Nemaha Natural Resources District

10-Year Master Plan

2011 - 2020

62161 Highway 136, Tecumseh, Nebraska 68450 - www.nemahanrd.org

Protecting Lives – Protecting Property – Protecting the Future

INTRODUCTION

The Nemaha Natural Resources District is one of 23 Natural Resources Districts (NRD's) created by the Nebraska Unicameral in 1969 with the passage of LB 1357. Since its formation in 1972, the Nemaha NRD has been assisting people in the Nemaha River Basin in the development and protection of our soil and water resources.

Nebraska statutes require that Natural Resources Districts develop a *Long Range Implementation Plan*. The purpose of the plan is to "summarize planned district activities and include projections of financial, manpower, and land rights needs of the district for at least the next five years and the specific needs assessment upon which the current budget is based." (Section 2-3277, R.R.S. 1943). The plan serves as a tool for carrying out the District's *Master Plan*.

I. AUTHORITY AND RESPONSIBILITIES

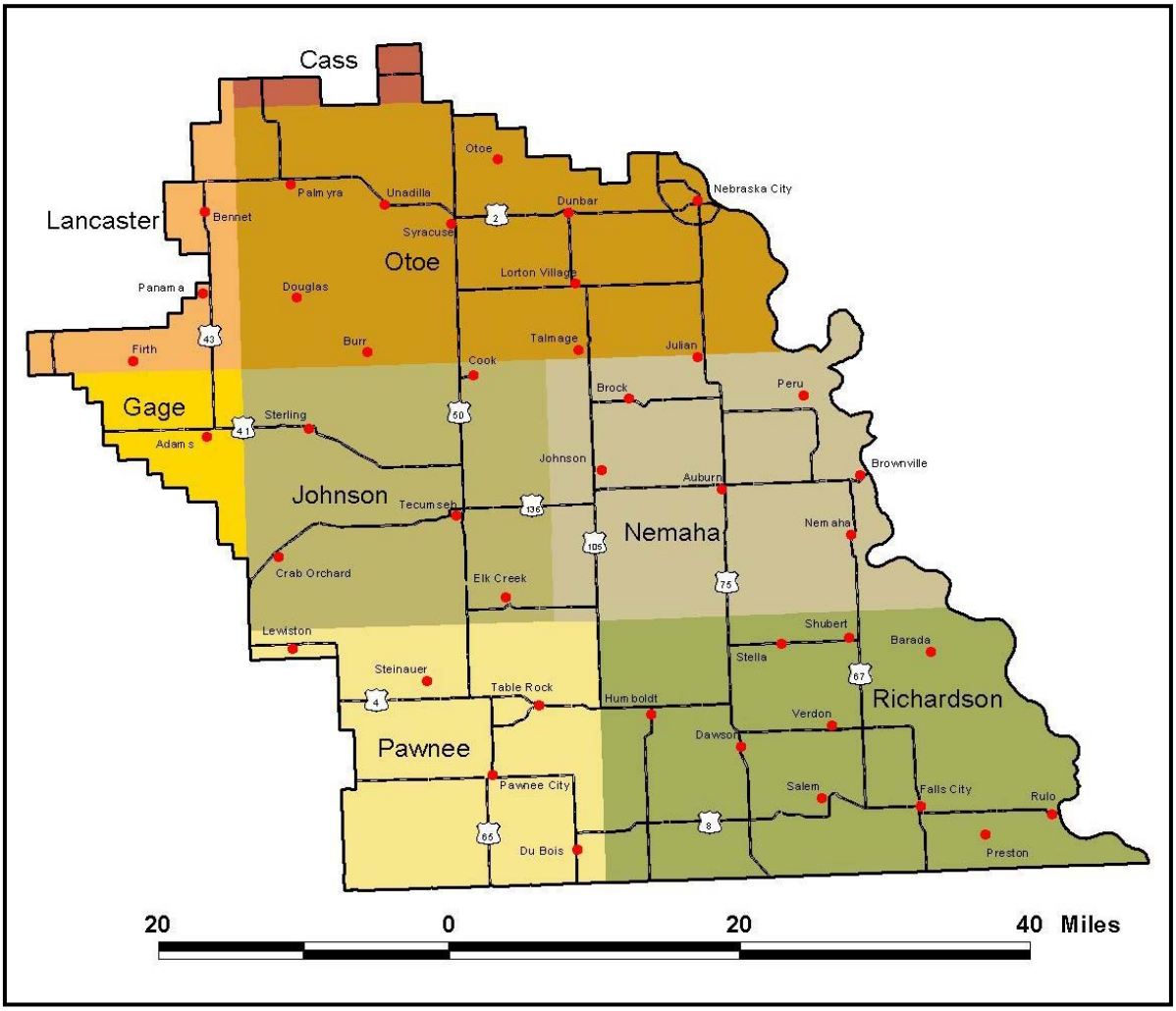
The Natural Resources Districts have been given statutory responsibility outlined in Sections 2-3229, R.R.S. 1943. This section states "The purposes of the Natural Resources Districts shall be to develop and execute, through the exercise of powers and authorities contained in this act, plans, facilities, works and programs relating to:

(1) erosion prevention and control,
(2) prevention of damages from flood water and sediment,
(3) flood prevention and control,
(4) soil conservation,
(5) water supply for any beneficial uses,
(6) development, management, utilization, and conservation of groundwater and surface water,
(7) pollution control,
(8) solid waste disposal and sanitary drainage,
(9) drainage improvement and channel rectification,
(10) development and management of fish and wildlife habitat,
(11) development and management of recreational and park facilities, and
(12) forestry and range management."

Nemaha NRD programs and projects are available to meet the goal of properly developing our water and related land resources.

II. DESCRIPTION OF THE DISTRICT

Location:	Southeast Nebraska (All of Johnson, Nemaha, and Richardson Counties; most of Otoe and Pawnee Counties; some of Gage, Lancaster, and Cass Counties)
Size:	2,402 square miles or 1,537,460 acres within the Big & Little Nemaha River Basins
Tributaries:	Brownell Creek, Camp Creek, Long Branch Creek, Muddy Creek, Pony Creek, Rock Creek, Lores Branch, Negroes Branch, Spring Creek, Squaw Creek, Turkey Creek, Walnut Creek, Winnebago Creek, Bean Creek, Ziegler Creek, and Wilson Creek.
Population:	44,560 (2011 census)
Taxing Authority:	Up to 4.5 cents per $100 valuation (local property taxes)
Funding:	The NRD uses a variety of different methods to fund programs including property taxes, grants, and income from goods and services.



III. GOVERNING BODY

The Nemaha Natural Resources District is governed by a 21-member Board of Directors. Directors are elected during the general election for a term of four years with half of the members up for election every two years. Directors are elected by their sub-district's voters.

To allow balanced representation across the District, the area is divided into ten sub-districts, all with approximately equal population. Two board members represent each of the ten sub-districts. Also, one board member is elected at large every four years.

The NRD Board operates according to a set of by-laws which are kept on file at the District headquarters in Tecumseh, Nebraska.

Nemaha NRD Board of Directors - 2011

Sub-district 1	Steve Sugden	Adams
Sub-district 1	Paul Weber	Firth
Sub-district 2	William Umland	Palmyra
Sub-district 2	Dan Watermeier	Syracuse
Sub-district 3	Michael Gilson	Nebraska City
Sub-district 3	Dave Guhde	Nebraska City
Sub-district 4	John Albrecht	Nebraska City
Sub-district 4	Wayne Goering	Nebraska City
Sub-district 5	Orval Gigstad	Syracuse
Sub-district 5	Duane Sugden	Sterling
Sub-district 6	Lisa Beethe	Elk Creek
Sub-district 6	Robbie Bohling	Johnson
Sub-district 7	Scott Kudrna	Auburn
Sub-district 7	Mike Speece	Auburn
Sub-district 8	Charles Duryea	Humboldt
Sub-district 8	Don Siske	Table Rock
Sub-district 9	Bill Niedfeldt	Shubert
Sub-district 9	Tom White	Falls City
Sub-district 10	Ted Godemann	Falls City
Sub-district 10	Bruce Walker	Falls City
At-large	Charles Bausch	Adams

IV. NRD STAFF

The staff of the Nemaha NRD headquarters consists of 13 full-time or part-time employees. The NRD also staffs full-time and part-time field clerks in five Natural Resources Conservation Service county offices within the District. Staff as of December 1, 2011, is:

Administrative Staff

General Manager	Bob Hilske
Assistant Manager	Scott Nelson
Administrative Assistant – Programs & Operations	Jane Kuhl
Administrative Assistant – Accounting & Bookkeeping	Allison Caspers
Secretary	Lisa Bartels

Field Staff

Field Representative	Mark McDonald
Field Representative	Vernon Speers, Jr.
Field Representative	Steve Bartels
Resources Specialist – Conservation Programs	Aaron Stalder
Resources Specialist – Watersheds	Shawn Kreienhop
Projects Crew Leader	Tomas Chalé Aké

Water Resources Staff

Water Resources Manager	Chuck Wingert
Resources Specialist - Water Programs	Charlie Pierce

NRCS Field Office Staff

Nemaha County Field Clerk (Auburn)	Deb Kreienhop
Richardson County Field Clerk (Falls City)	Amanda Hartman
Otoe County Field Clerk (Syracuse)	Kim Zech
Pawnee County Field Clerk (Pawnee City)	Kathy Harlow
Johnson County Field Clerk (Tecumseh)	Glenda Bates

In addition to the above listed positions, the District employs soil conservation technicians to assist NRCS in layout of land treatment practices. Seasonal laborers are also hired to assist with tree planting, maintenance of watershed structures and recreation areas, and to assist District farmers with the layout of non-cost-share conservation practices.

