect the management of 13 million acres of private woodland. The potential for polluted runoff during harvesting exists.

- a. ❖ **Milestone:** Provide 10 workshops per year to communicate consistent information to loggers, landowners, and government officials on best management practices for silvicultural activities.

Lead Agencies: CDs, DCNR – BOF, PGC

Cooperating Agencies: DEP, PCPF, PFA, PSCE, RC&D, SFI of PA

Implementation Steps:

- (1) ❖ Continue training efforts with Sustainable Forestry Initiative of PA forest practitioners.
- (2) ❖ Develop website for Sustainable Forestry Initiative of PA issues by 2000.
- (3) ❖ Develop a training schedule for forest practitioners on water quality.
- (4) ❖ Insure "Master Logger" certification program is consistent with this goal.
- (5) ❖ Develop a "statement of mutual intent" supporting BMP manual developed at PSU to maintain consistency among practitioners.

- (6) ❖ DCNR Bureau of Forestry will improve outreach with organized groups of forest landowners.

PROBLEM: Effective communication with 520,000 woodland owners and 4,000 forest practitioners is difficult. Proper BMP implementation is hard to visualize for many people.

- b. ❖ **Milestone:** Each year develop one new Service Forest Project Areas with demonstration sites that incorporate Nonpoint Source Best Management Practices (BMPs) for silviculture.

Lead Agencies: CDs, DCNR – BOF

Cooperating Agencies: BSP, PSCE, PFA, PCPF, USDA-NRCS, USDA-FSA, RC&Ds

Implementation Steps:

- (1) ❖ Develop BMP demonstration sites in each county statewide using public lands where appropriate.
- (2) ❖ Develop self-guided tour brochure for each site.
- (3) ❖ Distribute tour brochures to county conservation districts, extension offices, district forest offices, state parks, and local tourist information offices.
- (4) Develop video to show proper implementation of best management practices.

PROBLEM: The amount of timber harvest activity proposed on the 13 million acres of forest land in Pennsylvania makes it difficult to enforce regulations.

- c. ❖ **Milestone:** By 2000, develop a self-evaluation form for forest practitioner/landowner to evaluate BMP installation.

Lead Agencies: SFI of PA, PDSAF, PCPF

Cooperating Agencies: CDs, DCNR – BOF, PSCE

Implementation Steps:

- (1) ❖ Create and distribute self-evaluation form for forest practitioner and landowner to use to evaluate effectiveness of BMP installation.
- (2) ❖ Organize an evaluation team to train forest practitioners on proper use of self-evaluation form by 2000.
- (3) Provide a process that a forest practitioner can use to voluntarily request assistance without penalty to correct BMP installation problem.

PROBLEM: The effectiveness of BMP training needs to be evaluated. Currently no baseline data exists.

- d. ❖ **Milestone:** By 2004, develop a system to establish BMP baseline implementation. By 2010, develop a system to track BMP implementation.

Lead Agency: SFI of PA

Cooperating Partners: CDs, DCNR – BOF, HDC, NRCS, PSCE

Implementation Steps:

- (1) ❖ Develop baseline information on statewide BMP implementation in 1999 based on existing public sources.
- (2) ❖ Check BMP implementation in five years and adjust training accordingly.

PROBLEM: Many of the 520,000 forest landowners do not realize they are ultimately responsible for the control of polluted runoff from their property. Nor are they aware of the number of landowner assistance programs in the state.

- e. ❖ **Milestone:** Distribute 500 SFI landowner packets per year to inform landowners of their responsibility for minimizing nonpoint source pollution. Provide 10 landowner workshops on silvicultural BMPs per year. Enroll 150 new landowners in Forestry Stewardship Program (FSP) in 2000.

Lead Agency: DCNR - BOF

Cooperating Agencies: CDs, PSCE, SFI of PA, PFB

Implementation Steps:

- (1) ❖ Distribute Sustainable Forestry Initiative of PA Landowner Packets to landowners prior to timber harvesting operations.
- (2) ❖ Encourage landowners to enroll in Clean and Green Program as incentive to maintain long-term forest management goals.
- (3) ❖ Encourage landowners to enroll in Forest Stewardship Program (FSP).
- (4) ❖ Continue landowner workshops on silvicultural BMPs.
- (5) ❖ Periodic notices in cooperating agency newsletters informing the public of their responsibility if they harvest trees on their land.

