NONPOINT SOURCE MANAGEMENT PLAN

Strategic Plan and Guidance for Implementing the Nebraska Nonpoint Source Management Program – 2015 through 2030

Nebraska Department of Environmental Quality
1200 N Street, Suite 400
P.O. Box 98922
Lincoln, NE 68509-8922
402-471-2186
NDEQ.NonPointSource@nebraska.gov

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ACRONYMS AND ABBREVIATIONS

ACEP	Agricultural Conservation Easement Program
ACT	Avoid. Control. Treat
CA	Cold Water Class A (Stream)
CB	Cold Water Class B (Stream)
CIG	Conservation Innovation Grants
CLEAR	Community Lakes Enhancement and Restoration
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
CSA	Center for Semi-arid Agroforestry
CSP	Conservation Stewardship Program
CWA	Clean Water Act
CWP	Cooperative Water Quality Assessment Program
DDT	Dichlorodiphenyltriethane
E. coli	Escherichia coli (bacterium)
EEG	Environmental Education Grants Program
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentive Program
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FSA	Farm Service Agency
FSP	Forest Stewardship Program
FWS	Fish and Wildlife Service
GRTS	Grant Reporting and Tracking System
HELWC	Highly Erodible Lands and Wetlands Compliance
HFRP	Healthy Forests Reserve Program
IANR	Institute of Agriculture and Natural Resources
IBI	Index of Biological Integrity
ICI	Index of Community Integrity
LiDAR	Light Detection and Ranging
LPRD	Lincoln Parks and Recreation Department
MS4	Municipal Separate Storm Sewer System
NARD	Nebraska Association of Resources Districts
NAWQA	National Water Quality Assessment Program
NDEQ	Nebraska Department of Environmental Quality
NDHHS	Nebraska Department of Health and Human Services
NDNR	Nebraska Department of Natural Resources
NDOR	Nebraska Department of Roads
NET	Nebraska Environmental Trust
NETF	Nebraska Environmental Trust Fund
NGPC	Nebraska Game and Parks Commission
NHI	Nebraska Habitat Index
NOWWA	Nebraska Onsite Wastewater Association
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
NRCS	Natural Resources Conservation Service
NRD	Natural Resources District
NWF	Nebraska Wildlife Federation
PCB	Polychlorinated Biphenyls

PL-566	Public Law 566 (Small Watersheds Rehabilitation Program)
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RWBJV	Rainwater Basin Joint Venture
SHIP	Seasonal Habitat Improvement Program
SIPES	Social Indicator Planning and Evaluation System
SRF	State Revolving Fund
SWPP	Source Water Protection Program
TEA-21	Transportation Equality Act for the Twenty-first Century
TMDL	Total Maximum Daily Load
U2U	Useful to Usable
UIC	Underground Injection Control
UNL	University of Nebraska Lincoln
UNLE	University of Nebraska Lincoln Extension
URMA	Urban Runoff Management Assistance
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USDA	United States Department of Agriculture
USFS	United State Forest Service
USGS	United States Geological Survey
USTP	Underground Storage Tank Program
VPA-HIP	Voluntary Public Access and Habitat Improvement Program
WA	Warm Water Class A
WB	Warm Water Class B
WHP	Wellhead Protection Program

PREFACE

The Nebraska Environmental Protection Act (Nebraska Revised Statute § 81-1504) authorizes the Nebraska Department of Environmental Quality (NDEQ) "...to develop comprehensive programs for the prevention, control, and abatement of new or existing pollution of the air, waters, and land of the state" and "...to act as the state water pollution ... control agency for all purposes of the federal Clean Water Act…" The NDEQ has been designated the lead state agency for nonpoint source management by the Governor of Nebraska.

In 1987 Congress amended and reauthorized the Clean Water Act to address the nation's current and future water quality problems. The Water Quality Act of 1987 amended the declaration of goals and policy in the Clean Water Act by adding the following:

> *"... it is the national policy that programs for the control of nonpoint sources of pollution be developed and implemented in an expeditious manner so as to enable the goals of this Act to be met through the control of both point and nonpoint sources of pollution."*

This policy focuses on the importance of controlling nonpoint sources of water pollution.

The Water Quality Act of 1987 also added Section 319 to the Clean Water Act. Section 319 required the states to prepare a Nonpoint Source Assessment Report and to prepare and actively implement a Nonpoint Source Management Program. It also authorized significant federal financial assistance for implementation of nonpoint source management activities. The purpose of the Nebraska Nonpoint Source Management Program is to facilitate management of nonpoint source pollution in the state while addressing the requirements of Section 319.

This document was compiled by the NDEQ. Several federal, state, and local agencies and non-governmental groups involved in nonpoint source management provided information and helped facilitate its preparation. It represents a fourth update of implementation documentation to support the Nebraska Nonpoint Source Management Program. It follows the "*Nebraska Nonpoint Source Management (Section 319) Report*" prepared by the Nebraska Department of Environmental Control (currently Department of Environmental Quality) in 1989, the "*Nebraska Nonpoint Source Management Program*" developed by the state Nonpoint Source Task Force in 1990, and the "*Strategic Plan and Guidance for Implementing the Nebraska Nonpoint Source Management Program – 2000 through 2015"* developed by NDEQ in 2000. This document addresses new opportunities to effectively direct technical and financial resources toward restoring and protecting water resources and resolving statewide nonpoint source issues of concern. It was also developed with due consideration of the recommendations for revising state nonpoint source management programs included in the U.S. Environmental Protection Agency's 2012 guidance document "Key Components of an Effective State Nonpoint Source Management Program."

MISSION OF THE NEBRASKA NONPOINT SOURCE MANAGEMENT PROGRAM

The mission of the Nebraska Nonpoint Source Management Program is to protect the quality of Nebraska's water resources from nonpoint source pollution and to improve waters that have been degraded by nonpoint source pollution wherever possible.

VISION STATEMENT FOR THE NEBRASKA NONPOINT SOURCE MANAGEMENT PROGRAM

Nebraska will be recognized as a leader among states in addressing nonpoint source pollution through efficient and effective implementation of water quality management actions. This vision will be realized by effectively collaborating with partner organizations to support well-defined, highly focused watershed-based projects that measurably reduce the degradation of surface and ground water resources by nonpoint source pollution. Projects will be designed to integrate all available tools to restore and protect the human and ecological health of targeted waters.

ACKNOWLEDGMENTS

Many hours of collecting information, discussion, drafting, editing and rewriting were invested in producing this Nonpoint Source Management Plan to meet the challenge of restoring water resources degraded by runoff pollution and to protect high quality water resources from nonpoint source pollution threats over the next fifteen years. The Nebraska Department of Environmental Quality wishes to express its gratitude to a core of individuals who led this effort.

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Chapter 1 INTRODUCTION

The national nonpoint source management program authorized under Section 319 of the Clean Water Act (1987 amendment) was initiated in 1990 as a demonstration program to encourage the adoption of best management practices to control nonpoint source pollution. State programs focused on demonstration of practices to address priority "Issues of Concern" in priority watersheds or at statewide or regional levels. By the late 1990s, the program focus shifted away from limited demonstration to subsidizing installation of conservation practices to restore impaired waters in select watersheds. That focus was solidified with the required revision of state nonpoint source management plans in 2000.

Over the past 15 years, Nebraska has implemented its "*Strategic Plan and Guidance for Implementing the Nebraska Nonpoint Source Management Program – 2000 through 2015."* In that time, Nebraska has been a leader among states in implementing a nonpoint source pollution management program through a collaborative approach with many other agencies, organizations and non-traditional partners. This approach offers effective coordination of resources and expertise to reach a diverse audience of land managers and achieve effective installation of conservation practices. Nebraska is among the leading states in reporting reductions of nitrogen, phosphorous and sediment loads to receiving waters and in reporting successes in partial or full delisting of impaired waters. The collaboration among the state's many conservation partners to implement a holistic approach to nonpoint source management that focuses on both the watershed and the receiving water made these successes possible.

This document (Nonpoint Source Management Plan: *Strategic Plan and Guidance for Implementing the Nebraska Nonpoint Source Management Program – 2015 through 2030*) balances disparate, but important issues, by providing for a sound mix of large and small projects, local and regional projects, restorative and protective projects, communication, monitoring, investigation of causes and impacts of nonpoint source pollution, and evaluation of conservation practices and project effectiveness. It strives to identify and promote opportunities for nonpoint source management actions that not only improve water quality, but also provide other ecological, social, economic and public health benefits.

The immediate function of the Nonpoint Source Management Plan (2015-2030) is to provide guidance to the Nebraska Department of Environmental Quality in implementing the Section 319 program. Its larger and more important function is to provide a framework for collaborative efforts to focus the expertise and resources of multiple partners in implementing programs and projects that sustainably restore and protect water resources from runoff pollution. This management plan is intended to be a handbook to assist conservation partners and potential project sponsors in identifying and developing nonpoint source management activities and projects. It builds on the experiences and successes of implementing the previous plan as illustrated below.

HIGHLIGHTS AND SPECIAL ACHIEVEMENTS OF THE 2000-2015 PROGRAM

The 2000-2015 Nonpoint Source Pollution Management Plan (*Strategic Plan and Guidance for Implementing the Nebraska Nonpoint Source Management Program – 2000 through* 2015) was designed to make Nebraska a leader in collaborative and innovative efforts to develop and implement projects and activities to improve and protect water quality. The key to realizing this vision was building on the strong and positive relationships among the conservation agencies and organizations in the state. While each activity and project had its own special accomplishments, some innovations rise above the rest in illustrating Nebraska's leadership in addressing nonpoint source pollution.

COOPERATIVE PARTNERSHIPS

Liaisons. The 2000-2015 management plan formalized an existing liaison arrangement between the Nebraska Department of Environmental Quality and the USDA Natural Resources Conservation Service and proposed liaison relationships with other conservation partners. The vision was to create a cadre of professionals from core

organizations to improve inter-organization collaboration and improve the quality of programs and projects to manage nonpoint source pollution. Current liaison positions with the Natural Resources Conservation Service, the Nebraska Association of Resources Districts and the University of Nebraska Extension provide access to the depth and breadth of expertise and resources within these organizations to advance management of nonpoint source pollution in Nebraska. Other states have begun to develop similar partnerships.

Community Lakes. The Community Lakes Enhancement and Restoration (CLEAR) Program was developed as a collaboration among the Nebraska Department of Environmental Quality, the Nebraska Game and Parks Commission and the University of Nebraska Extension. The program provided assessment, planning and technical assistance to renovate small ponds in community parks. It also provided a streamlined process to fund a defined palette of practices and activities. Thirty-six projects were completed in 35 communities. Most communities leveraged projects to improve other park facilities and develop outdoor classroom activities with local schools and youth groups. The CLEAR Program received recognition by the Environmental Council of States as an Innovative Program of the Year (2001).

EQIP/319 Water Quality Special Initiative. The Nebraska Department of Environmental Quality and the Nebraska office of the Natural Resources Conservation Service collaborated to create the Nebraska Water Quality Special Initiative in 2004. The initiative annually dedicated from the NRCS Environmental Quality Incentive Program (EQIP) and Nebraska Nonpoint Source Management Program funds to support implementation of watershed management plans in select watersheds. The partnership provided project sponsors streamlined access to reliable funding to fully implement watershed plans. The initiative supported implementation of 11 watershed plans since 2005. EPA and USDA adapted Nebraska's initiative to create the National Water Quality Initiative in 2012.

Wellhead Protection Network. Completion of the source water assessment effort demonstrated a need for follow up action to address threats to ground water sources of community drinking water since 85% of Nebraskans rely entirely or partially on ground water as their source of drinking water. The Wellhead Protection Network was established in collaboration with The Groundwater Foundation to facilitate communication between operators of public drinking water systems, conservation professionals, and local and state regulators. The objective of the Network is to share information about common problems, emerging issues, new technologies, regulations and resources to help communities develop and implement plans to manage threats to their drinking water supply. Quarterly meetings are held around the state to maximize opportunities for local system operators and community leaders to participate. One meeting is held annually at the state capitol during the state legislature session to attract attendance by state senators and their staffs. All Nebraska communities have maps delineating their wellhead protection areas. Wellhead Protection Plans, mostly focused on nonpoint source pollution, were written and adopted for 103 of the 533 wellhead protection areas in the state through June 2014. The Wellhead Protection Program is voluntary at the local level.

Interstate Watershed Management Plan. Nebraska and Iowa collaborated in developing a common management plan for the Carter Lake watershed and the restoration of Carter Lake, an oxbow lake located on the west side of the Missouri River between Omaha, NE and Carter Lake, IA. Each state separately implemented the plan within its own jurisdiction. The major elements of the management plan were completed and the lake was delisted by Nebraska for algal toxin impairment in 2012.

Tribal-State Watershed Management Plan. The state, in cooperation with the Santee Sioux Nation of Nebraska, monitored Bazile Creek in northeast Nebraska and determined it to be impaired by *E. coli* bacteria. The upper portion of the Bazile Creek watershed lies outside the Santee Sioux reservation in an area heavily developed for irrigated farming. The lower portion mostly lies within the reservation and is dominated by small farming operations, small to medium livestock operations and pasture lands. The state prioritized the upper portion of Bazile Creek area for ground water management actions while the Tribe prioritized the lower portion for actions to improve water quality in the stream. In 2014, The Nebraska Department of Environmental Quality and the Santee Sioux Nation of Nebraska combined their separate interests and initiated discussions toward development of a common watershed management plan for Bazile Creek to address erosion, sedimentation and bacteria impairment of the creek and to address nitrate contamination of ground water.

INNOVATIVE TOOLS

Basin Rotation Monitoring. Nebraska implemented a basin rotation monitoring approach to allow periodic data collection at more sites on smaller streams than the annual ambient monitoring program allows. The approach focuses more intensive monitoring in one to three river basins each year on a six-year rotation schedule. Having water quality data representative of smaller watersheds improves project planning and evaluation.

Stream Classification System. A five-year study co-locating biological monitoring with physical and chemical monitoring in the same time frame produced a simple four-class classification system with respect to aquatic life for Nebraska streams. Stream flow, temperature and habitat structure were the dominant parameters predicting biological integrity while nutrient concentration had little influence. Within this framework, biological response can be predicted for large warm water, small warm water, large cold water and small cold water streams based on the presence of appropriate habitat structure; primarily over-hanging vegetation and substrate. The study results and the stream classification scheme will provide a reference for planning future stream restoration and protection projects and will elevate the importance of the integrity of aquatic communities as a measure of water quality and project success.

Quality-Assessed Agrichemical Contaminant Database for Nebraska Groundwater. The Quality-Assessed Agrichemical Contaminant Database for Nebraska Groundwater was developed as a central depository for ground water monitoring data collected by numerous organizations. Data are assigned a quality flag of 1 (lowest) to 5 (highest) based on a review of the amount and type of quality assurance and quality control used in obtaining the result. Data are accessible for both agency and public use at http://dnrdata.dnr.gov/clearinghouse/. The database serves as the basis for the annual Nebraska Ground Water Quality Report to the state legislature.

Nebraska Statewide Groundwater Monitoring Network. The Nebraska Statewide Groundwater Monitoring Network was developed by the state's Natural Resources Districts and the Department of Environmental Quality (NDEQ) to better assess and develop trends in Nebraska's ground water quality. The network consists of a defined subset of wells identified through the Agrichemical Contaminant Database that are monitored regularly. Data are used by Natural Resources Districts to delineate and set regulations for Ground Water Management Areas and by NDEQ to develop the annual Nebraska Ground Water Quality Report for the State Legislature.

Technological Advances. Nebraska has worked continually with its partners to develop and refine information and methods to improve planning, implementation and assessment of projects to abate nonpoint source pollution. Re-digitizing streams and upgrading the ***National Hydrography Data Set (NHD)*** to the 1/24,000 high resolution scale, expanded ***Light Detection and Ranging (LiDAR)*** mapping of the state and addition of the ***Color Infra-red Band*** to aerial photography of the state improved assessment of landscape conditions and enhanced selection and location of management practices in select watersheds. Development, application and assessment of ***Alum Treatment*** and ***Fishery Renovation*** practices improved management of internal nutrient loading in sand pit and oxbow lakes resulting in partial or full delisting of affected waterbodies.

NEW FUNDING STREAMS

Stormwater Management Grants. The state legislature authorized funding for stormwater management grants in 2006 to help communities regulated under the Municipal Separate Storm Sewer System (MS4) Program, address stormwater runoff problems. Funds may be used for structural or management practices and for educational activities. The program has been instrumental in accelerating the adoption of low impact development principles in larger communities. Smaller communities have greatly increased the installation of low cost diversions, retention basins and rain gardens and promotion of low input landscaping.

SRF Linked Deposit Program. The Nebraska State Revolving Fund (SRF) was developed primarily to assist municipalities with construction of water treatment and delivery systems. Access to funds to support nonpoint source management projects and activities was limited for municipal and other government units and not available to individuals. This limitation was resolved by approval of the SRF Linked Deposit Program by the 2014 Nebraska legislature. The new program authorizes the deposit of SRF funds in participating banks to provide subsidized loans to public and private entities and individuals for installation of structural practices to reduce nonpoint source

pollution. Eligible practices include, but are not limited to, erosion control structures, retention basins, on-site wastewater systems upgrades and installation of manure management systems for unpermitted livestock facilities.

Water Sustainability Fund. The Nebraska legislature created the Water Sustainability Fund in 2014 to address rising demands for water uses in the face of limited or declining water supplies and persistent water quality impairments. Projects may address increased water retention, improved efficiency of water use, restoration of impaired waters, protection of high quality water resources, improved stream flows and compliance with interstate compacts.

INNOVATIVE PLANNING

Community-based Watershed Planning. A Citizens Advisory Council representing the varied interests of local stakeholders is organized to work directly with a Technical Advisory Team composed of conservation professionals to develop water quality management plans for select watersheds. Local stakeholders take the lead in shaping the expectations for water quality improvements and selection of the practices acceptable to the community. Community-based watershed planning greatly increases the percentage of stakeholder participants and accelerates installation of management practices in future projects. Other states have adopted Nebraska's process.

Ground Water Planning. Nebraska applied the principals of community-based watershed management planning to planning for the protection of ground water in targeted areas. The initial application targeted installation of select conservation practices within the delineated wellhead protection area (approximately 2,500 acres) of the City of Edgar, NE. The process was scaled up later to develop the much larger (483,840 acres) Bazile Ground Water Area Management Plan that encompasses several community wellhead protection areas. Elements of watershed planning now are applied routinely to development of wellhead protection plans. Other states are interested in adapting the process to develop management plans for ground water areas.

Large Area Plan Implementation. A sub-watershed rotation strategy was employed to fully implement a watershed management plan in the 380,000 acre Shell Creek watershed through a series of phased projects. One or more new sub-watersheds opened each year and remained eligible for project funding for two years. This process concentrated installation of management practices in a relative small area in any given year, accelerated local adoption of conservation practices and improved the ability to demonstrate project accomplishments. Implementation of phased projects through sub-watershed rotation makes river basin planning and other large area planning a viable alternative to repetitive planning for separate smaller watersheds.

New Lake Watershed Planning. Developing and implementing watershed management plans prior to construction of new lakes is a high priority in Nebraska to prevent them from quickly succumbing to sediment and nutrient impairment. Watershed plans for new reservoirs include all of the elements of a plan for an existing reservoir, but generally include additional in-lake protective practices. Installing in-lake practices during the initial construction process is much cheaper, easier and more efficient than retrofitting these practices as part of a reservoir renovation. Ideally watershed management plans are implemented two years prior to the start of reservoir construction, but can be effectively achieved concurrent with reservoir construction. The process of watershed planning and inclusion of in-lake protective practices has become standard procedure in designing and constructing new reservoirs in Nebraska.

INNOVATIVE PROGRAM ACTIVITIES AND CONSERVATION PRACTICES

Nebraska On-site Wastewater Association. The Nebraska nonpoint source pollution management program was instrumental in helping installers and pumpers of on-site wastewater systems create the Nebraska On-site Wastewater Association (NOWWA). This professional organization was designed to standardize practices, provide continuing education, improve the quality of service and serve as an industry voice in developing legislation and regulations. Educational materials produced through several projects include a basic manual and specialty manuals on advanced systems for training and state certification of system installers and pumpers. A homeowners manual and training program also provides education to property owners on the selection, siting and management

of on-site wastewater systems. New regulations, supported by NOWWA, require systems installed after 2004 to be more robust and be registered with the state.

On-site Wastewater System Upgrade Practice. Adoption of new regulations and new design standards for on-site wastewater systems in 2004, offered an opportunity to address this potential source of bacterial and nutrient contamination of streams. The On-site Wastewater System Upgrade practice for Section 319 projects was created to support pumping and inspection of on-site wastewater systems and to replace systems installed before 2004. This highly popular practice is restricted to projects implementing a watershed management plan. Over 300 systems were inspected and more than 200 systems upgraded to current design standards through watershed projects.

Vegetative Treatment System. Installation and evaluation of vegetative treatment systems was supported in the early stages of development by the Nebraska nonpoint source pollution management program. The systems are designed for small livestock operations to capture feedlot runoff in a small settling basin and periodically apply the effluent to a permanent grass area through a gravity flow system or through a sprinkler system to grass areas or cropland. Study of a large multi-cell system demonstrated that vegetative treatment systems effectively prevent runoff and leaching of nutrients and effectively attenuate bacteria. The study also demonstrated that vegetative treatment systems might be an adaptable alternative to lagoons for large animal feeding operations. Design and management standards developed in Nebraska were incorporated into the Nebraska NRCS Field Office Technical Guide for management of runoff from small and medium livestock operations.

Conservation Consultant Practice. Structural conservation practices generally are easily understood and permanently maintained by land managers. Adoption of management practices, on the other hand, may require learning and applying new skills and developing confidence over several years that management practices will yield the desired benefits. The conservation consultant practice was created as a complement to other management practices to assist land managers in successfully implementing new management practices such as no-till or nutrient and irrigation management. Successful implementation and understanding of conservation management practices by land managers is critical to long-term continuance of those practices.

Crop Production Deferment. Access to agricultural land for installation of structural conservation practices is severely limited by crop production during the growing season (May – October) and by harsh winter conditions (January – February). The Crop Production Deferment practice was created to remove this obstacle to timely implementation of watershed management projects. Producers are paid the average county rental rate to defer crop production on the area delineated for construction (not whole fields) to allow access for summer construction. The area must have sufficient ground cover prior to construction and must be planted to a cover crop immediately after construction to prevent erosion. Acceptable cover may include early maturing crops (e.g., small grains), forage and grass that the producer may harvest prior to construction. The land must be available no later than August 1 for construction to begin. Construction must be completed within the year of deferment. The producer is compensated after construction is completed and the cover crop is planted.

Low Impact Development. Numerous projects in Nebraska focused on introducing urban stormwater management practices unfamiliar to citizens, community leaders and practitioners in the construction and land maintenance industries. Larger communities have relaxed mandatory curb and gutter standards to allow alternative street designs. Curb cuts draining runoff to rain gardens or bio-swales and low maintenance landscapes are now encouraged in streetscape designs. Architects and engineers now embrace roof gardens, low input landscaping and green space as design options for public and private buildings. Permeable pavement is accepted as a common design option for low traffic areas such as parking spaces, trails and walkways. Low/no phosphate fertilizer is now available through most garden centers and lawn maintenance companies. Landscape designers now promote rain barrels, rain gardens and plants requiring less water and nutrients. Installation and evaluation of demonstration sites and extensive communication and training for private citizens, community leaders and industry professionals was instrumental in gaining acceptance and creating a market for low impact development practices in Nebraska.

