

JOINTLY DEVELOPED BY

**Upper Elkhorn**  
 Natural Resources District

**NEBRASKA**  
 DEPT. OF NATURAL RESOURCES

# V-IMP Annual Review of 2022 Activities

June 2023

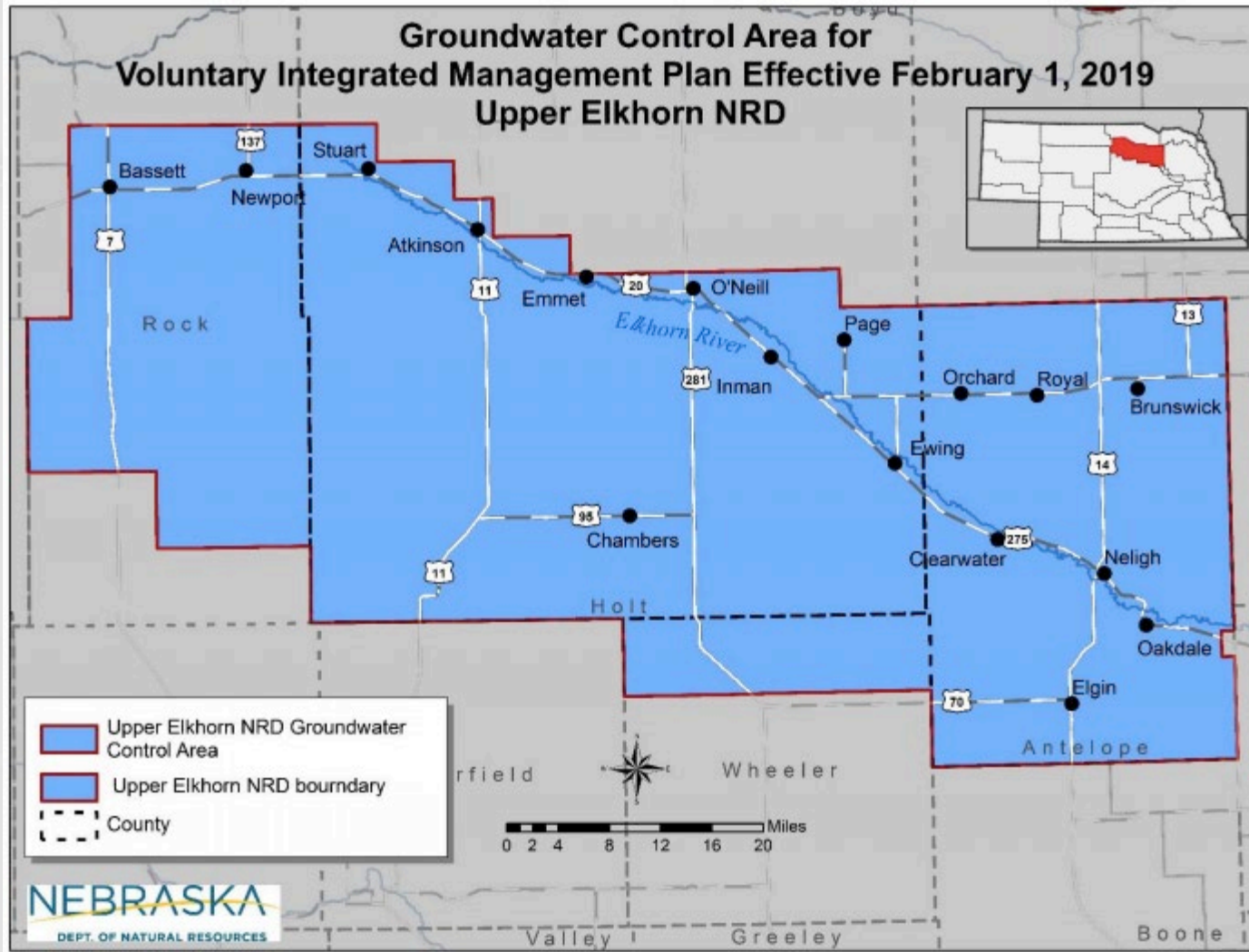
# Overview

- Reporting of UENRD Data
- Reporting of NeDNR Data
- Lower Platte River Basin Coalition Activities
- Evaluation of data reporting & communication
- Review of IMP Goals/Objectives/Action Items
  - Any changes needed moving forward

