

Lower Platte North NRD

Voluntary Integrated Management Plan

Annual Review of 2019 Activities

Reporting period: 7/15/2018-12/31/2019

July 2, 2020

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Lower Platte North
Natural Resources District

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Overview

- Integrated Management Planning-What is it?
- Lower Platte River Basin Coalition Activities
- Reporting of LPNNRD Data
- Reporting of NeDNR Data
- Review of IMP Goals/Objectives/Action Items
 - Any changes needed moving forward
- Evaluation of data reporting & communication

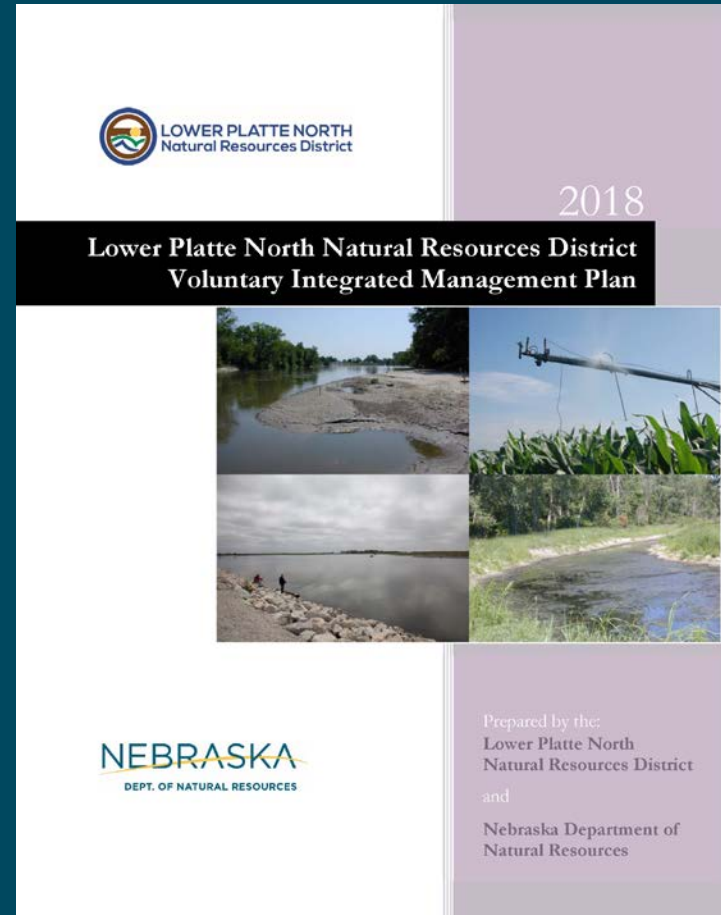
Integrated Management Planning

What is it?

Integrated Management Planning

➤ What is it?

- Proactive approach
- Surface water and groundwater management
- Jointly developed by NeDNR and the NRD
- Suited to local conditions
- Protects existing users
- Uses adaptive management approach

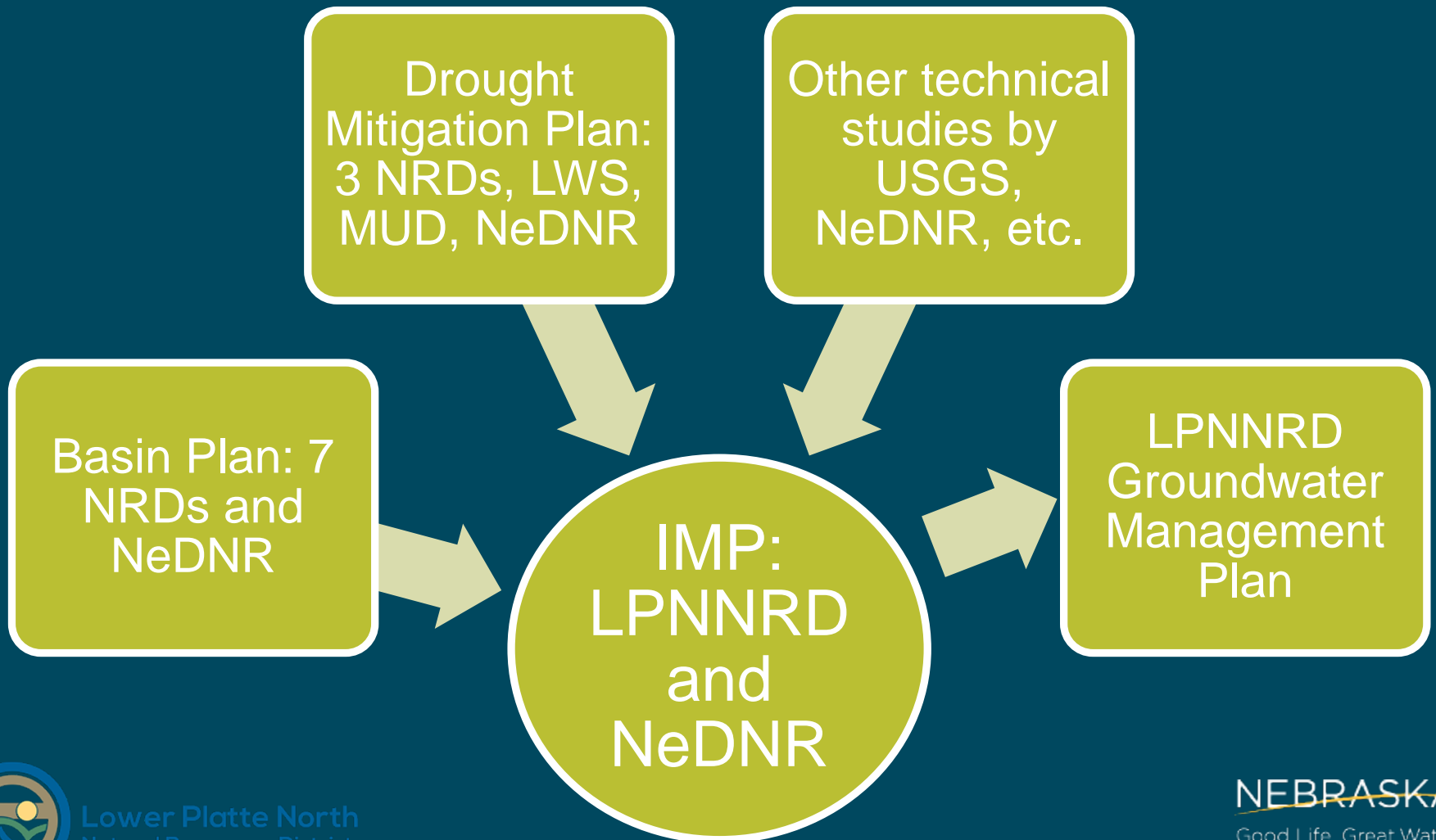


Why Do We Conduct Annual Reviews of the IMP?

- Joint management of hydrologically connected (HC) groundwater and surface water
 - Identify new opportunities and challenges
 - Increase understanding of HC areas (data, studies)
 - Evaluate and convey progress towards goals and objectives
 - Prioritize joint management actions for upcoming years



How do multiple plans work together?



