

Annual Report of 2016 Data for the Upper Loup Natural Resource District and Nebraska Department of Natural Resources Integrated Management Plan

Prepared by the Nebraska Department of Natural Resources
for the Annual Meeting August 9, 2017

Introduction

The Upper Loup Natural Resources District (ULNRD) and the Nebraska Department of Natural Resources (NeDNR or Department) jointly adopted an Integrated Management Plan (IMP), which became effective on July 15, 2016, with the goal of jointly managing groundwater and surface water within the ULNRD to sustain a balance between water uses and supplies for the long term. The purpose of this report is to fulfill the Department's responsibilities under the IMP annual reporting obligations and provide updates to current monitoring projects or studies as outlined in the IMP.

Reporting and exchanging information gathered from monitoring projects, streamflow data, or other studies provides a basis to increase understanding of the surface water and hydrologically connected groundwater system. The analyses conducted and reported here on the data collected through this IMP's monitoring plan are designed to evaluate and measure the success of the objectives of this IMP. This information exchange also helps to test the validity of the conclusions and information upon which the IMP is based. This report contains information from January 1 through December 31, 2016.

Department Reporting: Data

The IMP requires that the Department annually report on the following surface water data within the District:

- 1) Streamgauge measurements on NeDNR-maintained gages
- 2) Surface water permits issued, cancelled, or denied
- 3) Irrigation water use data (voluntarily reported)
- 4) Other data as agreed to by NeDNR and the ULNRD

These data are presented below.

1. Streamgauge Measurements

The locations of gages at which streamflow measurements are made by the United States Geological Survey (USGS) and the Department within the ULNRD are shown in Figure 1. Daily streamflow measurements from the single NeDNR measuring gage, on a canal, in the ULNRD are given in Appendix 1 (note that no data were available for this

streamgage after October 1). These data can be acquired from the NeDNR's website at: <https://nednr.nebraska.gov/RealTime/Stations/Details/130000>.

