



*Lower Elkhorn
Natural Resources District*

Master Plan 2010

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DEPARTMENT OF
NATURAL RESOURCES

Introduction

The 2010 Master Plan is prepared by the Lower Elkhorn Natural Resources District Staff and approved by the Board of Directors. Required by Statute as submitted to the Nebraska Department of Natural Resources (DNR) for review, this plan will replace the outdated 2000 Master Plan.

Our State enjoys abundant natural resources that are as diverse and dynamic as our famous unofficial motto, “If you don’t like the weather, wait 5 minutes and it will change.” In Northeast Nebraska, as with most of the State, we are truly fortunate to enjoy productive soils, precious creeks, rivers and groundwater, rolling hills lush with prairie grass and serene forested river valleys. The vast majority of these natural resources are managed today by our nationally unique watershed based system in cooperation with landowners. We are the only state with past vision that established progressive NRDs – Natural Resources Districts.

As a political subdivision of State government the Lower Elkhorn NRD serves citizens in all or parts of 15 counties and is governed by a 15 member Board that is locally elected. This Master Plan will highlight and summarize past accomplishments, briefly explain current programs and projects, define challenges and opportunities and most importantly, establish a course of action for the next 10 years.

BOARD AND STAFF

Board members serve 4 year terms and our 15 members are locally elected on a staggered rotation - 8 members during one election cycle and 7 members the next. The District is divided into 7 sub-districts (based upon population) for voting purposes with 2 members representing each sub-district and 1 member elected at large. A current map of the Sub-Districts with member photos is included. Several Board members have many years of dedication and distinguished service to LENRD.

Our staff is currently comprised of 22 full time employees and 13 part time/seasonal helpers (for maintenance at Willow Creek SRA and Maskenthine Lake Recreation Area). A majority of the staff have served LENRD for many years with a wealth of experience.

* Present Years of Service

General Manager – Stan Staab (* 25)

Assistant General Manager – Ken Berney (* 34)

Administrative Assistant – Vickie DeJong (* 32)

Information and Education Specialist – Julie Wragge (* 17)

Water Resources Manager – Rick Wozniak (* 19)

Groundwater Management Area Specialist – Brain Bruckner (* 4)

Water Resources Technician – Adam Nolan (* 2)

Water Resources Specialist – Donald “Skip” Kahler (* 35)

Water Resources Assistant – Tammi Loberg (* 22)

GIS – Geographic Information Systems Specialist – Mike Murphy (* 6)

Programs Secretary – Linda Unkel (* 27)

Receptionist – Suzan Widhalm (* 12)

Logan East Rural Water System Manager – Jim Kruse (* 3)

Logan East Rural Water System Assistant – Danny Johnson (* 16)

Logan East Rural Water System Financial Secretary – Laurie Schold (* 5)

Recreation Area Superintendent, Maskenthine Lake – Leonard Boryca (* 11)

LENRD/USDA-NRCS Forester – Pam Bergstrom (* 2)

LENRD/USDA-NRCS Program Assistants

Phyllis Knobbe, Cuming County (* 31)

Kathy Dohmen, Pierce County (* 16)

Carey Tejkl, Stanton County (* 16)

Karen Hansen, Wayne County (* 14)

Valissa Tegeler, Madison County (* 12)

LEGAL AUTHORITIES

The Nebraska Legislature enacted laws in 1972 consolidating 154 special purpose entities into 24 (later merged to 23) Natural Resources Districts (NRDs)

These Districts have broad authority to manage related resource needs while protecting soil, groundwater, wildlife and forestry resources. The Unicameral altered formal planning for the State’s 23 Natural Resources Districts with passage of LB 783 (Revised Statutes of Nebraska, 1943, sections 3-3201 through 2-3261) in 1978. Local property taxing authority was granted to fund projects and programs and those funds comprise approximately 1/3 of the total annual budget.

As required by Section 2-3276, each District shall prepare a Master Plan every 10 years. Focusing on NRD purposes set forth in Section 2-3229 including:

- 1) Erosion prevention and control
- 2) Prevention of damages from flood waters and sediment
- 3) Flood prevention and control
- 4) Soil Conservation
- 5) Water supply for any beneficial use
- 6) Development, management, utilization/conservation of ground 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

CHALLENGES AND OPPORTUNITIES:

In nearly 40 years since the NRD's were created in 1972, soil and water conservation has remained the primary purpose of the Districts. However, with broad statutory authorities NRD's have gradually expanded responsibilities to encompass many areas of natural resource management. This District's top priorities remain flood control and groundwater management which produce highly visible public projects (usually controversial) and water issues impacting rural living standards and right of landowners to use the resource. These issues also involve a large number of our landowners and citizens with flood protection and groundwater regulations for quantity and quality which may cause stress.

Natural resources management focus has now somewhat shifted from traditional soil and water conservation in rural areas to more so called "urban conservation and heightened citizen awareness" in the last several years with a new interest on a wide range of well publicized issues, some strong on environmental emphasis. Examples include hiking and biking trails, maintaining high water quality for domestic use, tree care and forestry concerns, continued wildlife management, protection of natural areas, improvement and creation of parks and recreation areas. Demands from an increasingly educated public and younger citizens are subjecting our District to spend more planning time to offer and complete programs and projects while requesting a fair share of public funds in exchange for their ideas. The public is becoming more vocal in rightful ways for equal chances to express their ideas and have "their voices heard."

Increased services with the same or less budget dollars are expected by the public. Securing grants to supplement our local tax funds to construct projects are competitive and increasingly difficult to acquire. Funding large projects in the future will be difficult.

GOALS AND OBJECTIVES:

LENRD annually prepares a Long Range Plan (LRP) used by Board and Staff as a guideline to implement programs and projects. The LRP outlines a very detailed format on each program carried out and is considered our “working document.” The LRP – Milestone Chart sets a schedule from October 1st each year to September 30th the following year, for the purpose of reviewing existing programs and projects and receiving input from our Board. The LRP is submitted to various State agencies and finally to Nebraska Department of Natural Resources for review and approval. The current LRP format has been in place for 11 years and is very effective and useable while LENRD works closely with USDA/NRCS to measure our efforts throughout the year.