LOWER PLATTE RIVER BASIN-WIDE ACTIVITIES

Lower Platte River Basin Activities

- Both LPNNRD 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

New Depletions Accounting

Lower Platte River Basin 2016-2019

TABLE 1 - PEAK SEASON DEPLETIONS

NRD	PEAK SEASON 5-YR ALLOWABLE DEPLETION (AF)	Prior Years NRD Reported Depletion (AF)	2019 NRD Reported NET Depletion (AF)	Total NRD Reported Depletion (AF)	NRD - Percent of Allowable	Prior Years NeDNR Reported Depletion (AF)	2019 NeDNR Reported Depletion (AF)	Total NeDNR Reported Depletion (AF)	NeDNR - Combined Percent of Allowable	Percent of Allowable	Prior Groundwater Acres Allocated 2016-2018	New Groundwater Acres Allocated 2019
Upper Loup NRD	2768	318.7	107.1	425.7	15.4%	463.6	-65.0	398.6	14.4%	29.8%	2,540	1,325
Lower Loup NRD	5883	467.0	226.2	693.2	11.8%	305.0	130.0	435.0	7.4%	19.2%	6,092	2,367
Upper Elkhorn NRD	1504	158.7	13.6	172.3	11.5%	0.0	0.0	0.0	0.0%	11.5%	2,050	275
Lower Elkhorn NRD	4514	515.0	292.2	807.3	17.9%	214.0	70.0	284.0	6.3%	24.2%	4,819	2,510
Papio-Missouri River NRD	869	1.5	0.0	1.5	0.2%	67.3	10.0	77.3	8.9%	9.1%	11	0
Lower Platte South NRD	993	5.5	18.0	23.6	2.4%	75.0	-10.0	65.0	6.5%	8.9%	64	70
Lower Platte North NRD	2276	768.3	128.4	896.7	39.4%	0.0	0.0	0.0	0.0%	39.4%	5,271	837
TOTALS	18,807	2,235	786	3,020	16%	1124.9	135	1,260	7%	23%	20,848	7,384

TABLE 2 - PEAK SEASON DEPLETIONS AND CONSUMPTIVE USE

NRD	PEAK SEASON 5-YR ALLOWABLE DEPLETION (AF)	NRD - Peak Season Depletion (AF)	NeDNR Reported Depletion (AF)	NRD - Peak Season Consumptive Use (AF)	NeDNR Reported 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	425.7	398.6	1033.8	398.6	824.3	1432.4	1943.7	70.2%
Lower Loup NRD	5883	693.2	435.0	1619.6	435.0	1128.2	2054.6	4754.8	80.8%
Upper Elkhorn NRD	1504	172.3	0.0	408.3	0.0	172.3	408.3	1331.7	88.5%
Lower Elkhorn NRD	4514	807.3	284.0	1619.3	284.0	1091.3	1903.3	3422.7	75.8%
Papio-Missouri River NRD	869	1.5	77.3	1.8	77.3	78.8	79.1	790.2	90.9%
Lower Platte South NRD	993	23.6	65.0	30.2	65.0	88.6	95.2	904.4	91.1%
Lower Platte North NRD	2276	896.7	0.0	1292.2	0.0	896.7	1292.2	1379.3	60.6%
TOTALS	18,807	3,020	1,260	6,005	1,260	4,280	7,265	14,527	77%

New Depletions Accounting

LPNNRD: FIRST INCREMENT + PROJECTED 5-YEAR EXTENSION

Year	Total Available Depletion (AF)	Available Groundwater Depletion (AF)	Available Surface Water Depletion (AF)	Used Groundwater Depletion (AF)	Used Surface Water Depletion (AF)	Total Used Depletion (AF)	Remaining Depletion for Next Year (AF)
2016	2,276	1,138	1,138	187.0 ¹	0	187.0	2,089
2017	2,089	1,044	1,044	369.2 ¹	0	369.2	1,720
2018	1,720	860	860	214.9 ²	0	214.9	1,505
2019	1,505	752	752	111.5 ³	0	111.5	1,393
2020	1,393	697	697	220.7 ⁴	0	220.7	1,173
2021	1,173	586	586	220.7 ⁴	0	220.7	952
2022	952	476	476	220.7 ⁴	0	220.7	731
2023	731	366	366	220.7 ⁴	0	220.7	511
2024	511	255	255	220.7 ⁴	0	220.7	290
2025	290	145	145	220.7 ⁴	0	220.7	69

¹From Daryl Andersen's October 2019 email to Amy Zoller

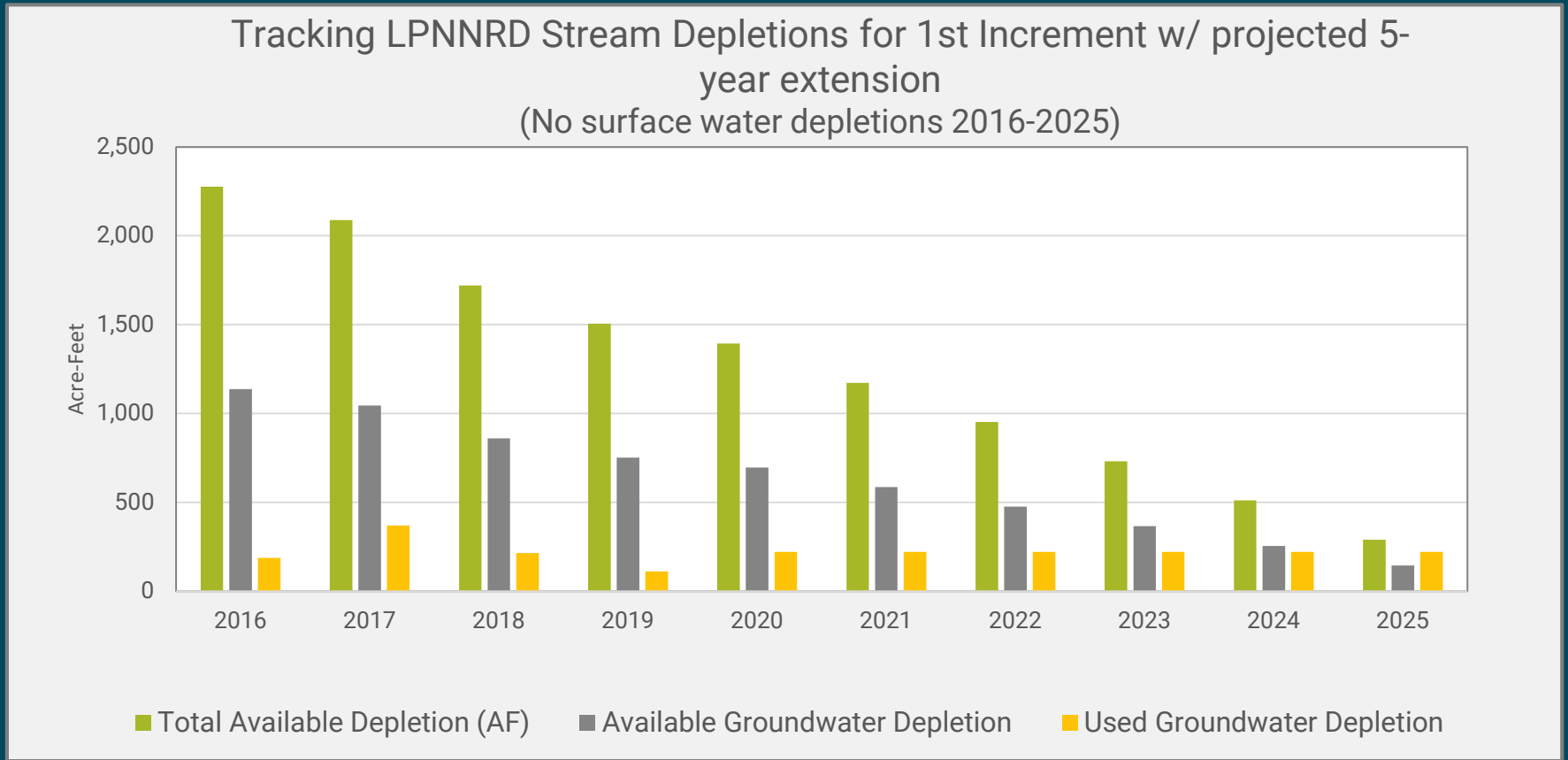
²From LPNNRD's 2019 Annual Report

³From LPNNRD's 2020 Annual Report

⁴Average Annual Used Groundwater Depletion (2016-2020)