# Groundwater Controls

1. Certification of groundwater irrigated acres
2. Establish a limit on the expansion of groundwater irrigated acres

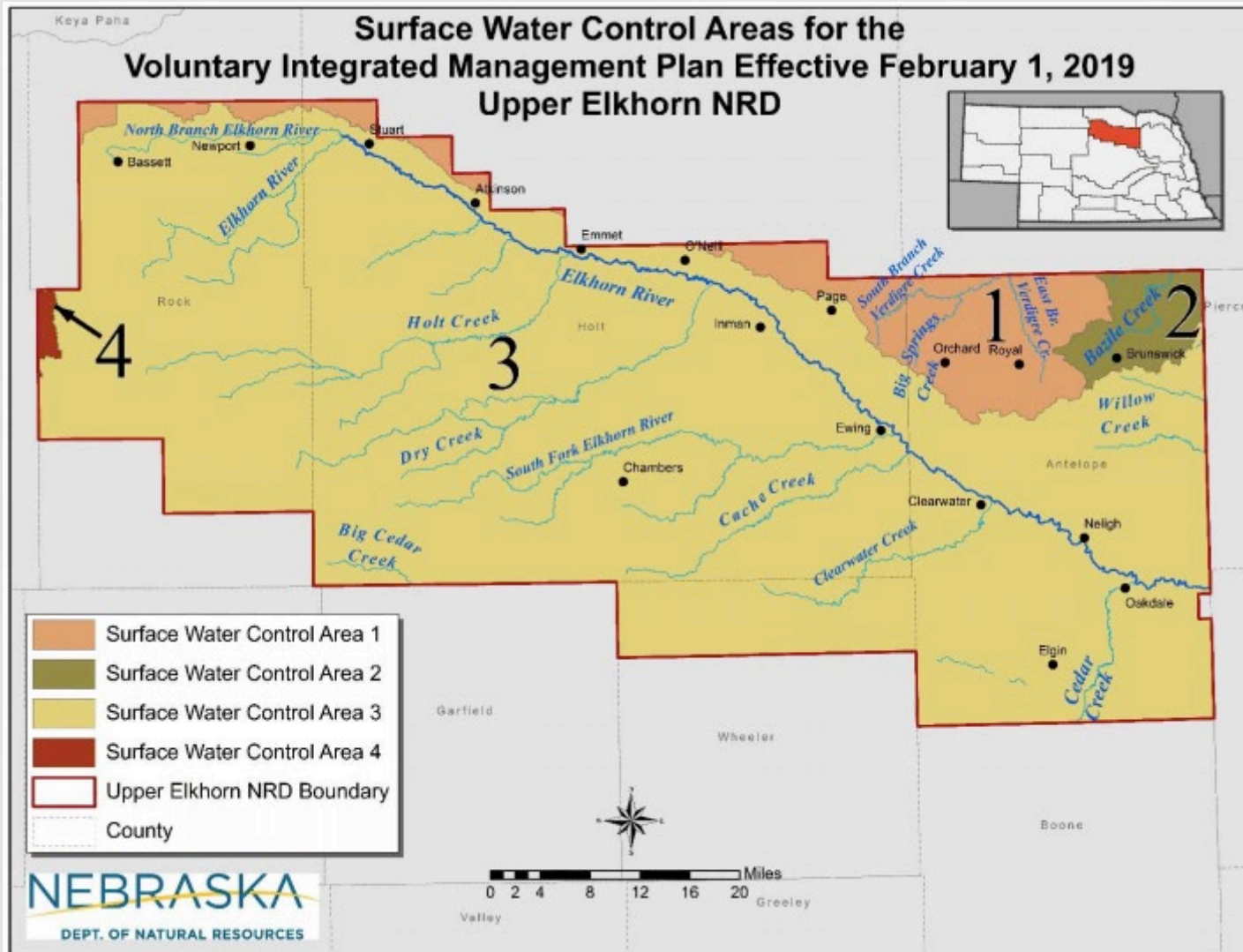
# Groundwater Controls



# Surface Water Controls

1. Surface Water Control Area 1 (Lower Niobrara Basin)
  - Moratorium or restriction on additional surface water irrigated acres
2. Surface Water Control Area 2 (Upper Missouri Tributaries Basin)
  - Education
3. Surface Water Control Area 3 (Lower Platte Basin)
  - Limitation on expansion of surface water irrigation
4. Surface Water Control Area 4 (Middle Niobrara Basin)
  - Temporary stay on development of surface water irrigation (expired 2/4/2020)

# Surface Water Controls Areas Map





# DATA COLLECTION & MONITORING

# Data Collection and Monitoring

- NRD Monitoring
  - Expansion of irrigated acres
  - Groundwater level measurements
  - Municipal water use
- NeDNR Monitoring
  - Surface water permitting activities
  - Groundwater Permitting
  - Water administration activity
  - Voluntary water use survey
  - Surface water pumpsite inspections
  - NeDNR streamgage measurements



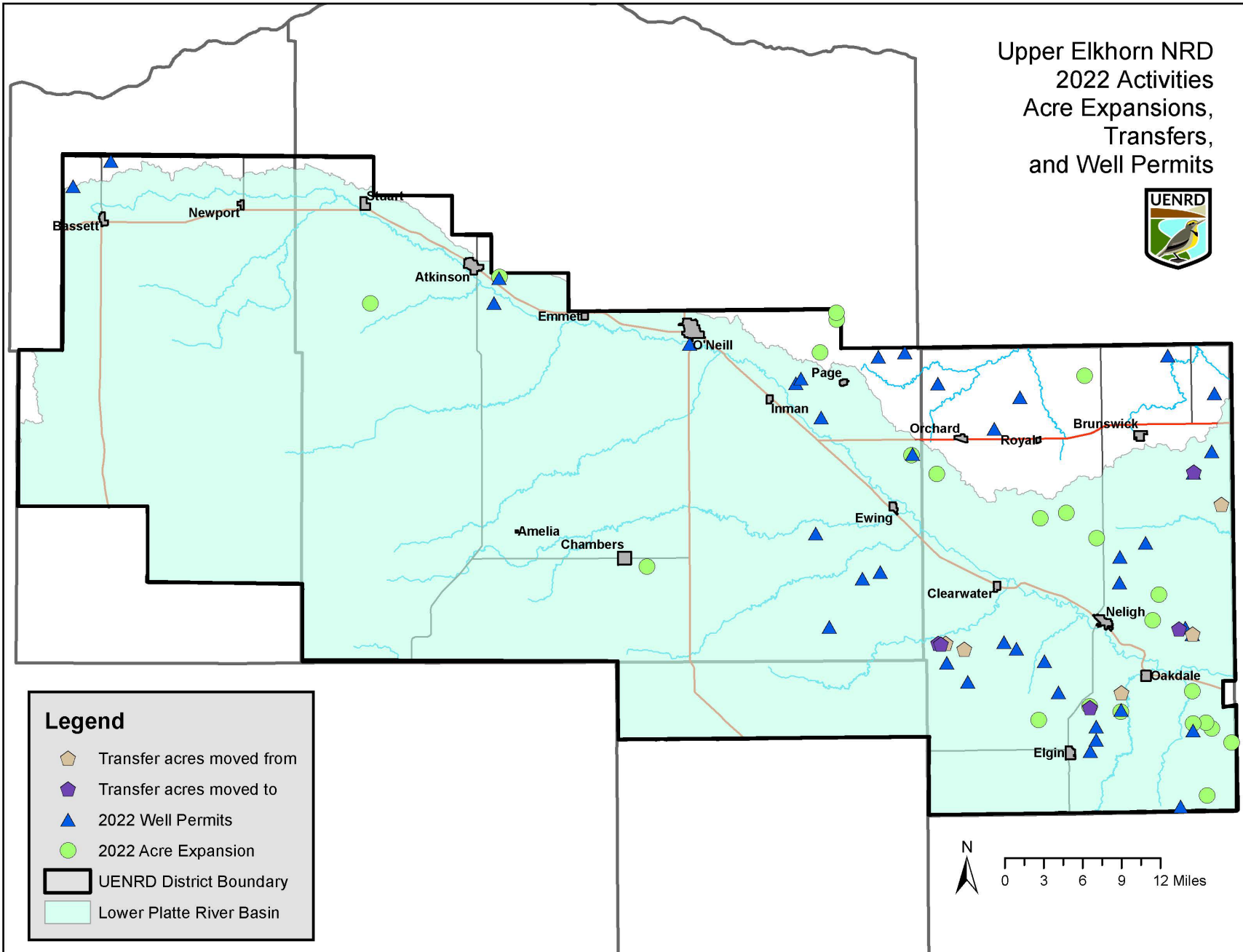


# Groundwater monitoring and data collection

- 39 well permits issued
  - 16 New
  - 23 Replacement
- Static water level monitoring at 365 monitoring and irrigation wells in Spring & Fall 2022.
- Nitrate sample collection from 684 irrigation wells
- Certification of groundwater irrigated acres
  - As part of the V-IMP Groundwater Controls the UENRD will certify all groundwater irrigated acres by February 2021.
  - As of February 22, 2023, **486,187** acres have been certified.