Refer to the current Annual Long Range Plan for more detail on all of the following:

CONSERVE SOIL

Major Objectives - Attain 100% District wide land treatment to control soil and wind erosion

- No time frame is set with this goalit will be ongoing!
- Develop/administer new and existing cost share programs to target erosion
- Continue work with USDA/NRCS to implement cost share programs
- Promote No Till programs and landowner awareness of this practice
- Administer LENRD Sediment and Erosion Act via State Statutes
- Support innovative programs such as LENRD/State Vegetative Buffer Strips

FLOOD CONTROL

Major Objectives – Our state slogan, “*Protecting Lives, Protecting Property, Protecting the Future*” fits our District objectives very well with our long term commitment to overall flood control and damage from sediment.

- Participate with local, State and Federal entities to plan, design and construct projects which control flood waters
- Consider LENRD comprehensive flood control when possible
- Watershed planning should take precedent over single project planning
- Requests from communities/and or counties, etc. will be of highest priority
- Strive to secure/combine funding from State and Federal sources when possible
- Continue to implement LENRD planning with staff as directed by the Board

CONSERVE GROUNDWATER QUANTITY AND QUALITY

Major Objectives – Monitor groundwater to detect changes, trends or problems

- Measure depth to groundwater (spring and fall) utilizing the LENRD network of 300 irrigation wells

- Continue extensive data base (since mid 1980's) of static groundwater levels
- Results of monitoring will be made public to landowners and citizens
- Monitor LENRD groundwater quality annually from 169 dedicated wells and 500 irrigation wells
- Define highly suspected areas of contamination for target monitoring and more restrictive management
- Collect groundwater samples for public water suppliers wellhead protection
- Promote cost share incentives for irrigation well owners ie. soil, manure, cornstalk nitrate sampling and automatic drip oilers for power units
- Continue cost share (LENRD 50 % landowner) for water meters on all new wells
- Assist irrigators to calibrate and improve water management by determining pumping rates and performing flow measurements
- Provide incentives to landowners to seal old, abandoned wells.
- Continue Phase II management for groundwater quality in Pierce County
- Assist with wellhead protection plans and management for communities
- Administer the Nebraska Chemigation Program – perform approximately 1,325 well inspections for safety to protect groundwater
- Assist public water suppliers with new production wells – Pay 50% of test wells
- Inspect livestock waste control facilities for water quality compliance in accordance with DEQ rules and regulations
- Collect soil samples for groundwater quality impacting “Vadose Zone which is the area between plant roots and the upper surface of groundwater”
- Continue to collect data (with USGS) for stream water elevations
- Contract and cooperate with US Geological Survey, UNL Conservation & Survey Division and private consultants to perform groundwater/hydrogeologic research for the purpose understanding our complex glaciated regions
- Continue to manage areas within the District designated by DNR (Department of Natural Resources) designed to impose future state control of groundwater

PRESERVE FISH AND WILDLIFE HABITAT

Major Objectives – Establish and preserve fish and wildlife on private and public lands

- Offer incentives and cost share encouraging producers to improve habitat
- Develop and implement programs/practices which are attractive to landowners and will be beneficial for wildlife habitat

PROVIDE OUTDOOR RECREATION OPPORTUNITIES

Major Objectives – Develop multipurpose projects which include recreation facilities

- Develop and maintain LENRD owned outdoor recreation projects and areas
- Assist communities with recreation development such as planning, acquisition and construction of outdoor recreational areas, trails and related facilities

SUPPORT PRO-ACTIVE CONSERVATION TREE PROGRAM

Major Objectives: Promote tree planting on private and public owned lands for all beneficial purposes

- Provide low cost conservation tree/shrub seedlings for many beneficial purposes including low cost planting service and installation of mulch (weed barrier fabric)
- Increase tree sales with a variety of LENRD promotional ads, personal contacts, educational programs, positive newsletter articles, press releases and commercial advertising

PROMOTE AGRO-FORESTRY INCENTIVES PROGRAM

Major Objectives: Increase tree planting and forestry restoration on private lands

- Support NRCS Conservation Technicians (providing additional training, conducting workshops, etc) and encourage landowner contacts for the purpose of growing our overall tree program
- Provide cost-share funds for management/establishment of new plantings
- Renovate old degrading windbreaks
- Promote educational activities for agro – forestry, ie. field days, tours, etc.

PROMOTE COMMUNITY FORESTRY INCENTIVES PROGRAM

Major Objectives: Provide technical assistance and funding to local communities

- Establish direct contact or offer educational programs to inform leaders
- Provide cost-share for approved community tree programs
- Establish goals to measure actual number of species planted

PROVIDE FORESTRY INCENTIVES FOR PRIVATE / PUBLIC FACILITIES

Major Objectives: Provide technical forestry assistance to private facilities open to the public (golf courses, etc.) to improve and enhance green space.

- Increase the number of trees planted by cooperating agencies (LENRD, NRCS) on these type of properties
- Provide assistance to these facilities with development of forestry management plans
- Cost share with local facilities and encourage working partnerships when possible

PROMOTION OF INFORMATION AND EDUCATION PROGRAMS

Major Objectives: Provide a variety of programs that educate and encourage youth and adults to become involved in conservation of our natural resources

- Provide grants to schools to develop outdoor classrooms on school property
- Provide the public with information regarding LENRD activities utilizing a quarterly newsletter and annual report - inserted and distributed in local newspapers
- Promote the National Association of Conservation Districts (NACD) Soil and Water Stewardship Week, distributing materials to churches and schools across the district.
- Promote LENRD programs and events utilizing multimedia advertising (radio, newspapers, farm shows, county fairs, website, earth day festivals, etc).
- Promote and honor excellence in soil and water conservation – recognize individuals, families and communities with various awards, including: the Master Conservationist Award, Honor Farm Award, and the Outstanding Tree Planter Award.
- Promote LENRD programs and environmental education to students across the district with classroom materials, presentations, special events, water festivals, earth day festivals, teacher workshops, etc.
- Provide various scholarships for teachers and students to attend 4-H camps and environmental education workshops.
- Sponsor various learning programs and contests across the state, including: Regional and State Envirothon competitions, FFA Land & Range Judging contests, 4-H & Scout events.