New Depletions Accounting

LPNNRD: FIRST INCREMENT + PROJECTED 5-YEAR EXTENSION



LPNNRD/NeDNR Quarterly Meetings Update

➤ Meetings held on:

- October 3, 2019
- January 7, 2020
- May 5, 2020

➤ Meeting topics:

- Modeling updates
 - LPNNRD hydrogeologic framework study (UNL-CSD)
 - Lower Platte Basin hydrologically connected area refinement
- Data collection
- Lower Platte River Basin Coalition
 - 5 year review/extension of 1st increment

Modeling Updates

- LPNNRD hydrogeologic framework study with UNL-CSD
 - SQS2 Area
 - Jesse Korus at UNL – CSD leading the work
 - Evaluation of AEM data
- Lower Platte Basin Missouri-Tribs Model
 - Coordinated effort with NeDNR and Lower Platte Basin NRDs
 - Incorporation and evaluation of AEM data
- LPNNRD data collection efforts
 - Automation of data collection for data loggers already installed throughout LPNNRD

Education & Outreach Activities in 2019

➤ NeDNR

- Nebraska State Fair
- Sandhill's Ranch Expo
- Husker Harvest Days
- Women in Ag
- Women for Water
- American Water Resources Association, Spring Conference

➤ LPNNRD

- Nitrogen Certification Classes
- Spring Conservation
- School Presentations



LPNNRD Data Collection and Monitoring

IMP Required Data Collection and Monitoring

➤ NRD Monitoring

- Groundwater elevation data
- Flow meter data (if meter data is collected)
- Certified irrigated groundwater acres
- Municipal and industrial groundwater uses
- New groundwater consumptive uses (agricultural, municipal, industrial)
- Retirement of groundwater consumptive uses (agricultural, municipal, industrial)
- Well drilling permits approved, cancelled, or denied
- Variances for new water uses granted, cancelled, or denied
- Water transfer permits granted, cancelled, or denied
- Stream gage measurements on District maintained gages
- District regulations/management activities (designated groundwater management areas, use restriction, etc.)
- New depletions accounting report
- Streamflow accretion activities (new projects, conjunctive management projects, etc.)
- Water banking activities (if bank exists)

NRD Data Collection and Monitoring*

- Groundwater elevation data
 - Report was given to Committee/Board April 2020 & in LPNNRD Annual Lower Platte Basin Plan Report
- Flow meter data (if meter data is collected)
 - 814 flow meters reported for an average of 2.42 in/acre
- Certified irrigated groundwater acres
 - 387,343.23 acres
- Municipal and industrial groundwater uses
 - 23 communities reported
- New groundwater consumptive uses (agricultural, municipal, industrial)
- Retirement of groundwater consumptive uses (agricultural, municipal, industrial)

NRD Data Collection and Monitoring*

- Well drilling permits approved, cancelled, or denied
 - 23 irrigation wells, 5 stock wells, 1 municipal well and 2 others
- Variances for new water uses granted, cancelled, or denied
 - 13 new variances were approved
- Water transfer permits granted, cancelled, or denied
- Stream gage measurements on District maintained gages
- District regulations/management activities (designated groundwater management areas, use restriction, etc.)
 - No new
- New depletions accounting report
 - 111.488 irrigated depletion and 16.91 livestock depletion
- Streamflow accretion activities (new projects, conjunctive management projects, etc.)
- Water banking activities (if bank exists)



NeDNR Data Collection and Monitoring

IMP Requires Data Collection and Monitoring

➤ NeDNR Monitoring

- Surface water irrigation use
- Transfers/cancellations of surface water appropriations
- New surface water appropriations granted (natural flow, storage, groundwater recharge, etc.)
- New groundwater permits issued
- Voluntary water use reporting
- Municipal and industrial surface water uses
- Streamgauge measurements from Department maintained gages
- Surface water pump investigations
- Surface water administrative actions taken
- New depletions accounting
- New data acquisitions, model and/or study results (conservation measures, riparian, evapotranspiration, etc.)

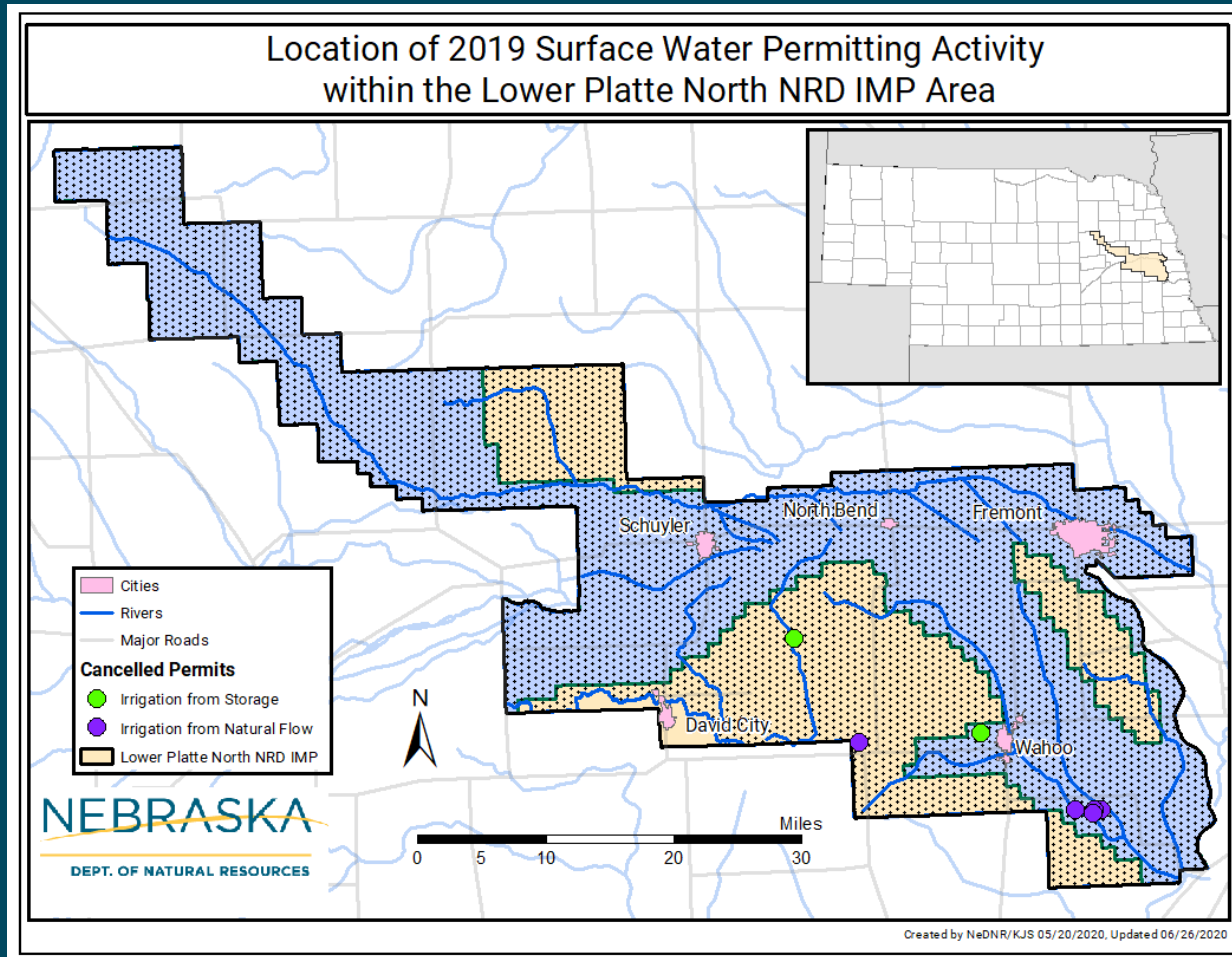
NeDNR Surface Water Permitting Actions

- New surface water applications approved = 0 (zero)
- Surface water appropriations cancelled = 7 (seven)