Recently Completed and Ongoing Major Projects and Programs

Watershed Planning and Development

Project Location: District-wide

Project Timeline: Ongoing

There are 16 watersheds that the NRD has developed and implemented plans on throughout the District. Watershed planning started in the 1950's, and plans were typically funded through the federal PL566 watershed program. Some of the later plans were developed using local funding sources. Planning assistance is usually provided by NRCS or private consultants. Plans completed to date are as follows:

Watershed	Plan Completed	Drainage in Acres	Structures Completed	*Counties Impacted
Big Muddy Creek – Upper	2006	35,200	16	JO/NE
Brownell Creek	1953	25,053	45	OT
Buck and Duck Creek	2004	17,880	0	NE
Long Branch Creek	1976	46,905	21	JO/NE/PA/RI
Middle Big Nemaha	1987	113,300	8	GA/JO/NE
#Pony Creek	1975	5,540	0	RI
Rock Creek	1966	7,970	15	PA
South Branch – Little Nemaha	1977	122,820	18	JO/LA/OT
South Fork	1973	31,110	15	PA/RI
Spring Creek	1964	33,465	24	JO/NE/OT
Turkey Creek	1998	175,700	60	JO/PA
Upper Big Nemaha	1965	114,980	74	GA/JO/LA/OT
Upper Little Nemaha	1991	128,200	19	CA/LA/OT
Wilson Creek	1962	129,409	77	CA/OT
Winnebago-Bean	1971	12,100	14	RI
Ziegler Creek	1965	17,600	15	OT
TOTAL			**421**	

*County abbreviations: Cass CA, Gage GA, Johnson JO, Lancaster LA, Nemaha NE, Otoe OT, Pawnee PA and Richardson RI
#The majority of the Pony Creek Watershed and all structures are located in Kansas

Middle Big Nemaha Watershed Project

Project Location: Gage, Johnson and Pawnee Counties

Project Timeline: 1987 to 2003

Total Project Cost: $3,000,000

The Middle Big Nemaha Watershed Project involved the construction of eight flood control dams ranging from 14 to 39 surface acres. Flood water storage in the eight structures totals 7,400 acre feet. Funding for the project was provided through the federal Watershed Protection and Flood Prevention Act (PL-566). One of the structures, MBN 96, is a high-hazard structure which reduces flood damages to the City of Tecumseh.

Muddy Creek Watershed Project

Project Location: the upper portion of the Big Muddy Watershed located in eastern Johnson and western Nemaha Counties

Project Timeline: 2004 to 2011

Total Project Cost: $1,218,347

Landowners expressed concern regarding erosion and stream downcutting in the Muddy Creek Watershed. The District hired JEO Consulting, who with the help of a 24-member task force, developed a plan identifying the concerns and proposing practices to help reduce downcutting in the upper 55 square miles of the watershed. Proposed management practices included the construction of dams, grade stabilization structures, and weirs. The NRD partnered with landowners, Johnson County, Nemaha County, and NRCS to create a funding plan that provided $1.14 million in assistance from the Nebraska Environmental Trust, Nemaha County, EQIP, and landowners to help fund the project. The remaining $80,000 was provided directly by the NRD. When completed the project included ten grade stabilization structures, four weirs, and one road dam.

Turkey Creek

Project Location: Southern Johnson and Central Pawnee Counties

Project Timeline: 1998 to 2004

Project Cost: $2,148,000

In 1998 NRCS completed a watershed plan that looked at alternatives to address flooding in the 175,700-acre Turkey Creek Watershed. The preferred alternative proposed constructing five larger structures and approximately 70 smaller structures in the watershed. With assistance from the Environmental Quality Incentive Program (EQIP), 319 non-point source pollution program, and the Nebraska Environmental Trust, 62 small dams were constructed. The District worked with consultants to apply for assistance to construct the five larger structures; however, it was determined that the benefit-cost ratio was too low to qualify for funding unless recreation was included at one of the sites. This resulted in the board terminating the project in 2004.

Lorton Road Dam

Project Location: Otoe County (3 miles east of Lorton)

Project Timeline: 2005-2006

Project Cost: $347,000

The District worked with several counties in the NRD to construct road dams which would use the federal Bridge Aid program as the major source of funding projects. The purpose of the project was to replace aging bridges with safer, lower maintenance dams that would cost less than a new bridge. A total of five sites were considered; however, the Lorton dam was the only structure ever completed. Funding and environmental concerns ended the program.

Kirkman's Cove Watershed Project

Project Location: Kirkman's Creek Watershed in northwest Richardson, northeast Pawnee, southeast Johnson, and southwest Nemaha Counties

Project Timeline: 2000-2003

Project Cost: $1,500,000

Kirkman's Cove Recreation Area was opened in 1988 and was constructed in conjunction with the Long Branch 21 watershed structure. Sediment loading into the reservoir was negatively impacting water-based recreation. The NRD, with funding assistance through EQIP, 319 non-point source pollution program, and the Nebraska Environmental Trust, provided cost-share funds to landowners willing to install management practices above the reservoir that would reduce sediment loading and hopefully extend the recreation life of the lake. $1.5 million in assistance was provided to install practices such as tile terraces, grade stabilization structures, and conversion of cropland to grass. The NRD worked with a steering committee of local landowners to tailor the program to best fit the needs of the producers in the watershed.

Iron Horse Watershed Project

Project Location: Pawnee County

Timeline: 2005 to 2011

Project Cost: $3,870,000

South Fork Structure 2-A (aka Iron Horse Trail Lake) was completed in 1983 and features a major recreation area operated by the NRD. Since its completion it has been estimated that 37 percent of the reservoir's capacity was lost as a result of sediment loading. In an effort to reduce sediment loading, the District opted to work with landowners above the reservoir to implement a watershed improvement project modeled after the Kirkman's Cove project. Utilizing funding from EQIP, the EPA 319 non-point source pollution program, and the Nebraska Environmental Trust, landowners were provided up to 90 percent cost-share to install best management practices that helped reduce sediment loading from 25,000 cubic yards to 10,000 cubic yards per year. The final component of the project was the installation of a sediment basin above Iron Horse Trail Lake. The basin was completed in 2011 in conjunction with the Iron Horse Trail Lake renovation project.

Buck and Duck Creek Watershed Project

Project Location: Nemaha County

Project Timeline: Ongoing

As part of the Buck and Duck Creek Project, the NRD developed a watershed project to promote the installation of management practices that will reduce sediment and contaminant loading into the planned reservoirs. The project uses funding from EQIP, the 319 non-point source pollution program, Nebraska Environmental Trust, and NRD to provide cost share to landowners to install best management practices such as buffer strips, terraces, and grade stabilization structures. A steering committee of landowners was formed to assist in developing the project. To accelerate the implementation of practices, the NRD agreed to use private consultants to design some structures and has an agreement with NRCS to provide staffing to assist with layout of practices.

Watershed Maintenance Activities

Project Location: District-wide

Project Timeline: Ongoing

Many of the early dams built in the Nemaha NRD are reaching 50 years in age. This is typically considered the design life of a small, low-hazard dam. Major repairs are often required on older structures, which can include replacement of the riser and spillway tube, repairing dam face erosion, and repairing the plunge pool. Some recent, major repairs include:

Year	Structure	Repair Work	Cost
2010	South Branch 11	Rip-rap dam face	$27,800
2010	Upper Little Nemaha 50	Rip-rap dam face	$59,000
2010	Speckmann-Ottemann	Replace riser & tube	$20,900
2010	Wilson Creek 2-27	Replace riser & tube	$19,500
2009	Wilson Creek 12-3	Replace riser & tube	$18,600
2008	Ziegler Z-3 & Z-6-1	Repair flood damage	$26,250
2008	Upper Little Nemaha 25 & 26	Repair flood damage	$19,350
2008	Brownell 2-1	Replace riser & tube	$19,900
2007	Wilson Creek 1-9	Replace spillway tube	$20,000
2007	Brownell 12-2	Replace spillway tube	$16,200
2007	Brownell 1-4	Replace riser & spillway	$16,190

Wilson Creek 8H

Location: Otoe County

Project Timeline: Undetermined

Project Cost: $706,000

Originally constructed in 1969, Wilson Creek 8H is one of 77 structures built in the Wilson Creek Watershed, which is located in southeast Otoe County. Presently designed as a low-hazard structure, the hazard class was upgraded to high after State Highway 2 was relocated directly below the structure and increased to four lanes. The structure must be upgraded to meet high-hazard design criteria, and NRCS is in the process of developing the designs necessary to do this.

Upper Big Nemaha 25C

Location: Gage County

Timeline: Undetermined

Project Cost: Undetermined

Upper Big Nemaha 25C was originally constructed in 1974 as one of 33 structures in the Upper Big Nemaha Watershed Project. Located near Adams, Nebraska, it was originally designed as a low-hazard structure but has been upgraded to high hazard as a result of a rail line and Highway 41 below the dam. NRCS is presently developing a plan to evaluate alternatives for addressing this structure.

Buck and Duck Creek Flood Control Structures

Project Location: 3 miles west of Peru

Project Timeline: 2004 to 2013

Project Cost: $5.6 million

Originally discussed in the 1960s, NRCS completed a watershed plan and environmental assessment for Buck and Duck Creek in 2004. The preferred alternative included the construction of two structures, one on each creek. It also proposed the development of a recreation area adjacent to the Duck Creek site. The PL566 program funding needed to cover the design and construction costs was secured as part of the FY2008 federal budget. Additional funds will be needed to help cover land rights and recreational development costs at the Duck Creek site. Construction of the Buck Creek site was started in 2010, and it is expected that the Duck Creek site will be constructed in 2013.