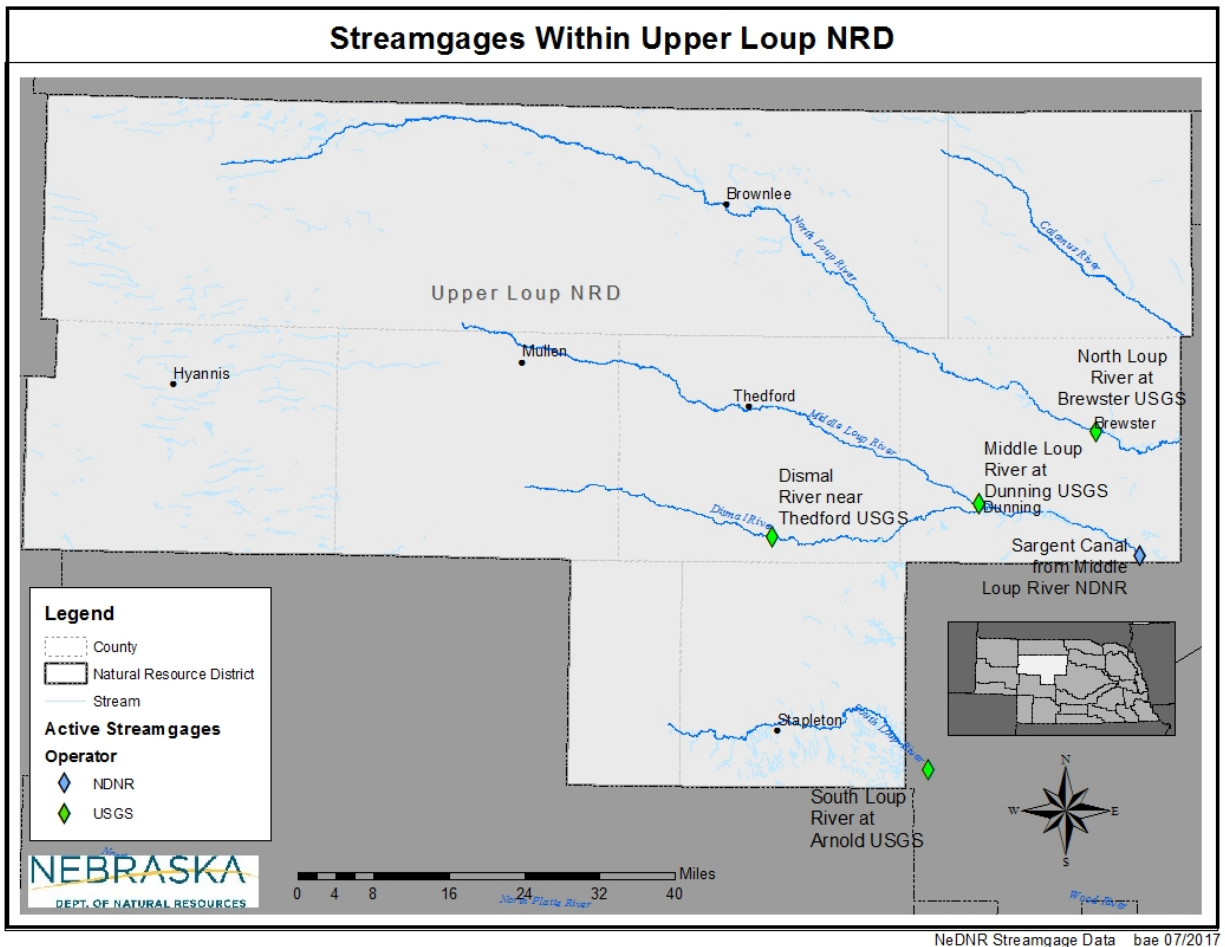