Surface Water Appropriations Cancelled in Full from July 15, 2018, to December 31, 2019

Appropriation Number	Date Cancelled	Source	NeDNR Action	Use	Begin Acres	Cancelled Acres	Cancelled Grant in cfs	Cancelled Grant in af	Basis for NeDNR Action
A-19349	11/8/2018	Robert's Reservoir 254	Cancelled in Full	Irrigation from Storage	72.3	72.6	NA	72.6	BUC-7185
A-19330	12/18/2018	Fendrich Lake	Cancelled in Full	Irrigation from Storage	6.6	6.6	NA	2.2	BUC-799
A-10862	1/9/2019	Dunlap Creek, Trib. To	Cancelled in Full	Irrigation from Natural Flow	35.5	35.5	0.51	NA	REL-7209
A-17997	10/9/2019	Wahoo Creek	Cancelled in Full	Irrigation from Natural Flow	197.0	197.0	2.81	NA	REL-7622
A-17998	10/9/2019	Silver Creek	Cancelled in Full	Irrigation from Natural Flow	67.0	67.0	0.96	NA	REL-7621
A-18124	10/9/2019	Wahoo Creek	Cancelled in Full	Irrigation from Natural Flow	71.0	71.0	1.01	NA	REL-7623

NeDNR Surface Water Permitting Actions



NeDNR Groundwater Permitting Actions

- Groundwater permits cancelled = 0 (zero)
- Groundwater permits issued = 0 (zero)

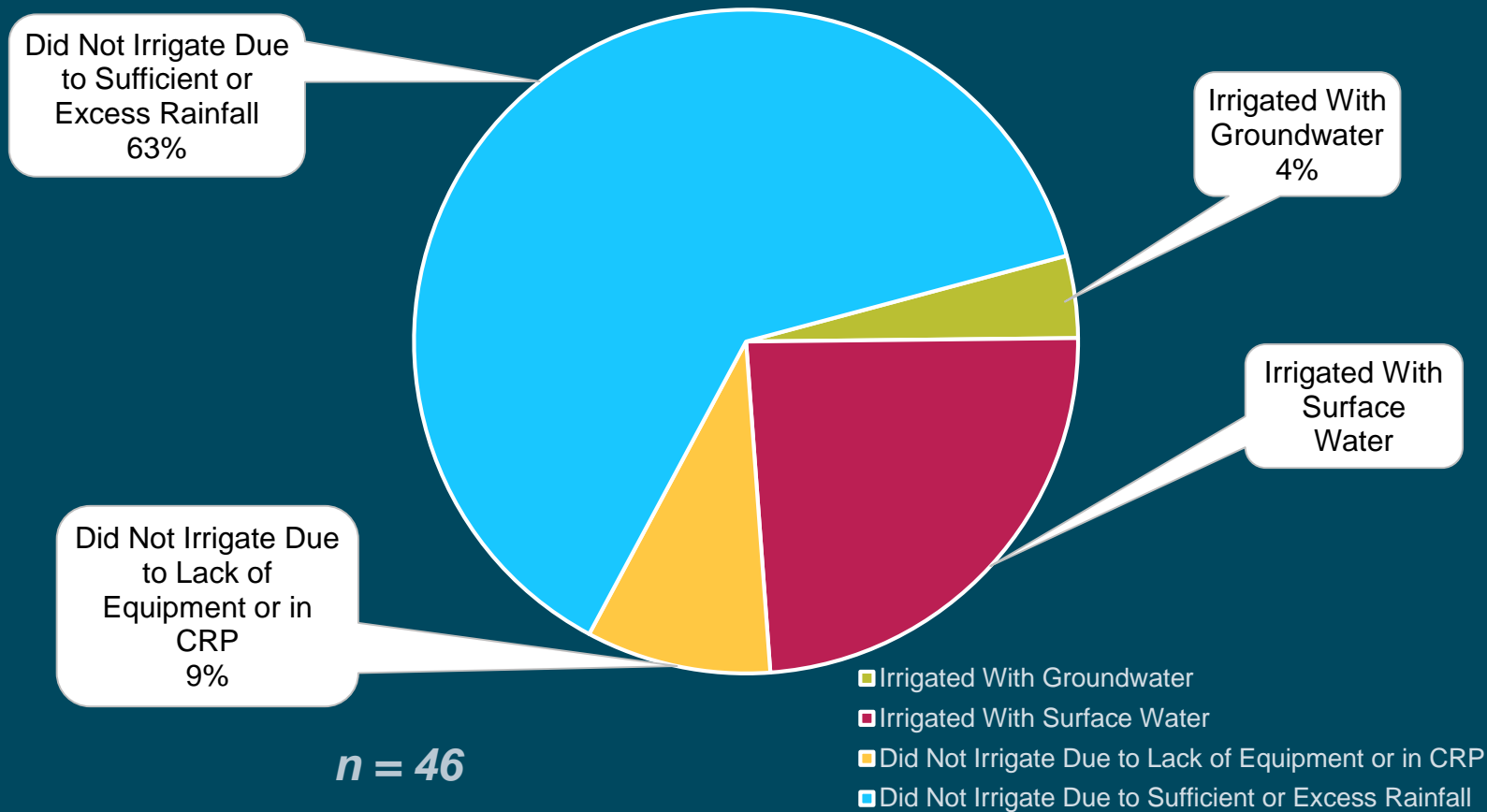
Includes groundwater permits for the following uses