Pawnee County Lake Pre-Feasibility Study

Project Location: Pawnee County

Project Timeline: 2002-2003

Project Cost: $125,000

Olsson Associates was hired by the NRD to complete a study to help determine the feasibility of constructing a dam on Turkey Creek that would create a multi-purpose reservoir ranging from 1,600 to 3,000 acres. Several locations south of Pawnee City were considered, and the study determined that the geology, soils, and drainage appeared to be suitable to construct a dam at the proposed site. The project cost was estimated at $30 million, and the study noted that flood control and recreation benefits were not enough to overcome the projected costs; so additional benefits such as using the stored water as a source for a regional public water system needed to be evaluated. Some additional investigation was done on including the water supply option; however, in 2006 it was decided to discontinue pursuing the project.

Small Dams Program

Location: District-wide

Timeline: Ongoing

Each year the District accepts applications from landowners for the construction of small dams. Small dams are considered structures with a drainage area of no more than 300 acres. NRD staff evaluates each application and determines which are considered the highest priority for that year. Usually one or two structures are approved for funding. The District contributes up to 75 percent of cost with the landowner picking up the balance. In recent years Small Dams funds have also been used to contribute towards structures being constructed through federal assistance programs.

Small Dam Program structures completed since 2007:

Year	Program Applicant	County	District Contribution	Total Project Cost
2010	Randy Miller Dam	Gage	$10,000	$59,000
2010	Ed Bruening Dam	Johnson	$48,900	$65,300
2010	Camp Cornhusker	Richardson	$45,000	$350,000
2009	McGuire-Watkins Dam	Pawnee	$10,000	$48,000
2009	Dennis Schuster Dam	Pawnee	$10,000	$68,700
2008	Dan Hill Structure	Richardson	$10,000	$41,000
2008	Arlen Grotrian Dam	Nemaha	$40,900	$54,500
2008	Klaus Hartmann Dam	Johnson	$46,800	$62,400
2007	Ken Brinkman Structure	Johnson	$28,100	$40,200
2007	Brandt Structure	Johnson	$30,323	$43,300

Firth Storm Water Drainage Project

Project Location: Firth, Nebraska

Project Cost: $90,000

Timeline: 2010-2011

Firth was experiencing storm drainage problems within their community, so they developed a plan to upgrade the existing storm drainage system within the community. The project included resizing culverts, upgrading drainage channels, and installing a new, four-acre detention cell to help store runoff. The NRD agreed to share in the cost to install the cell. Work on the project was completed in 2011.

Light Detection and Ranging (LiDAR) Data Acquisition

Project Location: Cass, Johnson, Nemaha and Otoe Counties

Project Cost: $20,000

Timeline: 2010-2011

The District along with four other NRDs provided funds to NRCS to help with the acquisition of LiDAR data for several counties in Nebraska including Cass, Johnson, Nemaha, and Otoe. LiDAR provides one meter quality elevation data that can be used for numerous programs and projects including preliminary dam design, breach inundation zone analysis, storm water drainage planning, floodplain management, and aquifer mapping. Data for Lancaster County was already available to the NRD, and there is presently no data available for Gage, Pawnee, and Richardson Counties.

Eastern Nebraska Water Resources Assessment Project (ENWRA)

Project Location: District-wide

Project Timeline: Ongoing

Project Cost: $20,000/year

This is a cooperative project that involves six NRDs in eastern Nebraska, the Nebraska Department of Natural Resources, UNL Conservation and Survey Division, and US Geological Survey. The purpose of the project is to collect and analyze aquifer data in the glaciated regions of eastern Nebraska. Funding for the program comes from annual contributions from partnering NRDs and is matched with various grants. Significant project outputs include electromagnetic imaging to better define aquifer boundaries, evaluation and mapping of electromagnetic imaging data, evaluation of new and historic well log data, and comparative analysis of electromagnetic and well log data. The Nemaha NRD has two areas designated for future electromagnetic imaging flights.

Multi-Jurisdictional Hazard Mitigation Plan

Project Location: Johnson, Nemaha, Otoe, Pawnee, and Richardson Counties

Project Timeline: 2007 to 2010

Project Cost: $135,000

FEMA required that local governmental jurisdictions such as cities and counties complete a hazard mitigation plan. Rather than have each entity create an individual plan, it was agreed that the NRD would develop a plan for the five counties in southeast Nebraska with the counties and NRD sharing the cost. JEO Consulting was hired by the District to secure grant money from FEMA and write the plan. The planning process included numerous meetings to obtain the necessary input to meet guidelines for writing the plan. Communities also provided a considerable amount of data on existing infrastructure and potential hazards. The plan was approved by FEMA in March, 2010.

Recreation Facilities

Project Locations: Variable

Timetable: Ongoing

The District operates four recreation facilities and the 22-mile long Steamboat Trace hiking/biking trail. Kirkman's Cove and Iron Horse Trail Lake are the two largest recreation facilities owned by the NRD, and they feature water based recreation, camping, picnicking, and hiking opportunities for the public. Prairie Owl and Wirth Brothers are smaller and offer more limited water based recreation and camping opportunities.

Year Open	Area	County	Acres/ *Miles	Major Uses
1976	Prairie Owl	Otoe	39	Fishing, no-wake boating & day use
1985	Iron Horse Trail	Pawnee	360	Fishing, no-wake boating, camping, hiking, swimming and day use
1988	Kirkman's Cove	Richardson	511	Fishing, boating, camping, hiking, swimming, day use & group events
1996	Wirth Brothers	Johnson	89	Fishing, no-wake boating, camping, swimming, day use and archery
1999	Steamboat Trace	Otoe-Nemaha	*22	Hiking and biking trail

The District typically budgets $20,000 to $30,000 annually for maintaining all four recreation areas with additional funds occasionally budgeted for repairs or improvements. Vehicle permits are required at Kirkman's Cove, Iron Horse Trail Lake, and Wirth Brothers Lake. Fees are also charged for some camping facilities.

The Steamboat Trace is located along an abandoned railroad right-of-way that runs from four miles south of Nebraska City to south of Brownville. It was obtained by the NRD through the federal railbanking program. Approximately $20,000 is budgeted annually for trail maintenance. A majority of the trail is in the Missouri River floodplain and is subject to flooding, which increases maintenance costs. The trail attracts both local and out-of-area users who enjoy using the trail for hiking and biking. The trail is normally used regularly from April through November; however, fall is the most popular time of use. Groups and group events are also popular uses of the trail. It is estimated that 3,000 to 4,000 people use the trail on an annual basis.

Goal - Encourage the conservation of soil resources in the Nemaha River Basin

Objective 1 - Continue to assist the State with the administration of the Nebraska Soil and Water Conservation Program

Each year the Nemaha NRD works with landowners to implement conservation practices district-wide using funding provided through the Nebraska Soil and Water Conservation Program. The District has established a maximum of 50 percent cost-share assistance up to $5,000 per application. Typically NRCS has provided assistance with program signup and design. Funding received is dependent on the State budget but typically ranges from $110,000 to $140,000 annually.

Planned Actions:

- Designate staff to administer program
- Periodically review administrative policies, including but not limited to, practice priorities, cost-share percentages, maximum assistance, and application procedures
- Establish annual sign-up periods
- Establish project completion deadlines and consider ideas to better assure that all funds are spent at the end of the year
- Coordinate sign-ups, application approvals, and project completion with NRCS
- Support increasing state funding assistance into the program

Objective 2 - Provide local funding to landowners to encourage the installation of best management practices

There may be occasions when the District or other local funding sources are used in conjunction with, or in lieu of, NSWCP funds. In the past 10 years, the District has budgeted up to 20 percent of the funds received through the NSWCP program to assist with practices not covered by State funds.

Planned Actions:

- Annually evaluate conservation needs and establish funding levels
- Periodically determine if the District should provide additional funding to conservation practices to increase participation or solve resource issues
- Consider opportunities to create future NRD funded cost-share assistance programs

Objective 3 - When practical and feasible, partner with communities, counties, and/or private landowners to install grade stabilization structures that reduce stream down cutting and sediment loading into surface water.

Stream down cutting and sedimentation is a major resource concern in southeast Nebraska. Most of the major rivers and streams have down cut 10 to 20 feet over the past 50 years, which results in sediment loading, loss of cropland, and threatens transportation and utility infrastructure. Down cutting can also threaten homes and other buildings in communities. Typically solving stream down cutting can be costly, and there are few options for grant funding.

Planned Actions:

- Work with counties and communities to identify waterways with down cutting or sedimentation problems that threaten infrastructure and develop plans for addressing those concerns
- Evaluate the technical and economic feasibility of addressing concern areas
- Consider opportunities to create multi-agency programs and projects that address downcutting and sediment concerns
- Identify and apply for funds that can assist with developing programs and projects that will control or reduce downcutting and sedimentation
- Use District staff in conjunction with assistance from counties, communities, and landowners to implement programs and projects
- Work with landowners in the NRD to provide technical assistance to address and solve head cutting and erosion issues on private property
- Establish and implement methods to evaluate the effectiveness of completed projects

Objective 4 - Continue to seek opportunities to implement watershed treatment projects above critical watershed structures.

The Nemaha NRD is responsible for over 400 watershed structures. Adequate land treatment above structures is beneficial because it can extend the functional life of a dam or grade stabilization structure. Land treatment can also reduce contamination from pesticides and fertilizers, which is particularly important if a watershed structure is used for recreation or watering livestock. In recent years projects have focused on watersheds above water-based recreation areas; however, other watersheds may also benefit from treatment in the future.