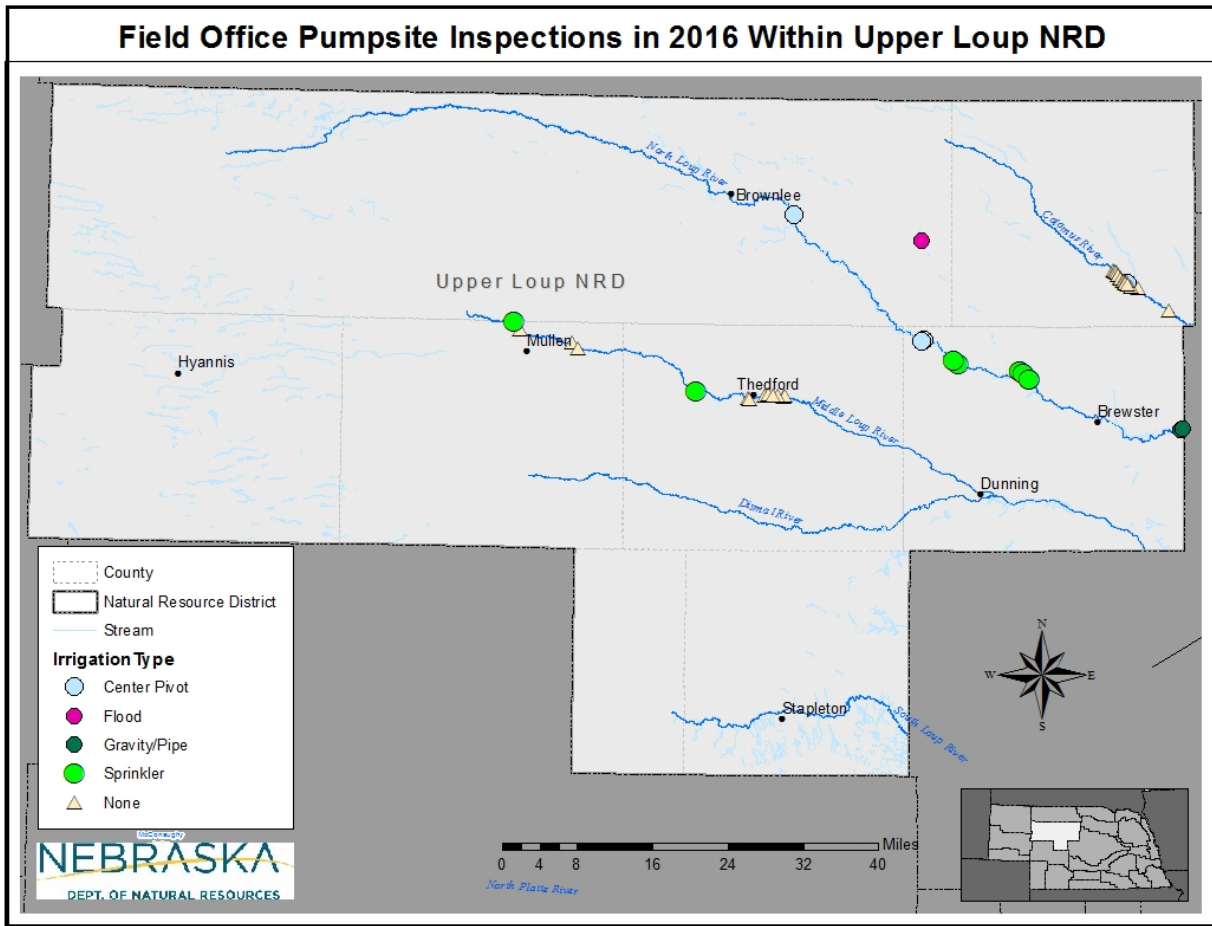