Lake Renovation. Since provisions of the Clean Lakes Program (Clean Water Act Section 314) were fully incorporated into the Section 319 program, Nebraska has been the national leader in supporting lake renovation through nonpoint source management program. These projects provide a capstone to successful watershed management by addressing the in-lake loading (recycling) of nonpoint source pollutants that cannot be addressed through implementation of conservation practices in the watershed. Through collaboration with Nebraska Game and Parks Commission, local Natural Resources Districts and local communities, Nebraska's nonpoint source management program assisted in renovating 30 public reservoirs and 36 community park ponds. Many of these lakes were delisted for one or more impairments. Others were placed in a new impairment Category 4R indicating unstable nutrient equilibrium in a newly renovated lake. Follow up evaluation of some lake renovation projects indicated a strong association of water quality improvement with removal of rough fish populations. Alum application generally proved effective in reducing phosphorous recycling (in-lake loading) in sand pit and oxbow lakes. The effect was greater when coupled with rough fish removal.

Chapter 2 PROGRAM IMPLEMENTATION

The Nebraska Department of Environmental Quality is designated as the lead agency for developing and implementing the Nonpoint Source Management Program in Nebraska. The Department provides leadership for this program on two levels: 1) facilitating coordination of programs and activities directed at nonpoint source pollution management by other organizations and 2) administering the Clean Water Act Section 319 Program in the state. On both levels, Nebraska relies on cooperation and coordination among local, state and federal conservation organizations to efficiently and effectively implement the nonpoint source management program statewide.

PROGRAM DEVELOPMENT AND OVERSIGHT

The Nebraska Nonpoint Source Management Program is designed to achieve measurable improvement in the quality of Nebraska's surface and ground water resources. The goals of this program will be achieved through iterative processes in partnership with other agencies, organizations and citizens.

Department staff are responsible for planning long-term goals and strategies for reducing nonpoint source degradation of water quality in the state. They achieve this by assessing water quality data to identify waters impaired by or in need of protection from nonpoint source pollution, identifying priorities for management actions, and developing guidelines for implementing programs and projects to address nonpoint source water quality concerns in the state. Department staff work with partner organizations through committees and consultation to identify opportunities to direct the resources of the separate programs to address nonpoint source water quality concerns.

DATA COLLECTION AND ASSESSMENT

The Department relies on monitoring data collected by its own staff and by other agencies to determine if and where contamination of surface or ground water occurs in the state. The Department has lead responsibility for collecting and assessing surface water quality conditions in the state and for determining whether surface waters meet the physical, chemical, or biological standards necessary to support designated beneficial uses. The state's Natural Resources Districts have lead responsibility for monitoring ground water quality and reporting results to the Quality-Assessed Agrichemical Contaminant Database for Nebraska Groundwater. Various organizations use the ground water data to determine where management or regulatory actions are needed or to locate high quality ground water areas for development of drinking water sources. The Nebraska Game and Parks Commission , in cooperation with other conservation organizations, identifies aquatic habitat conditions of surface waters. Reports and programs developed from these data are used to identify for restorative management actions through the nonpoint source management program. Water resources of exceptional quality or importance may be listed for potential protection actions through the nonpoint source management program.

IDENTIFICATION OF WATERS FOR MANAGEMENT ACTIONS

The process of identifying streams and lakes for nonpoint source management actions considers several factors anchored by state water quality standards and water quality assessments presented biennially in the Nebraska Integrated Report. Completion of approved total maximum daily loads (TMDLs) and watershed management plans also are factors considered in identifying waters for management actions.

Streams and lakes identified for restorative actions are first identified as impaired [303(d) list, Category 5] or as impaired waters for which a restoration process (NPDES permit, TMDL, management plan, etc.) has been established, but not implemented (Category 4). Waters dominated by point source impairments are deleted from this list. Waters dominated by natural contaminants (e.g., selenium), air-borne contaminants (e.g., mercury), legacy compounds (e.g., PCBs) and similar unmanageable pollutants also are removed from consideration. The list

is further reduced by removing waters that are deemed unmanageable due to the size of the watershed or characteristics of the system. These include large rivers and reservoirs, regulating reservoirs for irrigation systems, canals and similar complex systems.

Streams and lakes identified for protective management actions are first identified as meeting all of their designated uses (Category 1). Waters that are deemed unmanageable due to the size of the watershed or characteristics of the system then are removed from the list. These include large rivers and reservoirs, regulating reservoirs for irrigation systems, canals and similar complex systems.

Certain streams and lakes identified as priorities in programs administered by partner organizations also are identified for restorative or protective actions under the state Nonpoint Source Management Program. They include streams and lakes identified for renovation or protection that have a limited watershed or a watershed that is adequately treated to protect the investment in renovation. Primary resources for identifying these waters are the Nebraska Aquatic Habitat Program and the Nebraska Trout Management Program.

Ground water recharge areas with elevated nitrate-nitrogen concentration in the underlying aquifer are identified for restorative management actions under the state Nonpoint Source Management Program. The designated area must encompass one or more delineated wellhead protection areas and be within a Ground Water Management Area that is designated as Phase 2 or higher by the local Natural Resources District. Individual wellhead protection areas within a Phase 2 or higher level Ground Water Management Area may be considered for restorative management actions. Individual wellhead protection areas (including new wellhead protection areas) with ≤ 5ppm nitrate-nitrogen concentration in the underlying aquifer may be considered for protective management actions.

Wetlands identified for restorative or protective management actions include those belonging to wetland complexes identified in the Nebraska Wetlands Management Plan by the Nebraska Game and Parks Commission. Rare or unusual wetlands, such as fens and bogs, also are identified for restorative or protective management actions.

Wildlife and aquatic habitat are recognized as an integral part of the ecological function of a watershed including mitigation of nonpoint source pollution. Restoration or protection of habitat for wildlife and aquatic species should be a component of implementing watershed, area or waterbody restoration or protection projects.

TECHNICAL ASSISTANCE

Department staff provide a variety of technical assistance and services to support management of nonpoint source pollution. Staff specialists evaluate the condition of water resources and the potential to rehabilitate degraded resources or to protect unimpaired resources. They may recommend restoration activities or alternative uses of the resource. Staff also help in developing restoration strategies, management plans and project proposals.

PLANNING

The dynamic nature of nonpoint source pollution issues and frequently changing programs to address them pose both challenges and opportunities. Staff and Department administrators employ a continuous planning approach to adapt the Nonpoint Source Management Program to those changes. Frequent consultation with other conservation organizations and close coordination with their programs allows the Nonpoint Source Management Program to remain an effective complement to other conservation efforts in the state. Periodic review of internal procedures and program management practices continuously improves the efficiency and effectiveness of the program.

CONSISTENCY REVIEWS

The Nebraska Department of Environmental Quality reviews certain federal programs and projects to assure that they do not violate regulatory standards and do not conflict with policies and activities of the Nebraska Nonpoint Source Management Program. The consistency review also provides a mechanism to identify opportunities to

collaborate on mutually beneficial activities. A listing of federal programs and projects identified to be reviewed for consistency with the state's Nonpoint Source Management Program is given in Table 2.1.

Table 2.1 Federal Activities Identified for Consistency Review

U.S. Department of Agriculture	● Conservation Reserve Program ● Environmental Quality Incentive Program ● National Water Quality Initiative
U.S. Army Corps of Engineers	● Section 404 Permits (through 401 certification) ● Section 1135 habitat restoration project plans
U.S. Fish and Wildlife Service	● Wallop-Breaux project plans

Participation in various interagency committees provides a forum for agencies to discuss plans and activities that might affect other agencies. This fosters discussion regarding required permits, specific over-sight of certain activities and project actions that might interfere with ongoing or planned activities of other organizations.

The NRCS State Technical Committee and associated sub-committees is the largest and most accessible forum for interagency coordination of activities related to agriculture. Army Corps of Engineers activities are reviewed through the Clean Water Act Section 401 Water Quality Certification process. Wallop-Breaux activities are reviewed through consultation with Nebraska Game and Parks Commission and US Fish and Wildlife Service.

The Nebraska Department of Environmental Quality submits its grant applications and plans for major activities to the Omaha Metropolitan Area-wide Planning Agency and the Lincoln-Lancaster County Planning Department for review and comment. These agencies represent the major population centers in the state and cover the area with the greatest potential for nonpoint source management activities to affect local urban activities. Responses from these agencies are addressed and forwarded to EPA and/or other entities, as appropriate, to assure effective input on Department activities.

ADMINISTRATION OF THE CWA SECTION 319 PROGRAM

The Nebraska Department of Environmental Quality (NDEQ) administers the Clean Water Act Section 319 program in Nebraska. The Nebraska Nonpoint Source Management Program includes eight subprograms: Administration and Operations, Special Services, Targeted Studies and Special Initiatives, Watershed-Based Planning, Small Projects Assistance, Community Lakes Enhancement and Restoration, Urban Runoff Management Assistance, and Watershed-Based and Statewide Projects. These subprograms provide the necessary focus and flexibility to efficiently and effectively target resources in order to improve nonpoint source planning and to better address identified concerns. Responsibilities for program implementation are shared among Department staff specialists who develop and manage activities related to core resources and program components with oversight by a program coordinator. Core components of the program focus on lakes, streams, wetlands, ground water, and communication. Staff specialists review and provide recommendations on subprogram activities and provide oversight of projects supported with Section 319 funds.

ADMINISTRATION AND OPERATIONS

The Administration and Operations subprogram provides funds to support the internal needs of the Department for planning, monitoring, assessment and communication and to support technical assistance for external projects.

PROJECT DEVELOPMENT AND ADMINISTRATION

Department staff are responsible for administering projects funded with Section 319 funds to assure that grant conditions are met and project tasks are completed. This is done, in part, through review and selection of project proposals. Experience has shown that careful project design up front helps prevent most problems that otherwise

develop. Staff project managers keep abreast of project progress through semi-annual project reports, frequent communications and meetings with project sponsors, and periodic site visits. Staff project managers review materials and products of the projects as well. Staff review project budgets and reimbursement requests to assure expenditures are consistent with budgeted tasks. Project requirements are explained in guidance for the various programs and in guidance for developing project implementation plans. Further oversight is achieved through performance and financial reviews of individual projects.

Project Performance Review

Staff will conduct a performance review for each project. A performance review consists of reviewing the Project Implementation Plan (PIP) with project sponsors and verifying that tasks were completed as described in the PIP. Verification of tasks may require field visits to confirm installation of conservation practices or facilities. Staff will strive to conduct a performance review near the mid-point of a project to allow for course corrections and at the end of some projects to confirm completion of all project tasks. All projects will receive at least one performance review during the course of the project. The performance review will be documented in the project file with a memorandum summarizing the findings and recommendations from the review.

Project Financial Review

Staff will conduct a financial review on each project. The review will verify that grant funds and match funds were expended as described in the project budget. The review also will assure that expenditures are appropriately documented in the sponsor's project files. A financial review will be conducted primarily near the mid-point of a project to allow for timely corrections if necessary. Some projects will be selected for an additional financial review at the close of the project. The financial review will be documented in the project file with a memorandum summarizing the findings and recommendations from the review.

Reporting

State and EPA staff communicate frequently to review progress, discuss policy and guidance changes and to resolve difficulties in implementing the program. Annual reports and periodic program reviews provide an opportunity to evaluate progress in meeting objectives and make substantive changes in implementation strategy.

Progress of the program and individual projects is reported in several ways. Department staff submit annual reports to EPA on major tasks identified in annual Departmental workplans through the Grant Reporting and Tracking System (GRTS). Though some of these specific activities may span several years, they will be reported incrementally as annual tasks, allowing Department tasks to be closed annually. GRTS will be used as the primary method of reporting administrative details of the program. A narrative annual report will serve a dual function as both an outlet for success stories and for summaries of administrative details. Annual performance reports for each open grant will be submitted to EPA within 90 days of the end of the grant project/budget year. In addition, an annual report summarizing the accomplishments of the state's Nonpoint Source Management Program will be submitted to EPA by December 31 each year. Redundant reporting will be minimized to the extent possible by consolidating information entered into GRTS that can be retrieved by EPA to satisfy reporting requirements.

Sponsors of external projects will report progress through semi-annual reports to NDEQ. Department staff will review these reports and enter them into GRTS. Sponsors will submit final project reports to NDEQ upon completion of project tasks. NDEQ will review the final reports and approve or recommend revision of the report. Projects will be closed when final reports and final financial statements are approved.

The Department will forward final reports for individual projects, submit final reports for internal projects and initiatives, and provide final financial statements to EPA upon completion of all tasks and projects described in the appropriate fiscal year's work plan. Within 45 days of submission and/or during the grant closeout process, EPA will screen a subset of project final reports as part of its oversight responsibilities. Upon receipt of appropriate documentation the grant will be closed.

In addition to the required reporting under Section 319, the Department periodically reports program activities and financial status through other mechanisms. These include the Nebraska Integrated Report and reports to the Environmental Quality Council, state legislature, governor's office and other entities.

SPECIAL SERVICES

From time to time, the Department identifies a need for special services to enhance or accelerate implementation of the Nonpoint Source Management Plan. Funds are provided in the Nonpoint Source Management Program to accommodate this need and are negotiated in the state work plan on an annual basis. Services are administered through contractual arrangements with external partners or contractors. These arrangements, although temporary, may continue for extended periods. Funds are budgeted annually if the services are continued. Services may provide support for internal or external activities.

TARGETED STUDIES AND SPECIAL INITIATIVES

The Department occasionally identifies special needs for information to support program management decisions, improve monitoring strategies and methods, justify water quality determinations, evaluate the effectiveness of conservation practices, or support similar actions. In addition, unique opportunities appear from time to time for the Department to support projects that are highly compatible with the goals of the Nonpoint Source Management Program, but don't easily fit into traditional project guidelines. The Targeted Studies and Special Initiatives subprogram provides funds to support projects that meet these special needs and opportunities. Targeted studies and special initiative projects usually are developed internally by NDEQ and may be conducted by Department staff or commissioned to external partners or contractors.

WATERSHED-BASED PLANNING

The Department employs four types of planning to support nonpoint source management projects. These are Basin Management Plans, Watershed Management Plans, Area Management Plans and Project Implementation Plans. **Basin Management Plans** provide coverage of a river basin or sub-basin that allow multiple projects to be developed and implemented under the umbrella of the common basin plan. **Watershed Management Plans** focus on a more local scale, providing direction for one or more sub-watershed projects. **Area Management Plans** provide coverage for projects to restore or protect water resources that lack a significant drainage area (e.g., wetland, community lake) or lack a well-defined watershed (e.g., ground water recharge area, wellhead protection area). **Project Implementation Plans** direct activities for individual projects designed to achieve the objectives of the governing basin, watershed or area management plan. Section 319 funds may be used to support development of basin plans, watershed plans and area plans. The development of project implementation plans is not eligible for Section 319 funding. Proposals may be submitted at any time. Project implementation plans must be approved by EPA. Requirements for watershed-based planning projects are described in Chapter 11.

SMALL PROJECTS ASSISTANCE

The Small Projects Assistance subprogram was created to provide a rapid funding mechanism for small projects of great importance to the Nonpoint Source Management Program and to provide a mechanism to capture unique opportunities in imminent need of funding. Proposals may be submitted at any time. Project implementation plans are approved at the state level. Requirements for Small Projects Assistance projects are described in Chapter 11.

COMMUNITY LAKES ENHANCEMENT AND RESTORATION

The Community Lakes Enhancement and Restoration (CLEAR) subprogram was developed in response to numerous requests for assistance in rehabilitating small community-owned lakes. These impoundments typically form the centerpiece of the community park and are highly valued by citizens for recreation and aesthetics. The great value citizens place on these resources provides high visibility and outstanding promotional opportunities for the Nonpoint Source Management Program. Staff specialists from NDEQ, Nebraska Game and Parks Commission, and University of Nebraska Extension provide technical assistance to guide the community in developing the project. Inquiries for assistance in developing a project must be submitted well in advance of intended renovation. Project

implementation plans must be approved by EPA. Requirements for Community Lakes Enhancement and Restoration projects are described in Chapter 11.

URBAN RUNOFF MANAGEMENT ASSISTANCE

The Urban Runoff Management Assistance (URMA) subprogram provides flexibility to support small-scale urban demonstration projects when opportunities are presented. The program is designed specifically to support installation and demonstration of urban storm water management practices in high visibility areas. Proposals may be submitted at any time. Project implementation plans must be approved by EPA. Requirements for Urban Runoff Management Assistance projects are described in Chapter 11.

WATERSHED-BASED AND STATEWIDE PROJECTS

The Watershed-Based and Statewide Projects subprogram supports large-scale projects to restore or protect water quality within a defined watershed or a defined ground water recharge area and supports statewide projects to demonstrate emerging technologies or remove potential contaminants from the environment. The subprogram also supports projects designed to enhance statewide capacity to provide educational programming and materials on management of nonpoint source pollution. Project proposals are solicited annually through a Request for Proposals. Project implementation plans must be approved by EPA. Requirements for watershed-based and statewide projects are described in Chapter 11.

Chapter 3 LONG TERM GOALS, OBJECTIVES AND TASKS

Implementation of the Nebraska Nonpoint Source Management Plan will be guided by long term goals, objectives and tasks designed to effectively identify and efficiently address deficiencies in protecting Nebraska water resources from nonpoint source pollution. The goals facilitate: 1) implementation of the state nonpoint source management program, 2) communication and education regarding nonpoint source pollution and 3) implementation of activities and projects that will successfully reduce nonpoint source pollution of water resources.

The state Nonpoint Source Management Plan will be implemented through specific short-term actions over periods of 3-5 years (see Appendix B). The list of short-term action items will be revised periodically through amendments of the Nonpoint Source Management Plan. Other opportunities to address unforeseen actions that advance the goals of the Nonpoint Source Management Plan will be identified for action in the Section 319 annual plan of work.

GOALS – OBJECTIVES - TASKS

GOAL 1. **The Nebraska Nonpoint Source Management Program will be a comprehensive and collaborative program that efficiently and effectively implements actions to restore and protect water resources from impairment by nonpoint source pollution.**

Objective 1. *Actions for management of nonpoint source pollution will be based on sound data and effective directing of resources.*

Task 1. Review and, as necessary, revise monitoring and assessment methods and protocols to assure that data accurately detect and quantify nonpoint source threats and impairments and that data are useful in guiding nonpoint source management decisions.

Task 2. Evaluate nonpoint source pollution threats and impairments to water resources through ongoing monitoring, data assessment and special studies.

Task 3. Biennially revise the lists of waters identified for restorative or protective management actions to identify degraded or impaired waters and high quality waters for nonpoint source pollution management actions based on the latest state Integrated Report, published reports, special studies and consultation with natural resources specialists.

Task 4 Review and amend the state Nonpoint Source Management Plan at least every 5 years to update, at a minimum, the milestones and schedule for implementation.

Objective 2. *Strong working partnerships and collaboration among appropriate local, state and federal agencies and organizations will be established and maintained regarding management of nonpoint source pollution.*

Task 1. Participate in the USDA State Technical Committee and other inter-organizational advisory committees and work groups to communicate issues regarding management of nonpoint source pollution.

Task 2. Develop and support local citizen advisory groups to assist in planning and implementing local nonpoint source pollution management projects and activities.

Task 3. Utilize interagency liaisons to facilitate coordination and integration of program activities.

Task 4. Conduct consistency reviews of select federally-funded programs and activities in accordance with established procedures.

Objective 3: *Comprehensive and systematic strategies will be employed to restore and protect water resources from nonpoint point source pollution and to communicate nonpoint source information.*

Task 1. Develop basin, watershed and area management plans that meet EPA guidelines for a nine-element or alternative management plan and utilize multiple complementary conservation programs.

Task 2. Implement projects at statewide, basin, watershed, area and local scales that restore and protect water resources, reduce loading of pollutants, and lead to delisting of impaired waters or protection of high quality waters.

Objective 4. *The status, effectiveness and accomplishments of programs, projects and activities directed toward management of nonpoint source pollution will be continually assessed and periodically reported to appropriate audiences.*

Task 1. Conduct progress and financial reviews of Clean Water Act Section 319 projects.

Task 2. Track and assess implemented projects and activities to assure that restoration and protection of water resources and distribution of nonpoint source information are adequately addressed in a timely manner.

Task 3. Summarize program and project accomplishments and recommendations for further actions in annual, periodic and final reports and in project success stories.

GOAL 2. **Resource managers, public officials, community leaders and private citizens will understand the effects of human activities on water quality and support actions to restore and protect water resources from impairment by nonpoint source pollution.**

Objective 1. *Deficiencies in knowledge needed to improve decisions regarding management of nonpoint source pollution will be identified and investigated.*

Task 1. Identify and evaluate emerging or poorly understood nonpoint source pollutants such as bacteria, blue-green algae, hormones and antibiotics and their sources in Nebraska.

Task 2. Develop and improve management practices to control nonpoint source pollution.

Objective 2. *Tools to effectively transfer knowledge and facilitate actions regarding management of nonpoint source pollution will be developed, improved and maintained.*

Task 1. Develop and improve guidance documents for developing and implementing basin management plans, watershed management plans, area management plans and project implementation plans to restore or protect water resources.

Task 2. Develop and improve guidance documents for developing and implementing effective communication programs, projects and activities to educate key audiences about management of nonpoint source pollution.

Task 3. Develop and distribute audience-specific materials and methods to inform and engage community leaders, local media, youth, educators and other defined audiences regarding nonpoint source pollution management.

Chapter 4 THE NONPOINT SOURCE POLLUTION PROBLEM

Nonpoint source (NPS) pollution, unlike pollution from point sources (e.g., industrial and municipal wastewater treatment plants, etc.), comes from many diffuse sources and results in the alteration of the chemical, physical or biological integrity of water. Both point and nonpoint sources may generate conventional and toxic pollutants. Nonpoint source pollution is generally caused by rainfall, snowmelt, and/or irrigation water running off or percolating through the ground. As the water moves, it picks up and transports natural pollutants as well as pollutants associated with human activities, potentially depositing them into lakes, streams, wetlands, and aquifers. Atmospheric deposition and hydromodification are also sources of nonpoint source pollution.

NONPOINT SOURCE POLLUTION IN NEBRASKA

Nonpoint source pollution of Nebraska's surface and ground water resources is a significant and widespread problem. Agricultural nonpoint sources were indicated as the primary source of stream water quality degradation in the state. The most common impact to lake water quality in the state is excessive siltation attributed to accelerated agricultural, urban, and construction site runoff. Although degradation of ground water quality is increasingly being reported or discovered in the state, the ground water supply for most Nebraskans is of good quality. Major sources of ground water contamination in Nebraska include agricultural activities, leaking underground storage tanks, septic systems, waste disposal, and industrial facilities.

CATEGORIES OF NONPOINT SOURCE POLLUTION

For planning and management purposes, Nebraska focuses on eight nonpoint source pollution categories recognized by EPA. Emphasis on each category is relative to their contribution in the state.