Planned Actions:

- Evaluate the success of past watershed treatment programs to determine the impact and benefits
- Identify and prioritize watersheds that may be candidates for future treatment projects
- Use stream and lake sampling as a tool to identify lakes that could benefit from treatment efforts and help monitor the success of projects that are implemented

- Complete planning and implementation of the watershed treatment plan for the Buck and Duck Creek Watershed
- Incorporate a watershed plan into new structures that will include public, water-based recreation activities
- Evaluate the feasibility of developing, funding, and implementing accelerated land treatment programs above NRD operated watershed structures, particularly those that include private or semi-private water based recreation activities

Objective 5 - Use available regulatory authority to address erosion concerns on private land

The District has an approved sediment control plan. The plan is used in conjunction with state statutes to address sediment and erosion problems on private land. District staff inspects complaints; and if warranted, state law allows the NRD to require that measures be implemented to eliminate damage on neighboring land. Anyone found in violation of the standards outlined in the plan may receive cost-share assistance to address the concern.

Planned Actions:

- Update the District's sediment control plan as needed or required
- Assure that any official and unofficial complaints are administered fairly and expeditiously
- Work with landowners to find the best and most cost effective solutions to address erosion issues
- Provide cost-share assistance funding to help settle complaints
- Work with landowners to assure required work is completed and the problem corrected

Objective 6 - Continue the present partnership with NRCS

The Natural Resources Conservation Service has a mission similar to the NRD's, and as a result there has been a close partnership between the agencies since 1972. The District currently works with offices in all eight counties that encompass the NRD. District funded clerks are assigned to Johnson, Nemaha, Otoe, Pawnee, and Richardson Counties. NRCS typically provides most of the technical assistance for the Nebraska Soil and Water Conservation Program and has also helped the NRD with designing dams and grade stabilization structures. On larger projects such as watershed planning and larger dam design, the NRD will work directly with NRCS State Office staff. Since 2006 the NRD has worked with NRCS to secure additional technical help using Technical Service Provider (TSP) funds provided by NRCS.

Planned Actions:

- Continue to provide clerical assistance to the Johnson, Nemaha, Otoe, Pawnee, and Richardson County offices
- Partner with NRCS to plan and design dam and grade stabilization projects
- Utilize NRCS to provide technical assistance services for the NSWCP Program
- Participate on the EQIP Working Group
- Work with NRCS and NARD to obtain and use TSP funding that is made available

Objective 7 - Promote the importance of protecting soil from wind and water erosion.

In the past the NRD has worked hard to educate the public on the importance of protecting soil from wind and water erosion. Vehicles such as newspaper articles, radio announcements, and the District newsletter have been used to get the message out in the past. In many cases the promotional effort focuses on the projects and less on the soil erosion benefits provided.

Planned Actions:

- Use local media to help educate the public on the importance of protecting soil from and water erosion
- Use the District's website to educate the public on the importance of protecting soil from wind and water erosion
- Evaluate other electronic media options as potential tools for educating the public on erosion concerns

Objective 8 - Support efforts that protect highly erodible land from erosion

Because of the glaciated terrain in southeast Nebraska, the Nemaha NRD includes a considerable amount of highly erodible land (HEL). The District has always encouraged landowners and tenants of highly erodible land to operate and maintain it in such a manner that erosion is minimized. This includes installing best management practices, no-till farming, and/or maintaining HEL in grass.

Planned Actions:

- Utilize the NSWCP program to help get appropriate conservation practices installed on HEL
- Help make the public aware of what HEL is and why it is important to manage and protect it properly
- Support the creation and implementation of management practices that protect highly erodible land in the Farm Bill

Objective 9 - Support and encourage efforts that help keep marginal land in grass or woodlands

Because of the sloping terrain of southeast Nebraska, the Nemaha Basin includes a substantial amount of Class IV through Class VIII land. With its limited ability for use as cropland and the vulnerability to erosion, it is important that it be kept in grass or, where appropriate, woodlands. In addition to protecting soil from erosion, grass and trees are beneficial to native wildlife species found in the area. Historically programs such as the Conservation Reserve Program (CRP) and some wildlife habitat programs have helped to keep or return marginal land back to grass. The NRD has always supported these programs and where appropriate participated as a partner. The changing agricultural economic climate can have an impact on producers' interest in using marginal land for crop production, so it is important that an ongoing education program be maintained and efforts to provide incentives and assistance continued.

Planned Actions:

- Continue to support CRP or similar programs
- Promote the importance of having federally funded programs that encourage the protection of marginal land to USDA and Nebraska's Congressional Delegation
- Use the District's information and education program to promote the value of keeping or converting marginal ground to grass or trees
- Evaluate the development of a conservation easement program to allow landowners to voluntarily protect high quality grassland and woodland

Objective 10 - Develop and promote activities that help educate youth on the importance of protecting soil resources.

Youth are a critical target audience when getting out the message about protecting soil from water and wind erosion. Students tend to be the easiest to educate and have the time to learn. The District has been a long-time sponsor, organizer, and participant in area and district land and range judging competitions. Competitions help youth understand the importance and values of protecting soil resources and properly managing grazing.

Planned Actions:

- Work with NRCS, schools, FFA, and Extension to organize land and range judging contests including looking at options to improve performance and participations at future events
- Support the Envirothon Program
- Participate in statewide planning efforts to develop schedules, update rules, and update program information for land and range judging contests.
- Continue to sponsor a Watershed of Wonders day camp or similar event to help educate youth on protecting resources

Objective 11 - Inform public about District programs that are available to address soil erosion issues

To achieve the District's goal, it is critical the NRD partner with producers and landowners. The District uses newsletters, local media, and meetings to disseminate information on assistance programs. One-on-one meetings have also been excellent ways to provide information to the public on assistance and the importance of conserving soil.

Planned Actions:

- Continue to provide news releases and information on District programs to local newspapers and radio
- Continue to utilize the District's newsletter to provide information to the public on programs
- Utilize the District's website to provide information on District programs, projects, and activities
- Consider other viable electronic media options for providing program information to the public
- Encourage staff to promote District programs when meeting with landowners individually or in small group settings
- Provide information to schools, FFA leaders, and other student groups on District youth related programs and activities

Objective 12 - Promote and educate producers on the use and benefits of no-till farming

No-till farming is widely used and promoted in southeast Nebraska. Many area farmers have converted from more conventional farming methods to no-till over the past 15 years. In addition to a reduction in tillage, no-till can reduce fuel costs, simplify planting, and allow fields to be worked and planted in a shorter period of time.

Planned Actions:

- Continue to promote no-till as an alternative to more traditional tillage and planting operations
- Where feasible and beneficial, incorporate incentives to no-till into assistance programs

Goal - Protect and manage surface and groundwater resources in the Nemaha River Basin

Objective 1 - Administer and implement the District's groundwater management plan

State law requires the NRD to develop and implement a groundwater management plan. The plan includes management of groundwater quality, groundwater quantity, and the interrelationship between ground and surface water. The District last updated its plan in 2009. In addition to outlining the process for monitoring the status of the quality and quantity within the District, it promotes the use of rules as authorized by the state to manage water use. Rules may be revised as necessary to address concerns that occur.

Planned Actions:

- Review the plan once every five years to determine if any updates are required
- As determined necessary by plan review or as required by state statute, update the groundwater management plan, develop programs that address outlined concerns and meet state statutes
- When appropriate work with the Department of Natural Resources to revise the plan to address the interrelationship between surface water and groundwater.
- Update the public on any future proposed or implemented plan revisions
- Implement actions and programs as prescribed by the plan

Objective 2 - Monitor and evaluate changes in groundwater levels in the District

The District monitors over 125 wells to document changes in static water levels. The wells are measured twice annually in spring and fall. Monitoring wells used by the NRD are a combination of irrigation wells, domestic wells, and dedicated observation wells. The dedicated observation wells are maintained by the NRD and usually consist of a data logger which will automatically record the static water level on a preset schedule. The District continually looks for opportunities to expand the observation well network particularly in areas of the NRD that may be more vulnerable to declines and development.

Planned Actions:

- Continue to monitor groundwater level changes twice annually in the District
- Incorporate additional wells into the network particularly in areas where development has increased or declining water levels have become a concern
- When feasible install dedicated monitoring wells with full time data loggers and incorporate them into the District's network
- Regularly update the public on the status of groundwater levels in the District
- Provide groundwater level data collected by the NRD to other federal and state agencies as requested

Objective 3 - Monitor and evaluate changes in groundwater quality in the District

The District regularly collects samples from over 100 wells throughout the District to determine the groundwater quality and how it changes over time. All of the wells are tested for parameters such as nitrates; however, other samples may be tested for other parameters such as atrazine, metalochlor, or acetochlor to determine if those contaminants exist. Most of the wells in the network are domestic or irrigation wells; however, the NRD does have some dedicated monitoring wells in the system. Most of the sampling is done during the summer months. Additional wells are continually added to the network to help improve the District's understanding of the resources; in some cases the District requires that a new well be included in the network as a condition for approving a well permit. All approved well permits include a one-time sampling requirement for nitrate-nitrogen.

Planned Actions:

- Continue to monitor wells in the District for groundwater quality
- Look for opportunities to include additional wells in the network
- Update the public on the status of groundwater quality in the District

Objective 4 - Develop programs that encourage groundwater users to manage and conserve groundwater

The District's groundwater management plan includes both required and voluntary activities. Voluntary activities are often encouraged to avoid having to resort to more restrictive required activities. When appropriate the NRD may use financial incentives such as cost sharing to promote the use of best management practices.