PROMOTE AND FUND RECYCLING PROGRAMS

- Provide funding to the City of Norfolk in the form of cost share for a new facility to receive, sort and dispose of household hazardous waste (paints, lawn chemicals, etc.) that are dangerous to human and domestic pets
- Provide limited funding to USDA-Resource Conservation & Development (RC&D) councils for the purpose of recycling tires and other materials

MAINTAIN DISTRICT OWNED PROPERTY, PROJECTS AND EQUIPMENT

Major Objectives: Protect our public investment for all projects, related equipment and facilities with periodic inspection, replacement plans and updated and insured property

- Continue to develop operational and emergency plans for projects, including dams
- Assure that office and building needs are current and updated as necessary
- Conduct immediate inspections as emergency conditions require
- Maintain proper and current reports for property as conditions dictate

STRIVE TO REMAIN PRO-ACTIVE IN OUR LEGISLATIVE PROCESS

Major Objectives: Participate in the Legislative Process with a goal to preserve local control for all NRD's as we preserve and protect our soil and water resources and all related areas of natural resources mandated to us by the Unicameral.

- Scrutinize legislative bills that may impact LENRD's projects and programs
- Testify on related bills throughout the session as necessary
- Strive to inform State Senators regarding the importance of local control
- Participate in NARD (Nebraska Association of Resources Districts) legislative conference and other activities to promote LENRD

MAJOR PROJECT AND PROGRAM ACCOMPLISHMENTS SINCE 1972

LENRD has a proud history of completing successful public projects - *Protecting Lives, Protecting Property, Protecting the Future*. The projects were planned and at least partially financed with oversight to completion by the LENRD Board of Directors and staff.

******* FLOOD CONTROL PROJECTS *******

WILLOW CREEK STATE RECREATION AREA – opened to the public in 1984 and owned by the LENRD, this project consists of a 700 acre lake located on 1600 acres of land managed (through lease) by the Nebraska Game and Parks Commission as a State Recreation Area. The popular flood control dam and lake protects the Pierce and the City of Norfolk downstream. The area is now 25 years old with all recreation roads, camping pads and boat dock parking paved in 2009. WCSRA is the largest of the DNR - Resource Development Funded projects in Nebraska.

MASKENTHINE LAKE RECREATION AREA – opened to the public in 1979 and consists of an 85 surface acre lake with full recreation features including camping pads and swimming beaches. This project was the first DNR-RDF project in the State and provides flood control for the City of Stanton.

PILGER FLOOD CONTROL DAM – was constructed by USDA-NRCS in the late 1960's as a PL 566 Federal project and the LENRD assumed the operation and maintenance in 1972 when NRD's became operational. This 50 surface acre dam and lake provides important flood control to the Village of Pilger and the watershed.

VILLAGE OF DODGE DRY DAM – This small project (12 surface acre lake) was constructed in 2001 protecting the Northwest section of the community from historical flooding.

MAPLE CREEK RECREATION AREA - Was recently completed by the LENRD and consists of a 160 surface lake located on 556 acres in Colfax County. The dam provides flood control for the Village of Leigh, downstream county road bridges and the Colfax County fairgrounds. The recreation area with camping pads, beach, trails, boat docks, shower facility was completed in 2010 and opened to the public on May 21, 2011.

FLOOD CONTROL LEVEES – constructed by the LENRD (since 1990) for the communities of Pender, Scribner, Wakefield, Howells, and Winslow. Other flood levees constructed before 1986 (Norfolk, Pierce, Clarkson, West Point and Meadow Grove) are not officially LENRD projects, however some degree of oversight and cooperation with those communities may exist.

ROAD DAMS REPLACE OLD DANGEROUS BRIDGES – LENRD has constructed 72 of these dams since 1972 cooperating with county government and landowners. These dams / small lakes provide soil conservation, limited recreation and wildlife enhancement

RASSCH DAM – This small flood control dam was constructed in the 1970's providing significant flood benefit for residential and commercial property in Northeast Norfolk

SCRIBNER AIRBASE DAM – constructed in the early 1970's, this small project is still serving landowners in the immediate area with flood protection

FEMA HAZARD MITIGATION PLAN – Our LENRD plan was conditionally approved by the Federal Emergency Management Agency (2009) after first reading, which is very unusual. The Federal Disaster Act of 2000 established that a pre-mitigation program would be required by communities before funding disaster projects, including flooding events of public property. Working with the City of Norfolk, LENRD established a partnership to involve all but two of our 49 communities in this new plan.

******* SIGNIFICANT STORM WATER /DRAINAGE IMPROVEMENTS *******

Several projects were completed over the years providing important flood control in and around several communities, for example :

SOUTHWEST NORFOLK DETENTION CELL – Consists of combined wetlands and concrete lined channels carrying storm water from commercial and industrial development to the Elkhorn River.

SKYVIEW LAKE WETLANDS – Three shallow detention ponds and broad serpentine channel intercepts storm water from expanding residential areas filtering runoff for Norfolk's 50 surface acre urban lake in this popular park (water quality has shown significant improvement).

***** **GROUNDWATER IMPORTANCE** *****

Nebraska is one of the most groundwater rich regions in the world. The great Ogallala Aquifer underlies a large percentage of the State and together with several smaller regional aquifer provides fresh water for 85% of our residents (if the public water supply for the City of Omaha, which receives half of it's water from the Missouri River) isn't counted the total rises to 100%. Groundwater also sustains the majority of activities related to our # 1 industry – agriculture.

Most of Nebraska does experience variable amounts of precipitation throughout a typical year, so irrigation is common. Major row crops include corn, soybeans and edible beans in the West. In the LENRD, the Ogallala Aquifer can be found in Pierce and parts of Madison Counties while the Eastern portion of the District is highly glaciated and groundwater is random and difficult to locate. Much of eastern LENRD cropland is historically farmed as dryland but irrigation is primarily center pivot with some gravity flow used in some level areas.