# Upper Elkhorn NRD 2022 Activities

Upper Elkhorn NRD  
2022 Activities  
Acre Expansions,  
Transfers,  
and Well Permits



# Groundwater Acre Transfers\*

|              | Number of Acres | Transfer FROM                   | FROM Depletion Estimate (AF) | Transfer TO   | TO Depletion Estimate (AF) | Change in Depletion |
|--------------|-----------------|---------------------------------|------------------------------|---------------|----------------------------|---------------------|
|              | 4.85            | East Corners of W1/2 SE 29-25-8 | 0.87                         | NW SW 29-25-8 | 0.87                       | 0.00                |
|              | 15              | NW 34-25-8                      | 1.97                         | NW SW 29-25-8 | 2.69                       | +0.72               |
|              | 29.83           | SWNW 1-26-5                     | 0.00*                        | SW SW 22-27-5 | 1.92                       | +1.92               |
|              | 30              | NE 28-25-5                      | 3.67                         | SE 20-25-5    | 3.24                       | -0.43               |
|              | 22.62           | SW 15-24-6                      | 4.15                         | SE 19-24-6    | 2.06                       | -2.09               |
| <b>TOTAL</b> | <b>102.30</b>   |                                 |                              |               |                            | <b>0.13</b>         |

5 acre transfer applications were approved.

\*Reported as submitted for LPRBC annual report. Not all of UENRD is in LPRB.

# Groundwater Acre Expansions\*

| Legal        | Number of Acres | NIR (ft) | SDF % | % Depletion | Depletion Estimate (AF) |
|--------------|-----------------|----------|-------|-------------|-------------------------|
| NW 13-27-9   | 9.81            | 0.69     | 0.48  | 0.3         | 0.96                    |
| SW 35-24-5   | 11              | 0.59     | 0.51  | 0.3         | 0.99                    |
| SE 16-24-5   | 12              | 0.60     | 0.81  | 0.3         | 1.76                    |
| SE 28-26-12  | 9               | 0.92     | 0.86  | 0.3         | 2.14                    |
| NE 34-24-5   | 15              | 0.59     | 0.51  | 0.3         | 1.36                    |
| SW SW 1-26-7 | 35              | 0.65     | 0.14  | 0.3         | 0.92                    |
| NE 24-25-6   | 32              | 0.6      | 0.7   | 0.3         | 4.02                    |
| W NW 27-24-6 | 54              | 0.59     | 0.75  | 0.3         | 7.21                    |
| NE 3-29-14   | 87.19           | 0.87     | 0.8   | 0.3         | 18.26                   |
|              | <b>265</b>      |          |       |             | <b>37.62</b>            |

10 acre expansion applications were approved; 9 applications shown in chart\*

\*Reported as submitted for LPRBC annual report. Not all of UENRD is in LPRB.

# Municipal Water Use

| Municipality                             | 1/1/22 - 12/31/22<br>Gallons Pumped | Per Capita Use<br>(gals/person/day) | Population<br>Served | 2020<br>Census<br>Data | 2006 - 2015<br>Average Annual<br>Gallons Pumped | Baseline<br>Pumping Rate | Number<br>of Wells |
|--|-------------------------------------|-------------------------------------|----------------------|------------------------|---|--------------------------|--------------------|
| Atkinson                                 | 109,933,000                         | 230.46                              | 1,306                | 1,298                  | 98,922,370                                      | 218                      | 3                  |
| Bassett                                  | 64,648,500                          | 252.85                              | 700                  | 538                    | 54,020,000                                      | 239                      | 3                  |
| Brunswick*                               | 1,186,600                           | 25.38                               | 138                  | 138                    | NA*   | NA*                      | 2                  |
| Chambers <sup>4</sup>                    |                                     |                                     |                      | 268                    | NA <sup>1</sup>                                 | NA <sup>1</sup>          | 3                  |
| Clearwater                               | 35,473,00                           | 303.50                              | 320                  | 320                    | NA <sup>1</sup>                                 | NA <sup>1</sup>          | 2                  |
| Elgin                                    | 68,961,000                          | 263.33                              | 717                  | 712                    | NA <sup>2</sup>                                 | NA <sup>2</sup>          | 3                  |
| Ewing                                    | 36,855,500                          | 261.41                              | 386                  | 377                    | 41,170,250                                      | 291                      | 3                  |
| Neligh                                   | 105,806,553                         | 181.96                              | 1,592                | 1,516                  | NA <sup>1</sup>                                 | NA <sup>1</sup>          | 4                  |
| Newport                                  | 9,998,000                           | 342.16                              | 80                   | 69                     | NA <sup>1</sup>                                 | NA <sup>1</sup>          | 2                  |
| Oakdale <sup>4</sup>                     |                                     |                                     |                      | 322                    | NA <sup>1</sup>                                 | NA <sup>1</sup>          | 2                  |
| O'Neill                                  | 244,136,300                         | 180.46                              | 3,704                | 3,547                  | 233,851,800                                     | 173                      | 5                  |
| Orchard*                                 | 60,779,000                          | 439.06                              | 379                  | 379                    | NA*   | NA*                      | 2                  |
| Page                                     | 5,474,400                           | 90.29                               | 166                  | 167                    | NA <sup>1</sup>                                 | NA <sup>1</sup>          | 2                  |
| Royal*                                   | 11,620,100                          | 706.98                              | 45                   | 63                     | NA*   | NA*                      | 1                  |
| Stuart                                   | 62,497,000                          | 352.76                              | 486                  | 482                    | 67,884,530                                      | 315                      | 3                  |
| Summerland<br>Public School <sup>3</sup> | 5,215,384 <sup>3</sup>              | 29.14 <sup>3</sup>                  | 490                  | NA <sup>3</sup>        | NA <sup>3</sup>                                 | NA <sup>3</sup>          | 1                  |

Per Capita Use was estimated using 01/01/2022 – 12/31/2022 gallons pumped, divided by the population served in that period, divided by 365.25 days (1 year). Baseline Pumping Rates was estimated using 2006 – 2015 (10 year) average annual gallons pumped, divided by the 2010 Census Data, divided by 365.25 days. All data provided by municipalities.