Planned Actions:

- Seek out opportunities to provide cost share or other incentives to groundwater users willing to voluntarily implement activities that promote the efficient use of the resource
- When evaluating groundwater conservation programs, consider programs that have proven to be successful in other NRDs for inclusion in the Nemaha NRD plan
- Provide information to the public on the importance of conserving groundwater and programs the NRD has available to assist landowners
- Provide training or information to landowners on implementing best management practices that conserve water
- Develop programs that promote water conservation that are specifically targeted towards community water users

Objective 5 - Monitor surface water quality to help assure that EPA and State standards are being met

The District works with the Nebraska Department of Environmental Quality to monitor surface water quality throughout the NRD. Historically efforts have included stream sampling, lake sampling, and sampling efforts to address a specific quality concern such as toxic blue-green algae. Data collected is critical in monitoring the health of streams in the District, and it is also used to assure that water quality in the District's recreation facilities is safe for public use. DEQ often provides technical help, equipment, and funding assistance to help carry out sampling efforts.

Planned Actions:

- Continue to monitor water quality in District owned recreation lakes
- Assist DEQ with stream monitoring efforts as requested
- Identify lakes or streams in need of monitoring because of potential contamination concerns
- Maintain a District-wide surface water quality database
- Assist landowners to identify and address surface water quality concerns
- Provide information to the public on surface water quality and addressing water bodies with specific concerns and how those may/will be addressed

Objective 6 - Develop and participate in programs that help the District better understand and delineate groundwater in the District's aquifer regions and hydrologic framework

Groundwater geology in the Nemaha NRD is extremely complicated and variable. It requires an extensive amount of data to develop accurate and reliable aquifer maps and groundwater models. It is important that the District continue to develop or participate in programs and projects that improve and refine data that is presently available. In recent years the District has been a partner with four other NRDs to create the Eastern Nebraska Water Resources Assessment (ENWRA) study that is helping develop more accurate aquifer maps using magnetic imaging. The District has also started to require that anyone interested in drilling a high-capacity well include a test well log with a permit application. The data from the log can be added to the present database to increase log information available to the District.

Planned Actions:

- Continue to participate in the ENWRA Program
- Utilize well drilling logs to better document aquifer boundaries within the NRD
- Incorporate new well drilling log data into the current database
- When necessary and feasible create field data collection projects that will add critical log data into the District's present database.
- Use tools such as HEM, Lidar, and computer models to better map and define aquifers within the Nemaha Basin
- Consider adopting data collection projects or tools that will provide the NRD with additional and/or more accurate information on groundwater supplies

Objective 7 - Assist public water suppliers with implementing wellhead protection areas and plans

Presently 25 out of 41 communities and eight rural water districts operate public water supply systems in the NRD. Although state statutes would allow the District to do so, no rural water districts are presently operated by the NRD. Historically the NRD has worked with domestic water suppliers to delineate Wellhead Protection Areas to help protect source water in the NRD. The District has also provided technical expertise to public water suppliers to help them locate additional, better quality supplies of water.

Planned Actions:

- Continue to work with domestic water suppliers to identify well head protection areas
- Help public water suppliers develop programs that will better protect their groundwater supplies
- Provide technical expertise to public water suppliers seeking additional or better quality supplies of water for their users

Objective 8 - Work with communities and landowners to properly decommission abandoned wells

Thousands of water wells were constructed in rural areas and communities in the years before rural water districts and public supply systems were ever created. Over time many of these water wells fell into disrepair, went dry, or were no longer needed.

Abandoned and improperly constructed water wells can provide a direct conduit for surface water runoff to flow from the land surface to groundwater aquifers often carrying organic wastes, microbiological contaminants, fertilizers, and other chemical residues such as pesticides and petroleum products. Small mammals and reptiles can also fall into the water wells, further adding to the bacteriological contamination problem. Once groundwater is contaminated, it is very difficult, if not impossible, to clean up; and the process is always expensive. In addition open water wells are especially hazardous to small children and present a risk to human life that can be prevented.

Planned Actions:

- Educate District residents on the health and safety risks associated with abandoned groundwater wells
- Continue to fund and promote the District's Well Abandonment Cost-Share Program.
- Identify and document abandoned wells that are candidates for decommissioning
- Work with communities to identify abandoned wells and assist them with getting those wells decommissioned

Objective 9 - Continue to provide local administration of the Chemigation Program

State law requires that anyone applying a fertilizer, pesticide, or fungicide through an irrigation system obtain a permit to do so. Chemigators are also required to have the appropriate safety equipment on their systems to reduce the potential for groundwater contamination. The District partners with DEQ to locally administer the chemigation program. This includes permitting, field inspections of safety equipment, and local record keeping. In 2011 there were 122 chemigation permits issued in the NRD.

Planned Actions:

- Continue to work with NDEQ to administer the chemigation program
- Collect and approve permit applications received from irrigators in the District
- Work with irrigators to inspect safety equipment in accordance to State statutes
- Document and address safety equipment that fails to meet established performance requirements
- Submit applications, reports, and fees to NDEQ as required by statute.
- Identify wells illegally applying chemicals without a permit or safety equipment

Objective 10 - Provide free nitrate-nitrogen and bacteria analysis for District residents

Nearly all District residents get their drinking water from either private or municipal groundwater wells. Municipal groundwater quality is regulated and tested by the Nebraska Department of Health & Human Services; however, private water well testing is the responsibility of the well owner. Nitrate-nitrogen (NO_3-N) and bacterial contamination are common drinking water contaminants found in wells that can endanger human health.

Planned Actions:

- Continue to promote and encourage routine private water well sampling and analysis
- Educate District residents on the health risks associated with groundwater contamination, on methods to treat the problem, and on actions to reduce or eliminate the reoccurrence
- Look for opportunities to expand the water analysis programs

Objective 11 - Work with the State to assure proper permitting and registration of wells in the District

State law requires that all new wells be registered with the Nebraska Department of Natural Resources. Anyone desiring to drill a new high capacity well (pumping greater than 50 gallons per minute) is also required to obtain a well permit from the NRD before drilling the well. The District has worked with landowners, the State, and local well drillers to assure that these requirements are met. District staff also reviews existing permits to assure that the information and location of the well are accurate. In the event that a well is identified that has not been registered, the NRD will work with the landowner and State to get the well properly registered.

Planned Actions:

- Continue to work with the State, well drillers, and landowners on assuring that new and existing wells are properly permitted and/or registered
- Include the importance of permitting and registration in news releases and articles developed by the NRD

Objective 12 - Educate the public on the importance of protecting and managing water resources and inform them about District programs and regulatory requirements

Water impacts everyone in the Nemaha NRD. Farmers may depend on water for irrigation; business owners use water to operate manufacturing plants; and the average homeowner depends on having a high-quality, reliable source of domestic water. The District uses a variety of methods to make information on water issues available to the public including newsletter articles, news releases to local media, meetings, and specific mailings. Since the NRD administers many regulatory programs, it is critical that those impacted are informed of any requirements placed on them by the NRD. Education is also a key component. Historically the NRD has focused on youth education; however, with more regulatory requirements it may be necessary to expand programs to target water users.

Planned Actions:

- Look at opportunities to create information and education programs that are specific to surface water and groundwater
- Make certain that the public is provided access to water quality and quantity data collected by the District
- Continue to incorporate information on the District's water programs into local media releases
- Develop education programs targeted at youth and young adults
- Develop education programs that promote the sensible use of fertilizers, pesticides, and other potential contaminants
- Provide the public with information on new programs, particularly those that include regulatory requirements
- Use the NRD's newsletter and website to provide the public with information regarding water programs and issues

Goal – Help assure that domestic water supplies are safe and adequate to meet the public needs in the Nemaha Basin

Objective 1 - Maintain information and databases on public water supply systems within the NRD

Presently 33 public water systems operate within the Nemaha NRD. Systems fall into three categories: 1) municipal systems; 2) rural water districts; and 3) systems that serve a combination of rural and municipal customers. Historically the District has always acquired and stored some information on these systems such as location of wells, location of the systems, and volume of water used. This information is useful to the NRD when planning and making decisions on future groundwater development.

Planned Actions:

- Periodically review records to assure information on public water supply wells is correct
- Obtain the necessary information from public water suppliers to update District well records
- Work with public water suppliers in the District to develop wellhead protection plans
- Maintain records and information on supply systems that fail to meet quality standards

Objective 2 - Cooperate with public water suppliers providing the assistance and data needed to help support the operation of their system

The District regularly assists public water suppliers to help insure that their systems provide an adequate source of water that meets federal and state standards. This may include sampling, helping determine the ability of an aquifer to supply groundwater, providing assistance with locating new sources of water, and providing information on options to address contamination problems. The NRD has an extensive database of aquifer and hydrologic data that it can make accessible to the public water supplier.

Planned Actions:

- Continue to make hydrologic information available to public water suppliers
- Help suppliers address quantity and quality concerns
- Help suppliers identify and evaluate options for locating new public water supply wells

Objective 3 - Evaluate and support reasonable options for consolidated or regional water supply systems

The ability to secure an adequate source of water that meets federal and state standards in southeast Nebraska varies greatly depending on location and geology. Some aquifers produce ample supplies of water while in other parts of the District there may be little or no water available. It may be in the best interest of some suppliers to work together to consolidate systems or create a regional supply system. A regional water system could result in reducing quality issues, assuring adequate supplies into the future, reducing the cost to supply water to customers, allowing suppliers to share staffing, and allowing communities to expand without future water concerns. Over the past ten years, the NRD has had an interest in working with suppliers to evaluate the need for combining or regionalizing water systems including seeking grant funds for studies.

