



LOWER PLATTE SOUTH NATURAL RESOURCES DISTRICT

2019 MASTER PLAN



LOWER PLATTE SOUTH
natural resources district

Lower Platte South NRD
PO Box 83581
3125 Portia Street
Lincoln, NE 68521
402-476-2729
www.lpsnrd.org



Table of Contents

1 INTRODUCTION

- 1 AUTHORITY AND RESPONSIBILITIES
- 2 VISION STATEMENT
- 3 MISSION STATEMENT
- 3 MASTER PLAN

5 BACKGROUND

- 5 LOWER PLATTE SOUTH PAST AND PRESENT
- 8 DESCRIPTION OF THE DISTRICT

15 CURRENT RESPONSES

- 16 REGULATORY ACTS
- 16 GROUNDWATER MANAGEMENT
- 17 INTEGRATED MANAGEMENT
- 20 ASSISTANCE/COST-SHARE PROGRAMS
- 20 FORESTRY AND TREE SEEDLINGS
- 21 ENVIRONMENTAL EDUCATION
- 22 SALT CREEK FLOOD REDUCTION PROJECT (SALT CREEK LEVEE)
- 22 BANK STABILIZATION - URBAN CHANNELS
- 22 FLOOD CONTROL WATERSHED PROJECTS
- 23 FLOOD CONTROL NON-WATERSHED PROJECTS
- 23 STREAM INTERVENTIONS
- 23 ANTELOPE CREEK FLOOD REDUCTION PROJECT
- 23 LOWER PLATTE RIVER CORRIDOR ALLIANCE
- 24 RECREATION
- 24 PUBLIC INFORMATION AND AWARENESS
- 25 ADDITIONAL PLANNING

27 DIRECTION FORWARD

- 27 FUTURE NEEDS
- 30 GOALS, DESIRED OUTCOMES, AND OBJECTIVES
- 30 GOALS AND OBJECTIVES TABLE

This page intentionally left blank.



INTRODUCTION

AUTHORITY AND RESPONSIBILITIES

The Lower Platte South Natural Resources District (LPSNRD) is one of 23 natural resources districts created in 1969 with the passage of LB1357 by the Nebraska Unicameral. Since its formation in 1972, LPSNRD has been assisting people in the Lower Platte River Basin in the development and protection of our soil and water resources.

The natural resources districts have been given statutory responsibility outlined in Section 2-3229, R.R.S. 1943. This section states that “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.”

The NRD is authorized to levy taxes on property to generate funds to fulfill the mission of the NRD. The Lower Platte South NRD has a 21–member Board that, in addition to approving a budget and setting a tax levy, also sets policy, establishes priorities, and makes decisions related to the NRD’s work. The Lower Platte South NRD includes the City of Lincoln and contains parts of six counties. Overall the NRD includes slightly more than one million acres and approximately 350,000 residents.

The NRD has a staff of approximately 30 employees that operate and maintain close to 200 flood-control dams, 13 miles of levees, approximately 12 miles of urban stream channels, 50 miles of trails, 13 wildlife management areas, 12 community/public wetlands, and monitors groundwater quantity and quality. The NRD also provides project planning and management for additional projects/studies, environmental education, and administers programs that provide annually over \$1M in cost-share assistance to landowners to install best management practices (terracing, tree seedlings, meters, buffer strips, well decommissioning, etc.) to improve our water quality and protect our natural resources.

The successful implementation of these programs and projects is due in large part to a commitment of cooperation and collaboration with other local, state, and federal agencies and private organizations and individuals. This NRD has a history of innovation and leadership; for example, being among the first of the NRDs to utilize conservation easements as a resources protection tool, to develop and manage recreation trails, to acquire and restore wetlands, and to partner with the City of Lincoln in stormwater quality and quantity management.

VISION STATEMENT

A vision statement for LPSNRD is a picture of the district’s future. It becomes the framework for all of the district’s strategic planning. A vision statement has more to do with the future and describes what the district plans or hopes to be in the future. A vision articulates a view of a realistic, creditable, attractive future for the organization, a condition that is better in some important ways than what now exists. During the February 2018 planning retreat, the directors were asked to prepare a vision statement for LPSNRD that identified the district and clearly demonstrate the district’s goals to all stakeholders. The following overall vision statement has been adopted for LPSNRD:

“Protecting our natural resources for future generations.”

MISSION STATEMENT

The primary difference between a vision and mission statement is the timeline. A mission statement defines what an organization is currently doing, while a vision statement is a goal of what they'd like to accomplish. The mission is what people do to achieve the vision.

A mission is different from a vision in that the former is the cause and the latter is the effect; a mission is something to be accomplished whereas a vision is something to be pursued for that accomplishment. A mission statement is the day-to-day focus and describes how the district plans on achieving our objectives. This is a statement to directors, staff, and the public with interest in the district that clearly articulates what the district is doing, how it's going to do it, and ultimately why it's doing it. The mission statement for LPSNRD is:

“Maintain a sustainable environment through the conservation of land, water, and wildlife.”

MASTER PLAN

The Master Plan for LPSNRD was prepared by the district staff under the direction of the Master Plan Ad Hoc Subcommittee, recommended by Finance and Planning Subcommittee, and approved by the District Board of Directors on December 12, 2018. It replaces a similar Master Plan adopted in January 2009.

The purpose of this plan is to identify where we've been, what we're doing now, and where we want to be. The Plan will expand the mission and vision statements into goals, desired outcomes and objectives of LPSNRD for the next 10 years (2019-2029). The goals reflect the responsibilities and authorities contained in state statutes as outlined above. The listed objectives are included in the district's *Long-Range Implementation Plan* for the next five years, which is updated each year. The *Long-Range Implementation Plan* and the annual budget are the primary tools for implementing the Master Plan. Included in this plan are sections on the district's background, present projects and programs, and a direction forward.

This page intentionally left blank.



BACKGROUND

LOWER PLATTE SOUTH PAST AND PRESENT

Upon settlement of the area, in the mid-1850s, that is now the Lower Platte South NRD, flooding quickly became a primary concern. Floods that occurred were often fatal. The development of land and conversion to cropland only increased the frequency and severity of flooding. The first political response to the problem in the Lincoln area came in 1891, with the organization of Sanitary District #1 of Lancaster County. Under the district's authority, work was started to straighten Salt Creek through Lincoln hoping that increased flow velocity would reduce flooding.

On July 6, 1908, a major flood in the Salt Valley took many lives and efforts to straighten and deepen Salt Creek took on new urgency. Work resumed with greater vigor in 1909. At the same time,



Images of historical flooding in rural (left) and urban (right) areas of LPSNRD

landowners of a large area drained by Weeping Water Creek were having similar problems. Residents of an area in Cass and Otoe counties were losing large amounts of fertile soil almost annually due to flooding. Then in the 1930s, dust bowl conditions brought erosion concerns to the national forefront. Congress created the Soil Erosion Service (SES) in 1933. The Soil Conservation Service was created in 1935, which absorbed the SES. Finally, in 1937, a Standard Act to create Soil Conservation Districts was passed by Congress. The State of Nebraska adopted the act immediately and there were soon soil conservation districts throughout the state.

Severe flooding persisted and by 1945, public response to channel straightening had turned negative. That year, Sanitary District #1 was informed by federal authorities they would likely not assist those channel projects in the future.

In May of 1950, a major flood in the area killed nine people and damage to the land was extensive. In response, the Salt-Wahoo Watershed Association was formed, with the goal to bring all landowners and people in the area the benefits of water conservation, erosion control, flood abatement, recreation and wildlife development. The association included both rural and urban interests. Many other similar groups were formed across Nebraska, including the soil and water conservation districts in 1959 which followed county boundaries. Then in 1960, the

Salt-Wahoo Watershed District was formed to sponsor a U.S. Army Corps of Engineers (USACE) project to construct ten major flood control structures, channel improvements, and levee construction. By the late 1960s, state government leaders recognized a need to reorganize these groups under a single authority and combine the responsibilities of some 154 special purpose districts. Nebraska's natural resources districts (NRDs) were gavelled into existence by the Legislature in 1969 and started in 1972. These 24 (now 23) locally elected boards were organized according to river basin boundaries and had statutory authority to manage local natural resources and to levy property tax.

The Lower Platte South NRD inherited the Upper Salt Watershed Project and the Oak-Middle Watershed Project from the local county soil conservation districts and the Salt Creek Levee Project from the Salt Valley Watershed District. Flood reduction projects since 1972 have included the Weeping Water Watershed Project, Stevens Creek Watershed Project, the Antelope Creek Flood Reduction Project, Deadman's Run Flood Reduction Project, and many more. Over the years, the district's approach to flood management has shifted from flood control to flood damage reduction, utilizing techniques such as terracing and other land improvements, limiting development in floodplains, upgrading high hazard dams, and developing early-warning systems. Likewise, the district has become a

leader in the management of groundwater, stormwater, wetlands and rare saline wetlands, in providing recreation and in educating the public about conservation. The multipurpose nature of the Lower Platte South NRD makes it well-equipped to respond to increasing public conservation needs. Some of those response actions are outlined in the CURRENT RESPONSES chapter.

Governing Body

The Lower Platte South Natural Resources District is governed by a 21-member Board of Directors (see Table 1). Directors are elected at the general election for four-year terms 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. Each year a Board Chair, Vice-Chair, Secretary, Treasurer, Nebraska Association of Resources Districts (NARD) representative, and a NARD alternate are elected by the board from among the directors.

LPSNRD operates with four standing subcommittees, two administrative subcommittees, and four ad hoc subcommittees. Other ad hoc committees, commissions, coalitions, boards, etc. are formed as needed. At present the standing subcommittees are Land Resources; Water Resources; Urban; and Recreation, Forestry and Wildlife. The administrative subcommittees are Executive and Finance and Planning. The four ad hoc subcommittees include: Information and Education; Platte River; Integrated Management; and MoPac East-Lied Connector. The NRD Board operates according to a set of operating policies which are kept on file at the district headquarters in Lincoln, Nebraska.