PROBLEM: Landowners are not aware of the value of riparian forest buffers in protecting water quality and providing aquatic habitat and food sources for aquatic life.

- f. ❖ **Milestone:** Increase by 5 per year the number of articles/publications in immediate circulation to encourage landowners to establish and maintain riparian forest buffers. Number of workshops held on riparian forest buffers. Amount of cost-share dollars provided by SIP.

Lead Agencies: DCNR and DEP

Cooperating Agencies: ACB, CDs, PA Stream ReLeaf, PSCE, USDA-FS, USEPA

Implementation Steps:

- (1) ❖ Publicize existing data that identifies the need for riparian forest buffers
- (2) ❖ Develop workshops for landowners, local government officials and consultants on the benefits of riparian forest buffers.
- (3) ❖ Provide free planting stock to cooperating landowners to establish riparian forest buffers.
- (4) ❖ Provide funding for Stewardship Incentive Program (SIP) to provide cost sharing for establishing riparian forest buffers by 2000.
- (5) ❖ Establish an initiative to restore 600 miles of new riparian forest buffers in Chesapeake Bay Watershed by 2010, and to restore and conserve riparian forest buffers wherever feasible along all waterbodies statewide.
- (6) By 2004, develop a video that identifies areas that need riparian forest buffers, programs available to assist, and agencies to contact.

PROBLEM: 80 percent of Pennsylvania's 13 million acres of private forestland is not under any kind of written management plan. The use of a riparian management zone is absent from many timber harvesting operations.

- g. ❖ **Milestone:** By 2004, provide 10 new education/outreach/awareness activities that include riparian forest management zones. Write 150 new woodlot management plans by 2002. Increase by 10% the number of management plans that include riparian management zones.

Lead Agency: DCNR - BOF

Cooperating Agencies: CDs, PSCE, PA Stream ReLeaf, SFI of PA, USDA-FS

Implementation Steps:

- (1) ❖ Encourage the use of riparian management zones in woodland management plans.
- (2) ❖ By 2000, develop landowner workshops on riparian forest management zones.

PROBLEM: 80 percent of Pennsylvania's 13 million acres of private forestland is not under any kind of written management plan. Incentives are needed to encourage landowners to practice good stewardship.

- h. **Milestone:** Guidelines for Woodlot Management Plan developed for industry to adopt on all harvesting operations. Number of timber harvesting operations that used a woodlot management plan.

Lead Agencies: SFI, PCPF

Cooperating Agencies: DCNR – BOF, CDs, PSCE, PACD, PFA, USDA-FS, RC&Ds, ACF

Implementation Steps:

- (1) Develop a woodland management plan which jointly qualifies for SFI, Tree Farm Program, and Stewardship Program for forest landowners to use prior to all timber operations by 2004.

PROBLEM: There is a lack of adequate funding and staff to implement this action plan.

- i. **Milestone:** Adequate funding to accomplish the above mentioned silviculture tasks.

Lead Agencies: DCNR, USDA – FS, Penn DOT, SCC

Cooperating Agencies: PSCE, USEPA

Implementation Steps:

- (1) Increase funding for Forest Stewardship Program (FSP) and Stewardship Incentive Program.
- (2) Establish a Pennsylvania Forest Trust Fund where all pollution fines from forest-related pollution and private contributions are deposited.
- (3) Develop a strategy to fund water quality forest practices through methods other than direct public funding.