***** **GROUNDWATER MANAGEMENT** *****

Major achievements regarding groundwater management:

Mandated by the Legislature's LB 1106 (passed in 1986) all NRD's were required to submit formal groundwater management plans to the Nebraska Department of Natural Resources (DNR) with updates as deemed necessary. LENRD's Groundwater Management Plan is complex and is focused on both quantity and quality. A two fold approach was chosen by the Board which tracks groundwater quantity and precipitation. Numerous ongoing data collection methods are utilized while various methods of monitoring help understand and protect groundwater quality.

RESERVOIR LIFE GOAL – summarizes the overall mission for groundwater management of both quantity and quality as stated;

“To provide an adequate supply of acceptable quality groundwater to forever fulfill the reasonable groundwater demands within the LENRD for domestic, municipal, agricultural, industrial, wildlife and other uses deemed beneficial by the Board”

GROUNDWATER QUANTITY

- Static water levels measured annually in Spring and Fall (indicates groundwater volume) provides ongoing data since 1986
- Data illustrates although irrigation development has continued since 1972 water levels have not dropped significantly across the LENRD
- 5,384 registered irrigation wells are operating in 2010

- Water meters measure pumping volume and are now required on all high capacity wells. 50% cost share is provided from the LENRD
- Elkhorn-Loup Model (ELM) is a cooperative study/computer model with Upper, Lower Loup and Upper Elkhorn NRDs, US Geological Survey, UNL Conservation & Survey Division, and DNR designed to study the relationship of ground and surface water and impacts of irrigation
- Eastern Nebraska Water Resources Assessment (ENWRA) is a cooperative hydrological study with USGS, UNL Conservation Survey, DNR and 7 NRDs. This study is providing a “state of the art effort” to combine current geologic knowledge, computer modeling and best science available to reach goals that will eventually provide sustainability and manage interconnected surface water and groundwater
- LB 962, passed in 2004, is landmark legislation which strengthens surface/groundwater law and provides comprehensive management methods for NRD’s and other agencies to avoid conflict. Under this law, river basins may be declared fully appropriated (Lower Platte Basin is NOT) at this point in time. Fully appropriated status brings a full moratorium of well drilling and extensive management of groundwater.
- LB 483 was passed in 2008 providing temporary options for irrigated land allocation (up to 2,500 acres annually) for a total of 4 years. This formula is applied to 36% of the LENRD, while remaining land area can be allocated up to 5,000 acres annually. A full amount of acres was allocated in 2009-10 and most likely will be approved in 2011-12.

GROUNDWATER QUALITY

Since 1972 LENRD has devoted a great deal of effort, manpower and expenditures to monitor our groundwater quality, primarily for nitrates related at least somewhat to agri-chemicals. This work accelerated in the early 1980’s when a series of irrigation wells across the LENRD (with positive landowners cooperation) were added to the annual sampling network.

- Monitoring well network established in 1985 with 80 plus irrigation wells
- LENRD irrigation wells added to Statewide data network in 2006 which is managed by Nebraska Association of Resources Districts
- Department of Environmental Quality issues an annual report to the Legislature based upon Statewide/NRD network of irrigation well data
- A system of 63 dedicated monitoring wells provide ongoing quality data collected on a monthly basis
- Inspection of Chemigation systems (installed on center pivots) begins in 1986 and is now conducted annually by an independent consultant on 1,700 irrigation wells with wells rotated for data across the LENRD each year
- Entire LENRD is placed in a Groundwater Management Area 1997 for the purpose of targeted and improved regulation while attempting to work with landowners on a voluntary basis

- BMP's (Best Management Practices) for landowners are encouraged to prevent further groundwater contamination
- Examples may include soil sampling, irrigation well sampling, cornstalk nitrate sampling and livestock manure sampling. Cost share is available for some cooperator/landowner practices.
- Pierce County placed in Phase 2 management area 1997 due to elevated limits of nitrates with 50%-90% of EPA Maximum Contaminant Level affecting a majority of the county
- LENRD does not recognize Phase 1 (limited areas of nitrates reaching from 0-50%) and Phase 3 (greater than 90% of EPA-MCL's) at this time
- Phase 2 management requires landowners to become certified operators which includes a mandatory workshop, passing written exam, continuing certification with annual workshops, approved water samples from each well, annual soil samples for each field and submitting a written report
- Well head protection plans for communities have proven effective to protect municipal drinking water supplies and are usually designed with Nebraska Department of Environmental Quality (DEQ)
- At this time, LENRD participates in WHP with Norfolk, Belden, Stanton, Dodge and Logan East RWS - Wausa/Coleridge may be added as that regional water system progresses
- LENRD provides cost share for moisture sensors for irrigation water scheduling – a very popular and important BMP
- All livestock operations in the LENRD (usually confined lots) are monitored for runoff and obvious pollution problems in partnership with NRCS staff in each county. Reports are filed in cooperation with DEQ which has legal jurisdiction over livestock operations
- GIS (Geographic Information Systems) mapping is invaluable for our work

*******RURAL WATER SYSTEM ACCOMPLISHMENTS*******

Legislation provided all NRDs the option to create rural water systems as needed for domestic water supply. The systems are important to rural economic health and welfare and are funded with grants and loans from USDA Rural Development. The law also provided systems that were operating before 1972 the right to operate independently with NRD oversight or involvement.

- Logan East Rural Water System became operational in 1991 with 1 gravity storage tower (Oakland) two groundwater supply wells and 150 rural customers in the Oakland area
- As additional phases were added, the system today serves nearly 1100 rural customers, 3 small communities (Herman, Winslow and recently added Uehling – 3,800 total population base) with nearly 750 miles of buried service line, 2 additional storage tanks and another supply well
- Under planning for nearly 4 years, Wau-Col Regional Water System will bring high quality domestic from Wausa to Magnet, McLean, and several rural

customers. Belden will receive water from Coleridge as the project is scheduled for spring, 2011 construction

- Thurston County Rural Water System is located near Pender and serves 145 customers while managed day to day by Papio-Missouri River NRD
- Cuming County Rural Water District continues to operate as an independent system within the county, as it has for many years

****** PRESERVE FISH AND WILDLIFE HABITAT ACCOMPLISHMENTS******

LENRD has promoted, developed and managed fish and wildlife habitat where possible since the early 1970s. These efforts include instilling “a sincere appreciation for the declining value of wildlife in the public; attaining a positive balance of wildlife habitat to cropland while preserving and conserving existing fish and wildlife species for the benefit of future generations.”