- Agriculture
- Construction
- Resource Extraction
- Hydromodification
- Silviculture
- Urban Runoff/Stormwater
- Land Disposal
- Other

AGRICULTURE

The primary pollutants from cropland are sediment, nutrients, and pesticides, and potentially, salts and minerals from irrigated land. Runoff and percolation from feedlots, animal management areas, and intensively grazed pasture and rangeland can contribute nutrients, organic matter (oxygen demand), ammonia, and fecal bacteria to receiving surface waters and underlying ground water. Livestock grazing freely within stream riparian areas can destabilize streambanks and damage riparian vegetation. This increases the likelihood of erosion and in-stream sedimentation problems. Aquaculture, if not managed properly, can pollute surface waters through the introduction of nutrients, ammonia, and organic matter.

SILVICULTURE

Silviculture activities include road building, pesticide application, removal of trees, logging operations, and site preparation for revegetation. Sediment from road building and site preparation has the largest potential to impact water resources, although fertilizers and pesticides may cause periodic impacts. Because of Nebraska's relatively small forestry industry, nonpoint source pollution from silviculture generally is limited to small local impacts.

CONSTRUCTION

Erosion rates from construction sites typically are 10 to 20 times that of agricultural lands, and runoff rates can be as high as 100 times that of agricultural lands, resulting in localized impacts on water quality that may be severe. Construction sites may also generate other pollutants including fertilizer, pesticides, petroleum products, construction debris and other solid wastes. Enhanced stormwater management regulations have greatly reduced

pollution from larger construction sites in Nebraska, but runoff pollution from smaller sites and maintenance operations persist.

URBAN RUNOFF/STORMWATER

The urban nonpoint source problem is most acute in more heavily populated areas, although runoff from smaller communities and individual properties can be locally significant. Rainwater running off roofs, lawns, streets, parking lots, industrial sites and other areas transports sediment, heavy metals, inorganic chemicals, litter, petroleum products, fertilizers and fecal bacteria to surface waters. Some of these pollutants also may percolate into ground water. Ineffective onsite wastewater systems in small communities and combined sanitary and storm sewers in Omaha also are sources of concern for nutrient and bacteria contamination of water resources in Nebraska.

RESOURCE EXTRACTION

Resource extraction (i.e., mining) cannot be viewed as a homogeneous source of nonpoint source pollution. Many different materials are "mined", each with its own set of nonpoint source problems. Mining is a relatively small industry in Nebraska consisting primarily of sand and gravel extraction in the flood plains of large rivers. Lack of discharge from these operations limits their surface water impact mostly to disturbance of local aquatic habitat and hydrologic alteration. Poor management of gravel mining operations potentially could impact ground water. Deep well extraction of petroleum and uranium has potential to pollute ground water, most likely by the introduction of brine water to local aquifers. Close regulation of these industries in Nebraska limits their contribution to nonpoint source pollution.

LAND DISPOSAL

Both toxic and nontoxic pollutants from land disposal of wastes can be transported to surface water and ground water. Runoff from land disposal sites can contribute sediment, nutrients, fecal bacteria, and a myriad of toxic substances to receiving waters. Regulation of land disposal in Nebraska limits the impact of these potential sources. Abandoned landfill sites, streamside dumping, roadside dumping, improper manure application and ineffective onsite wastewater systems are the primary concern for land disposal pollution in Nebraska.

HYDROMODIFICATION

Physical alterations of watersheds, drainage ways, stream channels and other land characteristics can impact surface water quality by introducing pollutants, altering flow regimes, and degrading habitat. Channelization of streams and other changes in the landscape that increase the volume and velocity of runoff can accelerate erosion of the stream bed and banks and can physically degrade or destroy important aquatic habitats. Removal of riparian vegetation can increase water temperature, destabilize streambanks and reduce the ability of the riparian zone to filter pollutants. Conversely, reducing flows through diversions or depletions can limit the suitability of aquatic habitats to support fish and macroinvertebrate populations and decrease a stream's ability to assimilate pollutants without causing harmful effects. Diversion of water sources and draining and filling of wetlands greatly limits the functional value of these waterbodies for waterfowl usage, flow regulation, and water purification. Incision of streambeds, whether mechanically or through natural or accelerated erosion, can lower the water table and dewater wetlands and local aquifers. Significant hydromodification concerns in Nebraska include impacts on streams and lakes resulting from landscape alterations and stream channelization, and impacts on ground water and wetlands caused by water diversion, draining and filling wetlands and lowering of ground water levels through stream channel degradation.

OTHER

Some nonpoint source pollutants are difficult to categorize within a well-defined group. These include pollutants such as acid rain and mercury that are introduced to water resources through atmospheric deposition. Elements, such as selenium, arsenic or mercury, that occur naturally in some soils or bedrock may leach into water resources in high enough concentrations to cause impairment. Legacy compounds such as PCBs and DDT that are no longer used may persist in sediments and leach into the water column or accumulate in fish tissue. Random events such as chemical spills and disturbance from recreation and other activities also may degrade water resources. Water

quality impairments from selenium and mercury are common in Nebraska, but generally are beyond effective management.

Chapter 5 IDENTIFICATION OF IMPAIRED WATERS FOR RESTORATIVE ACTIONS

Effective implementation of the nonpoint source management program requires the direction of technical and financial resources to restore high-value water resources most impacted by nonpoint source pollution. Waters identified for restorative management actions include waters determined to be impaired for one or more designated uses (303(d) list, Category 4 or Category 5) in the state's Integrated Report and other waters determined by partner organizations to be negatively impacted by nonpoint source pollution.

This chapter defines the types of water resources and the criteria for identifying these resources for restorative management actions. Projects to restore waters degraded by nonpoint source pollution must be designed to implement a comprehensive management plan that addresses known or potential sources of nonpoint source pollution that may threaten the water resource.

STREAMS AND RIVERS

Attention to streams has been a relatively small component of state's nonpoint source management program. This was largely due to the greater focus given to lakes and reservoirs because of their predominance as the primary resource for aquatic recreation in Nebraska. As restoration projects on many of the major recreational lakes have been completed, interest in abating nonpoint source pollution of streams has increased.

Bacterial contamination (*E. coli*) is the primary cause of impairment to Nebraska streams. Sources of bacteria range widely from livestock operations, septic systems, and wildlife.

The presence of atrazine in Nebraska's surface waters reflects the magnitude of its usage and the local conditions where it is applied. The highest atrazine levels have been found to be associated with runoff events from intense spring rains, shortly after the herbicide has been applied. Streams exceeding Atrazine limits are impaired for Aquatic Life Designated Use.

Agricultural and urban development and channelization of streams has greatly accelerated the natural processes of erosion and deposition that produce stable meandering streams. Increased flow and altered flow patterns cause deep incision of the stream channel, disconnection from the natural floodplain and subsequent streambank instability. Destabilized streams degrade aquatic habitat and increase the delivery of sediment and other pollutants to downstream waters.

Concentrated installation of conservation practices designed to reduce soil erosion in a watershed may introduce "hungry water" that accelerates bed and bank erosion within the receiving steam. Both stream stability and aquatic habitat may be degraded in the process. Destabilized streams will continue to erode until the water column acquires a sufficient sediment bed load for the erosion/deposition process to again reach equilibrium. Attention to stream stability and aquatic habitat protection should be included in a well-designed watershed management project to avoid these unintended consequences. Nebraska recognizes the following stream types, as defined in Title 117, for restorative actions as part of a watershed management approach:

Cold Water Stream – The stream must be impaired for one or more of its designated uses. Stream projects should be designed to include protection or improvement in stream hydrologic and morphologic integrity, and to protect or improve biologic and habitat matrices.

Warm Water Stream – The stream must be impaired for one or more of its designated uses. Stream projects should be designed to include protection or improvement in stream hydrologic and morphologic integrity, and to protect or improve biologic and habitat matrices.

Streams identified for restorative management actions are listed in Appendix C (Table C.1). Other stream restoration projects may be considered where supporting data justify the project.

LAKES AND RESERVOIRS

Nonpoint source pollution is the primary cause of water quality impairment in Nebraska's lakes. This can be attributed to three factors: 1) many of Nebraska's lakes are on-stream reservoirs that trap pollutants during runoff events, 2) intensive land disturbance by agriculture and urban construction occur within many lake watersheds, and 3) Nebraska regulations prohibit discharge of point source pollutants directly into lakes and reservoirs. The two most common problems impacting the state's lakes are sedimentation and accelerated eutrophication. Bacteria, toxic algae and pesticide contamination occur periodically in some Nebraska lakes.

Sedimentation from upland runoff and shoreline erosion is a significant cause of impairment in Nebraska lakes. Sediment can reduce the storage volume of lakes and severely impair recreation, aesthetic and aquatic life uses. Suspended sediment increases the turbidity of the water and may decrease light penetration needed for growth of aquatic plants and increase water temperature by absorbing solar radiation. In-flowing sediments also deliver attached nutrients, particularly phosphorous, and other attached contaminants to lakes from the watershed.

Excess nutrients, especially phosphorus, can drive unsightly algae blooms that produce objectionable odors and may foster toxin-producing blooms of blue-green algae. Upland runoff is the primary source of nutrients in most lakes, but internal cycling of nutrients also is a major source of nutrient loading in the water column of many Nebraska lakes. Internal nutrient loadings may mask the benefits of watershed projects if ignored. Control of internal nutrient loading can be an important component of efforts to resolve nutrient impairment of lakes.

Blue-green algae (Cyanobacteria) has emerged as a significant cause of lake impairment. Blooms of cyanobacteria release algal toxins (primarily microcystin) into the water column that may cause skin lesions from contact and may cause death from consumption of water. High nutrient levels and nutrient imbalance often are associated with algal blooms, but other triggers are unknown. Blooms of cyanobacteria and associated toxins result in health alerts being posted at many beaches during the recreation season.

Bacterial contamination (*E. coli*) is a significant and pervasive cause of impairment to some Nebraska lakes, causing health advisories to be issued for many swimming beaches during the recreation season. Sources of bacteria range widely from livestock operations, septic systems, and wildlife. Some lakes also appear to harbor, and perhaps incubate, populations of *E. coli* that can be resuspended by wind and motor boat disturbance.

External loading of nonpoint source pollutants from agricultural and urban landscapes and internal loading (recycling) of pollutants in the water column threaten the longevity and pubic use of these waterbodies. Nebraska recognizes the following lake and reservoir types for restorative management actions as part of a watershed or area management approach.

Natural Lake and Associated Wet Meadows - The waterbody must be impaired for one or more of its designated uses and provide public access or other significant public benefits which management actions are designed to restore.

Publicly-Owned Reservoir - The waterbody must be impaired for one or more of its designated uses and provide public access or other significant public benefits which management actions are designed to restore.

Community Lake – The waterbody must be a community-owned lake (pond) within or directly adjacent to the city limits and be impaired for one or more of its designated uses which management actions are designed to restore.

Lakes and reservoirs identified for restorative management actions are listed in Appendix D (Table D.1). Other lake restoration projects may be considered where supporting data justify the project.

GROUND WATER

The most common ground water contaminant in Nebraska is nitrate-nitrogen. Nitrate contamination occurs primarily through leaching of nitrate-nitrogen from applied fertilizer through the soil profile. This contamination is most prevalent in areas with a high density of irrigated land cropped to corn, particularly in highly vulnerable areas with shallow depths to ground water and highly permeable soil.

Pesticide contamination occasionally is detected in sampled wells. These contaminations are mostly associated with accidents that result in a back-flow or spill of agricultural chemicals into or near a well during farming operations.

Bacteria and volatile organic compounds are occasionally detected in water well samples throughout the state. Bacterial contamination is mostly associated with intrusion of surface water from nearby feedlots or septic systems through faulty well casings and other construction deficiencies. Contamination by volatile organic compounds mostly is associated with commercial and industrial operations in urban areas or with storage and processing facilities for agricultural products.

Nebraska is highly dependent on ground water for human consumption (source of drinking water for 85% of the population) and for agricultural and industrial processes. Maintenance of high quality ground water resources is both a human health and economic necessity. Nebraska recognizes the following ground water areas for restorative management actions as part of a watershed or area management approach.

Ground Water Recharge Area – The ground water recharge area must be within a Ground Water Management Area designated as a Phase Two or higher level by the local Natural Resources District, have an elevated nitrate-nitrogen concentration in the underlying aquifer and encompass one or more delineated wellhead protection areas.

Wellhead Protection Area - Individual wellhead protection areas must be within a Ground Water Management Area designated as a Phase Two or higher level by the local Natural Resources District, serve a community public water system and have a current delineation map.

Ground water recharge areas identified for restorative management actions are listed in Appendix E (Table E.1). Other ground water restoration projects may be considered where supporting data justify the project.

WETLANDS

Wetlands influence both water quantity and water quality, and provide ecological, cultural, aesthetic and recreational benefits. The complex microenvironments they develop are particularly beneficial in supporting biodiversity. Many species of fish, birds, reptiles, amphibians, invertebrates, mammals and plants depend on wetlands for all or part of their life cycle. In Nebraska, nine of the 12 federally-listed and 19 of the 27 state-listed threatened and endangered species utilize wetlands.

Agricultural and urban development has negatively impacted wetlands in most areas of the state. Direct damage has been caused by dewatering wetlands through filling, ditching, tiling or excavating concentration pits. Indirect damage has resulted from changes in the landscape that cause excessive sedimentation, divert water flows or lower the water table. Encroachment of invasive species is a growing threat to the integrity of aquatic habitat provided by wetlands.

Agricultural and urban development activities continue to threaten wetlands from the impact of nonpoint source pollution. Nebraska recognizes the following wetland types for restorative management actions as part of a watershed or area management approach.

Eastern Saline Wetland – The wetland must be capable of maintaining all three wetland criteria (hydric soils, salt tolerant hydric vegetation, water) at appropriate intervals and of supporting an appropriate biological community following restoration.

Rainwater Basin Wetland – The wetland must be capable of maintaining all three wetland criteria (hydric soils, hydric vegetation, water) at appropriate intervals and of supporting an appropriate biological community following restoration.

Central Platte Wet Meadows - The wetland must be capable of maintaining all three wetland criteria (hydric soils, hydric vegetation, water) at appropriate intervals and of supporting an appropriate biological community following restoration.

Rare or Unusual Wetlands – The wetland must be capable of maintaining all three wetland criteria (hydric soils, hydric vegetation, water) at appropriate intervals and of supporting an appropriate biological community following restoration.

Wetlands identified for restorative management actions are listed in Appendix E (Table E.1). Other wetland restoration projects may be considered where supporting data justify the project.

AQUATIC HABITATS

The impact of nonpoint source pollution on aquatic habitats has largely been ignored or only incidentally considered in management efforts to date. But damage to aquatic habitat from nonpoint source pollution, including hydrologic modification, can be severe. In some cases, upland treatments of pollutant sources can inadvertently exacerbate damage to habitat in the receiving water. Attention must be given to mitigating the effects of nonpoint source pollution on aquatic habitat. Nebraska recognizes the following aquatic habitat conditions for restorative management actions as part of a watershed or area management approach.

Disturbed Habitat – The ecological integrity of the waterbody or segment of the waterbody must be disturbed by nonpoint source pollution. The waterbody must be capable of supporting water-dependent key species as defined in Title 117 at appropriate intervals following restoration.

Critical Habitat – The waterbody must be identified as critical habitat for a threatened or endangered species and the ecological integrity of the waterbody or segment of the waterbody must be disturbed by nonpoint source pollution. The waterbody must be capable of supporting the designated species at appropriate intervals following restoration.

Chapter 6 IDENTIFICATION OF OUTSTANDING WATERS FOR PROTECTIVE ACTIONS

Restoration of impaired waters has been the historic focus of nonpoint source management programs at both federal and state levels. However, effective management of nonpoint source water pollution must also include attention to preventing high quality waters from becoming impaired. The Nebraska nonpoint source program recognizes special water resources that merit implementation of protective measures to prevent them from becoming impaired. Waters identified for protective actions include waters determined to be supporting all of their designated uses (Category 1) in the state's Integrated Report and high-quality water resources identified by partner organizations for protective actions.

This chapter defines the types of special water resources and the criteria for identifying these resources for protective management actions. Projects to protect high quality water resources must be designed to implement a comprehensive management plan that addresses known or potential sources of nonpoint source pollution that may threaten the water resource.

STREAMS AND RIVERS

While Nebraska has abundant miles of streams of many types, private ownership of the surrounding landscape limits access for public uses. At the same time, development of watersheds for urban and agricultural uses threatens water quality and the biological communities dependent on streams. It is therefore important to protect limited high-quality stream resources available for public recreation and to protect the ecological integrity of streams that provide good water quality and support aquatic life. Nebraska recognizes the following stream types, as defined in Title 117, for protective actions as part of a watershed management approach:

Cold Water A Stream – The stream must support a reproducing population of Salmonid species and meet all of its designated uses.

State Resource Water B – The stream must be classified as a State Resource Water B and meet all of its designated uses.

Warm Water A, Warm Water B and Cold Water B Streams – The stream must meet all of its designated uses. Streams should be rated good or better for each of the biological indicators: Index of Biological Integrity (IBI), Index of Community Integrity (ICI) and Nebraska Habitat Index (NHI). Where biologic and/or habitat data are lacking, the project must be designed to assess and achieve these metrics.

Streams identified for protective management actions are listed in Appendix C (Table C.2). Other stream protection projects may be considered where supporting data justify the project.

LAKES AND RESERVOIRS

Natural lakes are particularly abundant in the Sandhills region of Nebraska, but also occur in fewer numbers across the state, many as oxbow lakes. In addition, numerous reservoirs have been constructed in Nebraska to provide a reliable water supply for agricultural and urban development and to protect those developments from flooding. Public access to lakes and reservoirs has made them the primary resources for water-based recreation in the state. Sediment, nutrient and bacteria runoff from agricultural and urban landscapes threaten the longevity and pubic uses of these waterbodies. Nebraska recognizes the following lake and reservoir types for protective actions as part of a watershed approach.

Natural Lake and Associated Wet Meadows - The lake must meet all of its designated uses and provide public access or other significant public benefits which management actions are designed to protect.

Publicly-Owned Reservoir - The waterbody must meet all of its designated uses and provide public access or other significant public benefits which management actions are designed to protect.

New Lake-to-be-Built – The proposed reservoir must be publicly-owned and provide public access for recreation when completed. The sponsoring entity must provide assurance that funding has been secured for construction.

Lakes identified for protective management actions are listed in Appendix D (Table D.2). Other lake protection projects may be considered where supporting data justify the project.

GROUND WATER

Ground water is the primary source of drinking water for Nebraska citizens (85%). Most community and private drinking water systems deliver water directly from the wells to consumers with minimal or no treatment. To provide these citizens with safe drinking water it is critical to protect ground water and the recharge area influencing the domestic water supply from contamination by nitrate-nitrogen, pesticides, bacteria and volatile organic compounds. Nebraska recognizes the following ground water recharge areas for protective actions as part of an area management approach:

Wellhead Protection Area – The system must not be under administrative orders by Nebraska Department of Health and Human Services, nitrate-nitrogen (NO_3) concentration in the underlying aquifer must not exceed 5ppm and the area must have a current delineation map.

Ground water recharge areas identified for protective management actions are listed in Appendix E (Table E.1). Other ground water protection projects may be considered where supporting data justify the project.

WETLANDS

Nebraska wetlands provide habitat for important flora and fauna and some provide critical habitat for threatened and endangered species. Many are culturally and socially significant to Nebraskans. While wetlands remain relatively undisturbed in the Sandhills region of Nebraska, more developed areas of the state have suffered severe losses in the quantity and quality of wetlands. Continued vulnerability of wetlands to land development and other disturbances heightens the urgency of protecting the high quality wetlands that remain. Nebraska recognizes the following wetland types for protective actions as part of a watershed or area management approach.

Eastern Saline Wetland – All three wetland criteria (hydric soils, salt-tolerant hydric vegetation, water) must be present at appropriate intervals and impacts of nonpoint source pollution may be no more than minimal.

Rainwater Basin Wetland – All three wetland criteria (hydric soils, hydric vegetation, water) must be present at appropriate intervals and impacts of nonpoint source pollution may be no more than minimal.

Central Platte Wet Meadows - All three wetland criteria (hydric soils, hydric vegetation, water) must be present at appropriate intervals and impacts of nonpoint source pollution may be no more than minimal.

Rare or Unusual Wetlands – All three wetland criteria (hydric soils, hydric vegetation, water) must be present at appropriate intervals and impacts of nonpoint source pollution may be no more than minimal.

Wetlands identified for protective management actions are listed in Appendix E (Table E.1). Other wetland protection projects may be considered where supporting data justify the project.

AQUATIC HABITATS

Widespread landscape disturbance for agricultural, residential, commercial and industrial development has altered the quality and quantity of water that flows into receiving waters. The impact on aquatic habitat and the species it supports often is severe. Attention must be given to protecting waterbodies where high-quality aquatic habitat exists. Nebraska recognizes the following aquatic habitat conditions for protective action as part of a watershed or area management approach:

Undisturbed Habitat – The waterbody or segment of the waterbody must have appropriate aquatic habitat structure, water-dependent key species as defined in Title 117 must be present at appropriate intervals and impacts of nonpoint source pollution may be no more than minimal.

Critical Habitat – The waterbody or segment of the waterbody must be identified as critical habitat for a threatened or endangered species, aquatic habitat structure must be appropriate, designated species must be present at appropriate intervals and impacts of nonpoint source pollution may be no more than minimal.

Chapter 7 COMMUNICATION

Effective restoration and protection of water resources occurs only when changes in human behavior and social norms make water quality improvements sustainable. Effective communication, therefore, is critical to initiate and facilitate changes in behaviors of land managers that lead to adoption and maintenance of water quality management practices to improve and conserve the state's water resources. Public and community involvement is essential to the success of nonpoint source management in Nebraska.

The communication component of a highly effective program cannot simply dispense information through newsletters and press releases. It must engage target audiences through effective materials and delivery systems compatible with their self-interests to motivate them to acquire the knowledge, skills and commitment to adopt and sustain practices that improve and protect water quality. Effective communication cannot be an afterthought to nonpoint source management efforts. It must be equal in importance to other components at both the program and project level.

This chapter discusses the process of learning, factors that influence how people process and respond to information, how people make conservation decisions and factors that influence permanent adoption of conservation practices. It also presents concepts and questions to consider in designing a communication campaign to connect with key audiences and successfully move them to adopt sustainable conservation practices and behaviors.

THE LEARNING PROCESS

Solving and preventing most nonpoint source pollution problems requires people to adopt new practices and change behaviors. Therefore, it is important to understand the learning process in order to affect positive behavioral change toward management of nonpoint source pollution. The two main components of the learning process that lead to the adoption of new conservation practices are: 1) gathering and evaluating new information and 2) applying the new information (Abdi Ghadim and Pannell, 1999).

During the first stage in the learning process, land managers collect, integrate and evaluate new information. This process reduces uncertainty for land managers and allows them to make good decisions that best advance overall management goals. (Marra et al, 2003). The probability of making a good decision increases over time with increasing knowledge, experience and practice (Pannell et al, 2006).

During the second stage, land managers apply the newly gained knowledge to their personal situation (Tsur et al, 1990). Implementing new land management practices requires knowledge, skill and decision making on components such as practice location, timing, sequencing scale, etc.