\*Not part of LPRBC, 3<sup>rd</sup> year collecting data

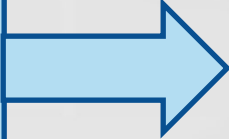
<sup>1</sup> Several municipalities are still working on getting previous years pumping data to UENRD: Chambers, Clearwater, Neligh, Newport, Oakdale, and Page.

<sup>2</sup> Elgin's data only went back to 2009, so an average annual baseline pumping rate (2006 – 2015) was unable to be calculated.

<sup>3</sup> Summerland Public School's well was new in August 2021 so there is no data before this time. Also not part of census.

<sup>4</sup> 2022 pumping data has not been reported to UENRD.

# Data Collection and Monitoring

- NRD Monitoring
    - Expansion of irrigated acres
    - Groundwater level measurements
    - Municipal water use
  - NeDNR Monitoring
    - Surface water permitting activities
    - Groundwater Permitting
    - Water administration activity
    - Voluntary water use survey
    - Surface water pumpsite inspections
    - NeDNR stream gage measurements
- 

# NeDNR Surface Water Permitting Actions

January 1, 2022, to December 31, 2022

- New surface water applications approved = 1
- Cancellations of surface water appropriations = 0
- Transfers of surface water appropriations = 0

# NeDNR Surface Water Permitting Actions

January 1, 2022, to December 31, 2022

- Approved one surface water application
  - One Domestic (DO) permit, which allows the user to divert water for domestic use.

## Surface Water Applications Approved Within the UENRD between January 1, 2022, to December 31, 2022

| Appropriation Number | Date Approved | Source        | Location of Diversion/ Reservoir (S-T-R) | Use | Grant in cfs | Grant in af | Acres | New Acres |
|----------------------|---------------|---------------|--|-----|--------------|-------------|-------|-----------|
| A-19842              | 6/1/2022      | Elkhorn River | S11-T29N-R14W                            | DO  | 0.11         | N/A         | 0.1   | N/A       |



# NeDNR Groundwater Permitting Actions

January 1, 2022, to December 31, 2022

- Groundwater permits cancelled = 0
- Groundwater permits issued = 0

*Includes groundwater permits for the following uses*

- *Application to Drill Without Regard to Spacing*
- *Industrial Groundwater Transfers*
- *Industrial Transfer Notice*
- *Municipal Groundwater Transfers*
- *Municipal Notice of Intent*
- *Permit to Violate Well Spacing*
- *Permit to Transfer to Adjoining State*

# NeDNR Water Administration Actions

## Water Year 2022

| Surface Water Administration in UENRD in 2022 |              |                |              |                |                                   |                                   |
|---|--------------|----------------|--------------|----------------|-----------------------------------|-----------------------------------|
| Notice Type                                   | Field Office | Water Division | Permit Type  | Effective Date | Reason for Admin Action           | Number of Affected Appropriations |
| Close   | Norfolk      | 2B             | Storage      | 7/1/2022       | Instream Flow<br>(NGPC and CPNRD) | 18                                |
| Close   | Norfolk      | 2B             | Natural Flow | 7/1/2022       |                                   | 67                                |
| Close   | Lincoln      | 2B             | Natural Flow | 7/1/2022       |                                   | 24                                |
| Close   | Lincoln      | 2B             | Storage      | 7/1/2022       |                                   | 67                                |
| Open  | Norfolk      | 2B             | Storage      | 7/8/2022       |                                   | 18                                |
| Open  | Norfolk      | 2B             | Natural Flow | 7/8/2022       |                                   | 67                                |
| Open  | Lincoln      | 2B             | Natural Flow | 7/8/2022       |                                   | 12                                |
| Open  | Lincoln      | 2B             | Storage      | 7/8/2022       |                                   | 67                                |

# NeDNR Water Administration Actions

## Water Year 2022

| Surface Water Administration in UENRD in 2022 |              |                |              |                |                                   |                                   |
|---|--------------|----------------|--------------|----------------|-----------------------------------|-----------------------------------|
| Notice Type                                   | Field Office | Water Division | Permit Type  | Effective Date | Reason for Admin Action           | Number of Affected Appropriations |
| Close   | Norfolk      | 2B             | Storage      | 7/19/2022      | Instream Flow<br>(NGPC and CPNRD) | 18                                |
| Close   | Norfolk      | 2B             | Natural Flow | 7/19/2022      |                                   | 67                                |
| Close   | Lincoln      | 2B             | Storage      | 7/19/2022      |                                   | 67                                |
| Close   | Lincoln      | 2B             | Natural Flow | 7/19/2022      |                                   | 18                                |
| Open  | Lincoln      | 2B             | Natural Flow | 7/19/2022      |                                   | 1                                 |
| Open  | Norfolk      | 2B             | Storage      | 11/29/2022     |                                   | 19                                |
| Open  | Norfolk      | 2B             | Natural flow | 11/29/2022     |                                   | 67                                |
| Open  | Lincoln      | 2B             | Storage      | 11/29/2022     |                                   | 66                                |
| Open  | Lincoln      | 2B             | Natural Flow | 11/29/2022     |                                   | 24                                |

## Pumpsite Inspections 2022

As time and conditions allow, the NeDNR field office staff visit pumpsites (as mapped) for each appropriation to check for compliance and collect various data.

UENRD contains a total of 80 surface water rights. During 2022, a total of 80 site inspections were completed, thirteen were found to have pumps set up and seven were in operation at the time of the inspection.

| Pumpsite Inspections |                      |                  |              |               |
|----------------------|----------------------|------------------|--------------|---------------|
|                      | Surface Water Rights | Site Inspections | Pumps Set Up | Pumps Running |
| Upper Elkhorn        | 80                   | 80               | 13           | 7             |

# Voluntary Water Right Use Reporting

The Department received responses on 23 out of 87 sent for the voluntary water use survey in the UENRD. These appropriators provided information for the year 2022 as follows:

Of the 19 appropriators with “IR” irrigation from a naturally flowing source

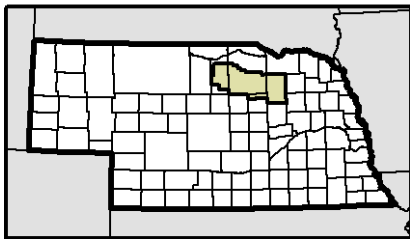
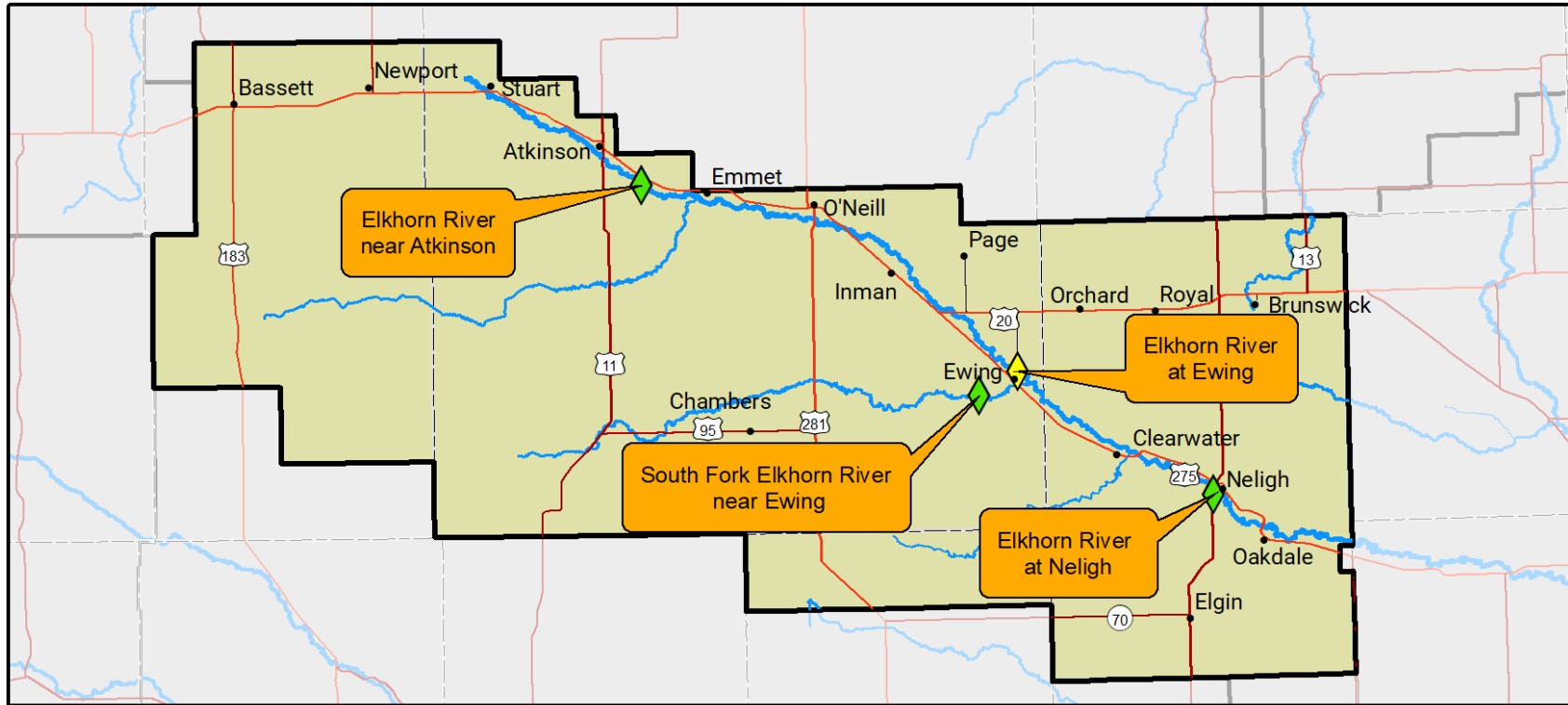
| Upper Elkhorn Voluntary Water Right Use |               |                                 |                         |   |
|---|---------------|---------------------------------|-------------------------|---|
| Water Type                              | Appropriators | Surface Water Irrigation (acre) | Average Inches per Acre | Remarks   |
| Surface                                 | 11            | 501.9                           | 7.7                     | Includes two in Water Division 2-C (Niobrara River) that irrigated 66 acres |
| Surface / Ground (comingled)            | 3             | 263                             |                         |   |
| Ground                                  | 5             | UNK                             |                         | One respondent did not irrigate   |

Two appropriations with “SO” irrigation from storage (on lands without a natural flow appropriation) were irrigated by groundwater only.

One appropriator with “SI” irrigation from storage (on lands with a natural flow appropriation) irrigated 2 acres with storage water, and one was irrigated by groundwater only.

# Streamgauge Locations in UENRD

## Streamgages in the Upper Elkhorn NRD IMP Area



Created by NeDNR | Updated by AJP 6/15/2021

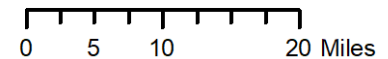
### Active Streamgauge Operator

- ◆ USGS, with funding provided by UENRD
- ◆ NeDNR

+ Upper Elkhorn NRD

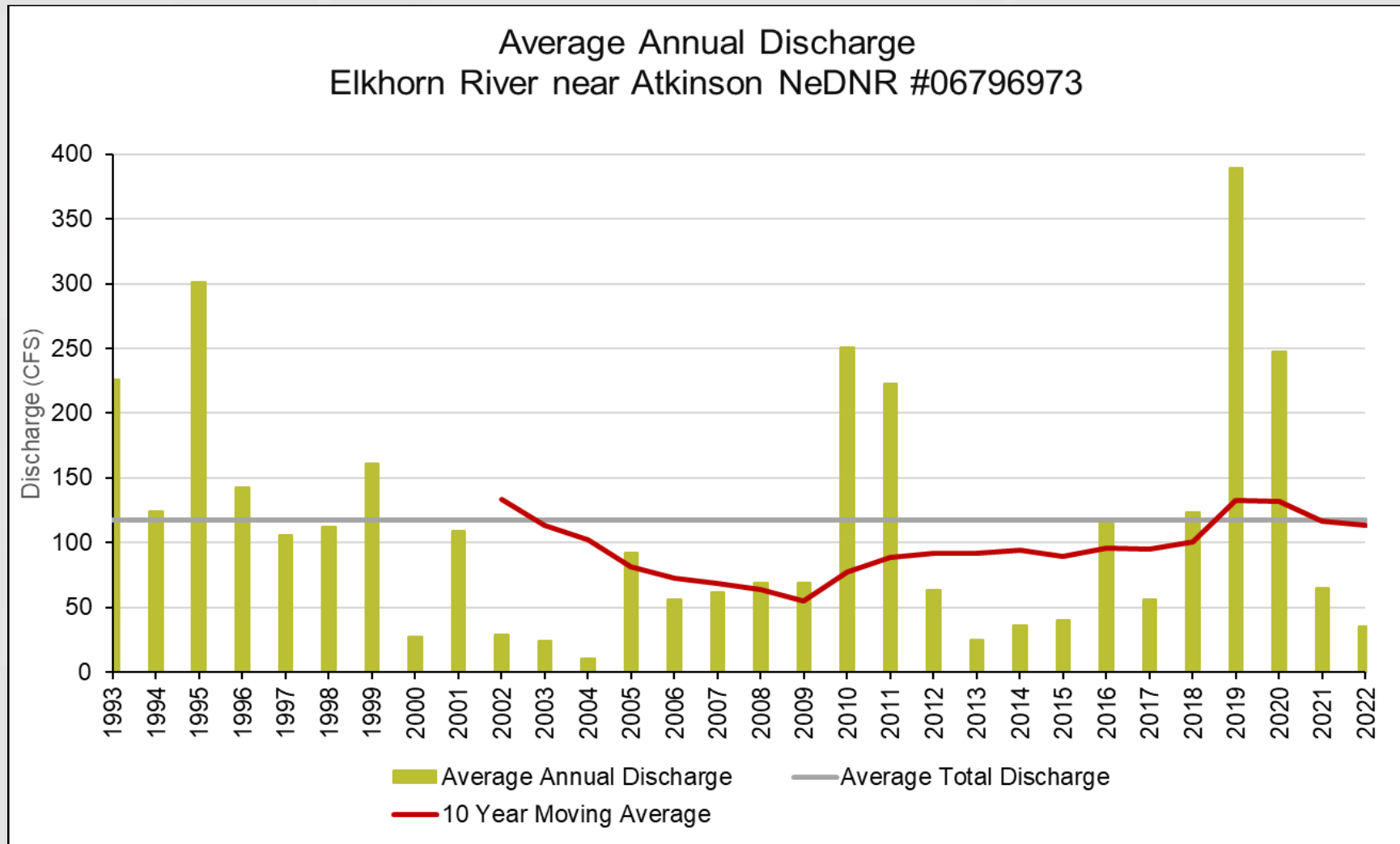
- Cities
- ~ River/Stream
- NE Hwy
- US Hwy