**List of Partners for Managing NPS Challenges from
Silviculture**

ACB	Alliance for Chesapeake Bay
ACF	Association of Cooperative Foresters
CDs	Conservation Districts
DCNR BOF	Bureau of Forestry

DCNR BSP	Bureau of State Parks
HDC	Hardwood Development Council
NRCS	Natural Resources Conservation Service
PACD	Pennsylvania Association of Conservation Districts
PCPF	Pennsylvania Council of Professional Foresters
PDSAF	Pennsylvania Division of the Society of American Foresters
PFA	Pennsylvania Forestry Association
PFB	PA Farm Bureau
PSCE	Penn State Cooperative Extension
PA Stream ReLeaf	
PennDOT	PA Department of Transportation
PTU	Pennsylvania Trout Unlimited
RC&D	Resource Conservation and Development Councils
SCC	State Conservation Commission
SFI of PA	Sustainable Forestry Initiative of PA
SRBC	Susquehanna River Basin Commission
USDA	US Department of Agriculture-Forest Service
USEPA	U.S. Environmental Protection Agency

6. HYDROLOGIC/HABITAT MODIFICATIONS

Action Plan to Address NPS from Hydromodification

This is a comprehensive list. Not all these tasks can be achieved within the next five years. The pollution prevention initiatives are indicated by this symbol ❖. Pollution prevention is important to nonpoint source management because it involves preventing pollution from occurring at its source, before it is generated and has to be disposed of, or cleaned up.

PROBLEM: Piecemeal planning and permitting of stream restoration is costly and time consuming. Currently stream restoration practices are permitted on a site-by-site basis. This is costly and inefficient. The approach to watershed restoration needs to be flexible enough to consider the whole watershed and its geomorphologic differences. These differences need to be documented and considered in restoration activities.

- a. **Milestone:** By 2004, complete 5 watershed wide restoration plans that consider the fluvial-geomorphology of the stream in addition to the remediation of the other sources of NPS pollution.

Lead Agency: DEP

Cooperating Agencies: CDs, DCNR, Municipalities, NRCS, SRBC, USACOE, USGS, Watershed Associations

Implementation Steps:

- (1) Research and document efforts in other states and agencies that promote watershed wide restoration efforts.
- (2) Consider the use of fluvial geomorphology in evaluating and restoring streams.
- (3) ❖ Incorporate flexibility and coordination in federal, state and local regulatory programs to facilitate watershed wide restoration and management plans.
- (4) ❖ Include watershed water quality improvement in the planning process.
- (5) Inventory and prioritize watershed needs for restoration (refer to Unified Watershed Assessment in Section III). Target high-priority and/or low activity watersheds.

- (6) Provide information to local watershed groups, natural resource agencies and landowners on available funding sources.

PROBLEM: Present methods of sizing replacement structures for culverts or bridges tend to focus on problems in the immediate project area and that area upstream of the proposed project. The downstream area is sometimes overlooked which can result in destabilizing of downstream channel sections causing erosion of the existing stream banks and sedimentation of the stream channel. Finally, there is minimal consideration given to nonpoint source pollution improvements when designing or replacing existing bridges or culverts.

- b. **Milestone:** By 2004, establish monitoring to document less downstream erosion and flood damage and more stable stream habitat after stream restoration. By 2002, establish a process to fund stormwater management plans and improvements under TEA-21. Remove 30 dams by 2004. Increase in the number of miles of fish passage. Number of riparian environments evaluated after hydromodification.

Lead Agency: DEP, PennDOT

Cooperating Agencies: DCED, DCNR, NRCS, PF&BC, PSU, SRBC, USGS

Implementation Steps:

- (1) Coordinate necessary policy and procedures so that stormwater management and improvements in NPS pollution mitigation are included as options for funding under TEA-21.
- (2) Investigate and utilize research/experiences from academia/other states to improve the design process of replacing culverts, bridges and other structures by considering a watershed approach to flooding and erosion problems.
- (3) Gather and analyze historical data on stream flow, channel conditions and floodplain conditions to aid in the design of replacement structures located in the river environment. Design proposed structure to eliminate/minimize any flooding problems, ice or debris problems, or scour problems that are known to exist at existing structures.
- (4) Gather and analyze the data to document the change in downstream flooding. Evaluate the health of the riparian environment after hydromodifications.
- (5) ❖ Identify best management practices to minimize NPS impacts to the stream.
- (6) Use the PA/MD Instream Flow Model to regulate water withdrawals based on biological information.
- (7) Support funding and implementation of projects involving breaching and removal of orphaned dams, and construction of fish passages.
- (8) Educate land developers, municipal authorities and the general public on impacts associated with low-head dams and the benefits of removing those which are no longer useful.