Proposals for board action are first taken before an appropriate subcommittee for review. The subcommittee makes a recommendation to the board and the board votes to adopt or reject the proposal. When the board adopts a policy,

Table 1: 2018 LPSNRD Board of Directors

SUB-DISTRICT	DIRECTOR	LOCATION
Sub-district 1	Don Jacobson	Lincoln
Sub-district 1	Gary Hellerich	Valparaiso
Sub-district 2	Mark Spangler	Murray
Sub-district 2	Sarah Wilson	Waverly
Sub-district 3	Vern Barrett	Ceresco
Sub-district 3	Mike DeKalb	Lincoln
Sub-district 4	Larry Ruth	Walton
Sub-district 4	Gary Aldridge	Lincoln
Sub-district 5	Bruce Johnson	Lincoln
Sub-district 5	Greg Osborn	Lincoln
Sub-district 6	Anthony Schutz	Lincoln
Sub-district 6	Deborah Eagan	Lincoln
Sub-district 7	Chelsea Johnson	Lincoln
Sub-district 7	Richard Bolte	Lincoln
Sub-district 8	Dan Steinkruger	Lincoln
Sub-district 8	Ron Svoboda	Lincoln
Sub-district 9	Milt Schmidt	Lincoln
Sub-district 9	Robert Andersen	Lincoln
Sub-district 10	Ray Stevens	Lincoln
Sub-district 10	Karen Amen	Lincoln
At-large	David Landis	Lincoln

approves a project or program, or otherwise issues a directive through voting, it is the responsibility of the district staff to carry out those actions.

At the discretion of the board, citizen advisory groups may also be formed to assist the board in considering specific projects or activities. Members are appointed and represent a group of people or businesses with particular interest in the project or activity.

NRD Staff

The Lincoln office staff currently consists of 29 full-time employees. LPSNRD also staffs three full-time resources technicians and two district secretaries in the Natural Resources Conservation

Service county offices located in Lincoln and Weeping Water. As of December 2018, the Lower Platte South NRD consists of the 33 full-time staff members listed in Table 2.

In addition to the listed full-time positions, interns and seasonal employees are hired to assist with water programs and maintenance of NRD projects. LPSNRD also contracts with State Correctional System for two supervisors for work crews to perform maintenance on a number of our NRD properties.

DESCRIPTION OF THE DISTRICT

Location

LPSNRD is located in southeastern Nebraska. It encompasses the southern portion of the Lower Platte River Basin and a portion of the Nemaha River Basin (Weeping Water Watershed). The district covers approximately 1,069,803 acres and stretches from the Missouri River westward to six miles into Seward County, a distance of 64 miles at the widest point. The greatest north-south distance is 48 miles from locations north of Highway 92 in Butler and Saunders counties down to southern Lancaster County.

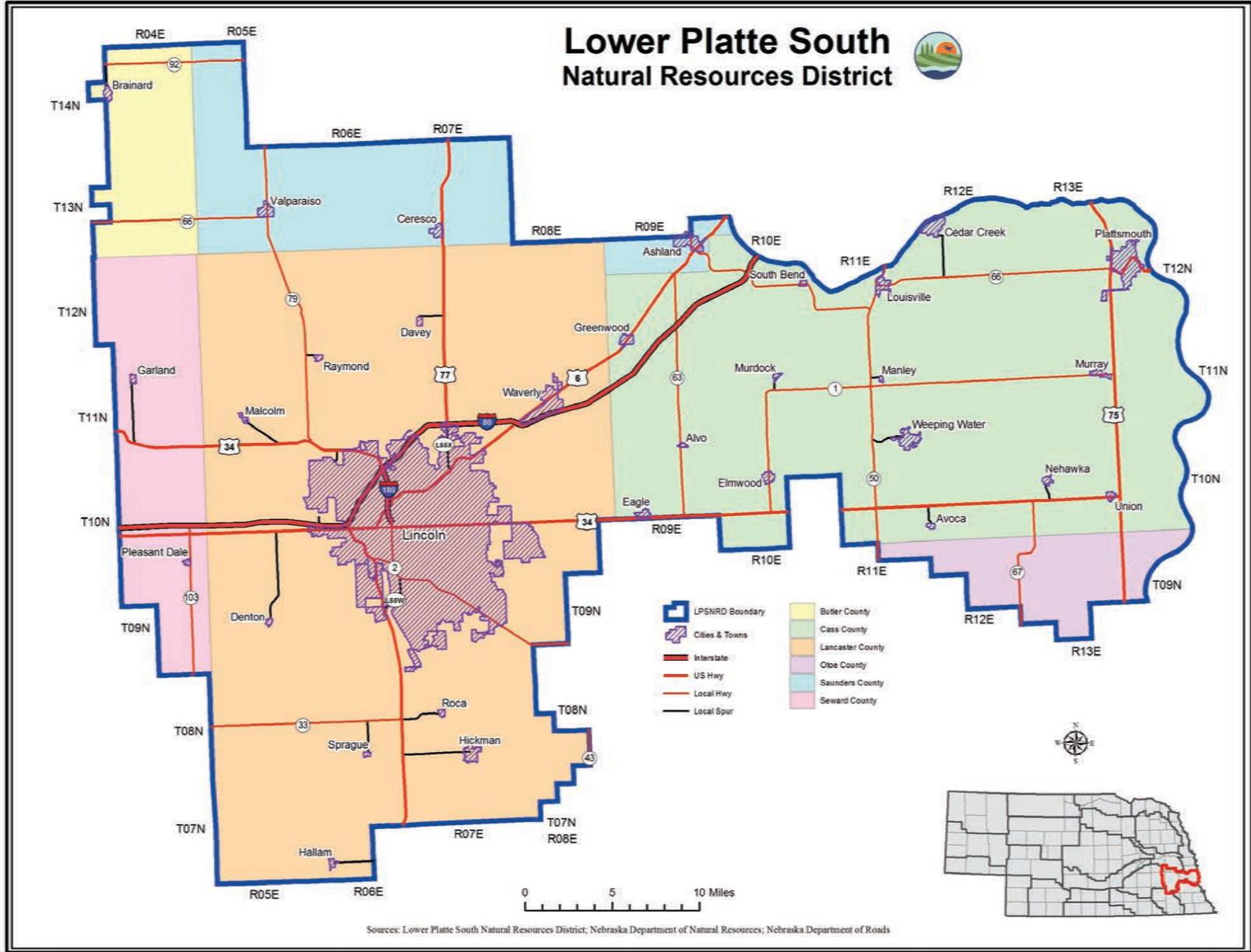
The district borders on five other NRDs: the Papio-Missouri River and the Lower Platte North NRDs to the north; Upper Big Blue NRD to the west; and the Lower Big Blue and Nemaha NRDs to the south. The district also spans parts of six counties: Lancaster, Cass, Saunders, Seward, Butler, and Otoe.

There are 31 municipalities within the district. The largest of these is Lincoln, followed by Plattsmouth, Waverly, Ashland, Hickman, Louisville, Weeping Water, and Eagle. Other communities in the district include Brainard, Valparaiso, Ceresco, Raymond, Davey, Malcolm, Denton, Sprague, Hallam, Roca, Pleasant Dale, Garland, South Bend, Murray, Elmwood, Cedar Creek, Union, Nehawka, Avoca, Manley, Alvo, Greenwood, and Murdock.

Table 2: 2018 Lower Platte South NRD Staff

ADMINISTRATIVE	
General Manager	Paul Zillig
Assistant General Manager	David Potter
Administrative Assistant	Kathy Spence
CLERICAL	
District Office Secretary/Program Assistant	Donna Reid
Receptionist/Secretary	Kathy Hauschild
District Field Office Secretary (Lancaster Co. NRCS Office)	Connie Hansen
District Field Office Secretary (Cass Co. NRCS Office)	Jean Ulrich
TECHNICAL	
Operation & Maintenance Coordinator	Al Langdale
Operation & Maintenance Technician	Craig Matulka
Resources Technician (Lancaster Co. NRCS Office)	John Albert
Resources Technician (Lancaster Co. NRCS Office)	<i>vacant</i>
Resources Technician (Cass Co. NRCS Office)	Cindy Spilinek
Stormwater/Floodplain Specialist	Kyle Hauschild
Resources Coordinator	Dan Schulz
Resources Conservationist	Ariana Kennedy
Environmental Education Specialist	McKenzie Barry
Public Information Specialist	Mike Mascoe
Water Resources Conservationist	Steve Herdzina
Water Resources Specialist	Dick Ehrman
Projects Coordinator	Ed Ubben
Information Systems Administrator	Nathan Kuhlman
GIS Specialist	Shaula Ross
Water Resources Technician	Chris Witthuhn
Operation & Maintenance Technician	Bryce Jensen
Maintenance Technician	Trent Henry
Environmental Education Assistant	Adam Sutton
ENWRA Project Coordinator (with UNL)	Katie Cameron
Bookkeeper	Connie Damrow
Water Resources Compliance Specialist	Ryan Rezac
District Engineer	Jared Nelson
Forester (with Nebraska Forest Service)	Jay Seaton
Planner	<i>vacant</i>
Corrections Crew Supervisor (Dept. of Corrections)	Doug Cheney
Corrections Crew Supervisor (Dept. of Corrections)	Sam Grove
Saline Wetlands Conservation Partnership (with Lincoln Parks)	Tom Malmstrom

Figure 1: Map of the Lower Platte South NRD



Topography and Soil

Since the recession of glaciers from the region, the relatively flat plain which the district outlines has been carved by numerous streams. The plain is also covered by a layer of loess, which is wind-transported silt of glacial origin. Loess in this area is generally only a few feet deep. However, in some areas it is up to 90 feet in depth. This loess is easily eroded if not covered by vegetation. Variations in the loess result in many kinds of soils within the district, all with different characteristics and capabilities. The soils are high in mineral content and are relatively fertile.

Surface layer soils are the most susceptible to various types of erosion. These layers are relatively unconsolidated and are more easily eroded than older layers, which are consolidated bedrock. Although some erosion will always occur, good management practices can slow the natural processes. These practices will also allow the resources to be utilized for long periods of time.