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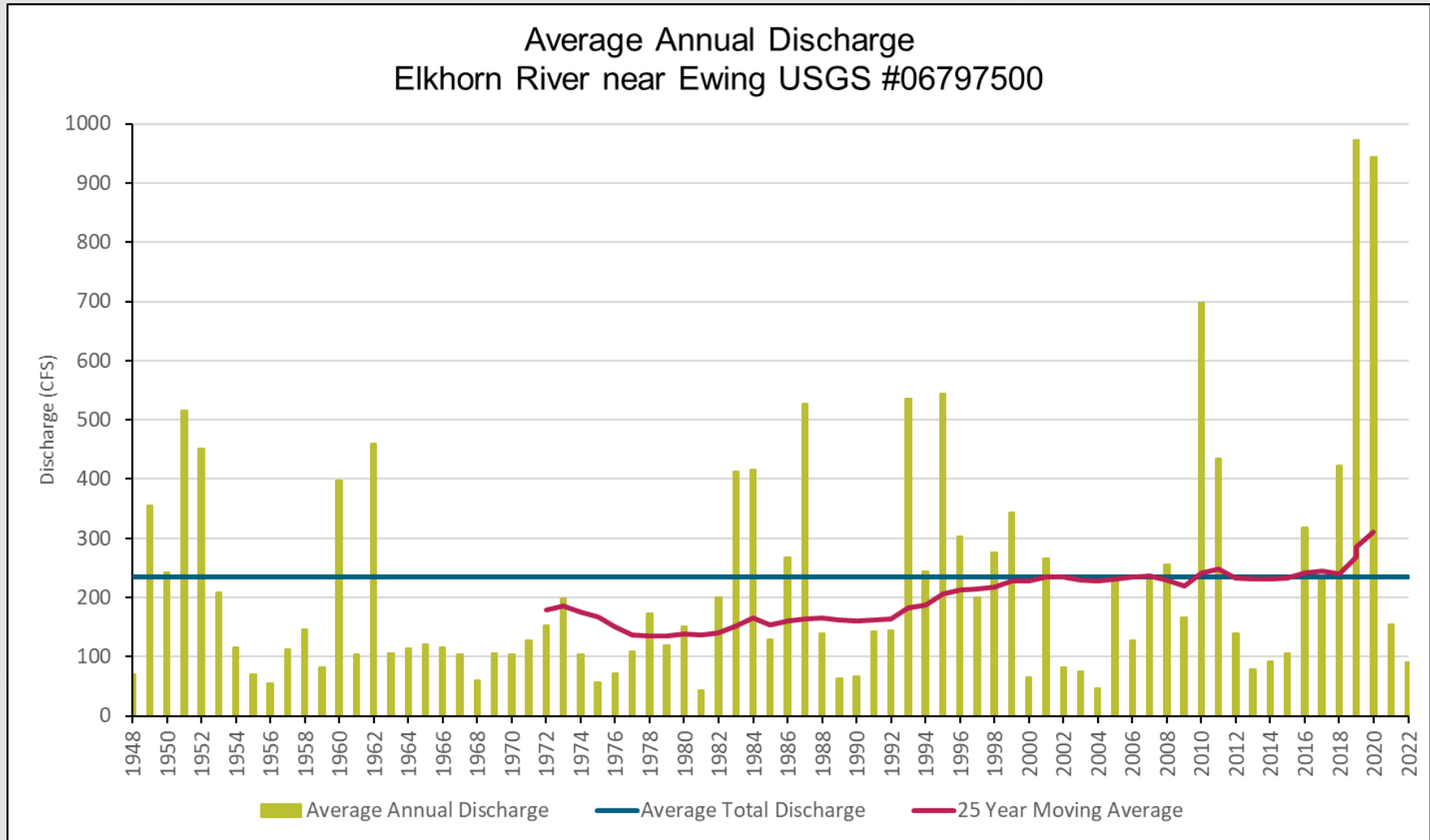
# Streamgauge Measurements – Atkinson (NeDNR)