Experts break this learning process down into a series of stages as illustrated in Figure 7.1 below (Pannell et al, 2006, Barr and Cary, 2000).

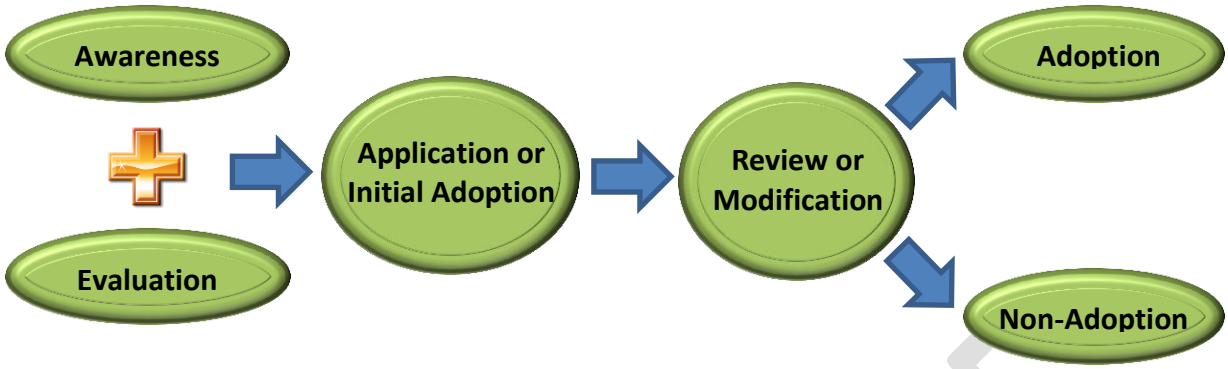

Figure 7.1 Learning Model for Adoption of Management Practices.
Adapted from Pannell et al, 2006, Barr and Cary, 2000.

HOW PEOPLE LEARN

Knowing how people learn, how they make decisions and who influences their decisions can aid in the development an effective communication program. Common learning styles include visual, auditory, kinesthetic and multimodal.

- *Visual Learners* prefer images, pictures, colors, and diagrams to organize information and communicate with others.
- *Auditory Learners* prefer information presented by listening to stories, information, music, and so forth.
- *Kinesthetic Learners* prefer to learn with hands-on methods and doing activities.
- *Multimodal learners* prefer some combination of these methods. The majority of learners fall into this category.

MOTIVATIONS FOR CONSERVATION ADOPTION AND BEHAVIOR CHANGE

It is often thought that farm size, duration of land ownership and cost to implement practices most influence the decision to adopt conservation practices. Recent studies have shown this not to be the case (Ryan, et. al, 2002). Rather, social processes often are the most critical factor influencing a land manager's decision to adopt conservation practices.

A survey conducted in 2012 by Useful to Usable (U2U) and SustainableCorn.org asked Midwestern corn producers to indicate how influential various groups and individuals are when making decisions about agricultural practices and strategies. The results (Table 7.1) showed that family, chemical dealers, and seed dealers have the greatest influence on land management decisions.

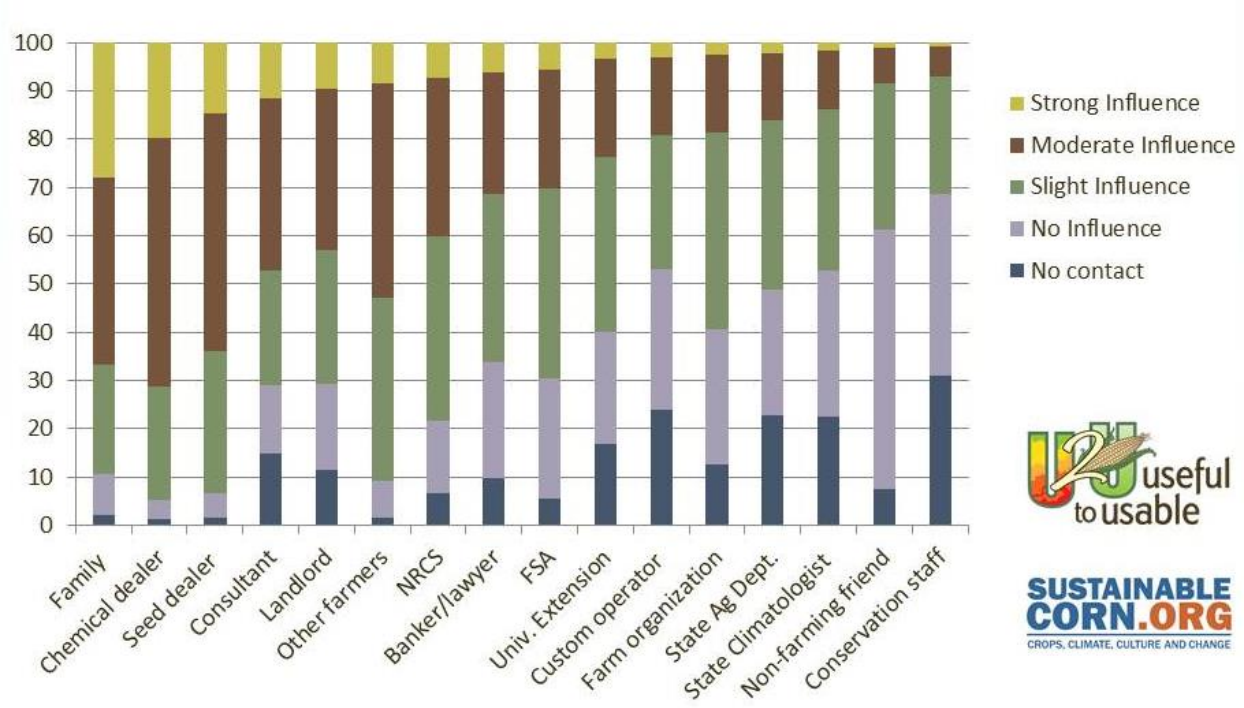

Figure 7.2 Sources Influencing Adoption of Conservation Practices

The study further investigated which groups are the most trusted source of information. The most trusted sources of information included university Extension, scientists, farm groups, and family and friends (Table 7.1). Least trusted sources included mainstream media, online social media, radio talk show hosts, and environmental organizations (Table 7.2).

Table 7.1 Most Trusted Sources of Conservation Information

Most Trusted	Distrust (%)	Neither trust nor distrust (%)	Trust (%)
University Extension	4.2	14.8	81.1
Scientists	10.9	19.6	69.6
Farm Groups	11.7	43.1	45.2
Family and Friends	7.1	49.7	43.2

Table 7.2 Least Trusted Sources of Conservation Information

Least Trusted	Distrust (%)	Neither trust nor distrust (%)	Trust (%)
Mainstream media	64.9	26.9	8.2
Social media	64.4	31.8	3.8
Radio talk show	63.1	31.6	5.2
Environmental Organizations	55.7	26.3	18

HOW TO DEVELOP AND IMPLEMENT A PROJECT COMMUNICATION PROGRAM

The communication component will vary depending on the program or the type, scope and size of the project, the audiences to be targeted, and the messages to be delivered. Planning and implementing a successful communication program requires an iterative and adaptive approach to setting goals and organizing resources to achieve those goals. Guidance is available in many forms for effective watershed planning, with the US EPA's *Handbook for Developing Watershed Plans to Restore and Protect Our Waters* as a primary reference. In this guidebook the US EPA identifies nine minimum elements for watershed plans, one of which includes an information and education (communication) component. Additionally *The Social Indicator Planning & Evaluation System (SIPES) for Nonpoint Source Management* provides valuable information for incorporating social indicators.

By following the planning guidelines below, an effective communication strategy can be developed and implemented.

- **Define Communication Goals.** By defining communication goals that support the overall program or project goals, it is possible to evaluate the effectiveness of the communication strategy. Communication goals should address the general topics below.
    - Awareness of water quality pollutants and sources.
    - Awareness of management practices.
    - Attitude or behavior change toward water quality issues.
    - Acquired knowledge and skills.
    - Use of practices (behaviors) and associated constraints.
    - Sources of information.

- **Review Demographic and Practice Adoption Data.** The target audience will influence the message delivered, who delivers the message, and how it is delivered. A review of demographic and practice adoption data may require readjusting communication goals. Things to consider when conducting the review may include the following:
    - Does anything stand out about demographic data?
    - How many are willing to try new practices, but are not yet using them?
    - What level of awareness is there about the practices?

- **Review Awareness, Attitudes and Constraints.** By further evaluating a target audience's awareness, attitudes, and constraints, communication goals and strategies can be further refined. For example, many farmers do not believe that farming activities are a significant contributor to water pollution or even that water pollution is a problem (Hau, Zulauf, and Sohngen, 2004). If this attitude is present in a given project area, it may be the largest constraint to conducting an effective communication program. Consider the following questions:
    - Are there any interesting patterns?
    - What constraints and awareness issues need to be addressed for behavior change to occur?
    - What existing attitudes can you leverage in crafting an outreach message?

- **Develop a Communication Strategy.** Significant planning and evaluation should have occurred prior to beginning the development of a communication strategy. At this point, specific activities, delivery methods, and effective messages should be developed. In addition, the following questions should be addressed.

- What social outcomes need to be achieved to improve water quality?
- What unique, key or general audiences should be targeted?
- What messages will be effective at reaching members of the target audiences?
- How should the messages be delivered to each audience?
- Who should deliver the messages?

MARKETING MESSAGES

After undertaking an iterative planning process and developing a communication strategy that identifies specific goals, target audiences, constraints to implementation, messages to be delivered and methods to deliver the messages, it is essential to invest time and resources *promoting* the messages that support the project. In marketing, there is no sale without trust. The same holds true for nonpoint source education. Trust gives people the confidence that the message they are receiving or the tool they are using will deliver what is promised. Trust, however, takes time to build and is the byproduct of a process that often begins with advertising.

Two concepts often discussed in marketing are reach and repetition. Reach determines the number of people who "hear" the message. Repetition refers to the number of "touches" or times a message is delivered. It is important to reach a large percentage of the project's target audience, but without repetition there is no promotion of trust.

An example of information marketing might be promotion of a watershed planning meeting. An organized communication campaign to boost attendance could include sending Save-the-Date invitations to key stakeholders well in advance of the event followed by a media blitz 2-3 weeks before the event to create general awareness. Reminder mailings containing more specific information about the content and intent of the meeting are mailed to key stakeholders 1-2 weeks prior to the meeting. This is followed by personal invitations and phone calls to key stakeholders in the week prior to the meeting to foster greater awareness of the issues in those individuals and secure a commitment to attend the meeting and participate in the planning process.

BENEFITS OF INVESTING IN COMMUNICATIONS

A well-planned and executed communication campaign can establish understanding and trust among citizens regarding a project. Greater cooperation and increased participation by land managers in the project areas will help the project reach its implementation and water quality goals more quickly. The knowledge and skills acquired through effective communication and experience in successfully implementing conservation practices through participation in the project will lead to permanent changes in attitudes and behaviors that will sustain the project's environmental improvements. An effective communication campaign will achieve the following benefits.

- Persuade local decision makers to adopt new policies.
- Strengthen the ability of organizations to manage nonpoint source pollution.
- Develop partnerships between agencies.
- Motivate action.
- Raise awareness of the issues.
- Accelerate farmers' adoption rates.
- Improve technology adoption.
- Generate excitement.

REFERENCES

Abadi Ghadim AK, Pannell DJ (1999) A conceptual framework of adoption of an agricultural innovation. Agricultural Economics

Barr, N.F., Cary, J.W. (2000) Influencing Improved Natural Resource Management on Farms. Bureau of Rural Sciences.

Erickson, D., Ryan, R. and R.De Young (2002) Woodlots in the rural landscape: Landowner motivations and management attitudes in a Michigan case study. Landscape and Urban Planning.

Marra M, Pannell DJ, Abadi Ghadim A (2003) The economics of risk, uncertainty and learning in the adoption of new agricultural technologies: Where are we on the learning curve? Agricultural Systems.

Pannell, D.J., Marshall, G.R., Barr, N., Curtis, A., Vanclay, F. and Wilkinson, R. (2006) Understanding and promoting adoption of conservation practices by rural landholders. Australian Journal of Experimental Agriculture.

Tsur,Y., Sternberg, M.,Hochman, E. (1990) Dynamic modelling of innovation process adoption with risk aversion and learning. Oxford Economist.

Chapter 8 NONPOINT SOURCE MONITORING STRATEGY

The Nebraska Department of Environmental Quality is charged with monitoring, assessing and, to the extent possible, managing the state's water resources. The purpose of this work is not only to provide critical data to the Nonpoint Source Management Program but also to protect and maintain good quality water. The water quality monitoring program consists of a variety of different monitoring strategies completed on 18,000 miles of flowing rivers and streams, greater than 280,000 acres of surface water in lakes and reservoirs, and the vast storage of ground water in Nebraska's aquifers.

Water quality monitoring is an integral and crucial mechanism for the successful implementation of the Nebraska Nonpoint Source Management Program. Water quality monitoring for nonpoint sources of pollution includes the important element of relating the physical, chemical, and biological characteristics of receiving waters to land use characteristics. A well-planned and implemented program of water quality monitoring will provide current information needed to address several key water quality management questions.

Section 319 funding may be used for monitoring in specific waterbodies consistent with the state's Nonpoint Source Management Program to: (1) identify nonpoint sources of pollution, (2) support the development of watershed-based management plans or acceptable alternative plans or (3) evaluate the effectiveness of nonpoint source pollution management projects in restoring or protecting water resources. Project funding may be used for water quality monitoring to assess the effectiveness of on-the-ground activities to improve water quality as part of the implementation of a watershed or area management plan. Either program or watershed project funding may be used for water quality monitoring to assess the impact of National Water Quality Initiative projects, including projects for which a watershed management plan has not been developed. Environmental monitoring must be conducted under an approved Quality Assurance Project Plan (QAPP) regardless of the entity conducting the monitoring unless specifically exempt. Monitoring conducted solely for educational and outreach purposes (e.g., volunteer monitoring) are exempt from the QAPP requirement.

Each of the following monitoring programs provides support for successful management of nonpoint source pollution in Nebraska. Details of Nebraska's monitoring efforts are described in the Nebraska Water Quality Monitoring Strategy 2009-2015.

AMBIENT STREAM MONITORING

Ambient monitoring is done at fixed monitoring sites designed to collect data annually from all 13 of Nebraska's major river basins. Samples are collected year-round in the first week of each month from each site.

NEBRASKA LAKE MONITORING

Monitoring is done from May 1 to September 30 on a monthly basis from publicly owned lakes and reservoirs across the state. Both chemical and biological parameters are measured to determine if water quality supports the lake's designated uses.

PUBLIC BEACH MONITORING

Samples are taken to measure *E. coli* bacteria and blue-green algae toxins, primarily microcystin, to give an indication of the quality of water at Nebraska swimming beaches. Weekly samples are collected at recreational lakes and reservoirs during the recreation season (May 1 to September 20).

GROUND WATER QUALITY MONITORING

Samples of ground water are taken each year from a selection of registered irrigation and dedicated monitoring wells across the state by the local Natural Resources Districts. A variety of parameters are tested, the most prominent contaminant being nitrate-nitrogen.

BASIN ROTATION MONITORING

Monitoring is done on a six-year rotation in the 13 major river basins in the state (Figure 8.1). Monitoring in each basin, during its rotation year, is done on a weekly basis between May 1 through September 30.

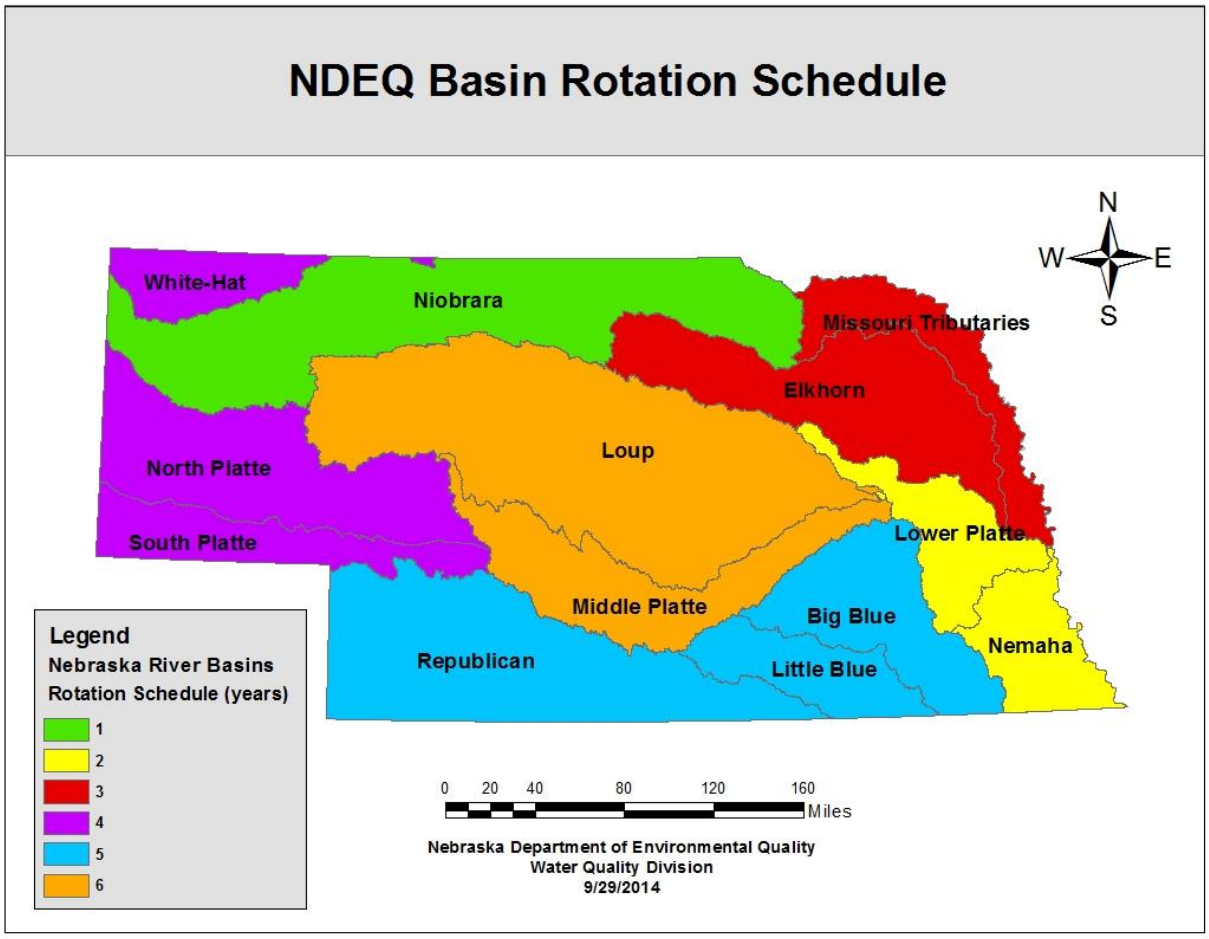

Figure 8.1 Nebraska River Basins Mapped for Basin Rotation Monitoring.

STREAM BIOLOGICAL MONITORING PROGRAM

Monitoring is done to assess the health of streams by evaluating the composition and numbers of resident aquatic macroinvertebrate and fish communities. Every year, randomly selected wadeable stream sites (i.e. streams that are shallow enough to sample without boats) are chosen for sampling in two or three river basins in conjunction with basin rotation monitoring.

FISH TISSUE MONITORING

Monitoring is generally conducted at locations where the most fishing occurs. Fish samples are collected annually from fixed advisory and trend assessment sites. Fish tissues samples also are collected in conjunction with basin rotation monitoring at annually selected streams and publicly owned lakes in two or three of Nebraska's 13 major river basins.

PROJECT MONITORING

Some projects supported by Section 319 funds include monitoring of water quality or other environmental parameters to measure the effectiveness of the project or select conservation practices. A Quality Assurance Project Plan (QAPP) is required for project monitoring. Monitoring plans generally are negotiated as part of the process of approving the project implementation plan.

Chapter 9 TECHNICAL AND FINANCIAL ASSISTANCE

Effective management of nonpoint source pollution necessarily requires a cooperative and coordinated effort by many agencies and organizations, both public and private. Various regulatory and non-regulatory programs are administered by federal, state and local agencies that support sustainable management of nonpoint source pollution in Nebraska. Each organization is uniquely equipped to deliver specific services and assistance to the citizens of Nebraska to help reduce the effects of nonpoint source pollution on the state's water resources. The Nebraska Nonpoint Source Management Program seeks fosters strong and effective partnerships that maximize coordination of each entity's efforts to restore and protect the quality of Nebraska's surface and ground water resources while maximizing ancillary environmental benefits.

Organizations cooperate through both formal and informal arrangements. Informal efforts include inter-organizational committees, advisory groups, program and project consultations, and staff interactions. Formal arrangements include involvement in cooperative agreements, shared liaisons and special work groups. Successful cooperation focuses the separate resources of partner organizations toward common issues while maintaining the integrity of the individual programs.

This chapter identifies the agencies and organizations commonly involved in activities that affect the management of nonpoint source pollution in Nebraska. The primary responsibilities, functions and service of the organizations are described below. Because individual programs change with some regularity, they are presented in tables at the end of the chapter rather than in the description of the organization. Table 9.1 lists the name and primary functions of individual programs of each organization. Table 9.2 lists the name and primary nonpoint source issues addressed by the individual programs of each organization.

FEDERAL AGENCIES

FEDERAL HIGHWAY ADMINISTRATION

The Federal Highway Administration (FHWA) oversees construction and maintenance of federally owned and federally funded highways and associated rights-of-way and other federally owned transportation systems. It reviews and approves construction and maintenance workplans to assure that environmental impacts are adequately minimized and permit requirements are fulfilled. FHWA programs:

- Support development of alternative transportation systems.
- Provide technical assistance in designing runoff controls for road construction and maintenance.

US ARMY CORPS OF ENGINEERS

The US Army Corps of Engineers (USACE) has regulatory authority over navigable waters. Its responsibilities include regulating flows on the Missouri River for transportation, managing dams for flood control and generation of hydroelectric power, and protecting water quality and aquatic habitats in its jurisdictional waters. The USACE manages or leases lands adjacent to flood control structures for recreational uses. Programs of the USACE:

- Regulate dredge and fill activities and alteration in jurisdictional waters.
- Regulate structural and hydrologic alteration of jurisdictional waters.
- Regulate disturbance of aquatic habitat in jurisdictional waters.
- Provide planning and funding to enhance and develop aquatic habitat.

US BUREAU OF RECLAMATION

The US Bureau of Reclamation (USBR) manages lands administered by USBR and provides oversight of USBR lands where management has been delegated to other entities. Several irrigation projects are subject to USBR oversight. Irrigation districts with repayment or water service contracts with USBR are required to develop water

conservation plans. The USBR participates with the US Geological Survey in monitoring and studying nutrient, pesticide and toxic metals contamination of water, soils and biota resulting from irrigation return flows. USBR programs provide:

- Planning and implementation of soil and water conservation practices on USBR lands.
- Technical and financial assistance to rehabilitate irrigation systems.