Climate

The Lower Platte South NRD is located in eastern Nebraska and considered as part of the Humid Continental Climate type as classified in the Koppen Climate Classification System. This climate is typified by great seasonal differences in temperature, and with some precipitation throughout the year. Summers are generally hot, with temperatures often topping 100 degrees Fahrenheit. Winters are cold and dry, with temperatures as low as -29 degrees Fahrenheit.

The average annual rainfall is about 30 inches and the greatest precipitation occurs between April and September. Monthly averages range between 0.64 and 4.35 inches. Average snowfall is 26 inches but can vary greatly from year to year. The average length of snow cover is 42 days. Average monthly temperatures range from a low of 24.6 degrees in January to a high of 77.6 degrees in July. The growing season (the average period between the last spring and the first fall frosts) is 162 days. The relatively high summer temperatures allow for substantial evaporation.

Small lakes and ponds in the district average 45 inches evaporation loss per year.

Vegetation

The district is in an area of prairie biome, with bluestem as the dominant native species. Along the stream courses, stands of hardwoods are common, with the two main associations being oak-hickory and cottonwood-willow.

Reports from early travelers such as Lewis and Clark in 1804 and Wislezenus in 1839 give some indication of vegetative conditions before settlement. "Along the rivers and streams, woodlands of burr oak, bitternut hickory, slippery elm, sumac, ash, box elder, hackberry, black walnut, mulberry and basswood thrived. Willow and cottonwood sprouted in many places where sandy, wet conditions existed. The prairie itself was dominated by bluestem, indiagrass and switchgrass, with many wild flowers such as sunflower, goldenrod and prairie clover."

During the process of settlement, most of the native vegetation was removed and replaced by such cultivated plants as corn, sorghum, alfalfa, soybeans, and wheat. Much of the woodlands were cleared for agricultural and firewood purposes.

Today, remnants of the original prairie can be found in scattered plots and along railroad and highway right-of-ways. Participation in the Conservation Reserve Program has helped return thousands of acres to permanent vegetation approaching its original vegetative state. Woodlands persist along stream courses, especially on the bluffs above the Platte and Missouri rivers, and in planted shelterbelts.

Saline wetlands are also located in the district. Nebraska's saline wetlands are only found within the Salt Creek Watershed that encompasses much of Lancaster and Saunders counties, and flows generally southwest to northeast before converging with the Platte River near Ashland. In an area shaped by Salt Creek and its floodplain, the saline wetlands contain a diverse mixture of habitats including saline marsh and meadows,



Whitetail deer (left) and ring-necked pheasant (right) are some of the most prevalent animals in the district

salt flats, and spring and seep fed wetlands, bisected by streams and surrounded by tallgrass prairie. Salt-loving plants found in the wetlands include sea blite, saltmarsh aster, and saltwort.

Wildlife

Three basic habitat types exist in the district and allow for a variety of wildlife. They are grasslands, woodlands, and wetlands.

Very few native prairies remain today, and a relatively small amount of woodland has persisted. Nevertheless, there are certain animals which can and do survive in this habitat. Some of the most prevalent are the whitetail deer, ring-necked pheasant, bobwhite quail, cottontail rabbit, fox squirrel, gray squirrel, coyote, turkey, and several kinds of ducks and geese. These species exist in lesser numbers: muskrat, beaver, raccoon, red fox, gray fox, badger, striped skunk, spotted skunk, opossum, weasel, blacktail jackrabbit, mink, crows, mourning doves, and occasionally eagles, hawks, and owls.

Wetlands within the district are home to many birds and insects. More than 250 species of migrating and residential birds have been documented since around 1900 in the district's unique Saline Wetlands. In addition, thousands of species of insects and other invertebrates, many of them adapted for a life among saline soils, can be found in the Saline Wetlands, including the federally endangered Salt Creek tiger beetle.

Land Use

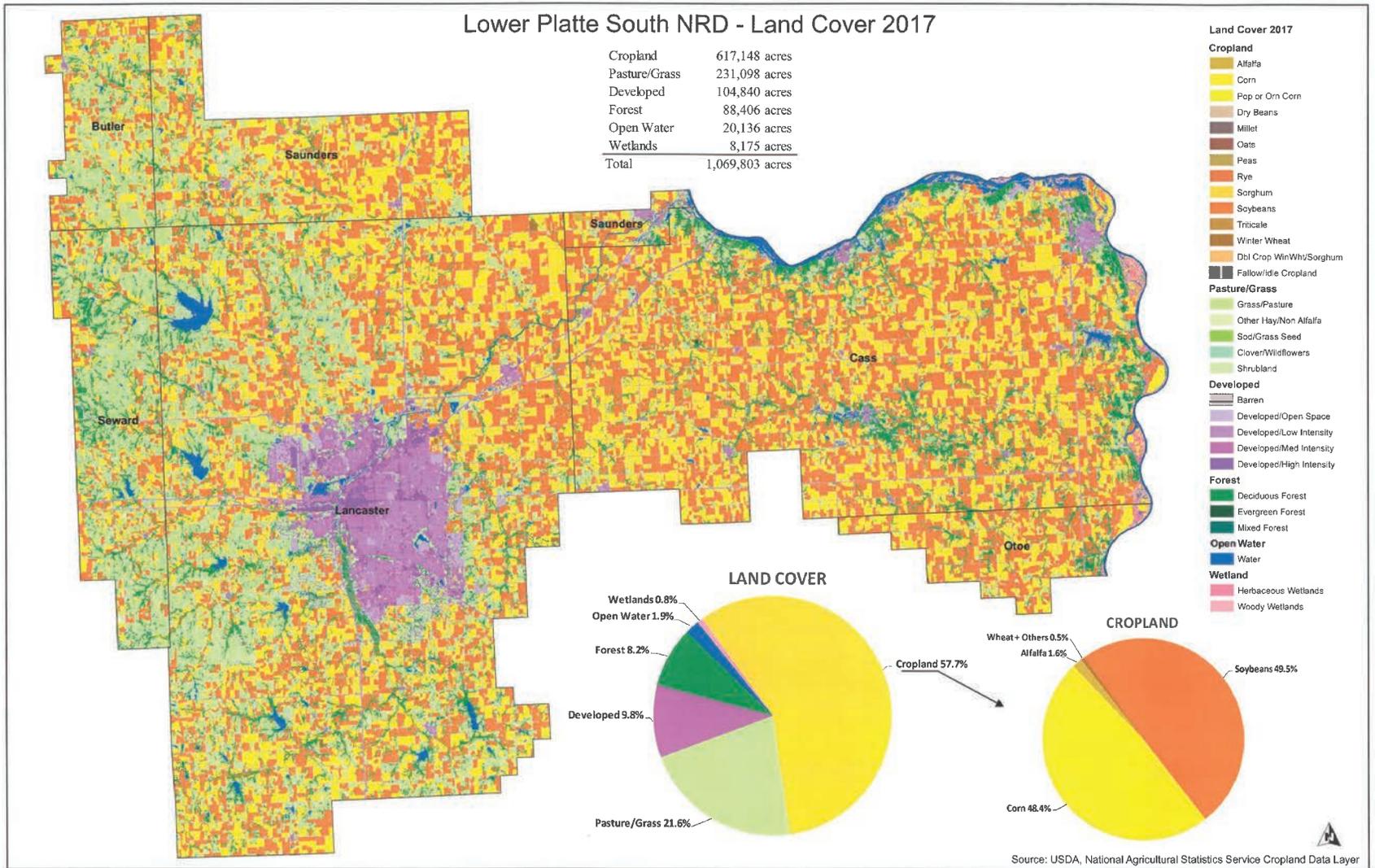
LPSNRD contains 1,069,803 acres, or approximately 2.16 percent of Nebraska's land mass (49,479,833 acres). As shown in Figure 2, the majority of the land in the district is used for crops (approximately 57.7 percent). The remaining acres comprise pasture/range, forest, and other land uses. Most of the district remains rural, as area in Lincoln's city limits (94 square miles) and other communities represent only a small percentage of the overall district. Table 3 provides a general breakdown of the district's land use based on 2017 USDA estimates.

Table 3: District Land Use Estimates

LAND USE	# ACRES	% OF DISTRICT
Cropland	617,148	57.7%
Pasture/Grass	231,098	21.6%
Forest	88,406	8.2%
Water/Wetlands	28,311	2.7%
Urban/Other (Developed)	104,840	9.8%
Total	1,069,803	100%

Agriculture will remain the predominant land use in LPSNRD, transitional agriculture is planned around Lincoln and in Cass County in areas adjacent to transportation corridors and along the river bluffs overseeing the Platte and Missouri Rivers. In Cass County mining will continue to expand where limestone deposits exist near Louisville, Wabash-Weeping Water-Nehawka.

Figure 2: LPSNRD Land Use Map



- Land Cover 2017**
- Cropland**
 - Alfalfa
 - Corn
 - Pop or Orn Corn
 - Dry Beans
 - Millet
 - Oats
 - Peas
 - Rye
 - Sorghum
 - Soybeans
 - Tribcale
 - Winter Wheat
 - Db1 Crop WinWh/Sorghum
 - Fallow/Idle Cropland
 - Pasture/Grass**
 - Grass/Pasture
 - Other Hay/Non Alfalfa
 - Sod/Grass Seed
 - Clover/Wildflowers
 - Shrubland
 - Developed**
 - Barren
 - Developed/Open Space
 - Developed/Low Intensity
 - Developed/Med Intensity
 - Developed/High Intensity
 - Forest**
 - Deciduous Forest
 - Evergreen Forest
 - Mixed Forest
 - Open Water**
 - Water
 - Wetland**
 - Herbaceous Wetlands
 - Woody Wetlands

Public and quasi-public recreational use will continue, and likely expand in the Ashland-Louisville area along the Platte River.

Water Resources

The water resources of the district take two forms: surface water resources in wetlands, lakes, and streams and groundwater resources stored in permeable sand, gravel, and rock formations beneath the surface.