PROBLEM: Lack of floodplain management at the municipal level. There is a severe lack of knowledge, tools and enforcement utilized by local municipalities in regulating existing floodplains. This has resulted in the development/modification of floodways and floodplains. Additionally, municipalities have found that the FEMA maps are inadequate in that they do not include many of the smaller streams.

- c. ❖ **Milestone:** By 2004, increase by 25% the number of municipalities effectively implementing floodplain management over the 1999 baseline. Increase by 10% annually the

number of “community assisted visits and contacts” to municipalities. List of streams for FEMA to map. Increase by 10% annually the number of people attending floodplain and stormwater management training.

Lead Agencies: DCED, DEP

Cooperating Agencies: CDs, FEMA, NRCS, PEMA, PSU, SRBC

Implementation Steps:

- (1) Educate municipalities through “community assisted visits and contacts” to 50 percent of Pennsylvania’s municipalities by 2002. (CD pilot). Provide annual certification training for those individuals responsible for administering the local floodplain and stormwater management programs. Recommend that individuals attend refresher courses every two to four years based on educational background.
- (2) Conservation Districts and municipalities provide to FEMA, through DCED, a list of problem smaller streams that should be mapped.
- (3) Identify resource needs for floodplain management at the local level.
- (4) Compile, update and maintain currently available tools necessary for floodplain management at the local level.
- (5) By 2004, develop a GIS data base of streams in municipalities having detailed FEMA studies, watersheds with detailed Stormwater Management Plans, communities without detailed FEMA studies having ordinances that supercede DEP’s and FEMA’s allowable 1’ increase, etc.
- (6) Develop videos and other innovative tools for local governments on:
 - land use planning
 - stormwater management
 - floodplain management
 - overview of stream classification/restoration and
 - maintenance of dirt and gravel roads in high quality/exceptional value watersheds

PROBLEM: Lack of stream buffers results in nonpoint source pollution. Riparian buffers protect the streams of Pennsylvania that they filter NPS pollution before they enter the stream, prevent thermal pollution, protect the stream banks from erosion, and provide aquatic habitat and food sources for aquatic life. Development, farming and other activities pose a serious threat and have seriously degraded riparian areas.

- d. ❖**Milestone:** By 2001, establish a procedure to track the number of stream miles with new buffers and the number of miles of riparian buffers saved from destruction through the permit review process.

Lead Agencies: DEP, DCNR

Cooperating Agencies: ACB, CDs, NRCS, PennDOT, PF&BC, PGC, PSU, SRBC, USF&WS, Watershed Groups

Implementation Steps:

- (1) Promote coordinated information to the general public on the value of buffers, protection of existing buffers, and the establishment of new stream buffers.

- (2) Target special watershed locations for demonstrations on the values of buffers for improving/protecting water quality in each county.
- (3) Explore funding for purchasing buffer easements on critical stream areas. Promote the Conservation Reserve Enhancement Program (CREP).
- (4) Restore and conserve riparian buffers wherever feasible along all waterbodies statewide.

PROBLEM: Wetland destruction adversely impacts the hydrology and NPS pollution load to streams. Wetlands provide an important role in filtering out NPS pollutants before they reach the streams.

- e. **Milestone:** Annually increase by 10 acres the number of wetland acres protected, created or restored.

Lead Agency: DEP

Cooperating Agencies: CDs, DCNR, PennDOT, NRCS, PF&BC, PGC, PSU, SRBC, USACOE, USF&WS

Implementation Steps:

Implementation Steps:

- (1) Discourage the impoundment of natural wetlands for stormwater management.
- (2) Coordinate and promote, through field days and demonstration projects, the use of created wetlands in road ditch outlets and in stormwater facilities to improve water quality and wildlife habitat.
- (3) Develop partnerships with private industry to promote construction of wetlands for NPS abatement.
- (4) Support funding to create wetlands to abate NPS pollution.
- (5) Educate people about the purposes of wetlands and the need to protect existing wetlands.

PROBLEM: Lack of consistency in policies among agencies in dealing with hydromodification issues such as NPS pollution and stormwater management can result in a significant impact to water quality.