US Environmental Protection Agency

The US Environmental Protection Agency (EPA) has authority under the Clean Water Act amendments of 1987 to provide federal leadership in helping states assess and manage nonpoint source pollution problems in the states. It has authority for oversight of dredge and fill permits issued by the US Army Corps of Engineers. The National Environmental Policy Act authorizes EPA to review and approve environmental impact statements developed by other federal agencies for actions that may cause environmental harm, including the impacts of nonpoint source pollution. EPA has authority to approve water quality standards developed by the states. EPA programs delegate authority and provide guidance and funding to support state programs that:

- Monitor, assess and restore water resources.
- Regulate handling and application of pesticides.
- Develop and enforce water quality standards.
- Inspect and regulate significant potential pollutant sources.
- Delineate and protect sources of drinking water.
- Plan for protection and restoration of water resources.
- Support implementation of local water quality protection and restoration projects.

US Fish and Wildlife Service

The US Fish and Wildlife Service (FWS) has responsibility under the National Environmental Policy Act, the Migratory Bird Treaty Act and the Endangered Species Act for conservation and management of fish and wildlife resources, and administers the Partners for Fish and Wildlife program to support projects on private lands. They have authority to review and impose conditions on land development and management plans that may significantly affect important fish and wildlife species and their habitats. Mitigating conditions for projects may be advanced through the National Environmental Policy Act process with other federal agencies, the 404 permit process with the US Army Corps of Engineers and through the National Pollutant Discharge Elimination System permit process with Nebraska Department of Environmental Quality. FWS programs support state programs and activities that:

- Assess, protect, restore and develop aquatic and upland habitat.
- Protect, restore and develop wetlands on private lands.
- Construct and enhance access for sport fishing and encounters with wildlife.
- Research and monitor habitat conditions.
- Inform and educate the public about wildlife issues.

US Geological Survey

The U.S. Geological Survey (USGS) collects and analyzes geological and geographic data to identify and monitor natural resources throughout the United States. The survey produces numerous and varied natural resources reports and maps used by other agencies for resource management activities. USGS programs:

- Maintain a statewide network of monitoring stations to assess water quality.
- Support regional and localized environmental studies.
- Provide for cooperation in localized water quality monitoring and assessment.

USDA – FARM SERVICE AGENCY

The USDA Farm Service Agency (FSA) administers both voluntary and regulatory programs to retire sensitive agricultural lands from cultivation and to discourage the conversion of grasslands, forestlands and wetlands to crop production. The agency also compiles data on land use, agricultural trends and conservation compliance that is useful in developing and implementing nonpoint source management activities. Key FSA programs provide:

- Guidance on a suite of practices to reduce erosion, reduce nutrient runoff to surface water and percolation to ground water, reduce pesticide use and enhance wildlife habitat.
- Cost share and incentive payments to convert crop land to grassland.
- Rental payments for long term retirement of sensitive agricultural lands.
- Enforcement of conservation compliance on highly erodible lands and wetlands.

USDA – FOREST SERVICE

The US Forest Service (USFS) manages several tracts of rangeland and several tracts of forest land in Nebraska. It has responsibility to assure appropriate nonpoint source management practices are implemented on these lands. The USFS also advises and assists private land owners in using trees for conservation and production of forest products. USFS programs:

- Research land use effects on forest productivity and sustainability.
- Provide technical assistance to private forestland owners.
- Promote multi-use plans for forest production.
- Promote soil and water conservation through forestry.
- Promote wildlife habitat development and protection on private lands.

USDA – NATURAL RESOURCES CONSERVATION SERVICE

The Natural Resources Conservation Service (NRCS) administers both voluntary and regulatory programs to enhance soil, water and wildlife conservation of private lands. The agency conducts soil mapping and interpretation of soils data and provides analysis and interpretation of site-specific resource data relative to planned land uses. Technical assistance, planning assistance and information also are provided to other agencies to assist in structural and land use planning, land development and resources conservation. Programs of the NRCS:

- Provide technical and financial assistance to implement conservation practices on agricultural lands.
- Support development and adoption of innovative conservation technology.
- Promote conservation of grasslands and wetlands.
- Assist local governments in prevention and mitigation of flood damage.
- Support restoration and enhancement of wetlands.
- Promote development and maintenance of wildlife habitat in agricultural systems.

STATE AND LOCAL AGENCIES, UNIVERSITIES AND ASSOCIATIONS

NATURAL RESOURCES DISTRICTS

Nebraska's 23 Natural Resources Districts (NRDs) are nominally organized on the boundaries of state's river basins. The NRDs are political subdivisions with authority for taxation and limited regulation of natural resources management. Principle responsibilities include flood control, development of ground water management plans, development and enforcement of ground water management regulations, enforcement of erosion control regulations, and conservation of natural resources. Many NRDs are involved in development of natural resource-based recreation. NRD programs provide:

- Technical and financial assistance to install conservation practices on private lands.
- Outreach to promote knowledge about and participation in conservation activities.
- Protection against nonpoint source contamination and depletion of ground water resources.

- Investigation and imposition of remedial action for sediment and erosion complaints.
- Training and certification for nutrient and irrigation management.
- Issuance and oversight of chemigation permits.
- Inspection of chemigation equipment to prevent spills and backflow to ground water.
- Youth and adult education on use and protection of natural resources.

NEBRASKA ASSOCIATION OF RESOURCES DISTRICTS

The Nebraska Association of Resources Districts (NARD) is a coordinating organization that provides legal, financial and management guidance to the state's 23 Natural Resources Districts. The NARD serves as the liaison for the local Natural Resources Districts with the state legislature and state and federal regulatory agencies. The NARD can promote, conduct and coordinate a variety of educational programs within and on behalf of the Natural Resources Districts. NARD programs:

- Coordinate production of materials and programs jointly sponsored by Natural Resources Districts.
- Support inter-district meetings and training sessions for managers and staff of Natural Resources Districts.
- Support natural resources education for youth.
- Support advocacy for natural resources conservation legislation.

NEBRASKA DEPARTMENT OF AGRICULTURE

The Nebraska Department of Agriculture (NDA) administers programs relating to the production, handling, processing and marketing of commodity products in the state. The Nebraska Pesticide Act authorizes the NDA to administer EPA's Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) program to regulate labeling, distribution, storage, transportation, use, application, and disposal of pesticides in Nebraska. NDA requires manufacturers to register products annually. The NDA is responsible for development and implementation of a state management plan for the prevention, evaluation, and mitigation of occurrences of pesticides and their breakdown products in ground water and surface water. NDA programs :

- Regulate handling and use of pesticides.
- Investigate complaints regarding possible misuse of pesticides.
- Provide training and certification of pesticide applicators.
- Assist in collection and disposal of waste pesticides (periodically).
- Support installation and maintenance of vegetated buffer strips.

NEBRASKA DEPARTMENT OF ENVIRONMENTAL QUALITY

The Nebraska Department of Environmental Quality (NDEQ) is charged with protecting the air, land and water resources of the state from pollution. Surface water quality standards developed by NDEQ for waters of the state assure attainment of designated beneficial uses. Various regulatory and non-regulatory programs allow NDEQ to monitor water quality conditions, assess threats to water quality, mediate land and resource uses that affect water quality, and provide planning and implementation of management programs to restore and protect the quality of the state's surface and ground waters. NDEQ is responsible for administering and implementing the state's nonpoint source pollution management program. NDEQ programs:

- Regulate the discharge of water pollutants through issuance and administration of permits for -
    - Discharge of wastewater from municipal, business and industrial facilities.
    - Discharge or land application of biosolids (sludge) from wastewater treatment facilities.
    - Discharge of stormwater from municipalities, industrial facilities and construction sites.
    - Deep-well injection of wastewater from industrial, mining and agricultural processes.
    - Construction and operation of wastewater treatment facilities.
    - Construction and operation of livestock feeding operations.
    - Construction and operation of hazardous waste management facilities.
    - Construction and operation of solid waste disposal facilities.

- Assure compliance with regulations through issuance and administration of certification for –
    - Inspection, installation and pumping of on-site wastewater treatment systems.
    - Application of fertilizer or pesticides through irrigation systems (chemigation).
    - Operation of municipal and industrial wastewater treatment facilities.
    - Compliance with federal permits and licenses with state water quality standards.

- Provide operation and design standards for –
    - Bulk fertilizer and pesticide secondary containment and load-out facilities.
    - Installation and maintenance of on-site wastewater treatment systems.

- Evaluate water quality conditions through –
    - Ambient and targeted monitoring of chemical parameters of surface waters.
    - Targeted biological monitoring of streams.
    - Ambient and targeted monitoring of ground water.
    - Ground water compliance monitoring at landfill, remediation sites and livestock facilities.
    - Surface water compliance monitoring at municipal, business and industrial facilities.
    - Assessment of surface water data to identify impaired reservoirs and streams.
    - Assessment of ground water data to identify threatened and contaminated aquifers.

- Facilitate communication activities that provide –
    - Certification training for wastewater treatment facility operators.
    - Certification training for chemigation operators.
    - Certification training for inspectors, installers and pumpers of on-site wastewater treatment systems.
    - Nutrient and irrigation management education for agricultural producers.
    - Storm water management training for public officials, contractors and consultants.
    - Source water and wellhead protection training for public officials.
    - Promotion of agricultural and urban best management practices.
    - Opportunities for citizen participation in water quality protection.
    - Information on drinking water quality to citizens and public officials.
    - Promotion of efforts and accomplishment in restoring and protecting water quality.

- Provide technical assistance to improve water quality by –
    - Assisting communities in delineating source water protection areas.
    - Assisting communities in identifying contamination threats to drinking water sources.
    - Reviewing design, installation and maintenance plans for on-site wastewater treatment systems.
    - Identifying and delineating areas vulnerable to ground water pollution.
    - Assisting partners in developing management plans for watersheds and ground water recharge areas.
    - Registering on-site wastewater treatment systems.

- Provide financial assistance to improve water quality by providing –
    - Funding to support watershed and ground water management projects.
    - Funding to support water quality communication activities.
    - Low interest loans to install conservation practices to improve and protect water quality.

- Focus efforts to reduce nonpoint source pollution by –
    - Identifying waters impaired by nonpoint source pollution.
    - Determining the relative contribution of pollutant sources to impaired waters.
    - Assessing watershed conditions and determine the load or contribution of pollutants to water resources.
    - Developing and implementing nonpoint source management strategies.

- Developing complementary partnerships to implement nonpoint source management projects.
- Reviewing and evaluating accomplishments of nonpoint source management activities.

NEBRASKA DEPARTMENT OF HEALTH AND HUMAN SERVICES

The Nebraska Health and Human Services System (NDHHS) is responsible for assuring the health, safety and well-being of Nebraska citizens. In cooperation with Nebraska Department of Environmental Quality, NHHSS is the lead agency for administering the Safe Drinking Water Act in Nebraska. Nebraska's safe drinking water regulations are designed to assure that public water systems are built, maintained and operated in a manner that delivers safe drinking water to Nebraska citizens. The NDHSS has authority to require local governments or system operators to develop and enforce local ordinances and other instruments to protect both the system and the source of its water supply. NDHSS programs provide:

- Standards for regulation of water well construction, maintenance and closure.
- Training and licensure of well installers and drinking water system operators.
- Issuance of health advisories for water-borne threats to human health and safety.
- Inspection of on-site wastewater treatment systems when required for property transfers.

NEBRASKA DEPARTMENT OF NATURAL RESOURCES

The Nebraska Department of Natural Resources (NDNR) has responsibility for delegation of surface water rights, oversight of impoundment structures and designation of flood plains in Nebraska. NDNR has general authority to plan, develop, and promote conservation and utilization of soil and water resources in the state, in cooperation with other federal, state and local organizations. It may adopt loss limits for state soils and establish a comprehensive sediment and erosion control program. The NDNR develops and maintains natural resources data bases and provides analysis capabilities to assist other water interests in statewide and area management of soil and water resources. NDNR programs:

- Provide funds to implement soil and water conservation practices.
- Provide funds to develop water resources for the economic and environmental benefit.
- Provide funds to construct impoundments for flood control and recreation.
- Provide funds to construct wetlands and sediment control structures and to protect reservoirs.
- Regulate placement, registration and operation of wells.
- Provide funds to decommission public and private wells.
- Maintain the Agrichemical Contaminant Database of groundwater samples.

NEBRASKA DEPARTMENT OF ROADS

The Nebraska Department of Roads (NDOR) has responsibility for construction and maintenance of state-owned highways, their rights-of-way and support facilities. NDOR reviews and approves construction and maintenance workplans to assure that environmental protection requirements are met and necessary permits are obtained. NDOR activities include erosion control, mechanical and chemical management of vegetation, and application of road maintenance chemicals. The department provides technical advice and assistance to county roads departments as well. NDOR programs provide:

- Compliance with runoff restrictions from construction sites and maintenance facilities.
- Compliance with wetland regulations at construction sites and maintenance facilities.
- Assistance to develop alternative modes of transportation.

NEBRASKA ENVIRONMENTAL TRUST

The Nebraska Environmental Trust (NET) is an independent state board composed of the Directors of key state natural resources agencies and private citizens appointed by the governor. The NET board is charged with management and distribution of a portion of the funds generated by the state lottery for environmental projects that include surface and ground water protection, wetland restoration and protection, wildlife and habitat enhancement, and solid waste recycling. NET activities:

- Provide funds for environmental improvement and protection projects.
- Promote natural resources conservation through communication and advocacy.

NEBRASKA GAME AND PARKS COMMISSION

The Nebraska Game and Parks Commission (NGPC) is responsible for management of fish and wildlife resources in the state and for development and management of state-owned parks, recreation areas and wildlife management areas. It has authority to review permit applications and land and water development plans for compliance with the state Threatened and Endangered Species Act. NGPC enforces wildlife and recreation regulations. Its activities include management of state-owned lands, private lands programs, and enhancement and protection of habitat and development of recreation facilities. NGPC programs:

- Provide data on wildlife and habitat condition.
- Provide planning assistance for resources development.
- Provide funds and guidance for reservoir and stream restoration.
- Provide funds and guidance to enhance, restore or create wetlands.
- Provide funds to improve the quality of habitat on private and public lands.
- Promote enrollment of marginal lands in a variety of USDA programs.
- Provide incentive payments to allow hunter and fisherman access to private lands.

UNIVERSITY OF NEBRASKA - INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES

The University of Nebraska Institute of Agriculture and Natural Resources (IANR) serves as a coordinating bridge among several natural resources-oriented departments of the University including, the Conservation and Survey Division, UN-Extension, UNL Water Center, Nebraska Forest Service, Nebraska Statewide Arboretum, Agricultural Research Division, Center for Advanced Land Management Information Technologies and the School of Natural Resources. IANR serves as the focal point, clearinghouse, partner, and facilitator in the development and education functions that support research and educational outreach efforts regarding nonpoint source pollution throughout Nebraska and beyond. Through these departments, IANR :

- Provides educational programming in a diverse range of topics including agricultural, forest and urban land management, pesticide application, nutrient and irrigation management, livestock management, and hands-on youth and adult education for youth and adults on nonpoint source pollution management.
- Provides technical expertise and assistance at local and state levels.
- Conducts research to improve productivity in agriculture and improve the effectiveness and efficiency of agriculture management systems.
- Conducts research to improve efficiency of nutrient and chemical applications and crop utilization, irrigation methods, tillage systems, and livestock management.
- Conducts research studying the processes of water pollution, intensity and location of contamination, and methods or technologies to remediate or prevent contamination.
- Maintains state geological, water, and soil surveys.
- Perform quality assurance assessment of ground water samples for the Agrichemical Contaminant Database .

LOCAL GOVERNMENTS AND ORGANIZATIONS

COUNTIES, MUNICIPALITIES, AND SANITARY IMPROVEMENT DISTRICTS

Counties, Municipalities, and Sanitary and Improvement Districts are organized as subunits of government with limited authority to regulate activities that may affect environmental quality. These subunits of government may:

- Impose zoning ordinances for location of agricultural and industrial facilities.
- Require special use permits to protect environmentally sensitive areas.

NATIVE AMERICAN TRIBES

Reservations for six Native American tribes (Omaha, Santee Sioux, Ponca, Sac and Fox of Missouri, Iowa, and Winnebago) are located in Nebraska. The tribes administer and set policies for land use practices on tribal lands. The Santee Sioux Nation in north-central Nebraska has an authorized nonpoint source management program. The Santee Sioux, Ponca, Sac and Fox of Missouri, and Winnebago tribes are active in monitoring the quality of tribal waters through other EPA funding programs.

ENVIRONMENTAL ADVOCACY GROUPS

There are numerous non-governmental organizations active in Nebraska that include water quality management issues among their interests. These include local chapters of larger national organizations and local special interest groups. Their activities relative to nonpoint source pollution management range broadly. These include political activism, promotion, education, and financial assistance through cost share or grant funding. Organizations that have been active participants in the state's nonpoint source management program to date include: Nebraska Rural Water Association, Nebraska Wildlife Federation, Pheasants Forever, The Groundwater Foundation and The Nature Conservancy.

COMMODITY GROUPS

Major commodity groups in Nebraska are represented by state associations that monitor legislation affecting their members' interests, provide services to their membership and represent the needs and views of their members and their industry through participation on interagency committees and work groups. The commodity groups primarily provide input on nonpoint source pollution management issues through participation on the USDA state technical committee and informal discussions with Nebraska Department of Environmental Quality and other agencies. In addition, they provide a communication link to their membership. Key groups include Nebraska Cattlemen, Nebraska Corn Growers Association, Nebraska Pork Producers Association, Nebraska Sorghum Growers Association and Nebraska Soybean Association.

Table 9.1 Conservation Programs Listed by Organization and Function

Organization/Program	Acronym	Technical Assistance	Funding Assistance	Research	Communication	Compliance	Planning	Monitoring
Federal Highway Administration (FHWA) www.fhwa.dot.gov/								
Transportation Equity Act for the Twenty-first Century	TEA-21		X					
US Army Corps of Engineers (USACE) www.usace.army.mil/								
Dredge and Fill Permits	CWA S404					X		
Aquatic Habitat Improvement	CWA S1113	X	X				X	
US Bureau of Reclamation (USBR) www.usbr.gov/								
Land Resources Management Program	--					X	X	
Soil Moisture and Conservation Program	--					X		
Rehabilitation and Betterment Program	--	X	X					
US Environmental Protection Agency (EPA) www.epa.gov/								
Nonpoint Source Management Program	CWA S319		X					
Federal Insecticide, Fungicide and Rodenticide Act	FIFRA			X	X	X		
Wellhead Protection Program	WPP	X			X			
Source Water Protection Program	SWPP	X			X			
Underground Storage Tank Program	USTP					X		
Environmental Education Grants Program	EEG		X					
State Revolving Fund Loan Program	SRF							
US Fish and Wildlife Service (FWS) www.fws.gov/								
Federal Aid to Fisheries and Wildlife Management Program	Wallop-Breaux	X	X					
Seasonal Habitat Improvement Program	SHIP	X	X					
Partners for Fish and Wildlife Program	--	X	X					
US Geological Survey (USGS) www.usgs.gov/								
National Ambient Water Quality Assessment Program	NAWQA							X
Cooperative Water Quality Monitoring and Assessment Program	CWP	X	X					X

Organization/Program	Acronym	Technical Assistance	Funding Assistance	Research	Communication	Compliance	Planning	Monitoring
USDA Farm Services Agency (FSA) www.fsa.usda.gov/FSA/								
Conservation Reserve Program	CRP	X	X			X		
Conservation Reserve Enhancement Program	CREP	X	X					
Highly Erodible Lands and Wetland Compliance*	HELWC					X		
USDA Forest Service (USFS) www.fs.fed.us/								
Forest Stewardship Program	FSP	X	X				X	
Center for Semiarid Agroforestry at UNL Program	CSA	X		X	X		X	
USDA Natural Resources Conservation Service (NRCS) www.nrcs.usda.go/								
Agricultural Conservation Easement Program	ACEP	X	X				X	
Conservation Innovation Grants	CIG		X					
Conservation Stewardship Program	CSP	X	X				X	
Healthy Forests Reserve Program	HFRP	X	X				X	
Environmental Quality Incentive Program	EQIP	X	X				X	
Regional Conservation Partnership Program	RCPP	X	X					
Small Watershed Rehabilitation Program**	PL-566	X	X				X	
Highly Erodible Lands and Wetland Compliance ^	HELWC	X						
Voluntary Public Access and Habitat Incentive Program ^^	VPA-HIP		X				X	
Natural Resources Districts (NRDs) www.nrdnet.org/								
Erosion and Sediment Control Program	--	X	X					
Chemigation Permitting Program	--	X	X		X	X		X
Technical Assistance and Land Treatment Cost-Share	--	X	X					
Water Quality Monitoring Programs	--	X	X	X				X
Nutrient and Irrigation Certification Programs	--	X	X		X			

Organization/Program	Acronym	Technical Assistance	Funding Assistance	Research	Communication	Compliance	Planning	Monitoring
Nebraska Association of Resources Districts (NARD) www.nrdnet.org/								
Information and Education Programs	--				X			
Nebraska Department of Agriculture (NDA) www.nda.nebraska.gov/								
Pesticide Applicator Training Program	--				X	X		
Pesticide Collection Program					X			
Nebraska Pesticide Act	--				X			
Nebraska State Buffer Strip Program	--		X		X			
Nebraska Department of Environmental Quality (NDEQ) www.deq.state.ne.us/								
Nonpoint Source Pollution Management Program	CWA S 319	X	X			X		
Community Lakes Enhancement and Restoration Program	CLEAR	X	X		X		X	
Total Maximum Daly Load Program	TMDL					X	X	
Water Quality Certification Program	CWA S401					X		
Surface Water Quality Standards Program	--					X		
Livestock Waste Control Program	--					X		
Water Quality Monitoring and Assessment Program	--							X
Groundwater Management Area Program	--				X	X		X
Wellhead Protection Program	--				X			X
Chemigation Certification Program	--					X		
Agricultural Chemical Secondary Containment Program	NE Title 198					X		
Combined Sewer Over-flows Program	--				X	X		
Integrated Solid Waste Program	--					X		X
National Pollutant Discharge Elimination Program	--					X		
Stormwater Management Program	--				X	X		
Underground Storage Tank Program	--	X	X					

Organization/Program	Acronym	Technical Assistance	Funding Assistance	Research	Communication	Compliance	Planning	Monitoring
NDEQ (Continued)								
Underground Injection Control Program	UIC					X		X
Resource Conservation and Recovery Act	RCRA					X		
On-site Wastewater Treatment Program	--				X	X		
Source Water Protection Program	--				X	X		X
Wastewater Pre-treatment Program	--					X		X
Wastewater Treatment Sludge Disposal Program	--					X		
Clean Water State Revolving Fund Program	--		X					
Drinking Water State Revolving Fund Program	--		X					
Nebraska Department of Health and Human Services (NDHHS) dhhs.ne.gov								
Septic Tank Inspection Program	--	X	X			X		
Well Licensing and Construction Program	--					X		
Nebraska Department of Natural Resources (NDNR) www.dnr.ne.gov/								
Soil and Water Conservation Fund	--		X					
Natural Resources Development Fund	--		X					
Water Well Decommissioning Program	--	X	X					
Nebraska Department of Roads (NDOR) www.transportation.nebraska.gov/								
Transportation Enhancement Program	--	X	X					
Wetland Compliance Evaluation Program	--					X		
Nebraska Environmental Trust (NET) www.environmentaltrust.org/								
Nebraska Environmental Trust Fund	NETF		X					

Organization/Program	Acronym	Technical Assistance	Funding Assistance	Research	Communication	Compliance	Planning	Monitoring
Nebraska Game and Parks Commission (NGPC) outdoornebraska.ne.gov/								
Federal Aid to Fisheries and Wildlife Management Program	--		X					
Aquatic Habitat Improvement Program	--	X	X					
Open Fields and Waters Access Program	--	X	X					
WILD Nebraska Program	--	X	X					
Nebraska Natural Heritage Program	--	X	X	X	X	X	X	X
University of Nebraska Institute of Agriculture and Natural Resources (IANR) www.ianrhome.unl.edu/								
IANR - Extension Programs	--			X	X			
Pheasants Forever (PF) www.pheasantsforever.org/								
Corners for Wildlife Program	--		X					

*=Required to participate in USDA Programs
^=Provides Technical Determinations to FSA used to administer the Highly Erodible Lands and Wetland Provisions of the Farm Bill
**=Not a Farm Bill Program but program is funded through the 2014 Farm Bill
^^=Grants provided to States and Tribes to improve habitat on public access areas.