Figure 1: USGS and NeDNR stream gage locations within the ULNRD.

NeDNR field staff performs surface water pump diversion facility inspections on an annual basis, to determine whether irrigation equipment is running and to identify the type and method of irrigation equipment and activity in use in the field. Figure 2 summarizes these pump diversion inspections conducted by NeDNR staff in 2016.



NeDNR FieldOfficePumpsite Data bae 07/2017

Figure 2: Pump diversion inspections in the ULNRD in 2016.

2. Surface Water Permitting

In 2016, the Department approved two surface water permit applications, which are listed in Table 1. These approvals resulted in adding slightly over 132 new irrigated acres. The locations of these new appropriations are shown in Figure 3.

Table 1: Approved surface water applications in 2016 within the ULNRD.

Appropriation Number	Approval Date	Legal Description (S-T-RW)	Status	Use	Acres	Grant in CFS	Number of New Irrigated Acres
A-18548	10/28/16	9-23-23	Active	Irrigation	128.4	1.83	128.4
A-19329	9/16/16	9-23-28	Active	Irrigation	4.0	0.06	4.0

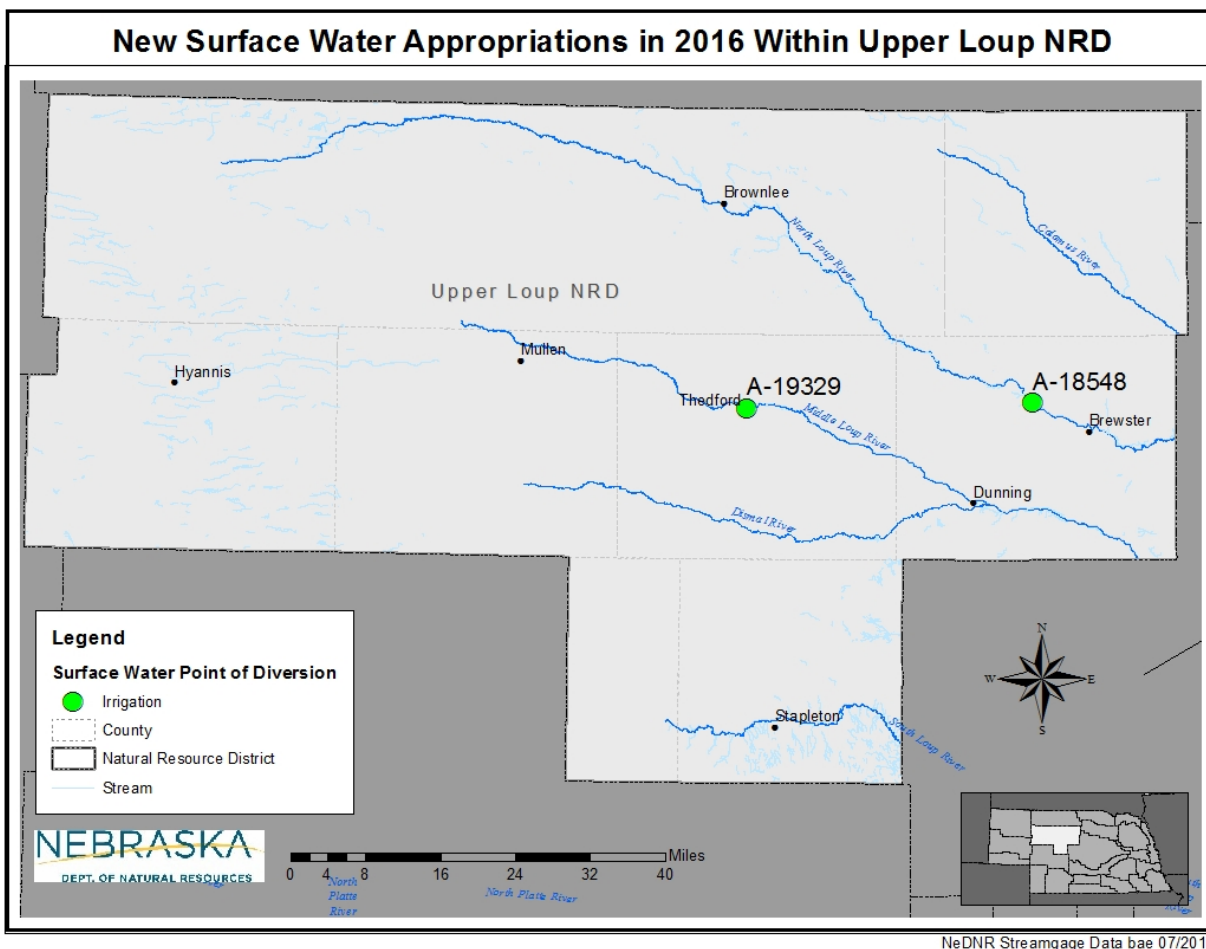


Figure 3: New surface water appropriations in 2016 in the ULNRD.

One surface water permit was cancelled in part during 2016, and is listed below in Table 2. This resulted in a cancellation of 24.1 irrigated acres. The basis for the Department's action, as provided by state law, is also listed below. No surface water permit applications were denied or dismissed in 2016.

Table 2: Surface water appropriations cancelled in 2016 in the ULNRD.

Appropriation Number	Cancellation in Part Date	Legal Description (S-T-RW)	Status	Use	Begin Acres	Cancelled Acres	Cancelled CFS	Reason
A-5878	1/25/16	10-23-28	Active	Irrigation	166	24.1	0.26	See below

The Department determined that a portion of the appropriation had not been used in the last five years; the owner did not contest this determination.

Authority upon which the action was based: *Neb. Rev. Stat. §§ 46-229.02(1) through 46-229.02(6)*: If the Department makes a preliminary determination that an appropriation has not been used for more than five consecutive years, and the owner of said appropriation does not successfully contest the determination, the Department may cancel said appropriation in whole or part.

3. Irrigation Water Use Reporting

There were 12 respondents out of 34 surveys sent in the ULNRD to the Department's voluntary surface water use reporting of activities in 2016 (a response rate of about 35%); however, four of these respondents did not complete the requested information on crops grown, irrigation methods, or tillage. A total of 602 acres were reported, categorized by irrigated vs. non-irrigated and crop type. Forage hay/grass was grown on all of the reported irrigated acres. The greatest number of acres of non-irrigated crops was in sorghum, with forage hay/grass second. The reported data are shown in Table 3 (note, only the data for the eight respondents that provided crop, irrigation, and tillage information are included in Table 3).

Table 3: Voluntary reporting of water use within the ULNRD for 2016.