- Continue to support Nebraska Game and Parks Commission considering this agency our partner in a majority of efforts to manage fish and wildlife
- Continue to encourage Game and Parks to provide fair and consistent administration of all related state and federal laws, especially with regard to surface water and endangered species
- Nebraska depends upon agriculture to sustain our economy and wildlife species must be managed in harmony with human activity
- Discouraged practices by public agencies and private individuals that result in the unnecessary destruction of permanent vegetation and trees
- Wild Nebraska is promoted by Game and Parks and limited cost share is offered by LENRD - the program is not as popular as it could be
- Nebraska Buffer Strip program has become quite popular and has somewhat replaced Wild Nebraska - LENRD offers cost share
- Local Pheasants Forever Chapters have provided leadership and cost share to landowners with growing success - LENRD supports their work with limited cost share and promotions
- Two Federally listed endangered species were discovered within LENRD - Topeka Shiner is a small minnow found in Taylor Creek (unique cold water stream approximately 6 miles long in Madison County) and Prairie Fringed Orchid is also found in certain wet meadow conditions
- Pallid Sturgeon Study over 5 years (Fed listed endangered fish) did help determine new scientific data but may have raised more questions than answers regarding Lower Platte River flows and impact to the Elkhorn

***** RECREATION AND URBAN CONSERVATION ACCOMPLISHMENTS*****

For several years LENRD has pursued a two phased approach for continued development of outdoor recreation facilities on District owned property and cooperation and cost share with communities for Urban Conservation/Recreation Development as they present

properly planned and engineered projects. Examples may include hiking/biking trails, improvements to playgrounds in parks and ball fields, park restrooms, etc.

- Continued updates of campground showers, camper pads, replacements of restrooms, playground equipment, etc for Willow Creek SRA (Pierce) and Maskenthine Lake Recreation Area (Stanton)
- Urban Conservation / Recreation Development includes assistance for more than 70 communities since the program began (with only 49 communities in the LENRD, some have qualified for more than one project)

******* FORESTRY PROGRAM ACCOMPLISHMENTS *******

LENRD has always maintained very strong tree planting programs which are a continuation of the stewardship ethic established by our predecessor Soil and Water Conservation Districts established Nationwide after the Great Dirty “30s” Dust Bowl. Today, LENRD maintains a 4 part program to promote tree planting.

- Conservation Tree Program provides low cost high quality seedlings to landowners primarily for shelter belts and windbreaks
- This program also includes low cost tree planting service, chemical weed control service, and water saving mulch and installation
- LENRD has distributed more than 3.6 million trees over the years
- Over 1.5 million feet of weed barrier (equals 24 miles) was sold to cooperators across the LENRD
- Agroforestry Incentives Program was established to provide additional technical training for USDA-NRCS Technicians and also provides cost share to landowners for approved forestry activities such as renovating old windbreaks
- Community Forestry Incentives Program was implemented to provide technical assistance to staff/qualified contacts for improved management, disease control, species selection, on city property
- Assisting establishment of a certified community tree board to pursue the coveted Tree City USA recognition is the ultimate goal
- Forestry Incentives for Public Facilities (on privately owned property) was recently established to provide tech assistance for golf courses, green-space etc. which must be open to the public
- Installation of a “state of the art” tree cooler to insure survival for seedlings and other trees to be planted during the spring was vital. The storage cooler is located at Maskenthine Lake
- All programs are supervised by a professional LENRD/NRCS forester

******* RECREATION TRAILS ACCOMPLISHMENTS *******

Recreational (hiking/biking/horseback riding) trails have become very popular across Nebraska in the last 15-20 years. Papio-Missouri NRD (Omaha) and Lower Platte South

NRD (Lincoln) have developed trail systems that are much older and have provided vital leadership and now other NRDs have followed suite. Trails have many advocates and local support remains very high. LENRD has provided support with planning and funding for several major trail efforts.

- The Cowboy Trail is the Nation’s longest Rails to Trails conversion in the United States and the State’s first major recreational trail extends 323 miles from Norfolk to Chadron. Historic Chicago & Northwestern Railroad right of way (now called the Cowboy Recreation and Nature Trail) passes through spectacular scenery in the Elkhorn River Valley on its way to the expansive and historic Sandhills.
- A 2.2 mile connector from Norfolk’s Ta-Ha-Zouka Park trailhead to the official start of the Cowboy Trail constructed in the late 1990s is very popular.
- The 9.5 mile Willow Creek Trail connects the city of Pierce with the Willow Creek SRA and loops around the 700 acre reservoir and recreation facilities
- Various trail projects were constructed in Laurel, Osmond, Wayne, Bancroft, Pilger, Scribner, Wisner- Pilger Schools “Gator” trail, Hadar and a variety of trails within the City of Norfolk

******* INFORMATION & EDUCATION ACCOMPLISHMENTS *******

The Information & Education programs have really exploded over the past few years.

- We have increased our contact with the schools through our educational programs.
- We have developed new workshops and festivals to reach more individuals – through both student and adult/teacher education.
- Public outreach has multiplied with the use of our new website, radio, and television advertising.
- Joining social media outlets and producing more online materials is part of our Long Range Plan.
- Face-to-face contacts with the public and the schools is still, by far, the best way to deliver our message.

******* STATUS OF FUTURE PROJECTS & PROGRAMS*******

Projecting a reasonable and common sense approach for Natural Resource Management 10 years or more into the future is not as simple as it may seem because our “crystal ball clouds easily” as Board opinions and financial conditions can and do change. However, the overall goal is obvious - try to move ahead with planning and agree that “everyone is on the same page as much as possible.”