Table 9.2 Conservation Programs Listed by Organization and Nonpoint Source Issue

Organization/Program	Acronym	Surface Water	Groundwater	Drinking Water	Habitat	Wetlands	Compliance	Other Related Programs	Communication	Land Use
Federal Highway Administration (FHWA) www.fhwa.dot.gov/										
Transportation Equity Act for the Twenty-first Century	TEA-21							X		X
US Army Corps of Engineers (USACE) www.usace.army.mil/										
Dredge and Fill Permits	CWA S404						X			
Aquatic Habitat Improvement	CWA S1113				X			X		
US Bureau of Reclamation (USBR) www.usbr.gov/										
Land Resources Management Program	--									X
Soil Moisture and Conservation Program	--									X
Rehabilitation and Betterment Program	--				X					X
US Environmental Protection Agency (EPA) www.epa.gov/										
Nonpoint Source Management Program	CWA S319	X	X	X	X	X				
Federal Insecticide, Fungicide and Rodenticide Act	FIFRA						X	X		
Wellhead Protection Program	WPP		X	X					X	
Source Water Protection Program	SWPP	X		X						
Underground Storage Tank Program	USTP		X				X			
Environmental Education Grants Program	EEG								X	
State Revolving Fund Loan Program	SRF	X	X	X	X	X			X	
US Fish and Wildlife Service (FWS) www.fws.gov/										
Federal Aid to Fisheries and Wildlife Management Program	Wallop-Breaux	X			X					
Seasonal Habitat Improvement Program	SHIP	X			X					
Partners for Fish and Wildlife Program	--	X			X					
US Geological Survey (USGS) www.usgs.gov/										
National Ambient Water Quality Assessment Program	NAWQA	X	X		X					
Cooperative Water Quality Monitoring and Assessment Program	CWP	X	X		X					

Organization/Program	Acronym	Surface Water	Groundwater	Drinking Water	Habitat	Wetlands	Compliance	Other Related Programs	Communication	Land Use
USDA Farm Services Agency (FSA) www.fsa.usda.gov/FSA/										
Conservation Reserve Program	CRP	X			X					X
Conservation Reserve Enhancement Program	CREP	X	X		X					X
Highly Erodible Lands and Wetland Compliance*	HELWC	X				X	X			X
USDA Forest Service (USFS) www.fs.fed.us/										
Forest Stewardship Program	FSP				X					X
Center for Semiarid Agroforestry at UNL Program	CSA									X
USDA Natural Resources Conservation Service (NRCS) www.nrcs.usda.go/										
Agricultural Conservation Easement Program	ACEP	X			X					X
Conservation Innovation Grants	CIG	X	X	X	X	X		X	X	X
Conservation Stewardship Program	CSP	X	X		X	X		X		X
Healthy Forests Reserve Program	HFRP	X	X		X	X		X	X	X
Environmental Quality Incentive Program	EQIP	X	X		X	X		X		X
Regional Conservation Partnership Program	RCPP	X	X		X	X		X	X	X
Small Watershed Rehabilitation Program**	PL-566							X		X
Highly Erodible Lands and Wetland Compliance ^	HELWC					X	X			X
Voluntary Public Access and Habitat Incentive Program ^^	VPA-HIP				X				X	
Natural Resources Districts (NRDs) www.nrdnet.org/										
Erosion and Sediment Control Program	--	X								X
Chemigation Permitting Program	--	X	X				X			
Technical Assistance and Land Treatment Cost-Share	--	X	X							X
Water Quality Monitoring Programs	--	X	X							
Nutrient and Irrigation Certification Programs	--	X	X				X			

Organization/Program	Acronym	Surface Water	Groundwater	Drinking Water	Habitat	Wetlands	Compliance	Other Related Programs	Communication	Land Use
Nebraska Association of Resources Districts (NARD) www.nrdnet.org/										
Information and Education Programs	--								X	
Nebraska Department of Agriculture (NDA) www.nda.nebraska.gov/										
Pesticide Applicator Training Program	--	X	X	X			X		X	
Pesticide Collection Program		X	X	X			X		X	
Nebraska Pesticide Act	--	X	X				X			
Nebraska State Buffer Strip Program	--	X	X		X					
Nebraska Department of Environmental Quality (NDEQ) www.deq.state.ne.us/										
Nonpoint Source Pollution Management Program	CWA S 319	X	X	X	X	X			X	
Community Lakes Enhancement and Restoration Program	CLEAR	X			X				X	
Total Maximum Daly Load Program	TMDL						X			
Water Quality Certification Program	CWA S401	X					X			
Surface Water Quality Standards Program	--	X					X			
Livestock Waste Control Program	--	X	X				X			
Water Quality Monitoring and Assessment Program	--	X	X				X			
Groundwater Management Area Program	--		X							
Wellhead Protection Program	--		X	X					X	
Chemigation Certification Program	--	X	X				X		X	
Agricultural Chemical Secondary Containment Program	NE Title 198	X	X				X			
Combined Sewer Over-flows Program	--	X								
Integrated Solid Waste Program	--	X	X					X		
National Pollutant Discharge Elimination Program	--	X					X			
Stormwater Management Program	--	X							X	
Underground Storage Tank Program	--		X				X			

Organization/Program	Acronym	Surface Water	Groundwater	Drinking Water	Habitat	Wetlands	Compliance	Other Related Programs	Communication	Land Use
NDEQ (Continued)										
Underground Injection Control Program	UIC		X				X			
Resource Conservation and Recovery Act	RCRA	X	X				X			
On-site Wastewater Treatment Program	--	X	X				X		X	
Source Water Protection Program	--	X	X	X					X	
Wastewater Pre-treatment Program	--						X			
Wastewater Treatment Sludge Disposal Program	--						X			
Clean Water State Revolving Fund Program	--	X								
Drinking Water State Revolving Fund Program	--		X	X						
Nebraska Department of Health and Human Services (NDHHS) dhhs.ne.gov										
Septic Tank Inspection Program	--	X	X							
Well Licensing and Construction Program	--		X				X			
Nebraska Department of Natural Resources (NDNR) www.dnr.ne.gov/										
Soil and Water Conservation Fund	--	X	X		X					X
Natural Resources Development Fund	--	X	X	X	X			X	X	X
Water Well Decommissioning Program	--		X				X			
Nebraska Department of Roads (NDOR) www.transportation.nebraska.gov/										
Transportation Enhancement Program	--	X			X			X		
Wetland Compliance Evaluation Program	--				X	X	X			
Nebraska Environmental Trust (NET) www.environmentaltrust.org/										
Nebraska Environmental Trust Fund	NETF	X	X	X	X	X		X	X	X

Organization/Program	Acronym	Surface Water	Groundwater	Drinking Water	Habitat	Wetlands	Compliance	Other Related Programs	Communication	Land Use
Nebraska Game and Parks Commission (NGPC) outdoornebraska.ne.gov/										
Federal Aid to Fisheries and Wildlife Management Program	--	X			X					
Aquatic Habitat Improvement Program	--	X			X					
Open Fields and Waters Access Program	--	X			X			X		
WILD Nebraska Program	--				X				X	X
Nebraska Natural Heritage Program	--	X			X	X	X	X	X	X
University of Nebraska Institute of Agriculture and Natural Resources (IANR) www.ianrhome.unl.edu/										
IANR - Extension Programs	--	X	X	X	X	X			X	
Pheasants Forever (PF) www.pheasantsforever.org/										
Corners for Wildlife Program	--	X			X					X

*=Required to participate in USDA Programs

^=Provides Technical Determinations to FSA used to administer the Highly Erodible Lands and Wetland Provisions of the Farm Bill

**=Not a Farm Bill Program but program is funded through the 2014 Farm Bill

^^=Grants provided to States and Tribes to improve habitat on public access areas.

Chapter 10 SELECTION OF CONSERVATION PRACTICES

LANDSCAPES

The landscape of Nebraska varies in climate, precipitation, soils, topography, and vegetation. Several entities have mapped the United States including Nebraska, based on these characteristics. Examples include the USDA Plant Hardiness map, the EPA Eco-regions map, and the University of Nebraska-Lincoln Topographic Regions map.

- ***Precipitation.*** Annual precipitation in the state varies from 35 inches in the southeast to 13 inches in the northwest. Higher rainfall areas of the state will have more opportunity for pollutants to be carried by surface runoff to water bodies and streams. The annual distribution of rainfall throughout the year and the local intensity of the rainfall is also important to consider.

- ***Climate.*** Humidity, evaporation, prevailing winds, temperature and precipitation are important considerations when planning conservation practices to address specific pollutants. Precipitation plays the biggest role, but it is important to consider precipitation in context with other elements of climate.

- ***Soils***. Soil type is a vital consideration in selecting conservation practices, specifically, what rainfall interacts with the soil. Sandy soils have very high infiltrations rates and low runoff potential. In contrast, soils with high clay contest have very low infiltration rates and high runoff potential. The soils Hydrologic Soils Group is a useful tool in evaluating watersheds and how they will respond to rainfall events.

- ***Topography.*** The angle and the length of the land's slope and how it relates to the drainage paths in conjunction with the above factors also are important to consider when planning conservation practices to address water quality concerns. Sheet and rill erosion from fields is a primary source of sediment and associated nutrients. Surface runoff after rainfall events transports sediment into streams, lakes and wetlands. Concentrated flow areas or gullies are also sources of sediments transported into water bodies and streams.

Prior to settlement and development by pioneers from the eastern United States, Nebraska was primarily covered by grassland. In general, tall-grass prairies in the southeast portion of the state transitioned through mixed-grass prairies in the central portion of the state to short-grass prairies in the west as precipitation decreased and elevation increased. Soil organic matter followed a similar trend with typically higher organic matter where rainfall was greater and plant growth was more abundant. Riparian and riverine landscapes typically had higher organic matter than their upland counterparts.

Conversion of grasslands to farmland began in the later part of the 1800s and continues today. Acres of cropland in Nebraska rise and fall with the price of grain. Much of Nebraska was farmed by the 1920s, but many acres were seeded back to grass in the period following the Dust Bowl. Erosion from water and wind caused much of the original topsoil to be lost, leaving soil low in organic matter. Irrigation development from large federal surface water projects began in the 1940s. The ability to drill deep irrigation wells allowed relatively level lands to be farmed and gravity irrigated in the uplands. The development of the center pivot allowed land that was not able to be gravity irrigated to be sprinkler irrigated.

Nebraska producers, in some areas of the state, have readily adopted conservation practices to control soil erosion while other parts of the state have been slower to implement these same practices. In general, the majority of fields in Nebraska are treated with one or more conservation practices that control "visible erosion". It is unusual to see visible and active gullies in cropland fields in most of Nebraska. The major threat to water quality is from the "invisible" components (i.e. nutrients and pesticides) that leave the field where they are applied and enter the surface water or ground water. Much of this may occur with relatively low amounts of runoff and soil loss.

It is important to recognize other factors impacting water quality in Nebraska. Streams in eastern Nebraska are impacted by the continued deepening of the channel of the Missouri River. Streams flowing into the Missouri River will continue to deepen and widen until the geomorphic processes again reach equilibrium and establish a new stable grade. This will contribute sediment into drainage systems in the form of streambank and channel erosion and may mask results of upland sediment reductions.

As conservation practices are adopted, soil infiltration rates will increase, runoff will decrease and soil organic matter will increase. Runoff patterns will again begin to approach runoff patterns and rates comparable to the time when the landscape was covered with grass.

SELECTING CONSERVATION PRACTICES

Appropriate conservation practices, when applied, improve or protect water quality. Many factors must be considered when selecting practices including, but not limited to: the type of impairment or threat, type and source of pollutant, size of the drainage area, amount and distribution of rainfall, topography, type and condition of the soil, and current land management practices. Consideration also must be given to managing pollutants through a systems approach that employs multiple practices. Conservation practices that work synergistically deliver more effective control of pollutants than a single practice can provide.

An effective systems approach must be based on a hierarchy of managing pollutants first at the source and last at the point of delivery. The USDA Natural Resources Conservation Service describes this system by the acronym "ACT" (**A**void, **C**ontrol, **T**rap). This system is based on implementing complementary conservation practices with different modes of action along the flow path to improve the efficiency and effectiveness of pollutant control.

> **Avoid.** It is sometimes feasible to eliminate contamination at the source by discontinuing a potentially harmful activity or use of a particular product. Discontinuing the use of a pesticide, for example, would completely eliminate that product from the runoff stream. Where discontinuance of an activity or product is not feasible, altering the activity or application of a product may significantly reduce, but not eliminate, contamination from that source. For example, limiting livestock access to a stream or changing the rate and timing of chemical application can reduce contaminant runoff. Where complete avoidance is not feasible or acceptable, it is important to employ additional complementary conservation practices to further reduce contaminant runoff.
>
> **Control.** Practices that control the direction and rate of runoff can provide additional reduction of contaminants mobilized in the flow stream. These practices allow precipitation, infiltration, absorption or attenuation of contaminants before they reach a receiving water. Filter strips and porous pavement, for example, facilitate infiltration of runoff water into the soil where natural processes degrade and absorb contaminants.
>
> **Trap.** When avoidance and control of pollutant runoff are unfeasible or inadequate, trapping contaminants before they can discharge to receiving waters may be a necessary last line of defense. The distinction between practices that control contaminants and those that trap contaminants, however, is somewhat ambiguous as the practices function in much the same way: precipitation, infiltration, absorption or attenuation of contaminants. Many conservation practices provide both functions. A sediment basin or constructed wetland designed to intercept flow and remove contaminants before discharging to a receiving water are the most clear examples of practices employed to trap contaminants.

Selection of conservation practices should consider all available resource information to ensure that the practices are compatible with the landscape, address the source of pollution and are accepted by the community. Careful

consideration should be given to adopting a complete conservation system that consists of multiple complementary conservation practices employed at both the site-specific and watershed scale.

Examples of conservation practices that have proven to be effective in reducing nonpoint source pollution and are commonly employed in Nebraska are listed in Table 10.1. Many of the these practices are effective in restoring or protecting both surface water and ground water resources from the impacts of nonpoint source pollution. This list is not meant to be exclusive of other practices that may be effective for particular sites or situations. It is meant to identify the function of popular conservation practices and to encourage resource managers to employ suites of complementary practices.

Table 10.1 Common Conservation Practices

Common Practices	Practice Mode of Action			Pollutants Addressed			
	Avoid	Control	Trap	Sediment	Nutrients	E. coli	Pesticide
Cropland							
Contour farming		x	x	x	x		x
Cover crop							
Crop to grass conversion	x			x	x		x
Crop to habitat conversion	x			x	x		x
Irrigation management	x	x		x	x		
No till		x	x	x	x		
Nutrient management	x	x			x		
Pest management	x	x					x
Terrace		x	x	x	x		
Underground outlet/grass waterway		x	x	x	x		
Livestock							
Alternate water supply	x			x	x	x	
Controlled stream crossing	x			x	x	x	
Exclusion fencing	x			x	x	x	
Manure management	x	x			x	x	
Prescribed grazing	x	x		x	x	x	
Vegetative treatment system		x	x		x	x	
Urban							
Bioswale		x	x	x	x	x	
Detention basin		x	x	x	x	x	
Fertilizer management	x	x			x		
Enhanced infiltration (soil amendment)	x	x	x	x	x		
Irrigation management	x	x			x	x	x
Low impact landscaping	x			x	x		x
Pest management							x
Porous pavement		x	x		x	x	x
Rain garden		x	x	x	x	x	x
Rain water harvesting	x	x		x	x	x	

Common Practices	Practice Mode of Action			Pollutants Addressed			
	Avoid	Control	Trap	Sediment	Nutrients	E. coli	Pesticide
Other							
Alum application		x	x		x		
Filter/buffer strip		x	x	x	x	x	x
Grade stabilization structure		x		x			
Grass seeding	x	x		x	x		
Habitat improvement	x	x		x	x	x	
On-site wastewater system upgrade		x			x	x	
Riparian restoration	x	x	x	x	x	x	x
Sediment control basin		x	x	x	x	x	
Sediment removal		x		x	x		
Shoreline stabilization		x		x	x		
Stream bank stabilization		x		x	x	x	
Water diversion	x	x		x	x		
Water retention basin		x	x	x	x	x	x
Well decommissioning	x				x	x	x
Wetland Restoration/Construction		x	X	X	X	x	x
Practice Facilitation							
BMP consultant							
Crop production deferment	x	x		x	x		X

* Note: The above table is meant to provide examples of the most commonly accepted practices employed in Nebraska. It is not meant to preclude other practices that that may be appropriate to specific projects or site conditions.

Chapter 11 PROJECT ELIGIBILITY CATEGORIES FOR SECTION 319 FUNDING

The Nebraska Nonpoint Source Management Program is designed to support both local and statewide projects. However, the scope and scale of projects vary greatly; each offering particular value to the state program, but presenting difficulty in comparability. Five subprograms for external project funding were created to capture the uniqueness of these varied projects, to provide timely response to unforeseen opportunities and to achieve a balance of effective activities within the program. The subprograms are: 1) Watershed-Based Planning, 2) Small Projects Assistance, 3) Community Lakes Enhancement and Restoration, 4) Urban Runoff Management Assistance, and 5) Watershed-Based and Statewide Projects.

Sub-units of government, educational institutions and non-profit organizations (eligible applicants) may apply for project support. Applications for watershed-based and statewide projects are solicited through a request for proposals each fall. Proposals for the other subprograms may be submitted at any time. A proposal selected for funding must be developed into a project implementation plan. Project implementation plans direct activities for individual projects and constitute the required work plan for sub-awards of Section 319 funds. Development of a project implementation plan is not eligible for Section 319 funding.

Section 319 funds may be used to support up to 60% of total project costs for nonpoint source pollution management projects. At least 40% of total project costs must be contributed as match from non-federal sources. (The exception to this allocation of funds is the Community Lakes Enhancement and Restoration subprogram that provides up to 25% of total project costs and requires a match of 75% nonfederal funds.) For the purposes of the Nonpoint Source Pollution Management Program, total project cost is defined as the amount of Section 319 funds plus the amount of required match funds. The nonfederal match may be in the form of cash or services-in-kind. The project sponsor must provide a cash contribution equal to at least 10% of the total project cost as part of the match requirement. (For Community Lakes Enhancement and Restoration projects the community must provide a cash contribution equal to at least 5% of the total project cost as part of the match requirement.) The Department of Environmental Quality reserves the right to adjust match requirements where extenuating circumstances dictate.

The amount of Section 319 funding is capped for projects in the Watershed-Based Planning, Small Projects Assistance, Community Lakes Enhancement and Restoration, and Urban Runoff Assistance subprograms. The Watershed-Based and Statewide Projects subprogram does not have a prescribed limit on the amount of Section 319 funds that can be allocated to a project. These projects should be designed to achieve the measureable objectives of a complete project or to achieve defined milestones of a watershed-based management plan in a phased process. However, individual awards generally will not exceed $300,000 or the amount of funds required to implement the project for two years. Projects exceeding $300,000 Section 319 funds or two years of implementation may be funded in increments. Funding for subprogram projects is subject to approval of a project implementation plan and the availability of federal Section 319 funds. Conditions for project funding are described in Table 11.1.

WATERSHED-BASED PLANNING

The Watershed-Based Planning subprogram provides funding to develop strategic plans to manage sources of nonpoint sources pollution within a defined area that may contribute to the impairment of receiving waters. Watershed-based management plans that incorporate EPA's nine minimum elements of a watershed plan are required to support most projects directed at restoration or protection of streams, lakes and wetlands. However, the characteristics of some water resources or the circumstances driving a need for restoration or protection do

not conform well with addressing all of the nine elements. These include ground water recharge areas, waterbodies with very limited watersheds and emergency management projects. For these situations, an area management plan that incorporates, at a minimum, EPA's five core elements of an Alternative Management Plan may be appropriate.

Strategic planning is a critical component of the process of restoring impaired waters or protecting high quality water resources. Implementation projects must be holistic in addressing all potential pollutants and the needs of individual land managers while also concentrating installation of conservation practices in strategic areas of the drainage that lead to measureable improvement in water quality or sustainable protection of high quality water resources. The Nebraska nonpoint source management program supports three watershed-based planning approaches (Basin Management Plans, Watershed Management Plans, Area Management Plans) designed to support projects.

Watershed-based plans must identify specific priority areas for future management actions within the drainage area and provide sufficient detail for the priority areas to support implementation projects with little additional planning beyond providing watershed specific information in the project implementation plan. The plans should consider both surface water and ground water issues.

Basin Management Plans are meant to achieve the coordination of activities and economies-of-scale envisioned in the Basin Planning Approach promoted by EPA in the early 1990s. In the context of the state Nonpoint Source Management Program, basin management planning is more narrowly focused on identifying water resources within a river basin that are in need of restorative or protective management actions to reduce nonpoint source pollution. Because the boundaries of Nebraska's Natural Resources Districts are delineated primarily by the boundaries of river basins or portions or river basins, basin management plans should address drainages within the jurisdiction of an individual Natural Resources District. Drainage areas that lie within the basin, but outside the boundary of the Natural Resources District, may be included in the basin plan with concurrence of the neighboring District. Basin management plans provide guidance for multiple subwatershed projects planned within the basin. Basin management plans must include EPA's nine minimum elements for watershed plans.

Watershed Management Plans focus on a more local scale that may range in scope from a few thousand acres of an individual waterbody to whole tributaries of larger river systems. They provide direction for one or more subwatershed projects. Watershed management plans must include EPA's required Nine Elements of a Watershed Plan.

Area Management Plans provide guidance for projects to restore or protect water resources that are not defined by watersheds (e.g., ground water) or lack a significant drainage area (e.g., wetland, sand pit lake, community pond). For many of these resources, some of EPA's required nine minimum elements for watershed plans are not relevant. Area management plans should address as many of the nine elements as possible, but must address at least EPA's five elements for an Alternative Management Plan.

SMALL PROJECTS ASSISTANCE

The Small Projects Assistance subprogram provides a rapid funding mechanism for small projects of great importance to the state nonpoint source management program and a mechanism to capture unique opportunities in imminent need of funding. The full range of activities eligible under the Section 319 Program may be implemented on an appropriate scale through a small project. Small projects are especially useful for conducting a local demonstration, activity or event, for initiating a pilot project in preparation for a larger watershed-based or statewide project and for supporting local communication efforts.