- *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*

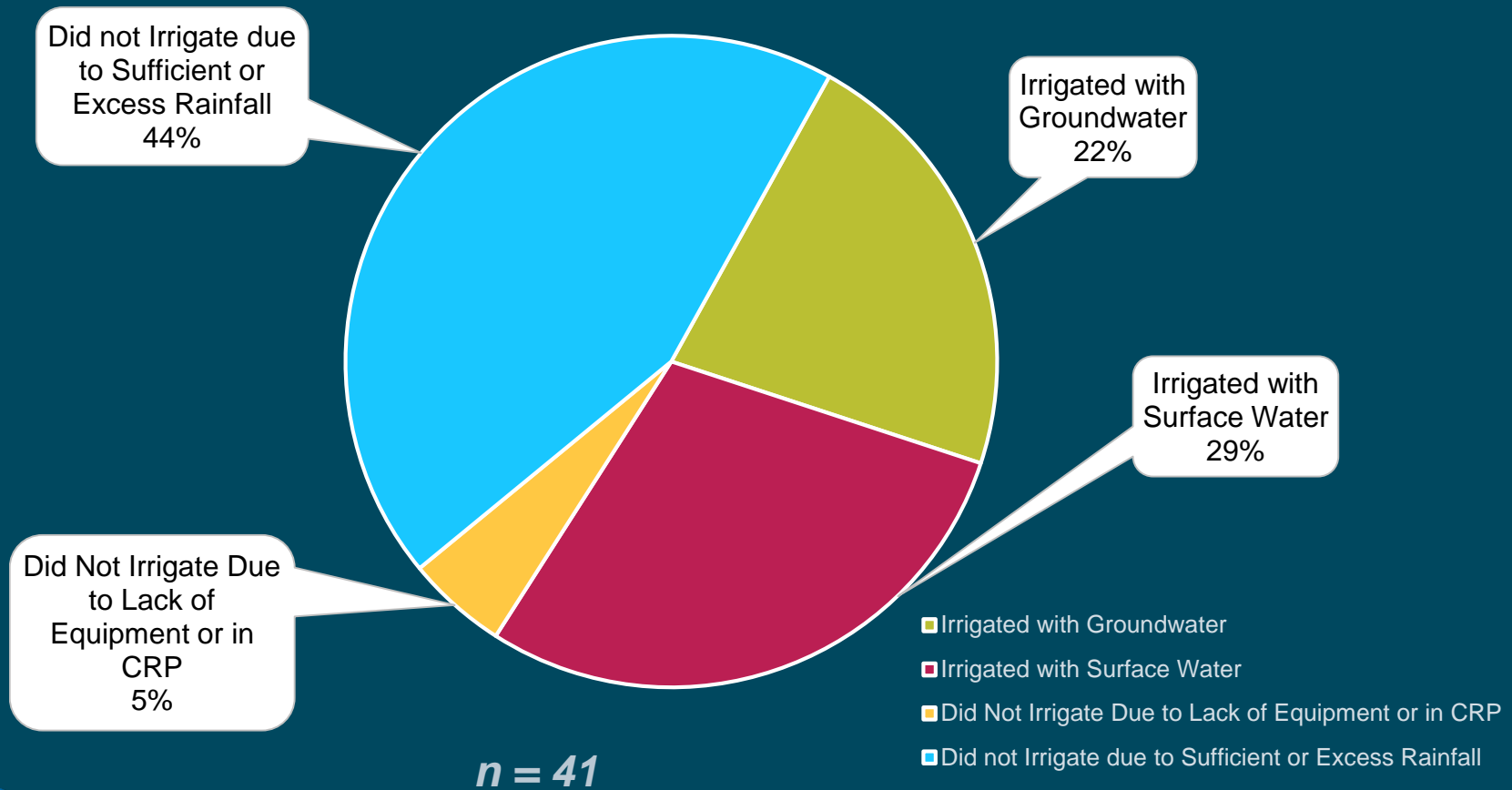
Municipal & Industrial Surface Water Uses

- New surface water applications for municipal or industrial uses approved = 0 (zero)
 - A-17097, a permit for dust control
 - This appropriation is under investigation and may be subject to cancellation for nonuse.

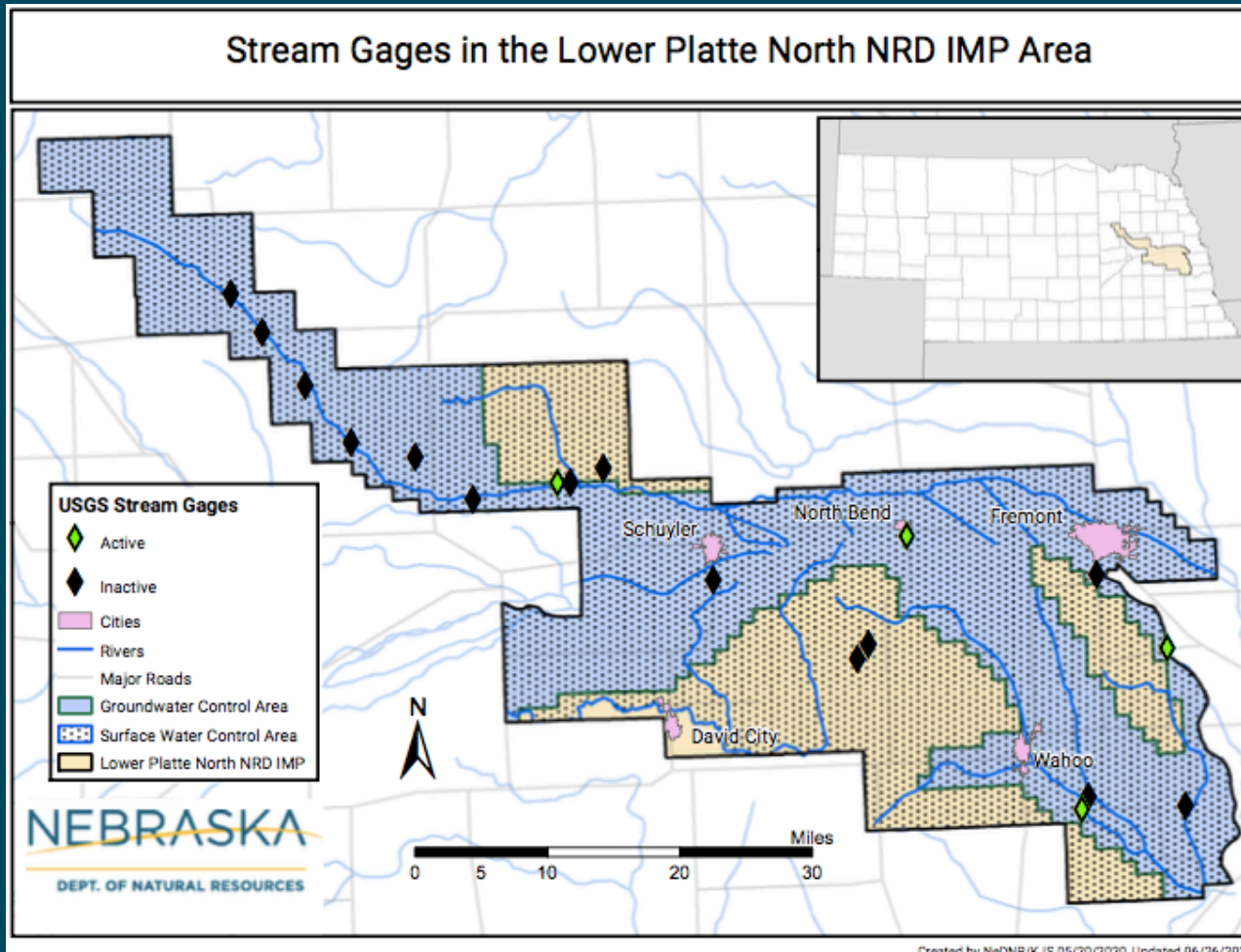
NeDNR Voluntary Surface Water Use Reporting (2018)



NeDNR Voluntary Surface Water Use Reporting (2019)