Crop Type	Total Reported Crop Acres	Crop Acres Irrigated		Crop Acres Not Irrigated	
		Acres	Percent of Reported Irrigated Acres (by Crop Type)	Acres	Percent of Reported Irrigated Acres (by Crop Type)
Forage Hay/Grass	254	148	100%	106	23%
Sorghum	348	-	-	348	77%
Totals	602	148	-	454	-

Department Education and Outreach Activity in 2016

Each year, NeDNR dedicates a portion of staff time and resources to education and outreach efforts that promote a better understanding of integrated water management and why it is important to the state's citizens. NeDNR's outreach efforts range from informal conversations with local citizens about how we envision and strive for collaborative water management, to more complex presentations, discussions, and demonstrations about the hydrologic connection between surface and groundwater.

In 2016, NeDNR staff attended the Sandhills Ranch Expo held in Bassett, Nebraska. This event provided many people who otherwise may not have had direct contact with Department staff an opportunity to learn about NeDNR in general and the Water Planning Division's focus on integrated water management specifically. NeDNR staff operated a groundwater model showing the connection and interaction of surface water with groundwater, discussed IMPs, and fielded questions.

Many of NeDNR's efforts, such as hosting an informational booth at the Nebraska State Fair or improving the INSIGHT web portal, are broadly focused and intended to provide all interested citizens with a better understanding of how integrated water management affects them. In 2016, NeDNR staff set up educational booths at the Nebraska State Fair, Husker Harvest Days, the Governor's Ag Conference, and the University of Nebraska-Lincoln's Women in Agriculture Conference. Improvements were also made to NeDNR's website (<https://dnr.nebraska.gov/>) and the INSIGHT web portal (<https://nednr.nebraska.gov/INSIGHT/>), which will provide citizens with a more convenient and user friendly experience when they need to access water resources related information or data.

Appendix 1: NeDNR streamflow gage measurements in ULNRD in 2016							
130000 – Sargent Canal from Middle Loup River							
Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
1/1/2016	0	2/5/2016	0	3/11/2016	0	4/15/2016	0
1/2/2016	0	2/6/2016	0	3/12/2016	0	4/16/2016	0
1/3/2016	0	2/7/2016	0	3/13/2016	0	4/17/2016	0
1/4/2016	0	2/8/2016	0	3/14/2016	0	4/18/2016	0
1/5/2016	0	2/9/2016	0	3/15/2016	0	4/19/2016	0
1/6/2016	0	2/10/2016	0	3/16/2016	0	4/20/2016	0
1/7/2016	0	2/11/2016	0	3/17/2016	0	4/21/2016	0
1/8/2016	0	2/12/2016	0	3/18/2016	0	4/22/2016	0
1/9/2016	0	2/13/2016	0	3/19/2016	0	4/23/2016	0
1/10/2016	0	2/14/2016	0	3/20/2016	0	4/24/2016	0
1/11/2016	0	2/15/2016	0	3/21/2016	0	4/25/2016	0
1/12/2016	0	2/16/2016	0	3/22/2016	0	4/26/2016	0
1/13/2016	0	2/17/2016	0	3/23/2016	0	4/27/2016	0
1/14/2016	0	2/18/2016	0	3/24/2016	0	4/28/2016	0
1/15/2016	0	2/19/2016	0	3/25/2016	0	4/29/2016	0
1/16/2016	0	2/20/2016	0	3/26/2016	0	4/30/2016	0
1/17/2016	0	2/21/2016	0	3/27/2016	0	5/1/2016	0
1/18/2016	0	2/22/2016	0	3/28/2016	0	5/2/2016	0
1/19/2016	0	2/23/2016	0	3/29/2016	0	5/3/2016	0
1/20/2016	0	2/24/2016	0	3/30/2016	0	5/4/2016	0
1/21/2016	0	2/25/2016	0	3/31/2016	0	5/5/2016	0
1/22/2016	0	2/26/2016	0	4/1/2016	0	5/6/2016	0
1/23/2016	0	2/27/2016	0	4/2/2016	0	5/7/2016	0
1/24/2016	0	2/28/2016	0	4/3/2016	0	5/8/2016	0
1/25/2016	0	2/29/2016	0	4/4/2016	0	5/9/2016	0
1/26/2016	0	3/1/2016	0	4/5/2016	0	5/10/2016	0
1/27/2016	0	3/2/2016	0	4/6/2016	0	5/11/2016	0
1/28/2016	0	3/3/2016	0	4/7/2016	0	5/12/2016	0
1/29/2016	0	3/4/2016	0	4/8/2016	0	5/13/2016	0
1/30/2016	0	3/5/2016	0	4/9/2016	0	5/14/2016	0
1/31/2016	0	3/6/2016	0	4/10/2016	0	5/15/2016	0
2/1/2016	0	3/7/2016	0	4/11/2016	0	5/16/2016	0
2/2/2016	0	3/8/2016	0	4/12/2016	0	5/17/2016	0
2/3/2016	0	3/9/2016	0	4/13/2016	0	5/18/2016	0
2/4/2016	0	3/10/2016	0	4/14/2016	0	5/19/2016	0