Planned Actions:

- Provide planning and technical support to systems considering consolidation.
- Promote the concept of regional or cooperative public water supply systems
- Encourage suppliers to allow for future consolidation when they plan their systems
- Continue to seek funding opportunities to help fund studies

Goal - Protect lives, infrastructure, and property in the Nemaha River Basin from flooding

Objective 1 - Evaluate watersheds within the Nemaha Basin and determine if new flood control projects are needed and feasible

Flood control has always been a high priority for the Nemaha NRD. Over the years the District has monitored watersheds developing plans in those watersheds that could benefit from flood control. Plans typically will include flood control and grade stabilization structures to reduce flood damages downstream in the watershed. Although many watershed plans have been completed, there are still some watersheds that have not been evaluated and/or planned. In most cases these watersheds never qualified for federal or state planning assistance.

Planned Actions:

- Close out any open watershed plans by either constructing or dropping any uncompleted structures.
- Review watersheds within the NRD and determine if any merit the development of a watershed plan
- Utilize Light Detection and Ranging (Lidar) Data to help identify and plan potential structure sites
- Identify new structures that should be constructed and develop plans for funding and completing the construction work.
- Provide information to the public on future watershed planning and flood control projects
- Identify potential funding sources to help pay for implementing new watershed projects

Objective 2 - Inspect all District operated structures to assure that they are safe and operate properly

The Nemaha NRD is responsible for operating and maintaining over 400 grade stabilization and flood control structures in the District. Most of the structures are classified as low hazard by the State of Nebraska; however, the NRD does operate a total of eight significant or high hazard structures. To assure that the structures are functioning properly and safely, the NRD does periodic inspections. The low-hazard structures are inspected biennially, and the significant and high-hazard structures are inspected annually. The State of Nebraska also does periodic inspections of dams, and those reports are also incorporated into the District's inspection program.

Planned Actions:

- Inspect all high-hazard structures annually and low and significant hazard structures biennially
- Coordinate inspections with the State of Nebraska

- Inform landowners regarding concerns or problems caused by their use or alteration of a structure and instruct them on the needed corrective action
- Provide NRD staff with adequate training to assure that dams are properly inspected
- Monitor dams after high runoff events to assure that they are operating properly
- Educate the public on the importance of inspecting and maintaining dams on private land

Objective 3 - Repair and maintain all District operated watershed structures.

Each year the NRD performs a wide variety of minor dam maintenance duties including removing trees, repairing erosion problems, repairing minor leaks in risers, eliminating rodent holes, unplugging tubes (plugged by beavers), and replacing trash racks. As dams age they may require more extensive repairs. Repair needs are evaluated regularly, and dams with the most critical problems are given the highest priority.

Planned Actions:

- Review all inspection reports and develop a maintenance plan that prioritizes work based on safety and need
- When necessary utilize NRCS staff or private consultants to assist with recommendations, designs, and/or approval of repairs
- Assign staff to perform routine maintenance and repairs
- Work with qualified area contractors to complete major maintenance repairs
- Quickly and safely address dams that have critical safety or repair concerns
- Update landowners on any dam operation, maintenance, or repair concerns
- Follow up repair or maintenance work to assure that it has corrected the problem or concern
- Provide staff with training to assure that they are familiar with the newest ideas and concepts in repairing dams

Objective 4 - Evaluate watershed structures to assure they meet present day dam safety and classification standards

Watershed structures in the NRD are classified by the State as 1) high-hazard, 2) significant-hazard, or 3) low-hazard structures. Almost all the structures in the Nemaha NRD are low hazard; however, there are some significant- and high-hazard structures in the District. Classification depends on potential downstream threat in the event the dam fails and it impacts the technical standards to which

the structures are designed. Occasionally changes occur downstream from a structure that could require that they be reclassified. This could include homes, buildings, roads, or other structures that create a greater threat to human life. If it appears that changes have occurred to warrant potential reclassification, a qualified consultant must be used to evaluate the structure for reclassification. If a structure is upgraded to a higher hazard classification, it could require that a dam be upgraded to meet more stringent standards. Upgrading a structure can often be technically challenging and costly.

Planned Actions:

- Monitor structures for downstream changes or design alterations that could result in potential reclassification
- Work with NRCS or private engineering firms to help evaluate dams that may need reclassification and develop plans to address structures that require reclassification.
- Make certain the appropriate staff is made aware of any changes to dam hazard classification criteria that could impact structures operated by the District
- Update landowners on the status of dam evaluation, planning, and construction

Objective 5 – Develop and maintain breach inundation zone maps for critical dams, and use data to establish methods that help limit the potential development in these areas

Rehabilitating dams to high-hazard criteria is expensive. Limiting development below low- and significant-hazard dams protects the structure from having to be reclassified as high hazard. Unless easements are in place, the NRD has no regulatory authority to limit development below dams; so the NRD must work with other entities such as counties and zoning boards to address this concern. Options for protecting vulnerable areas below dams include ordinances, zoning restrictions, and conservation easements.

Planned Actions:

- Evaluate, and if necessary, update breach inundation zone maps for high-hazard structures
- Develop breach zone inundation maps for significant- and high-hazard dams that have a high probability for future downstream development
- Form partnerships with counties and other local government to help address future development concerns
- Encourage the use of zoning and building restrictions to better control development below dams
- Evaluate the use of conservation easements in critical areas below dams to control future development
- Create programs to inform the public on the impacts of developing below flood control structures

Objective 6 - Evaluate and consider options for rehabilitating dams that are elevated to high-hazard criteria

Structures that if they fail pose a threat to human life are classified as high hazard. Threats typically occur when roads or buildings are constructed in the breach zone of a dam. Hazard classification is taken into consideration when planning structures, and great effort is made to avoid the need to construct a high-hazard structure to avoid the additional cost. There are situations when development occurs below a structure after it has been constructed requiring the dam to be upgraded. As the dam owner the NRD is responsible for upgrading the structure to meet the high-hazard criteria.

Planned Actions:

- Form partnerships with NRCS, state government, local government, and landowners to plan and fund projects
- Develop feasibility plans that consider realistic options for addressing dams elevated to high-hazard status
- Determine benefits and costs for all viable options
- Select the best alternative and develop a plan for funding rehabilitation
- Implement the alternative considered the best and most cost effective option

Objective 7 - Update emergency action plans and work with the state, counties, and communities to provide training opportunities

Emergency action plans are required on all high- and significant-hazard dams. The NRD keeps plans on file and updates them on a periodic basis. Plans include the basic procedure for warning the public and law enforcement in the event a dam is in danger of failing. To assure that a plan is carried out in the most efficient manner, it is beneficial to do occasional training exercises with the staff and others involved in the plan.

Planned Actions:

- Continue to update and maintain emergency action plans for all significant- and high-hazard dams every three to five years or as mandated by the Department of Natural Resources
- Work with state dam safety officials to assure that plans meet minimum requirements
- Work with communities and law enforcement officials to assure that they are aware of their role in the event emergency action is required
- Schedule training meetings and/or workshops to run through emergency action plans to assure that they are carried out in the most efficient manner possible.
- Develop meetings to coincide with emergency action plan updates

Objective 8 - Evaluate and consider alternative, non-structural methods to reduce flood damage

Typically flood control dams provide the most cost effective method of reducing flooding and protecting property. There are cases when other methods such as floodplain buyouts or restoring historic stream channels may be better options.

Planned Actions:

- Keep staff up to date on alternative options for reducing damage from flooding
- Work with counties and communities on obtaining updated floodplain map data
- Incorporate the evaluation of alternative flood control methods into flood control planning process
- Make communities and counties aware of potential non-structural alternatives that may be available to address flooding issues in their jurisdiction
- Where feasible work with communities within the NRD on floodplain buyouts

Objective 9 - Offer programs that encourage landowners to construct small, multi-purpose dams that meet the goals of the District

The NRD administers a Small Dams Program. Landowners around the NRD have an interest in dams and reservoirs for benefits such as grade stabilization, livestock watering, wildlife habitat, and recreation. In many cases structures benefit both the landowner and the goals of the NRD. Applications are accepted by the NRD, reviewed, and prioritized with the highest ranked structures typically approved for funding. Projects that provide some general benefit to the NRD such as flood control or grade stabilization are awarded the highest ranking.

Planned Actions:

- Continue to administer the Small Dams Program and include funding in the budget for up to two dams per year
- Evaluate and prioritize applications received from landowners on an annual basis taking into consideration funding, benefits, and interest when selecting structures for design and construction.
- Continue to look at options to combine NRD funds with local or state funds to complete small dam projects
- Work with qualified private consultants and NRCS staff for planning and design assistance
- Monitor completed projects to make certain they operate properly and that landowners are performing required maintenance

Objective 10 - Promote the importance for flood control, watershed planning, and the operation and maintenance of watershed structures.

One of the keys to the District's success in developing watershed and flood control projects has been keeping the public informed about the planning and construction of structures. Since most of the structures the NRD operates are done so through easements, it requires the District to develop working relationships with landowners. Information on watershed activities has typically been provided through meetings, newsletter articles, news releases to local media, and mailings. In recent years the District's website has also become an important tool for providing information. Historically educating the public about the benefits provided by flood control and the importance of maintaining existing structures has also been critical in achieving the goal of reducing flood damage in the NRD.