COMMUNITY LAKES ENHANCEMENT AND RESTORATION

The Community Lakes Enhancement and Restoration (CLEAR) subprogram provides a mechanism to fund rehabilitation of small community lakes (ponds) that typically form the centerpiece of a community park.

Community lakes are highly valued by citizens for recreation and aesthetics. The value citizens place on these resources for easily accessible recreation provides high visibility and outstanding opportunities to promote the nonpoint source management program.

The impoundment must lie within or immediately adjacent to the jurisdictional boundary of the community and normally must not exceed 5 acres in size. However, projects on impoundments up to 20 acres in size may be considered where minor restoration efforts will effectively restore the resource. Activities eligible for funding under the Community Lakes Enhancement and Restoration subprogram are more limited than other subprograms. Generally, activities are limited to: 1) watershed treatment, 2) design and engineering, 3) shoreline stabilization, 4) sediment removal, 5) improving inlet and outlet structures, 6) aeration systems, 7) volunteer monitoring supplies, and 8) tools and materials for outreach and education. Other practices may be considered on a case-by-case basis. The community lake must be capable of sustaining a warm water fishery following restoration. Sources of nonpoint source pollution determined to be significantly contributing to water quality degradation must be adequately treated prior to or concurrent with the lake renovation project.

A pre-application generally is required for community lake projects. Inquiries should be submitted approximately one year prior to the expected renovation. Specialists from Nebraska Department of Environmental Quality, Nebraska Game and Parks Commission, and University of Nebraska Extension will assist the community in assessing resource conditions and identifying restoration goals and appropriate practices. Formal applications may be submitted at any time after the consultation. Funding for Community Lakes projects generally is coordinated with Nebraska Environmental Trust (NET). The community must contribute at least 15% of the total project cost including a minimum cash contribution equal to 5% of the total project cost. By prior arrangement, the community may receive credit for the value of pre-project planning and design work as part of its match contribution to the project.

URBAN RUNOFF MANAGEMENT ASSISTANCE

The Urban Runoff Management Assistance (URMA) subprogram provides for timely funding to design and install site-specific best management practices to control urban nonpoint source pollution. Installations may be for demonstration or for permanent rehabilitation purposes and may be preemptive or retro-fit in nature. The project area and/or activities must be of a manageable size and scope appropriate for the funding level. Eligible costs include supplies and materials, practice installation, and technical services. Costs for personnel are discouraged.

WATERSHED-BASED AND STATEWIDE PROJECTS

The Watershed-Based and Statewide Projects subprogram represents the more prominent and traditional component of the state nonpoint source management program. It directs efforts to restore and protect water resources within a defined area (watershed-based project) and to implement statewide activities that reduce potential for pollution or support statewide efforts to communicate nonpoint source information to Nebraska citizens (statewide project). The allocation of financial and other resources among these separate project types is not prescribed, but a productive balance among them is expected.

Watershed-based projects, including ground water and wetland projects, support activities to restore or protect water resources. Projects should be designed to provide a holistic treatment of the watershed or designated area, but must specifically address known sources of pollution that impair or threaten the water resource. Installation of select conservation practices should be targeted to areas where contributions of pollutants is highest and to areas where management of the pollutant is most effective. Particular attention should be given to conditions that threaten human health.

Projects should be developed with appropriate partners to leverage financial and technical resources of other conservation programs. Section 319 funds primarily should complement rather than supplant other conservation

programs. Project participants are expected to make reasonable efforts to qualify for cost share assistance from other conservation programs prior to receiving assistance from Section 319 funds.

Individual projects should be designed to achieve measurable results leading to improvement of water quality. This requires concentrated installation of conservation practices in an area of manageable size. For purposes of the nonpoint source management program, this is nominally defined to be up to 30,000 acres. However, the extent and the complexity of the problem and local conditions necessarily dictate the size of the area that may require treatment. Large or highly complex treatment areas should be addressed in phases, directing implementation of conservation practices into smaller subareas through phased projects.

It is well understood that a positive environmental response to implementation of conservation practices may lag for an extended period of time as ecological equilibrium is restored between the watershed and the receiving water. Ground water restoration projects are particularly prone to this difficulty. For some projects, surrogate measures may be necessary to quantify short-term impacts that predict future improvements in water quality from project activities. For example, lower residual nutrient concentration in soils, reduced application of irrigation water, repopulation of aquatic species or modeled reduction of pollutant loads may indicate a trend toward water quality improvement.

Lake and wetland renovation activities are eligible for Section 319 funding provided 75% or more of the land in the drainage area of the waterbody is adequately treated. This standard is adopted from Nebraska Resource Development Fund, Rules and Regulations, Policy Statement VIII (Nebraska Department of Natural Resources). This policy specifically applies to construction of new reservoirs "for the purpose of prolonging the useful life of water storage structures, enhancing water quality, and limiting construction costs." The policy defines adequately treated as land where soil loss, (as calculated by the Revised Universal Soil Loss Equation or other acceptable procedures) is at or below the tolerable soil loss limit as defined in Appendix C of the Nebraska Erosion and Sediment Control Program. Lake and wetland renovation projects should include installation of structural conservation practices within the waterbody or additional conservation practices in the watershed as part of a watershed management approach to protect the investment in the renovation.

Statewide projects support activities that address universal nonpoint source pollution issues that are best addressed at a regional or statewide level. For example, projects might serve to broadly introduce new management practices through statewide or regional demonstration sites, provide equipment and technological assistance to enhance implementation of conservation practices, enhance collection of environmental data and information to improve management decisions, or remove toxic compounds through a statewide collection and disposal effort. While limited in number, these projects may produce long-term benefits in avoiding future water quality impairments.

Statewide projects also support activities to enhance statewide capacity to provide communication about nonpoint source pollution. Projects must focus on development of delivery systems, programming and materials designed to change attitudes and behaviors of target audiences. Materials and methods also should be designed to be applicable to support local watershed–based projects.

Table 11.1 General Conditions for Section 319 Project Funding

Subprogram	Section 319 Award Limit	Non-Federal Match[1] Requirement	Sponsor Cash Match Requirement[2]	Time Limit	Application Period	Approval
Basin Planning	$120,000	40%	10%	1 year	On-going	EPA
Watershed and Area Planning	$90,000	40%	10%	1 year	On-going	EPA
Small Project Assistance	$15,000	40%	10%	1 year	On-going	NDEQ
Community Lakes Enhancement And Restoration	$85,000	75%	5%	2 year	On-going	EPA
Urban Runoff Management Assistance	$75,000	40%	10%	1 year	On-going	EPA
Watershed-Based and Statewide Projects	$300,000[3]	40%	10%	3 years	Annual RFP	EPA

[1] The formula for determining the value of Section 319 funds and match funds is defined as: Total Project Cost = Section 319 Funds + Required Match. The value of the match must equal the required percentage of the total project cost. Additional non-federal funds may exceed the minimum match, but are not calculated in the total cost formula. Other federal funds are not considered in the total cost formula.

[2] The sponsor's minimum cash contribution is included as part of the non-federal match requirement.

[3] A strict limit of Section 319 funds for Watershed-Based and Statewide Projects is not defined. Section 319 funding should be commensurate with the scope of the project. Projects exceeding the guideline of $300,000 limit for Section 319 funds or three years of implementation may be funded in increments or as phased projects.

APPENDICES

APPENDIX A SCHEDULE/COST ESTIMATES/LOAD ESTIMATES

A time table for completing tasks and activities to implement the Nebraska Nonpoint Source Management Plan over the next 15 years is presented in Table A.1. The tasks and activities identified in the table are based on a projection of tasks and activities required to meet 2014 EPA Guidelines for the program and an estimate of tasks and activities traditionally performed to implement the state program.

The estimated cost for implementing the state program from 2015 through 2030 (Table A.2) is based on the average cost of select tasks and activities over recent years or on projected costs for tasks and activities new to the program.

Estimates of pollutant load reductions over the life of the 2015-2030 are presented in Table A.3. These values are based on average load reductions realized for similar projects in recent years.

Table A.1 State Management Plan – Schedule

Activity	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total Tasks
Administration and Operations																	
Personnel and Operations	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
Update Resource Priority Lists	1	1		1		1		1		1		1		1		1	9
Annual Report	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
Success Stories		2			1			2			1			2			8
Revise Nonpoint Source Management Plan					1					1					1		3
Monitoring and Monitoring Supplies	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
Outreach																	
Guidance Documents		2	1	1													4
Project Training Workshop	1			1			1			1			1			1	6
Special Services																	
Liaisons	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
Wellhead Protection Network	1		1		1		1		1		1		1		1		8
Agrichemical Data Clearinghouse		1		1		1		1		1		1		1		1	8
Planning																	
Basin Management Plans	2	1			1			1			1			1			7
Watershed Management Plans	3	1		1		1		1		1		1		1		1	11
Area Management Plans	1		1		1		1		1		1		1		1		8
Supported Projects																	
Targeted Studies and Special Initiatives	1			1			1			1			1			1	6
Small Projects	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3	40
CLEAR projects	1	1			1			1			1			1			6
Urban Runoff Management			1			1			1			1			1		5
Watershed Projects	3	4	5	5	4	5	5	4	5	5	4	5	4	4	5	5	72
Groundwater Projects	1		1			1			1			1			1		6
Waterbody Restoration Projects	1	1			1			1			1			1			6
Statewide Projects	1			1			1			1			1			1	6
Local Outreach/Demonstration Projects	1		1		1		1		1		1		1		1		8
TOTAL	24	21	17	19	18	17	17	19	16	19	17	17	16	19	17	18	291

Table A.2 State Management Plan – Estimated Costs

Activity	Units	Unit Cost	Total Cost	Section 319 Funds	EQIP Funds	NET Funds	NGPC Funds	Local Funds
Administration and Operations								
Personnel and Operations	16	$820,000	$13,120,000	$13,120,000	$0	$0	$0	$0
Update Resource Priority Lists	9	$0	$0	$0	$0	$0	$0	$0
Annual Report	16	$0	$0	$0	$0	$0	$0	$0
Success Stories	8	$0	$0	$0	$0	$0	$0	$0
Revise Nonpoint Source Management Plan	3	$0	$0	$0	$0	$0	$0	$0
Monitoring and Monitoring Supplies	16	$350,000	$5,600,000	$4,480,000	$0	$280,000	$0	$840,000
Outreach								
Guidance Documents	4	$1,000	$4,000	$4,000	$0	$0	$0	$0
Project Training Workshop	6	$1,000	$6,000	$6,000	$0	$0	$0	$0
Special Services								
Liaisons	16	$210,000	$3,360,000	$3,192,000	$0	$0	$0	$168,000
Wellhead Protection Network	8	$30,000	$240,000	$240,000	$0	$0	$0	$0
Agrichemical Data Clearinghouse	8	$70,000	$560,000	$560,000	$0	$0	$0	$0
Planning								
Basin Management Plans	7	$300,000	$2,100,000	$840,000	$0	$840,000	$0	$420,000
Watershed Management Plans	11	$200,000	$2,200,000	$880,000	$0	$880,000	$0	$440,000
Area Management Plans	8	$200,000	$1,600,000	$640,000	$0	$640,000	$0	$320,000
Supported Projects								
Targeted Studies and Special Initiatives	6	$150,000	$900,000	$540,000	$0	$0	$0	$360,000
Small Projects	40	$25,000	$1,000,000	$600,000	$0	$0	$0	$400,000
CLEAR projects	6	$340,000	$2,040,000	$433,500	$0	$1,300,500	$0	$306,000
Urban Runoff Management	5	$125,000	$625,000	$375,000	$0	$0	$0	$250,000
Watershed Projects	72	$500,000	$36,000,000	$9,000,000	$18,000,000	$5,400,000	$0	$3,600,000
Groundwater Projects	6	$500,000	$3,000,000	$750,000	$1,500,000	$450,000	$0	$300,000
Waterbody Restoration Projects	6	$3,000,000	$18,000,000	$3,600,000	$0	$5,400,000	$8,100,000	$900,000
Statewide Projects	6	$100,000	$600,000	$360,000	$0	$0	$0	$240,000
Local Outreach/Demonstration Projects	8	$90,000	$720,000	$432,000	$0	$0	$0	$288,000
TOTAL			$91,675,000	$40,052,500	$19,500,000	$15,190,500	$8,100,000	$8,832,000

Table A.3 State Management Plan – Estimated Load Reductions

Activity	Units	Average Nitrogen	Average Phosphorus	Average Sediment	Nitrogen (pounds)	Phosphorus (pounds)	Sediment (tons)
Supported Projects					0	0	0
CLEAR Projects	6	24,216	20,538	12,929	145,296	123,228	77,574
Urban Runoff Management	5	1,723	14	84	8,615	70	420
Watershed Projects	72	1,909	2,206	6,766	137,448	158,832	487,152
Groundwater Projects	6	764	882	2,706	4,582	5,294	16,238
Waterbody Restoration Projects	6	272,822	28,681	87,952	1,636,932	172,086	527,712
Local Outreach/Demonstration Projects	8	1	8	31	8	64	248
TOTAL	103				1,932,881	459,574	1,109,344

APPENDIX B SHORT TERM ACTION ITEMS

While this management plan is written for the years 2015-2030, the challenges and opportunities that will be presented in that time frame limit the accuracy of activities planned far in advance. It is necessary, therefore, to focus more attention on near-term activities that predictably can be accomplished within five years. The list of short-term activities will be continually evaluated and revised through periodic amendments to the Nonpoint Source Management Plan. However, even in the shorter time frame, unforeseen opportunities arise to implement actions that advance the goals of the Nonpoint Source Management Plan. Actions to address these additional opportunities will be identified in NDEQ's Section 319 Annual Plan of Work. The list below identifies tasks that are expected to be completed in the next 3-5 years.

Program Development

Redevelop a Nebraska Water Quality Special Initiative (NRCS, NDEQ)
Coordinate with National Water Quality Initiative (NRCS, NDEQ)
Develop an electronic records management process (NDEQ)
Maintain interagency liaison positions with NDEQ's Section 319 program (NDEQ, NRCS, UNE, NARD)
Identify and develop sources for program match-only projects (NDEQ)
Develop a strategy for Match Banking (NDEQ)
Develop a strategy for pre-approved project implementation plans (NDEQ)
Strengthen coordination with the Nebraska Aquatic Habitat Improvement Program (NGPC, NDEQ)
Strengthen partnerships with wetland and wildlife conservation organizations (NDEQ, NGPC, Various)
Integrate CWSRF Linked Deposit Program with nonpoint source management projects (NDEQ)

Communication

Develop guidance for basin management planning (NDEQ)
Revised guidance for watershed management planning (NDEQ)
Develop guidance for ground water recharge area management planning (NDEQ)
Develop guidance for designing and implementing project communication actions (UNE, NDEQ)
Develop guidance and curriculum for school-based water monitoring (UNE)
Conduct a workshop on developing basin, watershed and area management plans (NDEQ)
Conduct a workshop on developing project proposals and project implementation plans (NDEQ)
Develop materials and strategies to reach underserved audiences (UNE, NDEQ)

Targeted Studies and Special Initiative

Assess the impact of cover crops as a conservation practice (UNE)
Assess the impact of blue-green algae and blue-green algae treatment on water quality and aquatic life (UNE)
Assess the impact of communication targeted to primary influencers of land owners and land users (UNE, NDEQ)

Basin Management Plans

Develop a plan for Little Blue River Basin (Little Blue NRD)
Develop a plan for Missouri Tributaries (Papio-Missouri River NRD)
Develop a plan for Nemaha River Basin (Nemaha NRD)
Develop a plan for South Loup River Basin (Lower Loup NRD)
Develop a plan for Upper Niobrara-White Basin (Upper Niobrara-White NRD)
Develop a plan for Upper Salt Creek Basin (Lower Platte South NRD)

Watershed Management Plans

Develop a plan for Bazile Creek (NDEQ, Santee Sioux Nation, Lewis and Clark NRD)
Develop a plan for Kirkman's Cove (Nemaha NRD)
Develop a plan for Long Pine Creek (Middle Niobrara NRD)
Develop a plan for Lower Platte River Corridor (Lower Platte River Corridor Alliance)

Develop a plan for Shell Creek (Revision) – (Lower Platte North NRD & Shell Creek Watershed Improvement Group)
Upper Little Salt Creek Wetlands Management Plan (Lower Platte South NRD, NGPC)

Ground Water Area Management Plans
Develop a plan for Bazile Ground Water Management Area (Upper Elkhorn NRD)

Waterbody Renovations
Atlanta Basin Wetland (Rainwater Basin Joint Venture)
Conestoga Lake (NGPC, Lower Platte South NRD)
Funk Water Fowl Production Area (USFWS)
Jensen Water Fowl Production Area (USFWS)
Johnson Waterfowl Production Area (Rainwater Basin Joint Venture)
Laing Lake (City of Alliance)
Macon Lakes Wetlands (Rainwater Basin Joint Venture)
Marsh Wren Wetland (Lower Platte South NRD)
Prairie Dog Water Fowl Production Area (USFWS)
Ritterbush Water Fowl Production Area (USFWS)
Rockford Lake (NGPC, Lower Big Blue NRD)
Sacramento-Wilcox Wildlife Management Area (NGPC)
Sand Draw Creek (Middle Niobrara NRD, Brown County)
Spoonbill Flats Wetland (Rainwater Basin Joint Venture)
Upper Little Salt Creek Wetlands (Lower Platte South NRD, NGPC)
Youngson Water Fowl Production Area (USFWS)

APPENDIX C STREAMS IDENTIFIED FOR RESTORATIVE OR PROTECTIVE MANAGEMENT ACTIONS

The process for identifying streams for restorative or protective management actions is described in "Identification of Waters for Management Actions" in Chapter 2. Streams identified for restorative management actions are listed in Table C.1. Streams identified for protective management actions are listed in Table C.2. Projects regarding restoration or protection of streams should be implemented as part of a watershed management approach.

The list of Impaired Streams Identified for Restorative Management Actions (Table C.1) is not intended to be exclusive. Rather, it is meant to encourage development of projects to restore streams where nonpoint source impairments are known to exceed water quality standards. Other stream restoration projects may be considered where supporting data justify the project.

The list of High-Quality Streams Identified for Protective Management Actions is not intended to be exclusive. Rather, it is meant to encourage development of projects to protect streams threatened, but not yet impaired, by nonpoint source pollution. Other stream protection projects may be considered where supporting data justify the project.

As new water quality data assessments are completed, these lists will be revised and published through the annual request for project proposals.

Table C.1 Impaired Streams Identified for Restorative Management Actions

Waterbody ID	Waterbody Name	Class[1]	Impairment			TMDL[2]	Management Plan[3]
			E. Coli	Atrazine	Aquatic Life		
BB1-10100	Mission Creek	WA	x	x	x	2013	2014
BB1-10800	Big Indian Creek	WA	x	x	x	2013	2014
BB1-10900	Big Indian Creek	WB		x	x	2013	2014
BB2-10000	Turkey Creek	WA	x	x	x	2013	2014
BB2-20000	Turkey Creek	WA	x	x	x	2013	2014
BB3-10000	West Fork Big Blue River	WA	x	x	x	2013	
BB3-10200	Walnut Creek	WB			x		
BB3-10300	Beaver Creek	WB		x	x	2013	
BB3-10400	Beaver Creek	WB			x		
BB3-20000	West Fork Big Blue River	WA	x	x	x	2013	
BB3-20100	School Creek	WB		x	x		
BB4-20800	Lincoln Creek	WB		x	x	2013	
BB4-20900	Lincoln Creek	WB			x		
EL1-10700	Bell Creek	WB			x		
EL1-10932	Dry Creek	WB			x		
EL1-10940	West Fork Maple Creek	WB			x		
EL1-20100	Pebble Creek	WA	x		x	2009	
EL1-21000	Rock Creek	WA	x		x		
EL1-21900	Union Creek	WA	x				
EL1-22100	Union Creek	WA			x		
EL2-10000	Logan Creek	WB	x				
EL2-20000	Logan Creek	WA	x				
EL2-20400	Rattlesnake Creek	WB			x		
EL2-20800	South Logan Creek	WA	x				
EL2-40200	Middle Logan Creek	WA			x		
EL3-20200	Willow Creek	WA	x				
EL3-20400	Dry Creek	WB	x				
EL4-10400	Battle Creek	WA	x				
EL4-11300	Cedar Creek	WA	x				
EL4-20000	Elkhorn River	WA	x			2009	
LB1-10200	Rock Creek	WA	x			2013	
LB2-10100	Big Sandy Creek	WB	x	x	x	2013	
LB2-10500	Spring Creek	WB			x		
LB2-10600	Spring Creek	WB			x		
LO1-10600	Beaver Creek	WA	x				

Waterbody ID	Waterbody Name	Class[1]	Impairment			TMDL[2]	Management Plan[3]
			E. Coli	Atrazine	Aquatic Life		
LO1-10700	Beaver Creek	WA	x		x		
LO2-11300	Calamus River	CB	x				
LO2-11400	Calamus River	CB	x			2006	
LO3-10200	Turkey Creek	WB		x			
LO3-10400	Oak Creek	WB			x		
LO3-50300	Dismal River	CB	x			2006	
LO4-10100	Mud Creek	WB	x	x	x	2012	
LO4-10200	Mud Creek	WB	x		x	2012	
LP1-20600	Shell Creek	WA	x				2005
LP1-20700	Shell Creek	WB		x	x	2007	2005
LP1-20800	Shell Creek	WB			x		2005
LP2-10100	Wahoo Creek	WA	x			2007	2013
LP2-10110	Clear Creek	WA	x				2013
LP2-10121	Johnson Creek	WB			x		2013
LP2-10210	Cottonwood Creek	WB			x		2013
LP2-20300	Little Salt Creek	WB			x		
LP2-20400	Dead Man's Run	WB	x			2007	
LP2-20500	Oak Creek	WA	x			2007	
LP2-20600	Oak Creek	WB	x		x		
LP2-20710	Middle Oak Creek	WB		x	x		
LP2-20800	Oak Creek	WB		x	x		
LP2-20900	Antelope Creek	WB	x			2007	2012
LP2-21100	Middle Creek	WB		x	x	2007	
LP2-21500	Beal Slough	WB	x				
LP2-30100	Cardwell Branch	WB	x				
LP2-40300	Olive Branch	WB			x		
MP1-10100	Clear Creek	CB	x				
MP2-20300	Spring Creek	WA	x				
MT1-10100	Papillion Creek	WA	x			2009	
MT1-10110	Big Papillion Creek	WA	x			2009	
MT1-10111	Little Papillion Creek	WB	x			2009	
MT1-10111.1	Cole Creek	WB	x			2009	
MT1-10111.2	Thomas Creek	WB			x		
MT1-10120	Big Papillion Creek	WA	x			2009	
MT1-10200	Papillion Creek	WA	x			2009	
MT1-10210	Walnut Creek	WB			x		2002
MT1-10240	South Papillion Creek	WB			x		
MT1-10252	North Branch West Papillion Creek	WB			x		