Surface Water

The quality of water in streams within the district is judged by the Nebraska Department of Environmental Quality (NDEQ), according to how well the water meets three goals, called “beneficial uses.” All streams in the basin are assigned the beneficial uses of Aquatic Life Support, Agricultural Water Supply, and Aesthetics and Public Health. Studies have indicated that while a “significant percentage of surface waters are listed as not fully supporting” beneficial uses, there has been much improvement “in reducing point source pollution, such as pollution originating from wastewater treatment facilities.” Reports also state that “it would be unrealistic for the public to believe that water quality degradation from nonpoint source pollution, such as stormwater runoff and streambank erosion, will ever be fully eliminated. Great strides have been made in addressing nonpoint source pollution, but much work remains to be done.”

The district operates an estimated 200 flood-control dams, the USACE operates ten multi-purpose flood control dams, and landowners operate hundreds of private dams. The resulting ponds and lakes along with streams in the district are most severely threatened by nonpoint source pollution, or storm runoff that carries sediment and harmful chemicals into virtually all surface water bodies. Given Nebraska’s heavy orientation toward agriculture, drastic improvements in surface water quality will be difficult. However, the NRD along with other agencies, has learned that some improvements can be made.

In 2017, the district began developing a district-wide Water Quality Management Plan to look more closely at the quality of water. Together with NDEQ, the plan will be developed to identify additional priority areas with the district that future projects and best management practices can be implemented to reduce the pollution in our lakes, rivers, streams, and wetlands. In the fall of 2018, Antelope Creek was removed from the impaired water bodies list for *E coli*. This milestone is a great indicator that best management practices and projects through the district, in cooperation with other partners, is making a difference.

Groundwater

Groundwater is an important source of water in the NRD, especially for domestic uses. The District has identified six manageable groundwater reservoirs which are described in the Groundwater Management Plan.

The groundwater resources in the Platte River Valley represent the major source of drinking water for Lincoln and other communities. Recharge of groundwater supplies beneath the Platte River is affected by the amount of water flowing in the river. Continued withdrawals of stream water from the Platte and its tributaries upstream could possibly reduce the amount of water available in the aquifer for use by Lincoln and other communities in the future.

Anticipated growth in the district will require domestic water supplies. Rural water districts provide this service to nearly all of Cass and Otoe counties, and a large portion of southeast Lancaster County. Adequate domestic water supplies can be found in many of the other portions of LPSNRD. There has been some interest in new rural water districts (NRD improvement project areas) and its anticipated that interest will grow, but to this point, such systems have not proven to be economically feasible.

Population

The current population of LPSNRD is estimated at 345,000 (314,000 as of the 2010 census). The 2040 projected population is estimated to reach 443,000, an increase of 98,000 or approximately 4,210 people/year. Lancaster County projects an increase of 4,000 people per year with 90% (3,600 people/year) of that growth residing in Lincoln, 6% (240 people/year) of the growth will reside in rural/unincorporated areas, and 4% (160 people/year) will reside in the other communities. Cass County plans for growth of 210 people/year or a 0.7% annual growth.

Lincoln is the largest community in the district. Table 4 lists communities in the district with populations over 1,000, according to 2010 U.S. Census data.

Table 4: Population of Communities in District

District Community	Population
Lincoln	258,379
Plattsmouth	6,502
Waverly	3,277
Ashland	2,453
Hickman	1,657
Louisville	1,106
Weeping Water	1,050
Eagle	1,024



CURRENT RESPONSES

LPSNRD currently offers many programs and is involved in projects that help support the regulatory authority given to the NRDs by the legislature. Some of the programs are cost-share incentives, while others are educational and public awareness. District projects vary from flood-control structures to levees, and from city-NRD and joint agency interlocal agreement projects to projects solely funded by LPSNRD. In addition to the 12 NRD purposes, other regulatory acts later adopted by the legislature also guide the district in some of the programs offered and projects undertaken.

REGULATORY ACTS

There are three regulatory acts that direct the NRDs in their programs and projects.

Groundwater Management and Protection Act

This act defines broad policy goals concerning the utilization and management of groundwater, and encourages local implementation of these goals. The Act grants enough groundwater to landowners to meet reasonable and beneficial use needs, and grants authority to local Natural Resources Districts to regulate groundwater use. The Act also discusses the required contents of groundwater and integrated management plans, groundwater management areas, groundwater contamination, allocation, and permitting requirements.

Erosion and Sediment Control Act

This act represents a commitment by the State of Nebraska to reduce erosion of Nebraska lands and to reduce sedimentation and other problems that result from that erosion. The purpose of the Erosion and Sediment Control Act is to strengthen the already existing erosion and sediment control efforts of the individual landowners and of the federal, state and local governments. The Act's purpose will be accomplished by:

- Establishment of a system for the filing and processing of complaints concerning land where erosion is exceeding the soil loss limits established in accordance with the Act and whose sediment is causing damage to the complainant.
- The State and each Natural Resources District is to develop comprehensive and coordinated erosion and sediment control programs.

Nebraska Chemigation Act

The goal of this act is to protect the groundwater and surface waters of the State from contamination by fertilizers or pesticides. To accomplish this goal, the Act provided the legal requirements for the future use of chemigation as a means of nutrient or pesticide application.

The Nebraska Department of Environmental Quality (NDEQ) developed and implemented the rules and regulations necessary for irrigators to utilize the practice. Under the NDEQ rules, the natural resources districts were given the responsibility to manage the chemigation permit component that ensures that proper safety equipment is present and functioning properly.

GROUNDWATER MANAGEMENT

Groundwater Management Plan

Nebraska law requires each of the state's 23 natural resources districts (NRD) to have an active and operational Groundwater Management Plan. The Lower Platte South Natural Resources District (LPSNRD) Groundwater Management Plan is a detailed publication with information about the district, its geology, needs related to groundwater, programs, and plans.

The Groundwater Management Plan identifies three levels or phases pertaining to quality and quantity. In 1997, the entire district was declared and remains a designated Phase I Groundwater Management Area. It means LPSNRD is responsible for offering educational information to constituents about maintaining the quality and quantity of our groundwater. LPSNRD Board of Directors has designated eight Phase II Groundwater Management Areas in the district. Elevated levels of nitrates from nonpoint sources prompted all of the designations. The Elmwood Community Water System Protection Area (CWSPA) was designated a Phase III Groundwater Management Area in 2009 and is the only Phase III area in the district. Landowners or operators who make nitrogen management decisions within designated Phase III or Phase II areas may be required to attend a Nitrogen Certification Class every four years. LPSNRD will determine who needs to attend.



Irrigation is important in the district



Groundwater monitoring

LPSNRD designated the Dwight-Valparaiso-Brainard Special Management Area in 2012. The special management area designation by LPSNRD Board of Directors was in response to seasonal water level declines. There was a moratorium placed on new irrigated acres and an allocation for irrigation was adopted. The Dwight-Valparaiso-Brainard Advisory Group was formed and meets annually to discuss new information, research, and restrictions.

The various programs pertaining to the district's Groundwater Management Plan include:

- Chemigation
- Nitrogen Certification
- Reporting
- Well Permits
- Meters
- Irrigation Certification

Monitoring/Inventory

The district contracted to do our first airborne electromagnetic (AEM) flights in 2007 as the administrative agency for the Eastern Nebraska Water Resources Assessment's (ENWRA) initial pilot study program. The area covered was Firth-Hickman. Then in 2009, the district contracted to get the Sprague Area flown. The data gathered in AEM surveyed areas provided extensive information about the area's geology, aquifer characteristics, and water in storage. In 2013, Exploration Resources International (XRI), under contract with LPSNRD, gathered airborne



Airborne electromagnetic (AEM) flight over LPSNRD

electromagnetic (AEM) data in the northwestern part of the district. The project area included 99-square miles within a larger area, now called the Dwight-Valparaiso-Brainard Special Management Area. Two more AEM flights were done in 2015 (district-wide) and in 2016 (eastern portion of the district focusing on several CWSPAs).

LPSNRD's use of the AEM data is on-going. The information is intended to help landowners in project areas access data showing the depth to aquifer material, the thickness of the aquifer, and other basic information. Additional AEM planning and evaluation efforts are underway in hopes to provide more information on groundwater and the aquifers. The current 2018 project through the Eastern Nebraska Water Resources Assessment (ENWRA) is a multi-district project and is partially funded through the Water Sustainability Fund covering the western portion of the district at a one-to-two-mile grid spacing with a focus on CWSPAs and areas showing new development.

INTEGRATED MANAGEMENT

Hydrologically Connected Area

The Department of Natural Resources has identified and mapped those areas in the district where the surface water supplies are considered to be hydrologically connected to the groundwater. The current extent of these areas

is generally the alluvium along Salt Creek from Waverly to the Platte River and along the Platte to the Missouri River, totaling approximately 70-square miles. Seven public water suppliers (Lincoln Water System, Ashland, Louisville, Waverly, Metropolitan Utilities District (MUD), Cass County RWD 1, and Cass County SID #5) have wells in the hydrologically connected areas.

Integrated Management Plan

LPSNRD and the Nebraska Department of Natural Resources (NeDNR) have taken a proactive, comprehensive approach to sustaining the future water needs in the district through adoption of a voluntary Integrated Management Plan (IMP). Two other studies that provided development of the plan included the *Lower Platte South NRD Water Balance Study* and *Water for the Future: Stakeholder Perspectives*.

Some integrated management plans in Nebraska focus on management of the hydrologically connected ground and surface waters, however, the Lower Platte South plan is focused on integrating the management of all of the water supplies and uses within the entire district. Agriculture irrigation is an important water use in those areas of the district where sufficient groundwater is available but is not expected to expand significantly in the near future. With a growing urban and suburban population, domestic and commercial water uses will be both critical and challenging to satisfy.



The 2014 Integrated Management Plan and 2017 Annual Integrated Management Plan Report

The three goals in the Integrated Management Plan are to achieve a sustainable water supply, to manage the supply and make it available whenever and wherever needed, and to support water use and conservation that optimizes benefits. With limited surface water sources, highly erodible groundwater supplies and the geographic reality of the downstream location in the river basin, the IMP includes the anticipated need to look outside district boundaries to collaborate and cooperate on future water supply expansion.

The Integrated Management Plan requires an annual report of activity over the last year related to IMP goals and objectives. It also requires an annual review by LPSNRD and NeDNR of the entire plan to be held as a public meeting, where public comment on the plan is encouraged.