- f. **Milestone:** The national Stream Corridor Restoration Handbook appended for Pennsylvania as a cooperative endeavor of all members of the NPS Hydromodification Workgroup. Number of workshops held to provide training to technical service providers (consultants, academia, local, state and federal agencies) on the use of the Stream Corridor Restoration Handbook. Number of agencies using Pennsylvania's appended Stream Corridor Restoration Handbook and the Best Management Practices Handbook For Developing Areas.

Lead Agencies: CDs, DCED, DCNR, DEP, NRCS, PF&BC, PGC, PennDOT, SRBC, USACOE, USF&WS, USGS

Implementation Steps:

- (1) By 2001, establish an interagency training team to provide in-house workshops.
- (2) By 2004, provide 12 workshops on the Stream Corridor Restoration Handbook.
- (3) By 2002, develop a user friendly streambank restoration guide for local groups.

List of Partners for Managing NPS Challenges of Hydromodification Activities

ASFPM	Association of Flood Plain Managers
DCED	Department of Community and Economic Development
DCNR-BSP	Bureau of State Parks
DCNR-BFD&C	Bureau of Facility Design and Construction
DEP	Department of Environmental Protection
DRBC	Delaware River Basin Commission
HUD	U.S. Department of Housing and Urban Development
ICPRB	Interstate Commission on the Potomac River Basin
NRCS	Natural Resources Conservation Service (USDA)
PACD	Pennsylvania Association of Conservation Districts
PennDOT	Pennsylvania Department of Transportation
PEMA	Pennsylvania Emergency Management Agency
PF&BC	Pennsylvania Fish & Boat Commission
PSCE	Penn State Cooperative Extension
PGC	Pennsylvania Game Commission
SRBC	Susquehanna River Basin Commission
USACOE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USF&WS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

Municipalities, watershed associations and conservation districts are key organizations in managing NPS challenges in hydromodification activities at the grassroots level.

7. LAKES MANAGEMENT (Section 314 of CLEAN WATER ACT)

Action Plan to Address NPS in Lakes Management

This is a comprehensive list. Not all these tasks can be achieved within the next five years. The pollution prevention initiatives are indicated by this symbol ❖. Pollution prevention is important to nonpoint source management because it involves preventing pollution from occurring at its source, before it is generated and has to be disposed of or cleaned up.

PROBLEM: There are numerous methods currently being utilized, along with many others that are being developed, to address the unique interaction of the physical aspects of lake water quality available. Considering the individual aspects of each lake, the lake manager needs to be able to utilize these options to effectively address restoration. Currently there is no “one book” reference for lake management and restoration.

- a. **Milestone:** By 2003, develop a PA Best Management Handbook for Lake Management that includes innovative and traditional approaches to lake management and restoration.

Lead Agency: DEP

Cooperating Agencies: PACD, PALMS, PFBC, PRWA, USACOE,

Implementation Steps:

- (1) Develop more flexibility in permitting various in-lake management options to include innovative approaches to lake restoration.
- (2) Develop more flexibility in providing funding to address lake restoration efforts in identified high value lakes.

- (3) Promote innovative approaches to lake restoration through research and information exchange.
- (4) Educate homeowners in lake watersheds on lake dynamics as well as lake management.

PROBLEM: The regulatory definition of a “significant” lake is not adequate. Each lake is a unique interaction of chemical, biological and physical elements. Lakes in Pennsylvania are currently classified primarily in relationship to their watershed classification and a determination as a “significant” lake. “Significant” lakes are defined under regulatory language as those containing specific retention characteristics as well as public access. There are numerous private community owned lakes and access restricted public water supplies that are of importance to the Commonwealth. Additionally, the “significance” and “importance” of a lake needs to reflect the region in which it occurs.

- b. **Milestone:** By 2002, develop a comprehensive PA Lakes Classification System.