Waterbody ID	Waterbody Name	Class[1]	Impairment			TMDL[2]	Management Plan[3]
			E. Coli	Atrazine	Aquatic Life		
MT1-11510	Silver Creek	WB			x		
MT1-12000	Omaha Creek	WA	x				
MT1-12150	North Omaha Creek	WB			x		
MT2-10100	Elk Creek	WA	x				
MT2-10400	Elk Creek	WB			x		
MT2-10500	Aowa Creek	WA	x				
MT2-10520	South Creek	WA	x		x		
MT2-10521	Daily Branch	WB	x				
MT2-10530	South Creek	WB	x				
MT2-10540	South Creek	WB			x		
MT2-11300	Bow Creek	WA	x				
MT2-11800	Antelope Creek	WB			x		
MT2-12400	Bazile Creek	WB	x				
MT2-12500	Bazile Creek	WA	x				
NE1-10200	Winnebago Creek	WB			x		
NE1-12310	Unnamed Creek	WB	x				
NE1-13000	Weeping Water Creek	WB	x				
NE2-10600	Muddy Creek	WA	x		x	2007	
NE2-10750	Little Muddy Creek	WB	x				
NE2-11200	Pony Creek	WA	x				
NE2-12130	Turkey Creek	WA	x			2007	
NE2-12330	Long Branch Creek	WA	x		x	2007	
NE3-10000	Little Nemaha River	WA	x			2007	
NI1-10100	Ponca Creek	WA	x				
NI2-10100	Verdigre Creek	WA	x		x		
NI2-10320	East Branch Verdigre Creek	CA	x				2005
NI2-10800	Steel Creek	CA	x				
NI2-11700	Eagle Creek	CB	x				
NI3-10100	Keya Paha River	WA	x				
NI3-12200	Long Pine Creek	CB	x			2006	
NI3-12220	Bone Creek	CB	x				
NI3-12400	Long Pine Creek	CA	x				
NI3-13000	Plum Creek	CB	x			2006	
NI3-13100	Plum Creek	CA	x			2006	
NI3-21900	Minnechaduza Creek	CB	x			2006	
NI3-22500	Snake River	CB	x			2006	
NP1-30900	Whitetail Creek	CB	x				
NP2-12100	Lower Dugout Creek	CB			x		

Waterbody ID	Waterbody Name	Class[1]	Impairment			TMDL[2]	Management Plan[3]
			E. Coli	Atrazine	Aquatic Life		
NP3-10600	Upper Dugout Creek	WB			x		
NP3-10900	Red Willow Creek	CB	x			2012	
NP3-11700	Ninemile Creek	CB	x			2012	2004
NP3-12000	Ninemile Creek	CA	x				2004
NP3-12400	Gering Drain	CA	x			2012	
NP3-12600	Winters Creek	CA	x			2012	
NP3-13000	Tub Springs Drain	CA	x			2012	
NP3-30600	Horse Creek	CB	x			2012	
RE1-10200	Lost Creek	WB	x				
RE1-31200	Thompson Creek	CB	x				
RE2-10100	Methodist Creek	WB	x				
RE2-10200	Cook Creek	WB	x				
RE2-10300	Prairie Dog Creek	WB	x				
RE2-10610	Beaver Creek	WB	x				
RE2-10900	Spring Creek	WB			x		
RE3-10200	Medicine Creek	WA	x				
RE3-10300	Medicine Creek	WA	x				
RE3-10400	Medicine Creek	WA	x				
RE3-10500	Red Willow Creek	WB	x				
RE3-10600	Red Willow Creek	WA	x		x		
RE3-20200	Frenchman Creek	CB	x				
RE3-20220	Stinking Water Creek	CB	x				
RE3-20300	Frenchman Creek	CB	x			2005	
RE3-20400	Frenchman Creek	CB	x				
RE3-50400	Arikaree River	WB	x				
WH1-11300	Chadron Creek	CA	x				
WH1-20100	White Clay Creek	CB	x				
WH1-20310	Middle Fork Soldier Creek	CA			x		

[1] Stream classes include:
CA – Cold Water Class A stream.
CB – Cold Water Class B Stream.
WA – Warm Water Class A Stream.
WB – Warm Water Class B Stream.

[2] A Total Maximum Daily Load was approved in the year indicated.

[3] A nine-element management plan was approved in the year indicated.

Table C.2 High-Quality Streams Identified for Protective Management Actions

Waterbody ID	Waterbody Name	Class[1]	TMDL[2]	Management Plan[3]
BB1-10400	Plum Creek	WA		2014
BB1-11110	Bloody Run	WB		2014
BB1-11400	Bear Creek	WA		2014
BB1-11600	Indian Creek	WB		2014
LB1-10400	Rose Creek	WA		
LO1-30310	Timber Creek	WB		
LO2-10400	Mira Creek	WB		
LO3-50200	Dismal River	CB		
LP2-10161	Duck Creek	WB		2013
LP2-10170	Sand Creek	WB		2013
LP2-21000	Middle Creek	WB		
LP2-21210	Holmes Creek	WB		
MP2-20400	Plum Creek	WA		
MT1-10112	Little Papillion Creek	WB		
MT1-10251	Boxelder Creek	WB		
MT1-12100	Omaha Creek	WB		
NE1-11700	Buck Creek	WB		
NE2-12135	West Branch Turkey Creek	WB		
NI2-11300	Louse Creek	CA		
NI3-22400	Snake River	CA		
NP2-10300	Otter Creek	CA	2012	
NP3-11200	Red Willow Creek	CA		
NP3-11900	Ninemile Creek	CA		2003
NP3-12700	Winters Creek	CA		
NP3-30400	Sheep Creek	CB		
RE2-11100	Turkey Creek	WB		
RE3-10800	Driftwood Creek	WB		
RE3-50100	Buffalo Creek	WA		
WH1-11120	Big Bordeaux Creek	CB		
WH1-20300	Soldier Creek	CA		
WH2-10240	Monroe Creek	CA		
WH2-30000	Hat Creek	CB		

[1] Stream classes include:
CA – Cold Water Class A stream.
CB – Cold Water Class B Stream.
WA – Warm Water Class A Stream.
WB – Warm Water Class B Stream.

[2] A Total Maximum Daily Load was approved in the year indicated.

[3] A nine-element management plan was approved in the year indicated.

APPENDIX D LAKES IDENTIFIED FOR RESTORATIVE OR PROTECTIVE MANAGEMENT ACTIONS

The process for identifying lakes for restorative or protective management actions is described in "Identification of Waters for Management Actions" in Chapter 2. Lakes identified for restorative management actions are listed in Table D.1. Lakes identified for protective management actions are listed in Table D.2. Projects regarding restoration or protection of lakes should be implemented as part of a watershed management approach.

The list of Impaired Lakes Identified for Restorative Management Actions (Table D.1) is not intended to be exclusive. Rather, it is meant to encourage development of projects to restore lakes where nonpoint source impairments are known to exceed water quality standards. Other lake restoration projects may be considered where supporting data justify the project.

The list of High-Quality Lakes Identified for Protective Management Actions (Table D.2) is not intended to be exclusive. Rather, it is meant to encourage development of projects to protect lakes threatened, but not yet impaired, by nonpoint source pollution. Other lake protection projects may be considered where supporting data justify the project.

As new water quality data assessments are completed, these lists will be revised and published through the annual request for project proposals.

Table D.1 Impaired Lakes Identified for Restorative Actions

Waterbody ID	Lake Name	Impairment					TMDL[1]	Management Plan[2]
		Phosphorus	Nitrogen	Sediment	E. coli	Other		
BB1-L0010	Donald Whitney Memorial Lake	Phosphorus	Nitrogen					2014
BB1-L0020	Diamond Lake South	Phosphorus	Nitrogen					2014
BB1-L0030	Big Indian 11A	Phosphorus	Nitrogen	Sediment			2009	2014
BB1-L0040	Arrowhead Lake	Phosphorus	Nitrogen					2014
BB1-L0060	Rockford Lake	Phosphorus	Nitrogen					2014
BB1-L0080	Cub Creek Lake	Phosphorus	Nitrogen		E. coli			2014
BB1-L0100	Walnut Creek Lake 2A	Phosphorus	Nitrogen					2014
BB2-L0005	Swanton Lake	Phosphorus	Nitrogen					2014
BB2-L0020	Swan Creek Lake 5A	Phosphorus	Nitrogen					2014
BB3-L0030	Waco Basin	Phosphorus	Nitrogen					
BB3-L0050	Lake Hastings	Phosphorus	Nitrogen	Sediment				
BB3-L0060	Hastings Northwest Dam Lake	Phosphorus	Nitrogen					
BB3-L0080	Recharge Lake	Phosphorus	Nitrogen					
BB4-L0035	Oxbow Trail Reservoir	Phosphorus	Nitrogen					
EL1-L0080	Maskenthine Reservoir	Phosphorus	Nitrogen					
EL3-L0010	Willow Creek Reservoir	Phosphorus	Nitrogen			Algal Toxin		
LB1-L0010	Buckley Reservoir 3F	Phosphorus	Nitrogen					
LB1-L0020	Crystal Springs Northwest Lake	Phosphorus	Nitrogen					
LB1-L0030	Crystal Springs Center Lake	Phosphorus	Nitrogen					
LB1-L0040	Crystal Springs East Lake	Phosphorus	Nitrogen		E. coli			
LB1-L0050	Lone Star Lake	Phosphorus	Nitrogen					2008
LB2-L0030	Alexandria Lake No. 3	Phosphorus	Nitrogen			Algal Toxin		
LB2-L0050	Liberty Cove Lake	Phosphorus	Nitrogen					
LB2-L0070	Crystal Lake, SRA	Phosphorus	Nitrogen					
LO1-L0130	Pibel Lake	Phosphorus	Nitrogen					

Waterbody ID	Lake Name	Impairment					TMDL[1]	Management Plan[2]
		Phosphorus	Nitrogen	Sediment	E. coli	Other		
LO2-L0015	Davis Creek Reservoir	Phosphorus	Nitrogen					
LP1-L0230	Fremont Lake No. 17, SRA	Phosphorus	Nitrogen				2013	2011
LP1-L0270	Fremont Lake No. 16, SRA		Nitrogen				2013	2011
LP1-L0290	Fremont Lake No. 1, SRA	Phosphorus					2013	2011
LP1-L0300	Fremont Lake No. 2, SRA		Nitrogen				2013	2011
LP1-L0310	Fremont Lake No. 3, SRA		Nitrogen				2013	2011
LP1-L0320	Fremont Lake No. 5, SRA	Phosphorus	Nitrogen				2013	2011
LP1-L0330	Fremont Lake No. 4, SRA		Nitrogen				2013	2011
LP1-L0350	Fremont Lake No. 7 and 8, SRA		Nitrogen				2013	2011
LP1-L0355	Homestead Lake		Nitrogen					
LP2-L0030	Wagon Train Lake	Phosphorus	Nitrogen				2002	2003
LP2-L0040	Holmes Lake	Phosphorus	Nitrogen				2003	2003
LP2-L0050	Stagecoach Lake	Phosphorus	Nitrogen	Sediment				
LP2-L0090	Yankee Hill Lake	Phosphorus	Nitrogen	Sediment			2002	
LP2-L0100	Bowling Lake	Phosphorus	Nitrogen	Sediment			2001	
LP2-L0110	Bluestem Lake	Phosphorus	Nitrogen	Sediment				
LP2-L0120	Wildwood Lake	Phosphorus	Nitrogen					
LP2-L0130	Conestoga Lake	Phosphorus	Nitrogen	Sediment				2011
LP2-L0140	Olive Creek Lake	Phosphorus	Nitrogen					
LP2-L0150	Branched Oak Lake	Phosphorus	Nitrogen					
LP2-L0160	Pawnee Lake	Phosphorus	Nitrogen	Sediment		Algal Toxin	2001	
LP2-L0220	Meadow Lark Lake	Phosphorus	Nitrogen					
LP2-L0240	East Twin Lake	Phosphorus	Nitrogen					
LP2-L0260	West Twin Lake	Phosphorus	Nitrogen					
LP2-L0270	Czechland Lake	Phosphorus	Nitrogen					2013
LP2-L0280	Redtail Lake	Phosphorus						
MP2-L0410	Blue Hole East Lake, WMA	Phosphorus						

Waterbody ID	Lake Name	Impairment					TMDL[1]	Management Plan[2]
		Phosphorus	Nitrogen	Sediment	E. coli	Other		
MP2-L0570	Gallagher Canyon Reservoir	Phosphorus						
MP2-L0650	Lake Helen	Phosphorus	Nitrogen					2013
MT1-L0025	Walnut Creek Lake	Phosphorus	Nitrogen					1998
MT1-L0030	Wehrspann Lake, Site No. 20	Phosphorus	Nitrogen					
MT1-L0050	Ed Zorinsky Lake, Site No. 18	Phosphorus	Nitrogen				2002	1997
MT1-L0100	Standing Bear Lake, Site No. 16	Phosphorus	Nitrogen	Sediment			2003	2000
MT1-L0120	Glenn Cunningham Lake	Phosphorus	Nitrogen					2005
MT2-L0005	Powder Creek Lake	Phosphorus	Nitrogen					2003
MT2-L0010	Buckskin Hills Lake	Phosphorus						
MT2-L0020	Chalkrock Lake	Phosphorus	Nitrogen					
NE2-L0040	Kirkman's Cove Lake	Phosphorus	Nitrogen	Sediment	E. coli		2002	2003
NE2-L0090	Iron Horse Trail Lake	Phosphorus	Nitrogen				2006	2004
NE2-L0120	Burchard Lake, WMA	Phosphorus	Nitrogen					
NE3-L0030	Prairie Owl Lake	Phosphorus						
NI3-L0070	Cub Creek Lake	Phosphorus	Nitrogen					
NI3-L0220	Big Alkali Lake, WMA	Phosphorus	Nitrogen					
NP1-L0030	Lake Ogallala	Phosphorus	Nitrogen			DO	2007	
RE3-L0020	Bartley Diversion Dam Lake, WMA				E. coli			
SP2-L0030	Oliver Reservoir	Phosphorus	Nitrogen					
WH2-L0030	Meng Lake	Phosphorus	Nitrogen					
Statewide	Community Lake					Various		

[1] A Total Maximum Daily Load was approved in the year indicated.
[2] A nine-element management plan was approved in the year indicated.

Table D.2 High-Quality Lakes Identified for Protective Actions List

Waterbody ID	Waterbody Name	TMDL[1]	Management Plan[2]
LP1-L0250	Fremont Lake No. 20, SRA	2007	2011
MP2-L0540	Elwood Reservoir		
NP3-L0050	Bridgeport Northwest Lake, SRA		
RE3-L0110	Champion Mills Pond, SRA		
WH1-L0020	Chadron City Reservoir South		
WH1-L0030	Chadron City Reservoir North		
Statewide	New Lake to be Built		

[1] A Total Maximum Daily Load was approved in the year indicated.
[2] A nine-element management plan was approved in the year indicated.

APPENDIX E GROUND WATER RECHARGE AREAS AND WETLANDS IDENTIFIED FOR RESTORATIVE OR PROTECTIVE MANAGEMENT ACTIONS

The process for identifying ground water recharge areas and wetlands for restorative or protective management actions is described in "Identification of Waters for Management Actions" in Chapter 2. Ground water areas and wetlands identified for management actions are listed in Table E.1. Projects regarding restoration or protection of ground water or wetlands should be implemented as part of a watershed or area management approach.

The list of Ground Water Recharge Areas and Wetlands Identified for Restorative or Protective Management Actions (Table E.1) is not intended to be exclusive. Rather, it is meant to encourage development of projects to restore these water resources where degradation by nonpoint source pollution has occurred or to protect these water resources where they are threatened, but not yet degraded, by nonpoint source pollution. Other ground water and wetland projects may be considered where supporting data justify the project.

As new water quality data and resource information is assessed, this list will be revised and published through the annual request for project proposals.

Table E.1 Ground Water Recharge Areas and Wetlands Identified for Restorative or Protective Management Actions

Resource	Restore	Protect
Ground Water Recharge Areas		
Ground Water Management Area (≥ Phase 2) that Includes Wellhead Protection Areas	X	
Wellhead Protection Area in a Ground Water Management Area (≥ Phase 2)	X	
Wellhead Protection Area with ≤ 5ppm NO_3		X
Wetlands		
Eastern Saline Wetland	X	X
Rainwater Basin Wetland	X	X
Central Platte River Wet Meadow	X	X
Rare and Unusual Wetlands	X	X

APPENDIX F PROJECT SELECTION AND UTILIZATION OF SECTION 319 FUNDS

The Nebraska Nonpoint Source Management Plan is designed to provide a balanced approach in engaging citizens in learning about and taking action to reduce the impact of nonpoint source pollution on Nebraska's water resources. The process involves planning, communicating and implementing activities that reduce pollution threats or mitigate impairment of water resources by nonpoint source pollution. Efforts are targeted at both local and statewide levels.

Both the scope and scale of potential projects present challenges in comparability and in competitiveness for funding. To achieve a balance among varied project types, the management plan defines five subprograms to support external projects that advance the goals of the program in key areas and provide assistance to key audiences. The subprograms are described in Chapter 11. Proposals for watershed-based and statewide projects are solicited through a request for proposals each fall. The submission deadline is coordinated with the deadline for submission of proposals to the Nebraska Environmental Trust (traditionally the Tuesday following Labor Day). Proposals for the other subprograms may be submitted at any time, but may be deferred for consideration with other proposals.

Staff members of the Nebraska Department of Environmental Quality and liaisons with the program review proposals for the Watershed-Based and Statewide Projects subprogram. At least two staff members and one administrator review each proposal for the other subprograms. Some proposals may be sent to other outside reviewers when additional expertise is desired. Projects recommended by staff for funding are forwarded to senior administrators for final selection. Selected proposals must be developed into project implementation plans for final approval by EPA. Projects funded under the Small Projects Assistance subprogram are approved at the state level.

PROPOSAL REVIEW PROCESS

Proposals are initially screened for eligibility. Project sponsors must be a sub-unit of government, an educational institution or a nonprofit organization. Sponsors may not be debarred or suspended from eligibility to receive federal funds. Proposals must be responsive in submitting the required materials and information in the format prescribed in the request for proposals or in the guidelines of the appropriate subprogram. Projects must address one of the eligibility categories as described in Chapter 11 and include appropriate activities that advance the objectives of the nonpoint source management program. Mandated, regulatory and research activities are not eligible for funding.

Consideration is given to the sponsor's technical and financial ability to support the project. Past performance in implementing projects also is considered in approving or conditioning approval of a project. Considerations regarding the quality of the project include: ecological and public value of the water resources, local interest and support, partnerships, degree of impairment or threat, and the probability of success. Watershed-based projects should address waters identified for restorative or protective actions and should be designed to implement components of a governing watershed-based management plan. Projects must address an area of manageable size. Areas larger than 30,000 acres, usually, should be addressed through phased projects rotated strategically through the area to concentrate treatments into smaller priority areas.

Projects outside the current eligibility categories may be considered if funding is available. An alternative project must be of exceptional quality and provide an important opportunity to advance the goals of the nonpoint source management program. Alternative projects must meet the requirements described in similar project eligibility categories. Additional requirements appropriate to the project may be imposed.

COMPONENTS OF A PROJECT IMPLEMENTATION PLAN

All projects require a project implementation plan that details the work to be performed under a sub-award of Section 319 funds. The level of detail should reflect the scope and scale of the project, but must be specific enough for program managers to understand the project and to evaluate the sponsor's performance in implementing effective activities. The project implementation plan must include, at least, the components described below.

Background. The background should describe the purpose of the project, its geographic area, current water quality conditions, characteristics of the watershed, and past or current efforts to address water quality issues. Additional information that assists in understanding the context of the project and the actions proposed should be included in the background section.

Goals and Objectives. Measureable goals and objective must be clearly stated for the project.

Tasks and Practices. Quantifiable tasks related to the stated goals and objectives must be described. For watershed-based projects, the type and estimated quantity of conservation practices expected to be installed must be described. Methods for implementing tasks should be described as well.

Communication. Every project must include a communication component to inform and engage the key audiences in the project are and to share information about the project with partners, program managers and other interested parties. The communication component must identify key audiences, issues to be addressed and methods for reaching key audiences.

Pollutant Load Reduction. Watershed-based projects must estimate the reduction in pollutant loads to the water resource that the project is expected to yield. These must be specific to the immediate implementation project, not the cumulative loads of the governing management plan or sequential projects.

Partnerships. Partners assisting in implementing the project must be identified and their specific contributions described.

Evaluation/Monitoring. A process and methods for evaluating progress in implementing the project and measuring the impact of the project must be described.

Schedule. The project implementation plan must include a schedule for implementing key activities of the project. The schedule must be sufficient to evaluate orderly progress in completing described tasks and to allow program mangers the opportunity to observe and evaluate activities.

Budget. The project budget must break out major expenditures in sufficient detail for program managers to evaluate appropriateness and to track expenditures for specific tasks. Sources of funds also should be identified.

Map. A map of the project area should be included, where applicable, to assist project participants and program managers in identifying the location and characteristics of the treatment area relative to the receiving water to be restored or protected.

PROJECT FUNDING

Projects will be considered for competitive or directed funding as federal funds are available. Most proposals will be reviewed and selected through a competitive process. In this process, projects are evaluated for their quality

and contribution to advancing the goals of the nonpoint source management program. The highest quality and highest rated projects are selected for funding.

Some projects of exceptional and timely importance to the program may be funded directly with approval of the administrators of the Nebraska Department of Environmental Quality and concurrence by EPA. Examples include timely response to collaborate with conservation programs or initiatives of partners, timely response to an emergency need for conservation action, and an immanent need for information. Directed funding also may be used to fund subsequent phases of large projects for which a master project implementation plan has been approved, but portions of the project funding have been deferred to future grant years.

UTILIZATION OF SECTION 319 FUNDS

The nonpoint source management program is meant to complement, not to supplant, other conservation programs. Therefore, project sponsors are expected to utilize other existing conservation programs to fund project activities (in whole or in part) before utilizing Section 319 funds to supplement those activities. Section 319 funds are best utilized to bridge the gaps among other conservation programs by supporting complementary activities that may not be eligible under those programs. Utilizing Section 319 funds to enhance the cost share benefits of other programs may help encourage greater participation by land managers in implementing conservation practices. The use of Section 319 funds for installation of conservation practices should be guided by the principles presented below.

1. Project sponsors and partners should make other existing conservation programs available to land managers within the project watershed. Project sponsors and partners are encouraged to offer priority consideration (e.g., bonus points, set aside) within their other programs for cost-share applicants from the project watershed or area.

2. Priority should be given to cost share applications that integrate funding from other conservation programs. Some contribution from the individual landowner is encouraged and should be considered in selecting applications for cost-share or incentives. Certain practices may require a contribution from the land manager.

3. Land managers should make reasonable efforts to qualify and apply for cost share assistance from other existing conservation programs before utilizing Section 319 funds. This includes revising the cost-share application to improve its competitiveness reapplying to those conservation programs in a subsequent application period.

4. Priority should be given to cost-share applications that integrate complementary practices. Project sponsors and partners are encouraged to offer priority consideration (e.g., bonus point, set aside) for cost-share applications that include complementary practices that address multiple modes of action to reduce runoff pollution.

5. Total federal funds (e.g., EQIP + Section 319) may not exceed 75% of the total cost of the conservation practice.