Lower Platte River Basin Water Management Plan

The Lower Platte River Basin is defined as all surface areas that drain into the Lower Platte River, including those areas that drain into the Loup River and the Elkhorn River and all aquifers that affect surface water flows of the basin. The total area of the Lower Platte River Basin is approximately 25,400-square miles, which encompasses both the Loup River sub-basin and the Elkhorn River sub-basin. NRDs with significant area in the basin include Lower Platte South NRD, Lower Platte North NRD, Upper Elkhorn NRD, Lower Elkhorn NRD, Upper Loup NRD, Lower Loup NRD, and Papio-Missouri River NRD (NeDNR 2017). See Figure 3.

Together with NeDNR, the seven NRDs in the Lower Platte River Basin entered into an Interlocal Cooperative Agreement in April 2013 to form the Lower Platte River Basin Water Management Plan Coalition (Coalition). The Coalition recognizes the interrelation of water resources inherent within the basin and has embarked on a critical mission to manage new uses while protecting and sustaining the long-term balance between the water uses and water supplies throughout the basin within the seven represented NRDs.

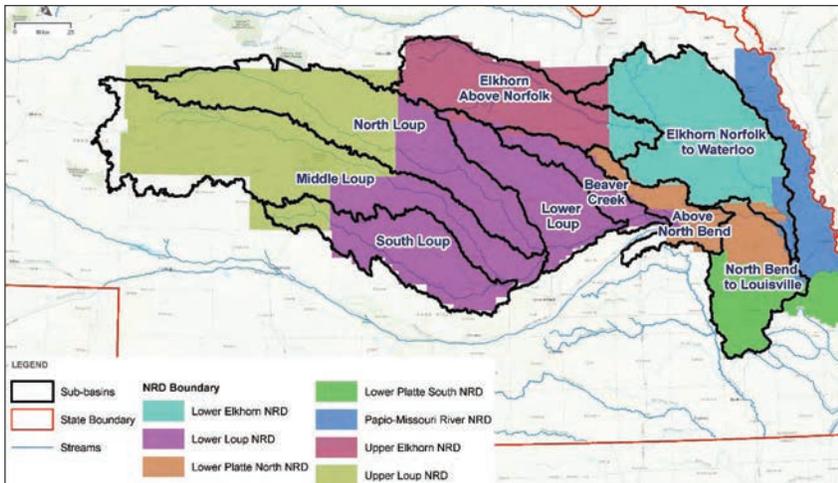


Figure 3:
The Lower Platte River Basin, as depicted in the 2017 Lower Platte River Basin Water Management Plan

In 2017, the Lower Platte River Basin Coalition, which includes the seven NRDs in the Loup, Elkhorn, and Lower Platte River Basins, and NeDNR, adopted the *Lower Platte River Coalition Basin Water Management Plan*. The plan sets criteria for managing new water development in the Lower Platte River Basin. The plan implements goals and objectives that work to protect the existing domestic, agricultural, and industrial water uses in the basin. This planning effort for the LPRDCP followed the development of the *Lower Platte River Coalition Basin Water Management Plan* to further address drought periods and address those specific times when peak demands overlap periods of low stream flows due to natural variability in the hydrologic cycle.

Lower Platte River Drought Contingency Plan

Beginning in 2016, the Lower Platte South Natural Resources District (NRD), Papio-Missouri River NRD, Lower Platte North NRD, Metropolitan Utilities District (MUD), Lincoln Water System (LWS), and NeDNR, collectively referred to as the Lower Platte River Consortium (Consortium), embarked on an effort to develop a drought contingency plan for the Lower Platte River Basin in Nebraska (*Lower Platte River Drought Contingency Plan* [LPRDCP]).

The drought-driven risks are diverse and the alternatives for resolving them were developed through this planning effort. The Lower Platte River serves approximately 80 percent of

Nebraska’s population, thousands of businesses and industries, more than two million irrigated acres. The Lower Platte River provides stream flows for threatened and endangered species.

The six water management agencies that comprise the Consortium worked together to develop regional solutions to improve the water supply reliability and drought resilience of the Lower Platte River. The primary focus of the LPRDCP is to refine the Consortium’s collective understanding of drought vulnerabilities, while developing more robust monitoring and forecasting tools coupled with timely triggers, new mitigation strategies, and responsive actions to create a sound, operational framework and to improve critical water supply needs of the area through drought periods.

Drought Emergency Response Plan

The district adopted the *Drought Emergency Response Plan* in March 2015. The purpose of the plan is to assist LPSNRD develop strategies to respond to and manage impacts of a multi-year drought. The plan was developed by the district as part of its IMP with input from communities and stakeholders within the district. The plan includes methods for the district, localities, agricultural, and recreational users to reduce demand during times of drought.

ASSISTANCE/COST-SHARE PROGRAMS

The Lower Platte South Natural Resource District (LPSNRD) helps landowners pay for improvements designed to enhance conservation of natural resources through our cost-sharing programs. Each year, LPSNRD cost-shares with approximately 250 landowners who make improvements to reduce soil erosion. These include creating terraces and grassed waterways on their fields, constructing sediment basins and more. These measures lead to better quality surface water. In order to provide these cost-sharing programs, we work with several other government agencies including:

- Natural Resources Conservation Service (NRCS): Formerly called the Soil Conservation Service, the NRCS is a part of the United States Department of Agriculture (USDA), a federal agency with an office in most counties. NRCS provides technical assistance with installing conservation practices, such as design and layout of projects.
- Nebraska Department of Natural Resources (NeDNR): The NeDNR is a state agency that allocates state funds to each Natural Resource District for cost-sharing on conservation practices. LPSNRD will forward some cost-share claims on to NeDNR for payment.

The amount of LPSNRD cost-sharing varies from program-to-program. Occasionally the district designates targeted areas where the cost-sharing is even higher than the listed amount to encourage best management practices in those areas.

Groundwater

There are several groundwater cost-share programs offered by the district. Whether a landowner is eligible for an LPSNRD cost-sharing program depends on the location of the land they want to improve. If the land is within a Phase II or Phase III groundwater management area (GWMA) designated by the district or a community water system protection area (CWSPA), the available cost-sharing programs and terms may be different

than if the land is outside those areas. Programs relating to groundwater include the following:

- Irrigation Management Assistant Program (pivot nozzles, re-use pits, etc.)
- Meter Program
- Fertilizer Flow Meter Program
- Soil Sampling Program
- Well Decommissioning Program

Land Treatment

Similar to groundwater, the district offers many programs to assist landowners in land treatment. Some of these treatments provide an opportunity for cost-share between the property owner and the district. Those land treatment programs include:

- Cover Crop
- Farm Pond
- Filter and Buffer Strips
- Flood Control Structure
- Surface Water Quality Best Management Practices (terraces, grassed waterways, etc.)

FORESTRY AND TREE SEEDLINGS

The Lower Platte South NRD offers two tree programs. Through our, Conservation Forestry Program, LPSNRD landowners can purchase seedling trees and shrubs for spring planting suitable for windbreaks, wildlife habitat, and many other uses. The District Community Forestry Program offers cost-sharing to various groups to buy trees to plant in communities.



Seedlings from the Conservation Forestry Program

ENVIRONMENTAL EDUCATION

The Lower Platte South NRD offers youth education services to promote and encourage curiosity about nature and the outdoors. The district provides various classroom presentations, programs, field trips, and resources.

Classroom Presentations

To help facilitate and integrate environmental education into classrooms, LPSNRD offers classroom presentations on a variety of natural resource topics. Fun activities raise environmental awareness and stress the importance of conservation. Our presentations are aligned to fit curriculum and state standards.

Field Trips

The Lower Platte South NRD offers four field trip options that allow students to apply classroom learning to nature. We provide field trips to Eastern Saline Wetlands, Nebraska Prairies, Water Quality Testing, and Platte River State Park. Each field trip is designed to fit educational curriculum while allowing students to experience first-hand what they have been learning about in the classroom.

Nature Clubs and Nights

LPSNRD understands the importance of encouraging students to learn about and explore nature, the environment, and natural resources. To help foster this belief, we offer Nature Clubs

in several of our District schools. These clubs meet after school and provide students time to be actively engaged in hands-on activities while learning about nature. Nature Club activities include making bird feeders, dissecting owl pellets, and embarking on nature scavenger hunts.

The success of the Nature Clubs has led to Family Nature Nights each fall and spring in schools across the district. These free evening events are designed for students and families to experience and connect with nature. All students in the school and their families are welcome to attend and participate in activities like potting plants, making paper, art projects, and chances to interact with live animals. Nature nights are an excellent way for a school to engage student and family learning while increasing knowledge of Nebraska's natural resources. The number of Nature Nights we can organize each year is limited.

Earth Wellness Festival

LPSNRD participates in the earth wellness festival each year. The earth wellness festival is an annual event offered to fifth-grade students of Lancaster County, Nebraska. Students attending earth wellness festival experience science as an essential and exciting part of their lives. The festival is a culminating event, reinforcing concepts introduced to students through current environmental curriculum like 4-H school enrichment.



LPSNRD offers youth education services to promote and encourage curiosity about nature and the outdoors

Programs

The many programs offered by the district are designed to benefit students and help educators meet their curriculum needs. Those programs include:

- Environmental Education Programs (Kindergarten Native Seed Kits, First Grade Worms, Second Grade Butterflies, Third Grade Trees, Fifth-Grade Earth Wellness Festival, Seventh-Grade Earth Day Kits, Seventh-Grade & High School Biology Field Trips, High School Environmental Studies Mini-Grant Program)
- Outdoor Classrooms
- Scholarship and Support
- Test Your Well Nights

SALT CREEK FLOOD REDUCTION PROJECT (SALT CREEK LEVEE)

The Salt Creek Levee System was built as part of the Salt Creek and Tributaries Flood Project in the 1960s and continues to provide risk reduction for Lincoln neighborhoods and businesses to this day. This project consists of 13.5 miles of levee along Salt Creek in Lincoln. LPSNRD is the local sponsor, which operates and maintains this (USACE) levee project. USACE inspections completed over the last few years have identified some deficiencies and maintenance needs. As a result, LPSNRD has developed a System-Wide Improvement Framework (SWIF) to address the levee system's needs over the short and long term. This effort will result in continued flood risk reduction to Lincoln's residents and businesses.