Lead Agency: DEP

Cooperating Agencies: DCNR, PALMS, PRWA, USGS

Implementation Steps:

- (1) By 2000, revisit definition of “significant” lakes and review other agencies definition of lakes to better define. Consider necessary changes to regulations (Chapter 101).
- (2) By 2001, develop a comprehensive list of all significant lakes as defined.
- (3) Develop a comprehensive list of “important” lakes, considering public, private community, drinking water and other lakes that do not qualify under the definition of “significant” but are of value to the Commonwealth and local communities.
- (4) By 2003, develop a lakes classification system that is separate from the streams classification system that consider regional differences.
- (5) Both public and private lakes should be eligible for restoration and technical assistance because they are all waters of the Commonwealth and can affect downstream water quality.

PROBLEM: Currently there is no single comprehensive source of educational, informational or technical assistance in the assessment and management of lakes. There is a great deal of educational and technical information available from many sources. What is needed is a central clearinghouse and directory.

- c. ❖**Milestone:** By 2003, establish a technical and educational clearinghouse of information to address lake management and restoration and provide outreach to public and private lake managers and owners.

Lead Agency: PALMS (Contact NALMS as starting point)

Implementation Steps:

- (1) ❖By 2003, develop a comprehensive directory of available technical, educational and informational assistance for lake management.
- (2) ❖By 2004, develop a Pennsylvania specific Best Management Practices (BMPs) Handbook for Lake Management.
- (3) ❖By 2003, develop a technical assistance strategy for watershed/lake associations and public water supplies.

- (4) ❖ Continue annual PALMS Conference to provide technical and educational outreach to address current water quality concerns and issues.

PROBLEM: There is no standard minimum chemical, biological and physical assessment criteria related to the lake classification system. The unique interactions of the chemical, biological and physical aspects of lakes create water quality condition that are often independent from those of contributory streams.

- d. **Milestone:** By 2003 develop specific NPS TMDL criteria for lakes to reflect lake processes which differ from streams.

Lead Agencies: DEP, PRWA

Cooperating Agency: USGS

Implementation Steps:

- (1) Identify seasonal lake cycles that affect water quality.
- (2) Develop language that addresses lake water quality concerns.

PROBLEM: Lakeshore erosion is a major contributor to the degradation of water quality, as well as designated uses of lakes in Pennsylvania. Specific BMP guidelines are needed to control lakeshore erosion.

- e. **Milestone:** By 2002, develop specific BMP guidelines for controlling lake shore erosion.

Lead Agencies: DCNR, BSP, B of Facility and Design

Cooperating Agency: USGS

Implementation Steps:

- (1) Identify lake, shoreline and watershed activities that contribute to shoreline erosion.
- (2) ❖ Identify or develop specific BMPs to address shoreline erosion.

PROBLEM: Exotic species such as the zebra mussel have the potential to change the chemical, biological and physical aspects of Pennsylvania lakes as well as their identified uses. A strategy for Pennsylvania is needed to help insure the restriction of currently introduced species as well as controlling the introduction of new species.

- f. **Milestone:** By 2004, develop a clearly defined strategy to control and mitigate exotic species that directly affect lake uses.

Lead Agencies: DEP, PALMS

Cooperating Agencies: DCNR, USGS, DRBC, SRBC, ICPRB, ORSANCO, PF&BC

Implementation Steps:

- (1) By 2001, identify current exotic species and assess their impacts on lake uses.
- (2) ❖ By 2002, develop specific strategies to control current exotics and the prevention of future introduction of exotics.

List of Partners for Managing NPS Challenges of Lake Management

DCNR-BSP	Bureau of State Parks
DCNR-BFD&C	Bureau of Facility Design and Construction
DEP	Department of Environmental Protection
DRBC	Delaware River Basin Commission

ICPRB	Interstate Commission on the Potomac River Basin
NRCS	Natural Resources Conservation Service (USDA)
PACD	Pennsylvania Association of Conservation Districts
PALMS	Pennsylvania Lake Management Society
PF&BC	Pennsylvania Fish & Boat Commission
PGC	Pennsylvania Game Commission
PSCE	Penn State Cooperative Extension
PRWA	Pennsylvania Rural Water Association
SRBC	Susquehanna River Basin Commission
USACOE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USF&WS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

Municipalities, watershed associations, conservation districts and lake associations are key organizations in managing NPS challenges in lake management at the grassroots level.