1992– 2022



# Streamgauge Measurements – Ewing (USGS)

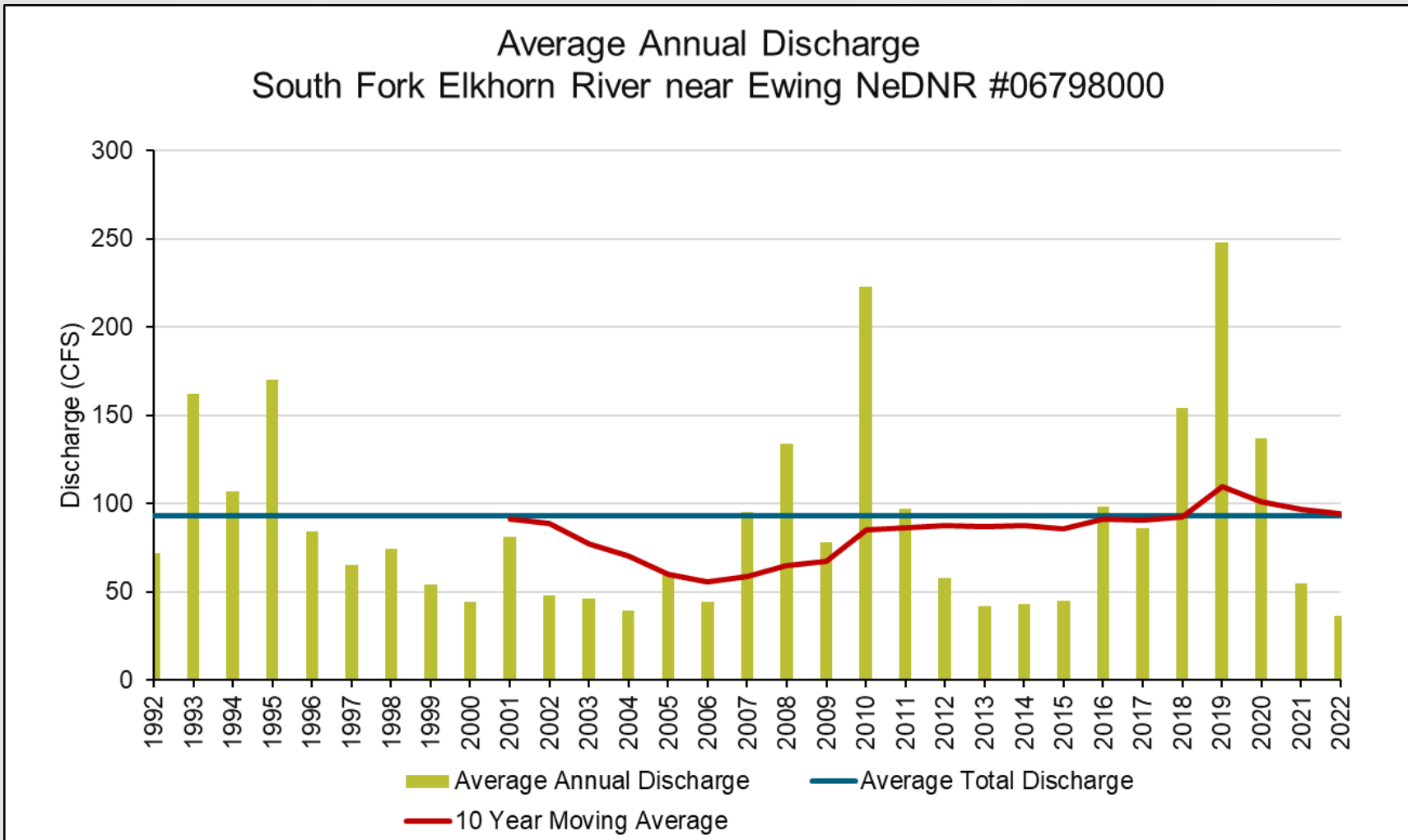
1947-2022





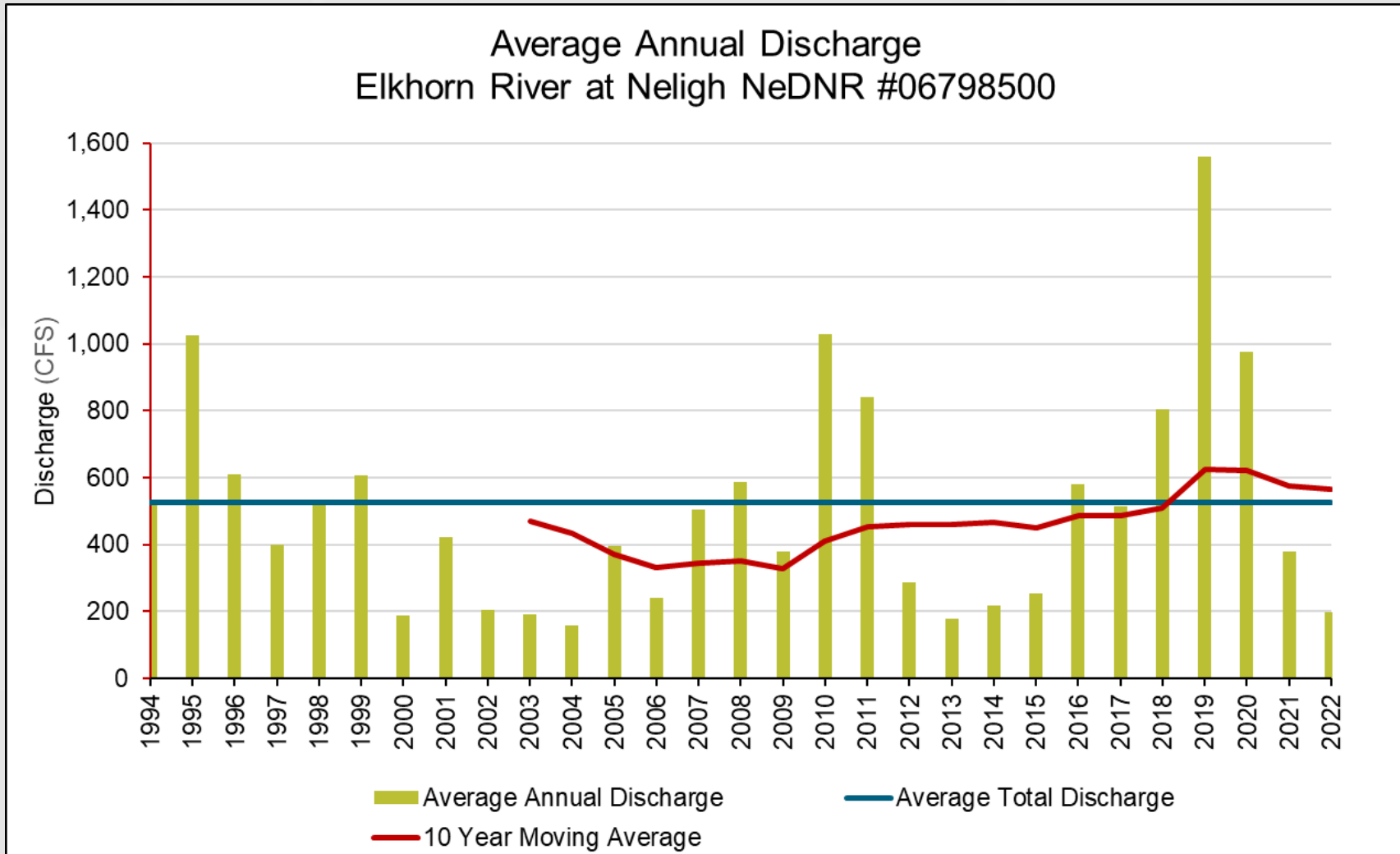
# Streamgauge Measurements – Ewing (NeDNR)