BANK STABILIZATION - URBAN CHANNELS

More than 12 miles of district stream banks have required stabilization using rip rap, gabions, concrete liners, or bio-engineering methods. The district has completed projects in Lincoln, Plattsmouth, Hickman, Ashland, and other areas of LPSNRD.



Urban stream improvement

The **1965 Agreement with Lincoln and Lancaster County** provides direction to what streams within the city and county are the responsibility of LPSNRD. According to the agreement, "the District shall be responsible for, and its responsibility within the city limits shall be limited to, the following major drainage channels (but not the tributaries thereof): Salt Creek, Beals Slough, Deadmans Run, Lynn Creek, Antelope Creek and in addition those portions of the following channels which in the future may lie within the city limits: Middle Creek, Haines Branch, Cardwell Branch, Little Salt Creek, and Stevens Creek."

FLOOD CONTROL WATERSHED PROJECTS

This project includes building dams that reduce flood damage providing flood storage and grade stabilization benefits, with 124 dams constructed so far. Partners include U.S. Department of Agriculture and the Natural Resources Conservation Service, Natural Resources Development Foundation, and the Department of Natural Resources. The many flood-control watershed projects include:

- Upper Salt
- Plattsmouth
- Oak-Middle
- North Oak
- Weeping Water
- Stevens Creek
- Camp Creek (land treatment)



Top: Aerial view Waverly/LPSNRD's Ash Hollow Dry Dam
Bottom: Union Plaza of Antelope Creek

ANTELOPE CREEK FLOOD REDUCTION PROJECT

The Antelope Creek Flood Reduction Project includes a new, vegetated water conveyance channel which will contain and convey the Antelope Creek 100-year flood flows. LPSNRD is the local sponsor that operates and maintains this USACE project. Partners for this project include University of Nebraska-Lincoln and City of Lincoln, with additional funding assistance from the State through the NRCS, Natural Resources Development Foundation, and NeDNR.

LOWER PLATTE RIVER CORRIDOR ALLIANCE

The Platte River is one of the great natural resources of Nebraska. It is the feature that attracted settlers to our State and guided the wagon trails. Today, we look at the Platte River much differently. It is a water source for cities like Lincoln and Omaha, a haven for wildlife, and a place for recreation. As development along the corridor increases, concerns related to flooding, ice jamming, endangered species, and recreation also increase.

To help address major issues and concerns along the Platte River, LPSNRD became a joint partner of the Lower Platte River Corridor Alliance in 1996. Alliance members also include Papio-Missouri River NRD and six state agencies. The Lower Platte North NRD was an original member but had recently chosen to no longer be an official member. The Alliance's primary focus is the lower portion of the Platte River that basically runs from Columbus to Plattsmouth. It winds past or through towns and cities such as Bellwood, Fremont, Waterloo, Ashland, South Bend, Cedar Creek, and Louisville. One of the Alliance's primary goals is to build a coalition between counties, communities, businesses and individuals concerned with preservation of the Platte River. Notable projects completed by the Alliance include the Water Quality Management Plan, Sandbar Dynamics Study, Cumulative Impact Study, and Platte River Obstruction Removal Projects.

FLOOD CONTROL NON-WATERSHED PROJECTS

These projects consist of 60 dams, primarily flood control dams that replace inadequate bridges on county roads through the NRD's Road Structure Program and individual flood control structures. Partnering counties include Cass, Saunders, Seward, Butler, Lancaster, and Otoe.

STREAM INTERVENTIONS

Stream interventions consist of 25 sites that utilize cost-sharing to stabilize streams. This is done by installing rock rip rap "riffle" areas to allow water to flow without causing additional erosion and bank stability problems. LPSNRD has partnered with the City of Lincoln on many of these projects as we identify sites through the basin master planning effort.

RECREATION

Based on the statutory responsibility outlined in Section 2-3229, R.R.S. 1943, LPSNRD is allowed to develop and manage recreational and park facilities. These facilities include community wetlands, trails, lakes, and wildlife management areas.

Community Wetlands

Wetlands within the district include Lincoln Saline Wetlands Nature Center, Little Salt Fork Marsh Preserve, Little Salt Springs WMA, Marsh Wren Saline Wetland, and Whitehead Saline Wetland.

Trail Corridors

Completed multi-use trail projects, consisting of nearly 50 miles, include the Mopac East, Oak Creek, and Homestead recreational trails and the Lied Bridge – Platte River Connection.

Lakes and Wildlife Management Areas

The district owns eight recreational lakes and manages seven of them. The recreational lakes include Cottontail Lake, Meadowlark, Merganser, Red Cedar, Tanglewood, Timber Point, Wild Plum, and Wildwood Lake. The Nebraska Game and Parks Commission currently manages Wildwood Wildlife Management Area. Little Salt Springs Wildlife Management Area is also classified as one of the district's community wetlands.

PUBLIC INFORMATION AND AWARENESS

The district provides public information through many avenues. LPSNRD website, LPSNRD.org, provides information on programs and projects, public use areas, the Board of Directors, staff, the fiscal budget, statutes and more. Since November of 2017, audio recordings of board meetings have been made available on the website. The district's "Know Your NRD" newsletter is published three times yearly and distributed to nearly every household in the district. Programs and projects are featured in print, radio and television advertisements throughout the year and the district maintains good working



*Top: Whitehead Saline Wetlands overlook in Lincoln, NE
Middle: Oak Creek Trail near Valparaiso, NE
Bottom: Wildwood Lake*

relationships with traditional media news outlets. Social media accounts, including Facebook and Instagram, are attracting a growing number of followers. A high percentage of those are youths and young adults. Social media podcasts featuring LPSNRD staff have recently become popular and are seen by staff as an effective way to promote programs and projects.

ADDITIONAL PLANNING

Other planning by the district provides direction for many LPSNRD projects and programs. Those additional plans include the hazard mitigation plan, erosion and sediment control program, and basin master planning.

Hazard Mitigation Plan

LPSNRD adopted the district's first Multi-Jurisdictional Hazard Master Plan in 2010. The district then updated the plan in 2015. The purpose of the plan update was to identify hazards; assess the vulnerability of each participant to the various hazards; determine potential losses associated with the hazards; examine the capabilities in place, and develop sound mitigation alternatives to reduce these vulnerabilities. Currently, the district is again in the process of updating the plan with an expected adoption date of March 2020.

Erosion and Sediment Control Program (Plan)

The district's current Erosion and Sediment Control Program was adopted in 1987 and amended in 1995 and again in 2016. LPSNRD describes in its program what it intends to do to implement the state program, including the state's goals. The district's program includes soil-loss limits for the various types of soils in the district, recommended erosion or sediment control practices and soil and water conservation practices which are suitable for controlling erosion and sediment within the district and the program procedures and methods to implement the State Erosion and Sediment Control Program.

Basin Master Planning

The City of Lincoln and LPSNRD developed a Comprehensive Watershed Management Plan for the City of Lincoln and its future growth areas. The comprehensive watershed plan was developed basin by basin, through the completion of watershed master plans for individual basins. Watershed master plans are used as planning tools to be referenced in conjunction with proposed development and as a guide in the preparation of future capital improvement projects. To date, the master plans developed together with the City of Lincoln include:

- Beal Slough
- Stevens Creek
- Southeast Upper Salt
- Deadman's Run
- Little Salt Creek
- Antelope Creek
- Haines Branch Watershed
- Middle Creek Watershed
- South Salt Creek Watershed
- Lynn Creek Watershed
- Oak Creek Watershed
- North Salt Creek Watershed

Additional basin master plans with other communities in the district include the *Waverly Watershed Master Plan*.

This page intentionally left blank.



DIRECTION FORWARD

FUTURE NEEDS

The Lower Platte South Natural Resources District is committed to flood protection and soil and water conservation and will not forget its origin in the two areas of flood control and soil conservation. Protecting the soil resources from abuse and erosion, whether the soils are put to agricultural, urban, recreational or industrial uses, will continue to be a priority focus of the district's technical, educational, and financial resources. Likewise, reducing the threats to property and lives from flooding will remain a top priority. The NRD, among local and state governments, is ideally structured to effectively address these critical natural resources issues. But, times have changed and will continue to change, and the NRD will evolve accordingly.

Soil conservation is an urban as well as a rural problem, and the nature of the problem has expanded from maintenance of crop-growing productivity to one of nonpoint source pollution by sediment, nutrients and chemicals. This nonpoint pollution threatens to contaminate both surface and groundwater, to fill lakes and streams with sediment, to impair recreation and fish and wildlife habitats and to cause property damage. Future district efforts must include education, financial assistance, technical assistance on the latest and most effective best management practices, and a mixture of both voluntary and regulatory application.

The traditional approaches to controlling floods with dams, channel improvements, and levees will continue to be considered where justified, but the array of nonstructural approaches will more frequently be the tools implemented. The focus on flooding problems has moved toward flood management, accepting that floods are likely to occur and developing strategies and programs to reduce property losses and threat to lives. Successful implementation of these programs require long-range planning, cooperation with other local governments, use of good science, technical assistance, education, and financial assistance.

Soil conservation and flood management, along with other resource issues, are better addressed on a more comprehensive basis -- that of regional watershed basins. Many resources issues are interrelated and can be most effectively approached with programs and projects that recognize these relationships. Flexibility and adaptation by the district will be needed to have successful programs.

The population of the district will continue to increase, with even greater percentages of the population living in the urban centers, in suburban areas, and on nonfarm acreages. The stresses and conflicts over land uses will increase, making comprehensive, long-range planning all the more necessary. The district will be involved with communities and counties in



As population growth continues, management of our natural resources remains a priority

managing these land use conflicts, developing strategies such as buffering, or clustering of uses and in impact assessments.