FLOOD CONTROL – considered one of the top priorities of LENRD

(1) BATTLE CREEK is considering a project after devastating floods in 2007-08. Moving ahead with organized planning and a competent engineering firm, a series of

public meetings, several meetings with LENRD staff/project subcommittee, the Battle Creek City Council has proceeded with two options for flood control for their community. Option one is a large diversion channel located on the West edge of the community and option two is some type of flood control dam which would be located on a site south of the community in a large watershed that drains through the area of 1,200 citizens. The City Council (by narrow vote) has chosen the channel as their first option. By request of the Council, the LENRD Board will act as local planning and partial funding sponsor and in full working partnership with the Council will arrive at an independent decision of their preferred option, most likely before 2011. Funding will be difficult with DNR-RDF, State highway funds, City of Battle Creek, Game and Parks Commission, LENRD as possible sources.

(A) DIVERSION CHANNEL (length = 5,480 ft, width = 140 ft, 490,00 cu yds est, construct new county bridge, construct new pedestrian bridge, 25 acres land acquisition with farmsteads and buildings, new state highway bridge)

Total Estimated Project Cost = \$ 5 million

Time frame 5-8 years probable

(B) FLOOD CONTROL DAM (160 surface acre pool, length 3,954 ft, top width 30 ft, 550,000 cu yards, 658 ac land acquisition including farmsteads and buildings)

Total Estimated Cost = \$ 6 million

Time frame = 10 years probable

(2) RANDOLPH FLOOD CONTROL PROJECT at this time consists of planning a large diversion channel along the South East portion of the community. The planning/study has progressed very slowly (since 2002) with the City, US Army Corps of Engineers and LENRD as partners. Funding is a major issue with Randolph very concerned about their ability to provide a share of funding. No details project details are available at this time but estimates appear to range from \$8-12 million depending somewhat upon the number of internal bridges that will be needed. Estimated completion and time frames are not available.

(3) SCRIBNER – ELKHORN RIVER BANK STABILIZATION consists of cooperation with the City of Scribner, Dodge County and US Army Corps of Engineers attempting to protect a section of the East Bank of the Elkhorn River as new channel(s) are now nearly established by flooding which in turn could relocate flows from the historic flood of June, 2010. A very busy, modern county bridge serving Scribner from the East is threatened and could be stranded “high and dry” if the channel moves, which will eventually cut back into a blacktop county road approximately 1 mile further East from the bridge.

(A) US Army Corps of Engineers proposes to provide planning, engineering and funding to address this bank erosion problem

Section 14 Emergency (Bank Stabilization) provides \$ 100,000 for initial study

Estimated construction cost = \$ 250,000

65% funded by USACE = \$ 162,500

Balance may be funded by City of Scribner, Dodge County, LENRD
Time Frame = 2011

(4) FLOOD LEVEE CERTIFICATION – LENRD has 11 flood levees of differing scope and levels of protection within our 15 county area protecting life and property for the communities of Pender, Scribner, Howells, Wakefield, Winslow, Norfolk, Pierce, Clarkson, West Point, Meadow Grove, and Hooper. All levees constructed after 1986 must be re-certified by very high standards established by the Federal Emergency Management Agency (FEMA) and the US Army Corps of Engineers. This includes Norfolk, Pierce, Clarkson, West Point, Meadow Grove, and Hooper (now in the process of re – certification) and included in the LENRD 2010-11 budget.

(A) All funds to re-certify Hooper Levee for 100 year storm frequency standards are from local sources (City of Hooper and LENRD) as no State or Federal funds are available. Estimated cost = (including planning, design and construction) \$ 1 million, 50,000 Time Frame = 2 years

(B) Our 5 other communities/levees face re-certification, and unknown FEMA/USACE timelines, future costs to local government will be very significant

(5) FUTURE PROJECTS RELATED TO FLOOD CONTROL – will continue to need some discussion and political courage for any significant forward movement!

WATER RESOURCES

(1) ELM STUDY – In 2004 and 2005, the Nebraska Department of Natural Resources met with the University of Nebraska, the U.S. Geological Survey, and the eight NRDs with land in the hydrologically connected area of the Loup and Elkhorn Rivers to discuss surface water and groundwater management needs. LB962, passed by the Nebraska Legislature in 2004, sought to minimize the conflicts between surface water and groundwater users by requiring the DNR to determine when new groundwater uses would adversely affect surface water users, and therefore, at least potentially, when groundwater regulation by the NRDs would be required to protect streamflow. The DNR recognized that a better understanding of the geology and groundwater and surface water resources of the area would substantially improve their ability to determine this. The group agreed to begin a study of the area, and named it the Elkhorn-Loup Model (ELM) study.

Field data collection and a groundwater flow model are the basic components of this study. The University of Nebraska Conservation and Survey Division and the U.S. Geological Survey have led the efforts to collect data and model the area.

As of this writing, two phases of the model are done and a third will be finished in 2014. Model runs have refined the boundaries of the hydrologically connected area, improved the calculations of the depletion factors for each square mile in the hydrologically connected area, and projected the impacts of groundwater use on streamflow under various management strategies. Test hole studies refined our knowledge of the base of the

principal aquifer in the area, 531 streamflow measurements in the Loup and Elkhorn basins in 2006 provided a snapshot of relative base-flow in the basins, and stream-aquifer relationships were estimated in several canals and in the North Loup and Middle Loup River beds using geophysical techniques.

Although the group has no specific plans for modeling beyond the phase 3 efforts, we anticipate that new modeling efforts will continue.

(2) ENWRA STUDY – The Eastern Nebraska Water Resources Project was initiated in 2006 for the purpose of cooperatively characterizing the geology and hydrogeology of the glaciated portion of Eastern Nebraska. ENWRA project sponsors believe increased study and understanding of the hydrogeologic complexity of this region and will advance fair and sustainable management of its water resources. Six NRD's and technical advisors including US Geological Survey, UNL - Conservation & Survey Division and the Nebraska Department of Natural Resources are involved in the study. A full-time coordinator is guiding the work.

(3) INSTALLATION OF FLOW METERS – LENRD has required flow meters on all high capacity wells (irrigation and industrial) for the purpose of collecting and measuring groundwater data, encouraging conservation of pumping and promoting stewardship among irrigators and landowners. This data will be very important to our water resource managers for future management decisions as we move toward restricted cropland development. Cost share from LENRD of 50% per meter is available. Future work will involve inspections, spot checks, and possibly a program to repair, maintain and certify meters.