## 1991-2022



# Streamgauge Measurements – Neligh (NeDNR)

1993-2022





# LOWER PLATTE RIVER BASIN-WIDE ACTIVITIES

# Lower Platte River Basin Activities

- Both UENRD and NeDNR participate in the Lower Platte River Basin Coalition (LPRBC)
  - Managers' and Technical Team meetings
  - Annual reporting (see next slide)
  - Annual Reporting Database
    - Tool to report and store annual water use data
  - Lower Platte Missouri Tributaries Model
    - Tool to analyze aquifer-stream interactions – includes Elkhorn and Lower Platte Rivers

# New Depletions Accounting

## Lower Platte River Basin Second Increment 2022

**TABLE 1 - PEAK SEASON DEPLETIONS**

| NRD                      | PEAK SEASON 5-YR ALLOWABLE DEPLETION (AF) | 2022 NRD Reported NET Depletion (AF) | NRD - Percent of Allowable | 2022 NeDNR Reported Depletion (AF) | NeDNR - Percent of Allowable | Combined Percent of Allowable |
|--------------------------|---|--------------------------------------|----------------------------|------------------------------------|------------------------------|-------------------------------|
| Upper Loup NRD           | 5435                                      | 41.5                                 | 0.8%                       | 0.0                                | 0.0%                         | 0.8%                          |
| Lower Loup NRD           | 11910                                     | -10.3                                | -0.1%                      | 62.1                               | 0.5%                         | 0.4%                          |
| Upper Elkhorn NRD        | 2965                                      | 37.8                                 | 1.3%                       | 0.0                                | 0.0%                         | 1.3%                          |
| Lower Elkhorn NRD        | 8346                                      | 0.0                                  | 0.0%                       | -10.0                              | -0.1%                        | -0.1%                         |
| Papio-Missouri River NRD | 1826                                      | 14.6                                 | 0.8%                       | 0.0                                | 0.0%                         | 0.8%                          |
| Lower Platte South NRD   | 2098                                      | 3.3                                  | 0.2%                       | 19.2                               | 0.9%                         | 1.1%                          |
| Lower Platte North NRD   | 3736                                      | -54.8                                | -1.5%                      | 0.0                                | 0.0%                         | -1.5%                         |
| <b>TOTALS</b>            | <b>36,316</b>                             | <b>32</b>                            | <b>0.1%</b>                | <b>71.3</b>                        | <b>0.2%</b>                  | <b>0.3%</b>                   |

**TABLE 2 - PEAK SEASON DEPLETIONS AND CONSUMPTIVE USE**

| NRD                      | PEAK SEASON 5-YR ALLOWABLE DEPLETION (AF) | 2022 NRD Reported NET Depletion (AF) | NeDNR Reported Depletion (AF) | NRD Prior Years Peak Season Consumptive Use (AF) | 2022 NRD Peak Season Consumptive Use (AF) | NRD Total Peak Season Consumptive Use (AF) | NeDNR Total Peak Season Consumptive Use (AF) | Total New Peak Season Depletions | Total New Peak Season Consumptive Use | Remaining 5-YR Allowable Depletion (AF) | Percent of Remaining 5-YR Allowable Depletion |
|--------------------------|---|--------------------------------------|-------------------------------|--|---|--|--|----------------------------------|---------------------------------------|---|---|
| Upper Loup NRD           | 2768                                      | 41.5                                 | 0.0                           | 723.4  | 236.2                                     | 959.6                                      | 0.0  | 41.5                             | 959.6                                 | 5393.5                                  | 99.2%   |
| Lower Loup NRD           | 5883                                      | -80.8                                | 62.1                          | 2192.8   | 155.1                                     | 2347.9                                     | 62.1   | -18.7                            | 2410.0                                | 11928.7                                 | 100.2%  |
| Upper Elkhorn NRD        | 1504                                      | 37.8                                 | 0.0                           | 629.7  | 56.4                                      | 686.1                                      | 0.0  | 37.8                             | 686.1                                 | 2927.3                                  | 98.7%   |
| Lower Elkhorn NRD        | 4514                                      | 0.0                                  | -10.0                         | 2826.6   | 0.0                                       | 2826.6                                     | -10.0  | -10.0                            | 2816.6                                | 8356.0                                  | 100.1%  |
| Papio-Missouri River NRD | 869                                       | 14.6                                 | 0.0                           | 60.8   | 26.7                                      | 87.5                                       | 0.0  | 14.6                             | 87.5                                  | 1811.4                                  | 99.2%   |
| Lower Platte South NRD   | 993                                       | 3.3                                  | 19.2                          | 23.6   | 3.3                                       | 26.6                                       | 19.2   | 22.5                             | 45.8                                  | 2075.5                                  | 98.9%   |
| Lower Platte North NRD   | 2276                                      | -54.8                                | 0.0                           | 1918.4   | -70.8                                     | 1847.5                                     | 0.0  | -54.8                            | 1847.5                                | 3790.8                                  | 101.5%  |
| <b>TOTALS</b>            | <b>18,807</b>                             | <b>(38)</b>                          | <b>71</b>                     | <b>8,375</b>                                     | <b>407</b>                                | <b>8,782</b>                               | <b>71</b>                                    | <b>33</b>                        | <b>8,853</b>                          | <b>36,283</b>                           | <b>100%</b>                                   |

# Education and Outreach Activities in 2022

## NeDNR

- Did not participate in any Education or Outreach Activities.

## UENRD

- KBRX Home Show
- Antelope County Home Show
- Sandhills Ranch Expo

## Jointly Identified Actions for Next Two Years

- Continue to monitor progress made in reaching targets described in the goals and objectives of the IMP
  - Reevaluate and revise, as necessary
- Continue to participate in basin-wide and regional planning efforts such as the Lower Platte River Consortium (drought planning) and Lower Platte River Basin Coalition (LPRBC)
- Continue effort to develop depletion/consumptive use tracking database as a part of LPRBC
- UENRD will continue process of certifying groundwater irrigated acres.
- Participate in public outreach opportunities in the UENRD area, as they are available.
  - 2023 Sandhill's Ranch Expo
- Review data from local studies, as available
  - Comparison of CENEB and ELM models

**Thank you!**

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Nebraska Department of Natural Resources