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
5/20/2016	0	6/26/2016	94	8/2/2016	58	9/8/2016	78
5/21/2016	0	6/27/2016	104	8/3/2016	66	9/9/2016	65
5/22/2016	0	6/28/2016	118	8/4/2016	73	9/10/2016	59
5/23/2016	0	6/29/2016	89	8/5/2016	84	9/11/2016	61
5/24/2016	0	6/30/2016	70	8/6/2016	94	9/12/2016	65
5/25/2016	0	7/1/2016	72	8/7/2016	96	9/13/2016	66
5/26/2016	0	7/2/2016	60	8/8/2016	140	9/14/2016	73
5/27/2016	0	7/3/2016	57	8/9/2016	191	9/15/2016	68
5/28/2016	0	7/4/2016	56	8/10/2016	214	9/16/2016	54
5/29/2016	0	7/5/2016	56	8/11/2016	219	9/17/2016	51
5/30/2016	34	7/6/2016	65	8/12/2016	211	9/18/2016	1.5
5/31/2016	104	7/7/2016	64	8/13/2016	176	9/19/2016	0
6/1/2016	69	7/8/2016	55	8/14/2016	169	9/20/2016	0
6/2/2016	70	7/9/2016	56	8/15/2016	163	9/21/2016	0
6/3/2016	70	7/10/2016	56	8/16/2016	184	9/22/2016	0
6/4/2016	69	7/11/2016	63	8/17/2016	150	9/23/2016	0
6/5/2016	70	7/12/2016	101	8/18/2016	115	9/24/2016	0
6/6/2016	70	7/13/2016	141	8/19/2016	102	9/25/2016	0
6/7/2016	70	7/14/2016	160	8/20/2016	92	9/26/2016	0
6/8/2016	70	7/15/2016	106	8/21/2016	88	9/27/2016	0
6/9/2016	70	7/16/2016	67	8/22/2016	143	9/28/2016	0
6/10/2016	77	7/17/2016	61	8/23/2016	207	9/29/2016	0
6/11/2016	82	7/18/2016	56	8/24/2016	217	9/30/2016	0
6/12/2016	82	7/19/2016	63	8/25/2016	214	10/1/2016	0
6/13/2016	82	7/20/2016	68	8/26/2016	183		
6/14/2016	85	7/21/2016	73	8/27/2016	151		
6/15/2016	85	7/22/2016	99	8/28/2016	138		
6/16/2016	80	7/23/2016	117	8/29/2016	145		
6/17/2016	82	7/24/2016	121	8/30/2016	162		
6/18/2016	81	7/25/2016	142	8/31/2016	176		
6/19/2016	82	7/26/2016	182	9/1/2016	155		
6/20/2016	78	7/27/2016	97	9/2/2016	132		
6/21/2016	77	7/28/2016	57	9/3/2016	105		
6/22/2016	77	7/29/2016	57	9/4/2016	99		
6/23/2016	86	7/30/2016	57	9/5/2016	100		
6/24/2016	100	7/31/2016	57	9/6/2016	116		
6/25/2016	98	8/1/2016	58	9/7/2016	99		