(4) CERTIFICATION OF IRRIGATED/DRYLAND CROP ACRES - In order to best conserve, protect, develop, and manage the natural resources within the District, the Board decided to, by 2013, determine and certify the number and location of irrigated acres in the District, regardless of source of water or purpose of use. One of the primary goals for the certification of acres is to allow irrigation only on acres classified as Certified Irrigated Acres within the District.

Those tracts of land greater than two acres that have been actually irrigated two out ten years from 1999 to 2008 or otherwise allowed to develop under a variance granted by the Board can be certified as irrigated acres. The Board may amend the Certified Irrigated Acres determination upon good cause shown.

(5) GROUNDWATER MONITORING - The LENRD's basic goal for managing groundwater is to work with groundwater users and other entities to ensure an adequate supply of acceptable quality groundwater. To help achieve this goal, the Board decided to develop long-term groundwater management strategies, and to assess groundwater conditions systematically. Groundwater monitoring helps the District to accomplish this.

The District measures specific physical and chemical in streams, ponds, reservoirs, and groundwater wells throughout the District. These data help the District to detect groundwater quantity and quality changes, trends, or problems.

Three groundwater well networks have been the primary source of groundwater information for the District:

- Irrigation well groundwater quantity network – The District collects depth-to-groundwater measurements from this network of 249 irrigation wells each spring and fall to evaluate groundwater quantity. Measurements from this network can trigger groundwater quantity regulation if spring depth-to-groundwater levels decline to specific levels. Data collection for many of these wells began in 1976, giving the District a long record of measurements. Since the District measures these wells before and after the irrigation season, detecting groundwater declines in the summer, the period of maximum groundwater use, is not possible. To address this weakness, monitoring wells (described in the last bullet in this list) will replace many of the irrigation wells at these sites over the next few decades.
- Irrigation well groundwater quality network – NRDs, in cooperation with the Nebraska Department of Environmental Quality, established a statewide monitoring network to assess long-term groundwater quality trends. The District collects samples from 90 of the approximately 1,400 groundwater wells in the statewide network. Over the next decade, the District will cooperate with the state to continue this monitoring.
- Monitoring well network – As of this writing, the University of Nebraska Conservation and Survey Division and the District have installed and equipped 63 monitoring wells at 37 sites to monitor both groundwater quantity and quality. Pressure transducers installed in the wells automatically measure and store depth-to-groundwater information every eight hours, so the District can understand the response of groundwater under pumping and non-pumping conditions. Submersible pumps installed in the wells allow the District to collect samples from the wells without risk of cross-contamination. District staff collect samples from these wells either monthly, semiannually, or annually to detect changes and trends in groundwater quality. The District will continue to add to the monitoring well network to enhance groundwater monitoring as manpower and funding allows.

(6) INTEGRATED WATER MANAGEMENT - In 2004, the Nebraska Legislature passed LB962, which required the DNR to consider and decide, annually, whether any river basin, subbasin or reach is fully appropriated. As of this writing, the term fully appropriated means that the supply of water is equal to the demands for surface water in a river basin, subbasin or reach. DNR study the Lower Platte Basin (Basin), which includes the Lower Elkhorn NRD, in 2013 to determine the basin's fully appropriated status. The District assumes that prior to the end of the period covered by this Master Plan, DNR will declare the basin fully appropriated.

When the DNR declares that an area is fully appropriated, they and the NRDs must jointly develop an Integrated Management Plan. The two entities will develop and agree

to common management goals. For their part of the plan, NRDs must consider the impacts of new groundwater development on streamflow, and must ensure that new groundwater uses do not adversely affect surface water users.

The Lower Platte River Basin Coalition, the group of NRDs within the Lower Platte Basin, is studying the prospect of preparing voluntary Integrated Management Plans. A voluntary plan can be jointly prepared with the DNR, even without a fully appropriated designation. Some NRDs have begun the voluntary planning process with DNR. The Lower Elkhorn NRD Board has not discussed the option of preparing a voluntary plan as of this writing.

On December 16, 2008, the Director of the Nebraska Department of Natural Resources made a preliminary determination that the Lower Platte Basin was Fully Appropriated. Then, on April 8, 2009, the Director reversed the preliminary determination that the Basin was Fully Appropriated, causing a status change in the Basin. LB483, passed in 2009 by the Legislature, required the NRDs affected by a status change to prepare a plan to ensure that if new groundwater irrigation was allowed, that this new development would not cause the Basin to be declared fully appropriated over the following four years. Each NRD in the Basin then submitted a plan to the DNR stating that each NRD would allow no more than 10,000 acres of new irrigated land through the end of 2012.

Roughly one-third of the District is considered to have hydrologically connected surface water and groundwater, which is the area affected by LB483. The District enacted rules in 2009 to also control new irrigation development in the remaining two-thirds of the District, which is non-hydrologically connected.

In order to decide where to allow new irrigated acres in each area, the Board created a process to score and rank applications for new irrigated acres. The Board uses this scoring system as a guide when recommending approval or denial of applications within the limits established by District rules and regulations. Categories and subcategories used for this system are objective and quantifiable. Each subcategory is assigned a numerical weight, or score, by the Board prior to ranking any variance application, which structured so that higher scores will result in a better ranking.

LENRD rules and regulations require the Board to decide annually how many new groundwater irrigated acres to allow after 2012, when the District's four-year plan under LB483 is complete. The Board will choose from at least three options: to continue to allow 2,500, or some other number of new irrigated acres per year; to allow no new irrigated acres; or to allow an unlimited number of new irrigated acres.

(7) USE OF GPS - The District uses survey grade Global Positioning System (GPS) equipment to measure elevations of wells in the District groundwater monitoring programs. This equipment will also be used to accurately locate irrigation wells as needed for the certification of irrigated acres.