Most of the anticipated growth is east of Lincoln to Stevens Creek and south of Lincoln to the planned south beltway. Additional growth areas are north and west of Lincoln, infill lots in Lincoln, growth in Waverly, Hickman and Ashland, and along transportation corridors (Hwys 75 and 50 and Interstate 80 Exits 420 at Greenwood and 426 at Mahoney State Park) in Cass County, and communities such as Louisville and Plattsmouth that are in close proximity to the Omaha metro area. Incorporated communities currently occupy 109 square miles, with Lincoln occupying 95 square miles and annexing an average of 400 acres per year (0.625 sq. mi/yr).

It is anticipated that due to the 2040 Lincoln/Lancaster County Comprehensive Plan projections, LPSNRD can anticipate:

- Increased water use for domestic purposes
- The need for additional measures to protect water quality
- Major stream channels will likely require stabilization as the areas develop
- Protecting limited agricultural land will increase in priority
- Additional population will desire additional NRD assistance



LPSNRD's multi-use trails provide wildlife habitat and year-round recreational opportunities

As land use conflicts increase, threats to unique resource areas will also increase. The district alone, but more often in collaboration with other private and government organizations, is well-suited to provide protection to wetlands, native prairies, woodlands and stream corridors. Flood plain easements, conservation and preservation easements, acquisition, and local zoning regulations are some the tools available to protect such unique areas.

The demand for open space and outdoor recreational opportunities increase as the population increases. While the state and communities within the district provide many of these opportunities, the district provides for a number of recreational areas, and has the authority to develop and manage area and regional recreational spaces. Preservation of flood plains and stream corridors provide open space, woodland and wetland protection, recreational use, and reduction of future flood damages. Trails and other linear resources corridors also provide multiple opportunities.

Protection of both the quantity and quality of the district's groundwater resources will continue to be important and be of even greater importance in the future. The district will strive to ensure everyone, everywhere in LPSNRD, will have access to adequate water supplies of appropriate quality. Protection of community water supplies from depletion or contamination will continue to

be a priority focus of the district's efforts, along with maintenance of the agricultural irrigation industry. Provisions for rural water supplies and distribution systems will increase in importance as the nonagricultural, rural population grow in number and in quantity demands.

Interagency cooperation and collaboration with the private sector will be the rule rather than the exception in the future, just as it is today. Effectiveness and efficiency can best be obtained in this manner, with the different partners playing different roles in each cooperative venture. In some cases, LPSNRD will be the lead agency and in others will provide only minimal effort or support.

Innovative financing will be necessary to enable the district to maximize its responsibilities. Limitations on property taxes will require the district to seek other grants, loans, and cost-share arrangements. Financing must be reviewed on the long-term, rather than annually, to allow the district to be positioned at the proper time to implement successful programs and projects.

There have been many studies completed and models developed pertaining to the changes in our climate. LPSNRD has been monitoring these studies and anticipates changes that will affect our district and require needed changes within our programs. The district refers to much research done by the University of Nebraska-Lincoln as we recognize changes in climate. Then Vice-Chancellor Ronnie D. Green said in a publication in 2014, "As we plan for the next hundred years, a thorough understanding of our changing climate is needed. The impacts of climate variability have been visibly experienced in Nebraska and the northern Great Plains of the United States in the past decade, particularly in terms of a change in the length of the growing season and in greater variability in temperature and precipitation. Combined with the expected increase in the global population to 9.6 billion by 2050 that is expected to exert significant increased pressures on the world's water and land resources, it is particularly important to assess with all available information, what the

current models tell us regarding the potential impacts of climate change on our state and its critically important natural resources in the near future and longer term” (*Understanding and Assessing Climate change – Implications for Nebraska, UNL, September 2014*). The district must recognize changes occurring in our climate and adapt to those changes. The district should not necessarily concentrate on the cause, but rather on recognizing the effects and how to deal with change.

GOALS, DESIRED OUTCOMES, AND OBJECTIVES

The Master Plan is the document that expresses the Board of Directors’ vision of the future and shapes the direction and activities of the Lower Platte South Natural Resources District. The Board of Directors adopted a set of goals, along with desired outcomes and objectives, in 2018 which are the framework for this Master Plan. Objectives define strategies or implementation steps to attain the identified goals. Unlike goals, objectives are specific, measurable, and have a defined completion date. They are more specific and outline the “who, what, when, where, and how” of reaching the goals.

The district must be a **Conservation Leader** for the residents, landowners, businesses and governmental agencies and through example, education and programs encourage and assist them to be **Responsible Conservationists**. Working together, our natural resources will flourish.

We must adjust our attitudes and approaches to have **Sustainable Water Resources** for all purposes. Within the district the **Natural and Unique Resource Areas** must be protected and enhanced. Other goals include **Healthy Forests** and **Healthy Wildlife Habitat**.

The Board also has developed goals for management of both rural and urban lands. **Properly Managed Agricultural Lands** will benefit all natural resources and sustain the

agricultural economic base. For urban areas **Low Impact Development** should be the goal in both developing and redeveloping areas.

The district will continue to pursue the goal of **Minimal Flood Threat and Damage** to our homes, businesses, roads and bridges, and personal safety. Another goal is to ensure there are **Ample Natural-Resource-Based Recreation** opportunities for all citizens to enjoy. An overarching goal is to work towards building **Resiliency to Changing Climate** and having a **Clean Environment** for the future.

Brief descriptions of the desired outcomes from the goals for the district are provided on page 31.

GOALS AND OBJECTIVES TABLE

The tables on pages 32-36 show how the NRD’s goals tie in with the 12 statutory purposes of the Lower Platte South NRD. The tables also show a list of desired outcomes and objectives for the district. They were established by the NRD Board of Directors through a strategic planning process and a Directors’ Retreat in February 2018. The goals closely reflect responsibilities and authorities contained in the state statutes. The objectives are reflected in the district’s Long-Range Implementation Plan (LRIP) as actions to be taken toward accomplishing the goals. It should be the responsibility of each subcommittee to identify a list of measurable goals or outcomes (ie. 1-year, 10-year, etc.) for their respective subcommittee each year at the time the LPRIP is being reviewed and adopted. This process would further tie the master plan in with the LRIP and budget process. Likewise, staff and the subcommittee should rate progress on each objective and measurable goal or outcome each year to identify progress being made.

Desired Outcomes from District Goals

NRD is a Conservation Leader

The Lower Platte South NRD is at the forefront of innovative conservation with its projects and programs. New conservation technology, research, demonstrations and education are utilized to promote all best management practices.

People are Responsible Conservationists

The NRD is a credible source of information on natural resources for the public and other agencies and works with schools on providing natural resources education. The public acts responsibly on natural resources and environmental issues and agencies and elected officials include natural resource concerns in their decision-making.

Sustainable Water Resources

Water resources are a priority for the NRD. The NRD acquires data about the groundwater resources, which vary across the district, to the point that the NRD has the ability to predict changes in groundwater quality and quantity. Groundwater levels are maintained and quality standards are exceeded or met for all domestic and other water uses.

Surface waters also meet or exceed water quality standards and minimum streamflows are determined and maintained for fish, wildlife, and recreational uses. All areas of hydrologically connected ground and surface water are identified, with integrated management plans developed and implemented. Wastewater meets or exceeds regulatory standards and landowners and the public all utilize best management practices.

Protected Natural and Unique Resource Areas

All remaining natural and unique resource areas are identified, assessed, and sustained or enhanced.

Low Impact Developments

All developments are compatible with and also conserve natural resources. Developments should also utilize “green” best management practices in design, construction, and landscaping.

Ample Natural-Resource Based Recreation

The NRD provides diverse, safe, outdoor recreation opportunities across the district.

Minimal Flood Threat and Damage

Flood damages are reduced or eliminated and the public safety risk from flooding is minimized. All floodplains are accurately mapped and regulated under a “no adverse impact” policy.

Healthy Forests

The forestry resources of the NRD are diversified and enhanced in urban areas. Rural forests are preserved and expanded.

Healthy Wildlife Habitat

Diverse, dispersed, and healthy wildlife populations thrive throughout the NRD. Critical habitat for endangered species is identified and managed, with appropriate Recovery Programs, and wetlands are protected and restored to full functions.

Properly Managed Agricultural Lands

Owners of all agricultural lands utilize best management practices for water quality and maintain soils at sustainable levels in accordance with their capabilities.

Resiliency to Changing Climate and Clean Environment

Best management practices for energy and conservation are everyday activities for the residents and businesses of the NRD. Local efforts will mitigate and adapt to the changing climate and with conservation measures work to protect resources. Adaptation refers to actions taken at the individual, local, regional, and national levels to reduce risks by adjusting to and moderating negative effects from even today's changed climate conditions and to prepare for impacts from additional changes projected for the future. Mitigation refers to actions, programs, and strategies to address current and potential risks and effects of changes in climate and to reduce the need for adaptation; implementation of mitigation improves long-term resilience to such changes. These definitions may change over time and LPSNRD will use federal and state regulations and/or policies to make such changes as applicable.