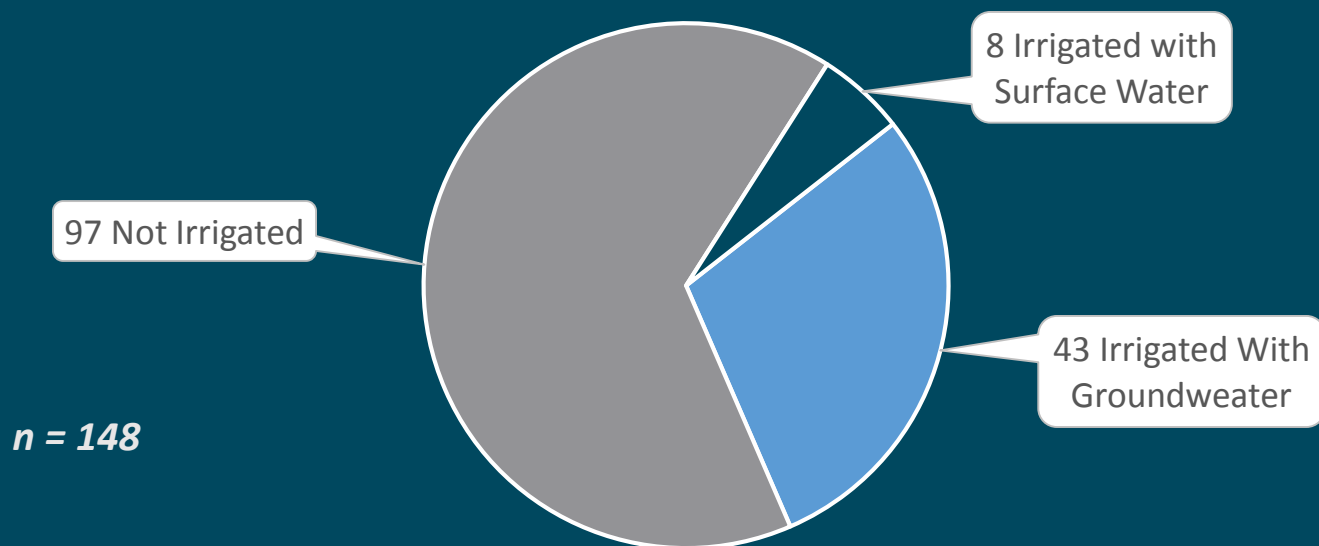


NeDNR Streamgaging



NeDNR Surface Water Pumpsite Inspections (2018)

NeDNR Pumpsite Inspections in 2018 in LPNNRD
Data Set = All Inspections
Number of Sites Irrigating with:



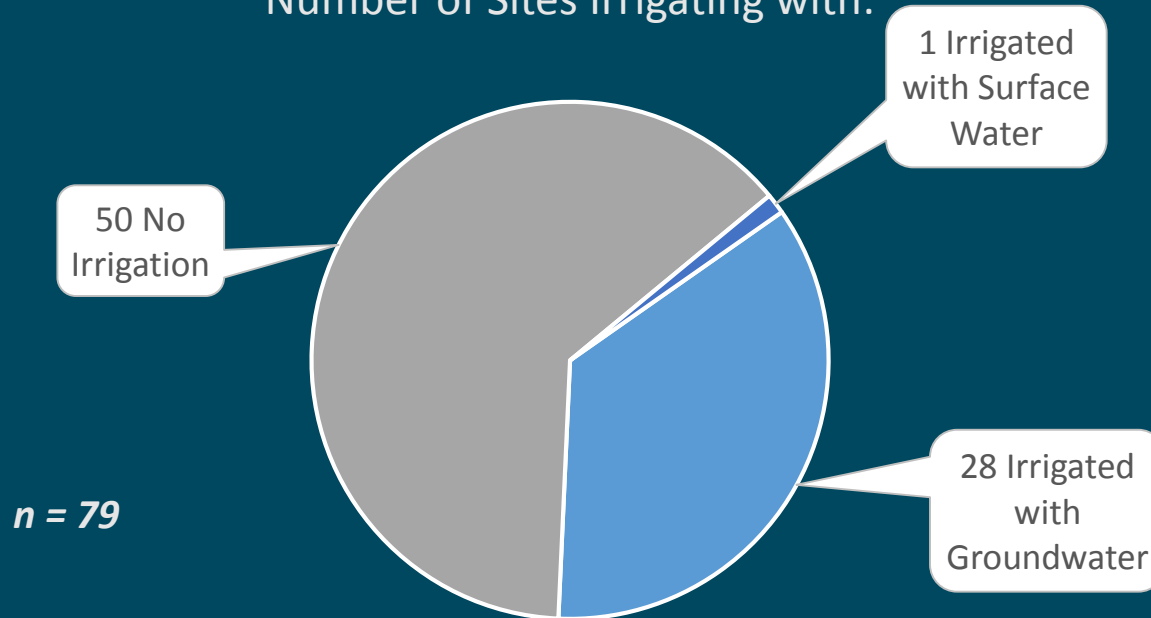
■ Irrigated With Groundwater

■ Not Irrigated

■ Irrigated with Surface Water

NeDNR Surface Water Pumpsite Inspections (2019)

NeDNR Pumpsite Inspections in 2019 in LPNNRD
Data Set = All Inspections
Number of Sites Irrigating with:

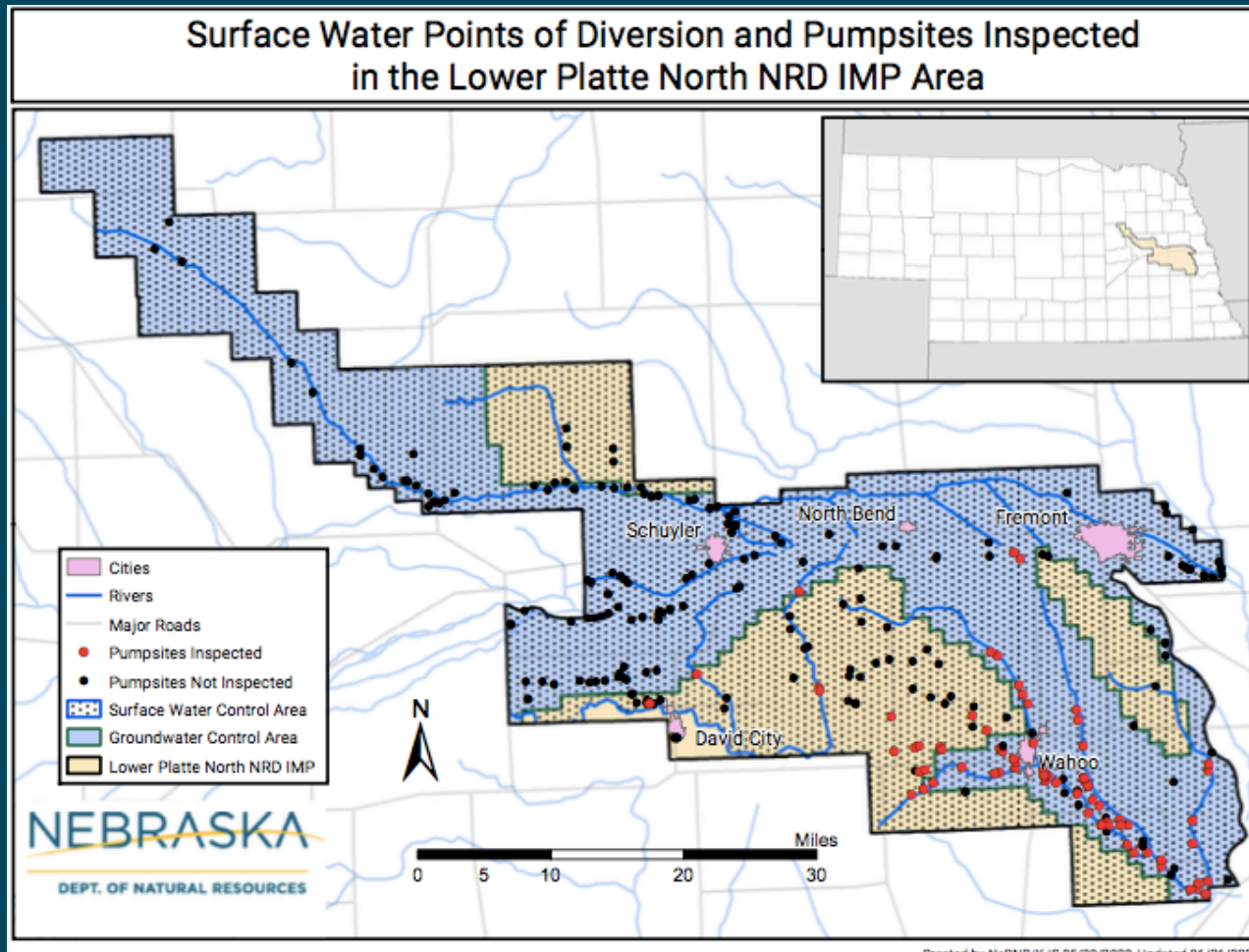


■ Irrigated with Groundwater

■ No Irrigation

■ Irrigated with Surface Water

NeDNR Surface Water Pumpsite Inspections (2019)



NeDNR Surface Water Administration

- NeDNR surface water administration actions* taken = 0 (zero)
 - In water years 2018 and 2019, surface water supplies were sufficient for all permitted uses in LPNNRD

*Enforcement of the prior appropriation doctrine principals of first in time, first in right, in times of shortage

New Depletions Accounting

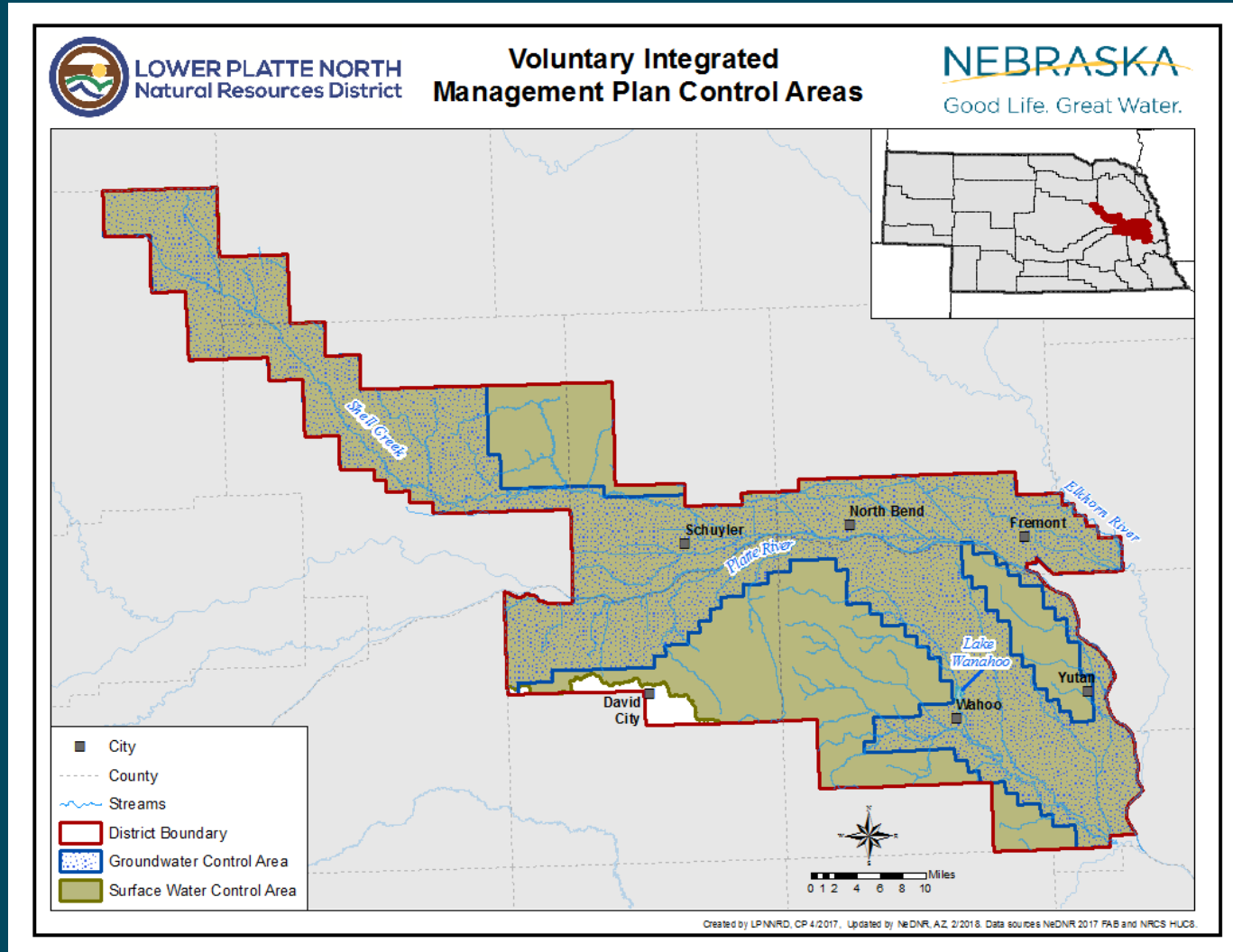
NeDNR Actions 2016-2019

Estimated Stream Depletions from NeDNR actions in LPNNRD Since 2016							
2016-2017		2018		2019		Net Total Depletions	
Peak	Non-Peak	Peak	Non-Peak	Peak	Non-Peak	Peak	Non-Peak
0	NA	0	0	0	0	0	0

REVIEW OF IMP GOALS/OBJECTIVES/ACTION ITEMS

LPNNRD Integrated Management Plan Area

Groundwater and surface water control areas



Controls

➤ Groundwater

- Limit new groundwater uses to 50% of the annually available stream depletions over the Basin Plan's first five-year increment
- Require annual use reports for municipal groundwater users

➤ Surface water

- Limit new groundwater uses to 50% of the annually available stream depletions over the Basin Plan's first five-year increment
- Require annual use reports for municipal surface water permit holders and municipal groundwater transfer permit holders

Goal 1

Goal 1: Develop and maintain a District-wide water supply inventory		
Objective	Action Item	Assigned To
Objective 1.1: Conduct data collection and analyses of current and potential water supplies using best available information, data, science, and considering future technological advances.	1.1.1 Maintain a database of current ground and surface water supplies.	District and Department
	1.1.2 Use best available science to identify District-wide aquifer distribution, including the distribution of bedrock, perched, and pocket aquifers.	District and Department
	1.1.3 Maintain a database of current water quality problem areas.	District
	1.1.4 Use best available data and methods to refine delineations of hydrologically connected surface water and groundwater.	District and Department
	1.1.5 Evaluate the potential to augment existing supplies by accessing additional waters within and outside of the District, including recharge projects, improving existing and adding new water storage/conveyance infrastructure, or through brackish water supplies.	District and Department
	1.1.6 Evaluate short and long term climate variability and potential effects on water supply.	District and Department
	1.1.7 Evaluate new technologies and methods of water accounting that support water management goals.	District and Department
	1.1.8. Coordinate District and Department databases to better utilize staff time, improve water management efficiencies, and assist with public outreach.	District and Department
Objective 1.2: Determine the District's inflows and outflows of surface water and groundwater and changes in storage	1.2.1 Continue surface water and groundwater monitoring across the District.	District and Department
	1.2.2 Use surface water and groundwater measurements and models to estimate District inflows and outflows.	District and Department
	1.2.3 Identify data gaps in monitoring networks (precipitation, stream flow, groundwater level networks, etc.).	District and Department