In the near future the LENRD will undertake Certification of Irrigated Acres whereby landowners will have to provide proof of the acres irrigated and the source of this water. Though some locations of wells are in a database with the Department of Natural Resources (DNR), past history has indicated no locations where wells do exist. During this certification process the LENRD will request permission from landowners to attain precise locations of these wells horizontally and vertically. The LENRD also has permanent monitoring wells located throughout the district. These wells are used for indicating groundwater quality and quantity. During spring and fall, static water levels from irrigation wells are measured to indicate depletion and recharge. With the purchase of Survey Grade GPS Equipment the static water level will be measured from a known elevation. The elevation in feet below the ground surface will help the LENRD and geologists learn more about the relationship between surface water and groundwater.

(8) USE OF GIS - The LENRD uses Geographic Information System (GIS) for many natural resources projects. GIS is currently being used to add irrigated acres, LB 483. The variance applications have several categories such as Proximity to other Wells, Wellhead Protection Areas, Depletion Factor, Soil Conservation Score and others. GIS will also be used in Certification of Irrigated Acres. The LENRD uses GIS to create Redistricting Maps showing the Board Members Representation. Water Level Maps compare the present year to a previous year to give the Board and Staff a feel for the underground geology. GIS has been used for the Recreation Areas of Maple Creek, Willow Creek, Maskenthine, and also to show areas devastated by the flood of 2010 on the Elkhorn River. GIS is also used for our Monitoring Wells, Summer Sampling Program, and our Phase II Area in Pierce County. GIS is an integral part of the work the LENRD does.

FUTURE STAFFING PROJECTIONS

As the District moves into expanded natural resource management, there will be very important decisions to be made regarding staff needs. Based upon existing programs and projects, not to mention workloads made necessary by unknown legislative impacts and very likely additional mandatory rules and regulations associated with ground and surface water, additional staff will be necessary. More specialist emphasis should be given.

WATER RESOURCE SPECIALIST – manage and coordinate State mandated Chemigation Program, manage water meter program, assist with water data collection

WATER RESOURCES FIELD TECH – collect water data

FULL TIME FORESTER – convert part time USDA-NRCS Forester position to full time NRD position to promote all forestry activities

PART TIME INFORMATION & EDUCATION ASSISTANT – as programs and projects increase and grow, there will be need for this position, for example maintaining and expanding the web site and promoting the District to all citizens

GEOLOGIST – there is need to further study, define and understand our complex geology for groundwater management. This position should be filled as soon as possible

PROJECT MANAGER (CIVIL ENGINEERING DEGREE) – this position will be increasingly important as the District continues to develop flood control projects and other projects that require technical background

10 YEARS AND BEYOND

Where does the District go from here? The following “Visionary Projects” are reasonable and needed but will require political courage, time and funding.

- (1) SOIL CONSERVATION – More emphasis should be placed on “creative methods and practices” to conserve our precious topsoil! A very good example is the No-Till program that has won National Awards and acclaim for the District.
- (2) WILLOW CREEK ALGAE INVESTIGATION - This project is already underway but will require sustained effort by the Board and staff to identify the recurring algae problem. Partnerships with the Nebraska Department of Environmental Quality and the US Geological Survey will be critical as will cooperation from the landowners.
- (3) INCREASED GROUNDWATER QUALITY MANAGEMENT – especially in Pierce and Northern Madison Counties will be critical to prevent further contamination of the aquifer. It is vital to protect and sustain our water resources with regulation and education as increased landowner participation is more necessary than ever.
- (4) STRIVE TO RESOLVE PUMPING CONFLICT – identify areas that are concerns for problems between rural domestic users and landowners who own and manage land that is irrigated. When pumps go on in dry conditions.....conflict occurs!
- (5) CONTINUE STUDIES OF COMPLEX GEOLOGIC FRAMEWORK – will be vital to understanding aquifer conditions and management of groundwater. This effort must be “on-going using as much sound science” as possible.
- (6) LOWER PLATTE BASIN – INTEGRATED MANAGEMENT PLAN (IMP) – Development of some type of broad based IMP is critical for all water users. Legislation passed in 2010 to develop these plans. This IMP will be developed with input from the Loup, Elkhorn, and Lower Platte NRDs and representatives from other water interests as well as the Nebraska Department of Natural Resources.
- (7) INCREASE PROMOTION OF FORESTRY PROGRAMS – Nebraska is rapidly losing populations of various trees in rural and urban areas due to storms and aggressive agriculture practices related to current high commodity prices. As the State’s leading tree planters, NRDs will need to become more creative with incentives to plant more trees.

- (8) EXPAND LOGAN EAST RURAL WATER SYSTEM – as the system reaches 20 years of service to users, strong consideration and planning needs to be in place to identifying supplemental source water. The 3 groundwater, deep well supply remains adequate at this time but continued pumping and strain on the aquifer is obvious. Purchasing water from Fremont is a viable option, but additional users must be found.
- (9) EXPAND WAU-COL REGIONAL WATER SYSTEM – even as this project is being constructed, planning and consideration should be given to connecting Osmond and Laurel as well more rural customers. There is a “great deal of growth capacity remaining”
- (10) PROMOTE COMPREHENSIVE STUDY OF THE ELKHORN RIVER BASIN – this type of study should be promoted and led by the NRDs. As a result of the record flooding of the Elkhorn River in June, 2010, massive damage was suffered by private landowners and public infrastructure (bridges, roads, etc) and the US Army Corps of Engineers and / or the US Geological Survey should be involved with all affected counties, cities, NRD’s and other interests. Initial contacts and meeting have taken place but more organization is needed.
- (11) CONTINUE DEVELOPMENT OF MAPLE CREEK WATERSHED – based on successful planning, construction and opening of the Maple Creek Recreation Area near Leigh (even after 11 years) future plans should be made to revisit the dam sites in the watershed. As studied by the USDA–NRCS in the 1960s–70s, completion of the 27 dam sites will provide 72–75 % flood protection downstream. This is significant and any efforts will certainly be controversial, expensive and will take years but should be pursued. NRDs should lead the way with flood control.
- (12) CONSIDER IMPOUNDMENT SITES FOR ALTERNATE USE – several dam sites in the District could very well be studied for so called “timed release” of water for the purpose of fish and wildlife enhancement. Not unreasonable in today’s world.