GOAL	DESIRED OUTCOMES	OBJECTIVES	STATUTORY PURPOSE
A. Sustainable Water Resources	A1. Groundwater quantity and quality is known for the entire NRD	A1a. Create interactive data bases of all hydrogeology and water quality data	6
		A1b. Implement a quality and quantity monitoring network of wells in all critical areas	
		A1c. Investigate hydrogeology where data/wells are not available	
		A1d. Develop estimates of groundwater availability, yield, and quality at all locations	
	A2. Groundwater levels stable and quality meets standards	A2a. Manage quantity and quality consistent with Groundwater Management Plans	6
	A3. Ability to predict changes in groundwater quality and quantity	A3a. Design interactive/predictive models for all geographic areas of management	6
	A4. Areas of interrelated ground and surface water are managed	A4a. Identify and map areas of interrelated ground and surface waters	6
		A4b. Implement integrated management plans for each area	
	A5. Surface waters meet or exceed water quality intended use standards	A5a. Identify and quantify source impairments of desired beneficial uses	6, 7
		A5b. Implement plans to preserve or restore desired surface water quality	
		A5c. Install monitoring network in watersheds and in-lakes/streams for water quality	
	A6. Minimum streamflows are maintained for fish, wildlife, and recreational uses	A6a. Quantify minimum streamflows for each critical stream segment	6, 7, 10
A6b. Acquire instream flow rights on priority segments			
A6c. Implement a program to protect and/or supplement streamflows			
A6d. Establish a monitoring network on instream flow stream segments			
A7. Wastewaters meet or exceed regulatory standards	A7a. Identify and evaluate all sources of wastewater and treatments	7, 8	
	A7b. Develop a program to assist with improvements to meet regulatory standards		
A8. Domestic water supplies meet or exceed regulatory standards and are of adequate quantity	A8a. Identify and evaluate all domestic water supplies and systems and quality	5, 6, 7	
	A8b. Develop a plan to protect and enhance existing and future domestic water supplies		
A9. Landowners/public all utilize best management practices	A9a. All water users know how much water they use for what purposes	1, 4, 5, 6, 7, 10, 12	
	A9b. All water users know the quality of their water		
	A9c. Information and education of water users on Best Management Practices		
	A9d. Promote water and energy efficient irrigation practices		

STATUTORY PURPOSES

- | | | |
|---|---|--|
| <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 10. Development and management of fish and wildlife habitat 11. Development and management of recreational and park facilities 12. Forestry and range management |
|---|---|--|

GOAL	DESIRED OUTCOMES	OBJECTIVES	STATUTORY PURPOSE
B. Low Impact Developments	B1. Developments are compatible with and conserve the site's natural resources and use "green" BMPs	B1a. Include open space in all new residential and commercial developments	1 - 7, 9, 10, 12
		B1b. Water-wise landscaping planted in new developments	
		B1c. Integrate stormwater quantity and quality BMPs into all existing and new developments	
		B1d. Require cluster development and shared infrastructure in rural areas	
		B1e. Educate developers and homeowners on "green" BMPs for developments	
		B1f. Require detailed analysis of water supply availability and quality in rural developments	
		B1g. Utilize conservation easements to protect open spaces and natural areas in new developments	
		B1h. Water practices in new developments meet or exceed regulatory standards	
C. Minimal Flood Threat and Damage	C1. All floodplains have been accurately mapped	C1a. Utilize newest photography, topography, and models to digitally map floodplains	2, 3
		C1b. Update floodplain maps periodically with land use and other changes	
	C2. Floodplains are regulated under a "no adverse impact" policy	C2a. Assist cities and counties to revise ordinances to incorporate "no adverse "impact" policy	2, 3
		C2b. Assist cities and counties to revise ordinances where appropriate require no net rise/no net loss of storage	
	C3. Public safety risk from flooding is minimized	C3a. Install and operate flood warning systems in critical areas	2, 3
		C3b. Assist in development of flood response plans in place for all communities and counties	
		C3c. Monument floodplain boundaries in key areas	
		C3d. Assist in establishment of buyer notification of floodplain risks	
		C3e. Educate public about flood threats and response plans	
	C4. Flood damages are reduced or eliminated	C4a. Cooperate in programs to retain floodplains as open space in new developments	2, 3
		C4b. Acquire and hold conservation easements to preserve critical floodplains	
		C4c. Assist in revision to Lincoln's existing urban area ordinances to include storage no rise pensatory	
C4d. Acquire and relocate high-risk structures from floodplains			
C4e. Assist in ordinances to require new subdivisions to absorb their stormwater quantity impacts			
C4f. Implement cost-effective and environmentally sound flood storage projects to reduce existing and future flood impacts			

STATUTORY PURPOSES

- | | | |
|--|---|--|
| 1. Erosion prevention and control | 6. Development, management, utilization and conservation of groundwater and surface water | 10. Development and management of fish and wildlife habitat |
| 2. Prevention of damages from flood water and sediment | 7. Pollution control | 11. Development and management of recreational and park facilities |
| 3. Flood prevention and control | 8. Solid waste disposal and sanit ary drainage | 12. Forestry and range management |
| 4. Soil conservation | 9. Drainage improvement and channel rectification | |
| 5. Water supply for any beneficial uses | | |

GOAL	DESIRED OUTCOMES	OBJECTIVES	STATUTORY PURPOSE
D. Protected natural and unique resource areas	D1. Natural and unique resource areas are identified, assessed, and sustained or enhanced	D1a. Identify the location and extent of natural and unique resources areas	10, 12
		D1b. Conduct environmental baseline assessments of natural and unique resource areas	
		D1c. Monitoring program established to assess changes in resources	
		D1d. Programs are developed to respond to changes in resources on natural and unique resource areas	
		D1e. Ownership or conservation easements are secured over natural and unique resource areas	
		D1f. Educate public on the value of natural and unique areas	
E. Ample natural-resource based recreation	E1. Diverse outdoor recreation opportunities available across the NRD	E1a. New developments incorporate new or replace existing recreation opportunities	11
		E1b. Development of recreation trails connecting communities and significant destinations	
		E1c. NRD projects provide public access where it is appropriate and feasible	
		E1d. Inspect and maintain recreation areas to be safe, clean and attractive	
		E1e. Highlight natural resources education at NRD public access areas	
F. Properly managed agricultural lands	F1. Best management practices utilized on all agricultural lands	F1a. Conservation plans implemented on all agricultural lands	1 - 7, 9, 10, 12
		F1b. Agriculture producers use energy-efficient practices	
	F2. Soil losses at or less than sustainable levels	F2a. Treat and manage all lands to soil losses to less than sustainable levels ("T" rates)	1, 4, 7
	F3. Agricultural lands managed according to their soil survey capabilities	F3a. Identify prime agricultural lands and protect from conversion to other uses	1 - 4, 7, 10, 12
		F3b. Educate land users and public officials about soil capabilities and restrictions	
G. Healthy forests	G1. Urban forests are diversified and enhanced	G1a. New developments include trees/shrubs on streets and public lands	10, 12
		G1b. Trees are replaced and diversified in existing urban areas on public lands	
	G2. Rural forestry is expanded in diversity and scope	G2a. Preserve and enhance wooded riparian corridors	10, 12
		G2b. Windbreak, energy conservation and wildlife plantings on all rural home sites	

STATUTORY PURPOSES

- | | | |
|---|--|--|
| <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 6. Development, management, utilization and conservation of groundwater and surface water 7. Pollution control 8. Solid waste disposal and sanit ary drainage 9. Drainage improvement and channel rectification | <ul style="list-style-type: none"> 10. Development and management of fish and wildlife habitat 11. Development and management of recreational and park facilities 12. Forestry and range management |
|---|--|--|

GOAL	DESIRED OUTCOMES	OBJECTIVES	STATUTORY PURPOSE
H. People are responsible conservationists	H1. NRD is a credible source of information on natural resources	H1a. Public views and uses NRD as a credible source of information H1b. NRD prepares and directs information on natural resources to the public	1 - 12
	H2. Public is knowledgeable on natural resources and environmental issues	H2a. Public becomes conservation-minded in their actions H2b. Educate the public about conservation issues resulting in responsible actions	1 - 12
	H3. Agencies and elected officials include natural resources concerns in decision-making	H3a. NRD serve as an advisor to agencies/officials on natural resources H3b. Agencies/officials include natural resource factors in decisions	1 - 12
	H4. Schools provide natural resources education	H4a. Outdoor classrooms are available to students in all grade levels in all schools H4b. Environmental / natural resources curriculum taught at all grade levels in all schools	1 - 12
I. Healthy wildlife habitat	11. Diverse, dispersed, healthy wildlife populations	I1a. Identify suitable habitats for wildlife throughout NRD	10
		I1b. Protect and restore critical habitats/corridors particularly riparian areas	
		I1c. Protect surface water quality in lakes, wetlands, and streams	
		I1d. Public aware and supportive of wildlife habitat protection	
	12. Critical habitat for endangered species managed	I2a. Identify and map designated critical habitat for all endangered species	10
		I2b. Develop and implement recovery programs for each endangered species	
		I2c. Develop and implement Habitat Conservation Plans as appropriate	
13. Saline wetlands and prairies protected and restored to full functions	I3a. All freshwater and saline wetlands delineated, classified and mapped	1 - 7,10	
	I3b. Critically sensitive wetlands acquired in fee or by easement by the public		
	I3c. Key wetlands restored to their full function		

STATUTORY PURPOSES

- | | | |
|---|--|--|
| <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 6. Development, management, utilization and conservation of groundwater and surface water 7. Pollution control 8. Solid waste disposal and sanit ary drainage 9. Drainage improvement and channel rectification | <ul style="list-style-type: none"> 10. Development and management of fish and wildlife habitat 11. Development and management of recreational and park facilities 12. Forestry and range management |
|---|--|--|

GOAL	DESIRED OUTCOMES	OBJECTIVES	STATUTORY PURPOSE
J. Resiliency to changes in climate and clean environment	J1. Mitigation of and adaptation to changes in climate	J1a. Recognize that mitigation of and adaptation to changes in climate are consistent with NRD statutory purposes	1 - 7,9-12
		J1b. Board and staff study the scientific consensus on the effect of changes in climate on our region in general and Nebraska in particular.	
		J1c. Continually consider the effect of changes in climate when initiating new NRD programs, and when making changes in existing programs	
		J1d. Implement programs and practices that will improve carbon capture potential of land resources as a mitigation tool	
J2. Energy and conservation practices are everyday activities		J2a. Increase proportion of materials that are recycled and reused	7,8
		J2b. Construct buildings and infrastructure to use sustainable materials and techniques	
		J2c. Energy-efficient and low polluting vehicles become standard.	
K. NRD is a conservation leader	K1. NRD at the forefront of innovative conservation	K1a. NRD conservation programs and projects utilize leading edge conservation technology	1 - 12
		K1b. Utilize research, demonstrations, and education to promote use of better BMPs by the public and agencies	
		K1c. Promote use of sustainable products and practices in construction of NRD projects	

STATUTORY PURPOSES

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
12. Forestry and range management

This page intentionally left blank.



LOWER PLATTE SOUTH
natural resources district

Lower Platte South NRD
PO Box 83581
3125 Portia Street
Lincoln, NE 68521
402-476-2729
www.lpsnrd.org