Planned Actions:

- Use local media and the NRD newsletter to promote the development of any new watershed projects
- Use the local media and District newsletter to promote efforts to upgrade and repair watershed structures
- Use local media, the District newsletter, and electronic media to provide information to the public on programs available to help construct dams on private property
- Continue to promote the benefits provided by NRD flood control structures
- Promote the damage reduction benefits resulting from District structures following major flood events

Objective 11 - Promote the District's efforts to assure structures are operating in a safe, efficient manner

The NRD expends a considerable amount of resources assuring that watershed structures operate safely. It is important for the public to know that the NRD is making every effort to assure that dams are safe and will continue to provide the flood protection for which they are designed. Historically the operation and maintenance of dams has been a routine responsibility of the NRD and often done without much public awareness.

Planned Actions:

- After flood events provide information to the public on how safely the District structures operated and the resulting damage reduction
- Work with communities, counties, and other local entities to better educate them on the importance of developing emergency action plans in the event of a potential structure failure
- Make landowners aware of how their management and use of the site can impact the safe operation of a dam

Goal - Provide local and regional outdoor public recreation opportunities in southeast Nebraska

Objective 1 - Continue to operate and maintain present recreation facilities at Kirkman's Cove, Iron Horse Trail Lake, Prairie Owl, and Wirth Brothers Lake

The NRD presently operates public recreation facilities around four flood control structures in the District. Kirkman's Cove and Iron Horse Trail Lake are the larger areas with Wirth Brothers Lake and Prairie Owl smaller in size. Typical maintenance activities include mowing, spraying for weeds, weekly cleanup of use areas and restrooms, garbage pickup, and replacement or repair of broken facilities such as picnic tables, restrooms, grills, etc. Vehicle entry permits are required at three areas, and fees are also required to use some RV camping facilities. Most of the use at NRD parks occurs between May and September. Some facilities are closed during the winter months.

Planned Actions:

- Provide staffing to perform routine maintenance services at all NRD recreation facilities
- Coordinate and schedule routine trash pick-up, water, and electric services for the recreation facilities
- Update and implement a recreation maintenance and improvement plan for District facilities
- Continue to contract mowing of Kirkman's Cove, Iron Horse Trail Lake, Wirth Brothers Lake, and Prairie Owl recreation areas.
- Where feasible and beneficial contract out haying and/or grazing using proceeds to help pay for area maintenance
- Periodically evaluate fee structure to determine if increases are needed

Objective 2 - Develop a recreation facility in conjunction with the Buck and Duck Creek Watershed Project

The District plans to incorporate recreation facilities into the Duck Creek dam which is located west of Peru. Present plans call for a park with facilities similar to Kirkman's Cove and Iron Horse Trail Lake. NRCS is working with the NRD on planning for the site. It has been estimated that the proposed park facility could attract over 10,000 users per year. NRCS has estimated that the cost to develop the necessary park facilities will be around $1.4 million.

Planned Actions:

- Continue working with NRCS to develop a recreation plan for Duck Creek
- Seek funding from state and local grants to help pay a portion of the cost to construct the facilities
- Construct planned park facility at Duck Creek
- Look for unique public use opportunities to incorporate into the recreation area
- Develop an operation and maintenance plan for the recreation area

Objective 3 - Continue to operate and maintain the Steamboat Trace Trail

The District operates and maintains the Steamboat Trace, which is a 22-mile long trail that was developed on an old railroad right-of-way that extends from south of Nebraska City to Brownville. Maintenance typically consists of tree trimming, mowing, spraying for weeds, and repairing the rock surface. Because the trail is located adjacent to the Missouri River, it is prone to flooding and flood damages on occasion.

Planned Actions:

- Provide staffing to regularly maintain the trail
- Regularly inspect the trail for maintenance issues with special focus after storm events
- When available use local contractors to complete major maintenance or repairs items
- Identify options to address reoccurring maintenance problems and damages from flooding
- Work with Otoe County and OPPD to address the location of the Arbor Spur Trailhead and potentially eliminate using the county road to access the trail
- Promote the trail both locally and regionally
- Look for opportunities to increase donations to the trail and expand the user base

Objective 4 - Evaluate ways and, if feasible, implement programs, projects, or facilities that will increase recreation area and trail use

The District is always looking at ways to encourage more use of NRD recreation facilities. Increasing park use offers several benefits including more fee income, reduced opportunities for vandalism, wider spectrum of the public using the facilities, more visibility for the NRD, and improved experience for the park user. The NRD obtains input on improvements from users through the permitting process. Where feasible those comments are incorporated into the decision making process.

Planned Actions:

- Continue to acquire suggestions from park area users on improvements that can be made to the parks
- Identify and implement ways to better determine use numbers at District recreation facilities and the segment of the public using the trail
- Evaluate similar facilities and look for opportunities to install features that will expand recreation facility use by the public
- Consider special one- or two-day events that may attract new users to NRD recreation facilities
- Promote park facilities in area newspapers and media outlets
- Develop and circulate informational materials about NRD parks

Objective 5 - Work with Game and Parks to improve sport fisheries habitat and upgrade angler access facilities at District recreation areas

The Nebraska Game and Parks Commission has worked with the NRD in the past to stock appropriate fish in lakes associated with District parks. They also regularly monitor fish populations in lakes to assure the appropriate species balance is maintained and populations of undesirable species are limited. Game and Parks also has access to grant funding that can be used to upgrade fish habitat in lakes and improve angler access opportunities including those for disabled anglers.

Planned Actions:

- Continue to work with Game and Parks on fish stocking programs
- Work with Game and Parks to develop habitat plans for new lakes and lake renovation projects
- Continue to work with Game and Parks to monitor fish species in District recreation lakes
- When appropriate utilize Game and Parks grant funds to make improvements to District park areas
- Monitor District recreation lakes for invasive fish and Zebra Mussels

Objective 6 - Seek ways to make the operation and maintenance of District recreation facilities more cost efficient

Each year the NRD spends a significant amount of money on maintaining parks. To assure that facilities are well maintained within a reasonable cost, the NRD typically considers several options for addressing maintenance and repairs. In some cases it is most cost effective to have staff handle maintenance items while in others contracting the service out may be the better option. Vehicle entry and camping fees have been used to help generate income for maintaining parks. Fees presently generate up to $10,000 per year. There also may be options for incorporating facilities that require less maintenance thus reducing costs.

Planned Actions:

- Regularly evaluate recreation area and trail maintenance activities and consider incorporating changes that improve cost efficiency.
- Evaluate the recreation fee structure once every five years
- Utilize materials and facilities that result in long-term maintenance reduction to the District parks and trail
- Consider eliminating facilities that receive little or no public use

Objective 7 - Work with local and state law enforcement authorities to improve enforcement of rules and regulations at District recreation facilities

The NRD depends on local law enforcement and Game and Parks to enforce District park rules. Historically the NRD has worked with law enforcement on an informal basis to enforce rules. Law enforcement varies depending on the season and jurisdiction responsible for overseeing the area.

Planned Actions:

- Hold periodic meetings with law enforcement agencies to discuss the park rules and appropriate enforcement
- Obtain input from law enforcement on any potential rule changes
- Develop processes for addressing any major problems that could occur at District parks
- Consider options for funding law enforcement activities if deemed necessary and feasible
- Improve signage displaying area rules and regulations

Objective 8 - Evaluate the benefits of incorporating public recreation when planning future projects

Historically the NRD has considered including recreation facilities when developing watershed plans. In some cases adding recreation as a component of a project can provide additional economic benefits and elevate a project from a negative benefit-cost ratio to a positive ratio. Factors that typically are considered when evaluating a project for recreation include type of recreation activities that can be developed, site suitability, public demand, cost, and potential funding sources to fund development costs. Depending on the facilities being developed, cost to incorporate recreation facilities can range from $500,000 to over $1 million. Maintenance requirements and cost also have to be considered.

Planned Actions:

- Continue to consider and evaluate future watershed projects for recreation potential and benefits including the District's ability to provide adequate funding and staff to properly maintain facilities
- Monitor public demand for recreation in southeast Nebraska.
- Include recreation facilities on watershed projects where feasible

Objective 9 - Seek opportunities to assist counties and communities desiring to improve public recreation facilities.

Almost all communities in the District operate park facilities. Historically the NRD has worked with communities to provide technical assistance and in some cases financial assistance to upgrade city parks. In recent years the NRD has provided funding through the Urban Special Projects program to help fund trails and outdoor education components in community parks.

Planned Actions:

- Continue provide funding assistance for some park related improvements to communities through the Urban Special Projects Program
- Where feasible, provide technical assistance to communities for park development
- Seek opportunities to work with communities on park development that enhance District recreation goals and facilities

Objective 10 - Use the District's Information and Education program to promote the use of the NRD recreation facilities, and encourage partnerships with other public entities to improve public recreation opportunities in southeast Nebraska

It has been important to assure that everyone in the District is aware of and has an opportunity to use NRD recreation facilities. The District promotes facilities through local media, newsletters, the NRD's website, and brochures. The District not only makes the public aware of the recreation areas but also informs the public of closings, water quality concerns, and park improvements. The District also provides information to the public on assistance programs such as Urban Special Projects that potentially can assist communities with recreation projects in their jurisdiction.