Goal 2

Goal 2: Develop and maintain a District-wide water demand inventory		
Objective	Action Item	Assigned To
Objective 2.1: Evaluate current and future water demands that may be influenced by municipal, agricultural, industrial, hydropower, and instream flow requirements	2.1.1 Develop standard protocols to ensure municipal water supply reports and forecasts are integrated into the District-wide and Department databases.	District and Department
	2.1.2 Evaluate how population growth and potential water reuse could influence per capita water consumption to estimate future water demands.	District and Department
	2.1.3 Continue certification of irrigated acres, well metering, and reporting requirements to track current water demands.	District
	2.1.4 Evaluate how historical and future land use/cover changes, urban growth, or adoption of conservation practices affects water demand.	District and Department
	2.1.5 Coordinate with the Department to identify surface water rights for potential prioritization in Department adjudication investigations.	District and Department
	2.1.6 Evaluate current and project future water demands of all water users to assess instream flow within the district and comply with downstream requirements.	District and Department
	2.1.7 Evaluate potential water demands for hydropower.	District and Department
Objective 2.2: Evaluate current water demands and estimate future impacts concerning surface or groundwater quality	2.2.1 Estimate effects on demands due to environmental mitigation activities that utilize large quantities of water.	District
	2.2.2 Estimate effects on demands in scenarios where municipal wells are moved to hydrologically connected areas to improve quality.	District and Department
	2.2.3 Continue mapping and tracking surface water irrigated acres and voluntary water use reporting to monitor surface water demands.	Department

Goal 3

Goal 3: Develop and implement water use policies and practices with the purpose of achieving and sustaining a balance between water uses and supplies		
Objective	Action Item	Assigned To
Objective 3.1: Update policies, practices, and programs to maintain and improve water supply and water quality as it affects supply	3.1.1. Where feasible, promote practices focused on reuse of rain, storm, waste, industrial, or irrigation water.	District
	3.1.2. Develop a District-wide water banking program to minimize water conflicts between different water users and sources.	District and Department
	3.1.3 Cooperate with other entities to identify, evaluate, and prioritize locations and types of conjunctive water management and water use projects	District and Department
	3.1.4. Periodically review rules and regulations, ensuring they are up-to-date with current data, technologies, and the IMP.	District and Department
Objective 3.2: Develop programs and guidelines to conserve water within municipalities, the agricultural sector, and industrial applications	3.2.1 Where feasible, implement cost-share programs for irrigation conservation by partnering with producers in technologies that improve irrigation efficiency and track water usage over time.	District and Department
	3.2.2 Use new, and existing, studies and data to establish specific guidelines for sustainable development of major, minor, and pocket aquifers.	District
	3.2.3 Collaborate with municipalities and industrial users on development or refinement of water conservation plans.	District

Goal 4

Goal 4: Communicate to the public that Nebraska has a great supply of water, and we need to continue to manage it well		
Objective	Action Item	Assigned To
Objective 4.1: Maintain existing public outreach activities and programs	4.1.1 Maintain District certification classes to update producers on current water conditions, best management practices, potential state legislation, and changes in District and state water management issues.	District
	4.1.2 Maintain public education programs including county fairs, newsletters, newspaper articles, radio spots, public notices, fliers, social media, and District and Department websites.	District and Department
	4.1.3 Continue to cooperate with UNL Extension to utilize and explore the use of mobile applications to assist producers with different water conservation practices.	District and Department
Objective 4.2: Incorporate new data, technologies, and programs to enhance public outreach	4.2.1 Develop new materials and activities to educate the public on the benefits and limitations of riparian vegetation management.	District and Department
	4.2.2 Educate homeowners on ways to conserve water in the home, garden, and lawn, through planting of more drought-resistant plants or different landscaping practices.	District
	4.2.3 Explore information-sharing systems between District personnel and water users in the District. These systems could be used to track precipitation patterns, crop evapotranspiration (ET) requirements, soil moisture levels, rotation of pumping between water users to reduce peak aquifer demands, real-time groundwater energy level sites in important aquifers or subareas, and current stream flow conditions.	District
	4.2.4 Quantify water use efficiencies and disseminate through public education programs to enhance productivity.	District
	4.2.5 Explore public education through television and social media to inform the public about current programs and elicit feedback for projected District programs.	District

Goal 5

Goal 5: Coordinate with Lower Platte River Basin NRDs, and appropriate groups and agencies, to develop a water management plan for the Lower Platte River Basin that maintains a balance between current and future water supplies and demands		
Objective	Action Item	Assigned To
Objective 5.1: Continue active participation in Lower Platte River Basin Coalition (Coalition) water management planning activities	5.1.1 Cooperate on water management studies and planning with the Coalition.	District and Department
	5.1.2 Evaluate federal, statewide, and local funding options for basin-wide water management activities.	District and Department
	5.1.3 Coordinate to develop and implement transfer and water banking systems that are compatible between the District and the Coalition	District and Department
	5.1.4 Evaluate proposed transfers utilizing methodology consistent with other Lower Platte NRDs, as specified in the basin-wide plan.	District
Objective 5.2: Coordinate to expand conjunctive management opportunities to mitigate new uses	5.2.1 Review and analyze existing studies of water storage opportunities in the Lower Platte River Basin and conduct additional multi-agency studies, as appropriate.	District and Department
	5.2.2 Evaluate benefits and limitations of potential conjunctive management projects	District and Department
Objective 5.3: Coordinate with ENWRA to increase knowledge about existing groundwater supplies and connection to surface water	5.3.1 Continue active participation in ENWRA meetings, studies, and activities.	District and Department
	5.3.2 Evaluate whether ENWRA data can improve modeling of hydrologically connected areas on a large scale.	District and Department
Objective 5.4: Strengthen coordination with other agencies about efforts to sustain or increase Lower Platte River flows	5.4.2 Coordinate to review and assess benefits and limitations of protecting Lower Platte River flows through existing instream flow water rights.	District and Department
	5.4.3 Continue to coordinate with other agencies on riparian vegetation management activities.	District and Department

Long-Term Study

LONG-TERM STUDY			
Goal / Study	Action Item	Assigned To	Reporting/ Exchange
Long-term Study 1.1 Increase understanding of tile drainage systems in the District and their impact on water supply.	1.1.1 Conduct a tile drainage study based upon review of existing data and funding.	District	Discuss solutions to obstacles pertaining to action items listed at annual meeting.
	1.1.2 Seek voluntary data from landowners pertaining to tile drain locations.	District	
	1.1.3 Evaluate the potential to develop modeling scenarios that predict the impact of tile drainage on streamflow and recharge.	District and Department	

Jointly Identified Actions for Next Two Years

- Review potential IMP amendments to be consistent with Basin Plan
- Continue cooperative efforts to increase sources of available surface and groundwater data
- Continue hydrogeologic investigations of the LPNNRD through collaborative work with UNL's Conservation and Survey Division
- Continue process for Lower Platte-Missouri Tributaries groundwater model evaluation of AEM data
- Continue to participate in basin-wide and regional planning efforts such as ENWRA, 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
- Participate in education and outreach events in the LPNNRD, as available
- Review data from local studies, as available

Questions or Comments?



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