Planned Actions:

- Continue to promote the District's recreation facilities using local newspapers and radio stations
- Utilize the District's website to update the public on the status of the District recreation areas and the trail
- Look at other electronic media opportunities to provide information to the public on the trail and parks areas
- Utilize special events or media events to promote major park or trail improvements
- Develop public relations campaigns targeted at encouraging new users and groups to visit NRD recreation facilities

Goal - Promote the protection and management of grass and forest resources in the Nemaha River Basin

Objective 1 - Participate in programs that inform the public about the negative impact invasive species have on grassland and forest resources

Numerous invasive species have an impact on ecosystems in southeast Nebraska. Some of the bigger threats include sericea lespedeza, musk thistle, phragmites, and purple loosestrife. Tree species such as eastern red cedar and locust have also become a threat to pastures in the District. The District has worked with the Five Rivers RC&D and local weed superintendents to get more information out to the public on these concerns. In addition the District has worked with the Five Rivers Weed Management Area to increase the focus on addressing invasive species.

Planned Actions:

- Continue to work with the Five Rivers RC&D and the Five Rivers Weed Management Area to increase awareness of invasive species in southeast Nebraska
- Incorporate information on invasive species into educational programs sponsored by the NRD
- Include articles in the NRD newsletter on invasive species

Objective 2 - Provide landowners with conservation tree sales and planting services

Since its inception in 1972, the NRD has provided tree sales and planting services. Each spring the NRD handles 30,000 to 40,000 trees for use in conservation plantings throughout the NRD. District staff works with state foresters to evaluate species suitability for the NRD. Trees not suited to the area or that show problems with disease are not offered by the District. Cost-share assistance through SWCP is offered on eligible projects.

Planned Actions:

- Continue to sell conservation trees to the public
- Continue to provide tree planting services
- Work with the Nebraska Forest Service on selecting trees suitable for southeast Nebraska
- Work to coordinate tree program activities with neighboring NRDs to help make the program more efficient
- Monitor tree planting sites to determine survival and growth rate
- Consider options to upgrade and improve the tree planting program
- Continue efforts to promote tree planting to the public

Objective 3 - Work with the Nebraska Association of Resources Districts and other NRDs in Nebraska to maintain or create a source of seedling conservation trees in Nebraska

In recent years NRDs around the state have worked with the Nebraska Association of Resources Districts to help administer the statewide tree program. NARD works directly with the Bessey Nursery in Halsey to assure that districts are getting desirable, high-quality seedling trees. They help coordinate ordering between the NRDs and Bessey as well as help determine future needs.

Planned Actions:

- Continue to participate in the agreement with NARD to administer the statewide tree program
- Provide input to NARD and the Nebraska Forest Service on tree concerns as needed or requested

Objective 4 - Provide the public with technical assistance on trees, tree planting, tree disease, and insect problems

The District regularly provides technical assistance and advice to the public on tree planting, disease and insect problems, plant identification, and tree care. When necessary the NRD consults foresters from the Nebraska Forest Service to address more challenging concerns.

Planned Actions:

- Provide assistance to the public on tree planting and care
- Continue to provide technical assistance to the public on tree disease and insect problems
- Work with the Nebraska Forest Service to address more challenging or complicated concerns
- Continue the Plant-A-Tree Program with District schools

Objective 5 - Monitor disease, insect, or other problems that could impact the forest resources in the Nemaha Basin

The District staff works with federal and state foresters to monitor disease and pest problems that could impact trees species. This may require staff to attend meetings or workshops on occasion to obtain the most recent information that is available. The District uses monitoring information to help decide on species to offer and educate the public on methods to control or reduce the impact of the threat.

Planned Actions:

- Continue to monitor insect disease and other concerns that pose a threat to the forest resources of southeast Nebraska
- Attend meetings to obtain information on threats to the forest resources in the District
- Provide information on tree threats to the public as appropriate
- Encourage the use of disease and insect resistant tree species

Objective 6 - Promote programs that help maintain grass, wetland, and woodlands on marginal land

The District has always supported programs such as CRP and the Grassland Reserve Program which promote the concept of converting cropland into grass. Grass provides more habitat and reduces nonpoint source pollutants such as sediment from entering waterways.

Planned Actions:

- Continue to support and promote programs such as CRP to encourage cropland to grass conversion
- Support efforts to allow landowners to reenroll land into existing programs such as CRP
- Work with landowners to look at programs that help convert marginal cropland to grass or woodlands
- Continue to support the Nebraska Buffer Strip Program alone or in conjunction with CRP

Objective 7 - Promote the use of environmentally beneficial plants in urban and residential areas

In recent years the NRD has worked with several communities to incorporate native and environmentally beneficial plants into community landscapes. When eligible and feasible funding may be provided to communities through the Urban Special Projects Program. Often times these plantings can serve as an educational tool for the public.

Planned Actions:

- Work with communities on using native and environmentally beneficial species in community landscapes
- Continue to include plantings as an eligible practice in the Urban Special Projects program

Objective 8 - Inform the public on District programs that encourage the planting of trees and grasses

In order for the District to have a successful tree program, it is critical that the public be made aware of the programs and assistance that the NRD makes available to them. Every year the District makes a major effort to promote the sale of conservation trees through the District newsletter, news articles, the NRD website, and brochures. The District also promotes trees through education programs such as the Plant-A-Tree Program, which targets youth audiences.

Planned Actions:

- Annually provide local media with information on the District's tree planting services
- If necessary purchase advertisements from local newspapers and radio stations promoting tree planting services provided by the NRD
- Use the District's website to promote the tree program
- Explore other forms of electronic media to promote the District's tree planting program
- Include information on the tree planting program in the NRD newsletter or other mailed media
- Provide brochures or other written materials that help inform the public on trees and tree planting
- Continue the Plant-A-Tree Program to help educate youth on the importance of planting trees

Goal – Help manage and enhance fish and wildlife habitat in the Nemaha River Basin

Objective 1 - Provide landowners the opportunity to participate in federal and state wildlife habitat programs

The District has participated in numerous wildlife habitat programs in the past that help partner with landowners to install practices to improve wildlife habitat including Wild Nebraska, Partners for Wildlife, and the Nebraska Buffer Strip Program. Habitat improvements may include seeding of native grasses, food plots, shrub and tree plantings, reduction of grazing, wetlands enhancement, and riparian area improvements. Typically landowners receive a payment or cost share assistance for participating in the program. The District works with the Nebraska Game and Parks Commission, U.S. Fish and Wildlife Service, and other conservation organizations to implement programs.

Planned Actions

- Continue participation with Nebraska Game and Parks in the Wild Nebraska Program
- Continue participating with U.S. Fish and Wildlife Service in the Partners for Wildlife Program

Objective 2 - Seek opportunities to incorporate riparian buffers, wetland development, and protection into watershed projects

Some flood control or grade stabilization projects offer opportunities for establishing buffers along streams and/or developing or enhancing wetlands. In some cases it may be required to meet mitigation requirements for permits. Typically wetland development or enhancement will require assistance from a qualified biologist to assure that the end product meets wetland requirements. Mitigation actions typically increase the overall cost of a project, and post-construction monitoring may also be required to assure that the project results in appropriate environmental protection.

Planned Actions:

- Incorporate potential stream protection, stream enhancement, or wetland development sites in future watershed plans
- Evaluate future watershed projects for potential wetland development and determine the potential for using wetlands for environmental mitigation
- Incorporate wetlands and riparian buffers where practical and feasible
- Create programs that help educate the public on the importance of wetland and stream channel ecosystems

Objective 3 - Develop programs that teach both adults and youth about the importance of fisheries and wildlife habitat

Historically the NRD has had opportunities to partner with agencies such as Nebraska Game and Parks to work on or develop programs that promote the value of fisheries and wildlife habitat. Programs such as Project Wild and Envirothon are good examples of programs that the NRD has used to help educate the public, particularly youth. Other opportunities may be available including developing the District's own program that could have a place in educating the public. Many programs are geared at youth education, and there may be a need for more adult education in the future.

Planned Actions:

- Continue to use programs such as Project Wild when doing youth and adult education events
- Look for or develop education programs that compliment present efforts, and if possible, provide a more localized education opportunity
- Continue to support the Envirothon competition
- Provide information to the public on habitat issues and concerns by using local media, the NRD newsletter, and electronic media

Goal – Provide support to communities, counties, and drainage districts to address drainage concerns within the Nemaha River Basin

Objective 1 - Work with communities to address problems that are caused by storm water runoff

Storm water runoff and drainage issues are ongoing problems for cities and villages. In recent years several communities in the NRD have asked for assistance in dealing with drainage issues, and the District will typically provide technical assistance on projects. In some cases the NRD will consider providing funding assistance to communities for drainage projects.

Planned Actions:

- Work with communities by providing technical assistance on addressing drainage issues
- Promote the importance of addressing storm water runoff from urban areas
- Evaluate funding requests from other communities on a case-by-case basis to determine if NRD funding is appropriate

Goal – Promote the reduction of solid and hazardous waste within the Nemaha River Basin

Objective 1 - Support and promote programs that help reduce household hazardous and other hazardous waste

Many homes have supplies of household hazardous wastes that are no longer useable or are outdated. This may include items such as cleaning products, paint, lawn chemicals, insecticides, and automotive products. These products typically cannot be disposed of in landfills, so owners have few options for disposal. In recent years hazardous waste pickups have been scheduled through the support of the Five Rivers RC&D. The NRD has assisted in the past by sponsoring grant applications to help fund the effort.

Planned Actions:

- Continue the support of household hazardous waste pickup events
- Promote pickup events to increase public participation and awareness
- Provide information to the public on the proper disposal of these materials

Objective 2 - Support the use of recycled materials

More options are available for using recycled materials. As cost and availability come down, the NRD should consider the use of such materials. Historically the District has used recycled paper products and wood products. The District also uses shredded paper for tree mulch rather than disposing it.

Planned Actions:

- Continue to use recycled paper and wood products
- Look for opportunities to expand the use of recycled products in the future