



Nebraska
Department of Natural Resources

NEBRASKA'S WATER MANAGEMENT RESOURCE

Providing the sound science and support for managing
Nebraska's most precious resource.

INTEGRATED WATER MANAGEMENT PLANNING PROCESS AND THE LPSNRD VOLUNTARY IMP

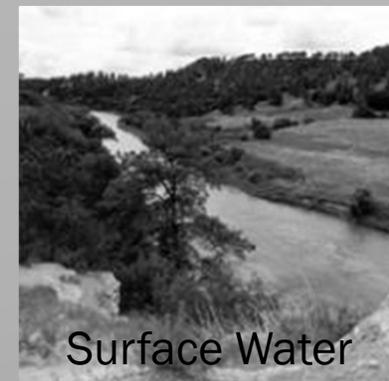
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Overview

Integrated Management Plans (IMPs)



Voluntary IMPs and the IMP Process



Implementation Example: Flood Diversions



LPSNRD IMP

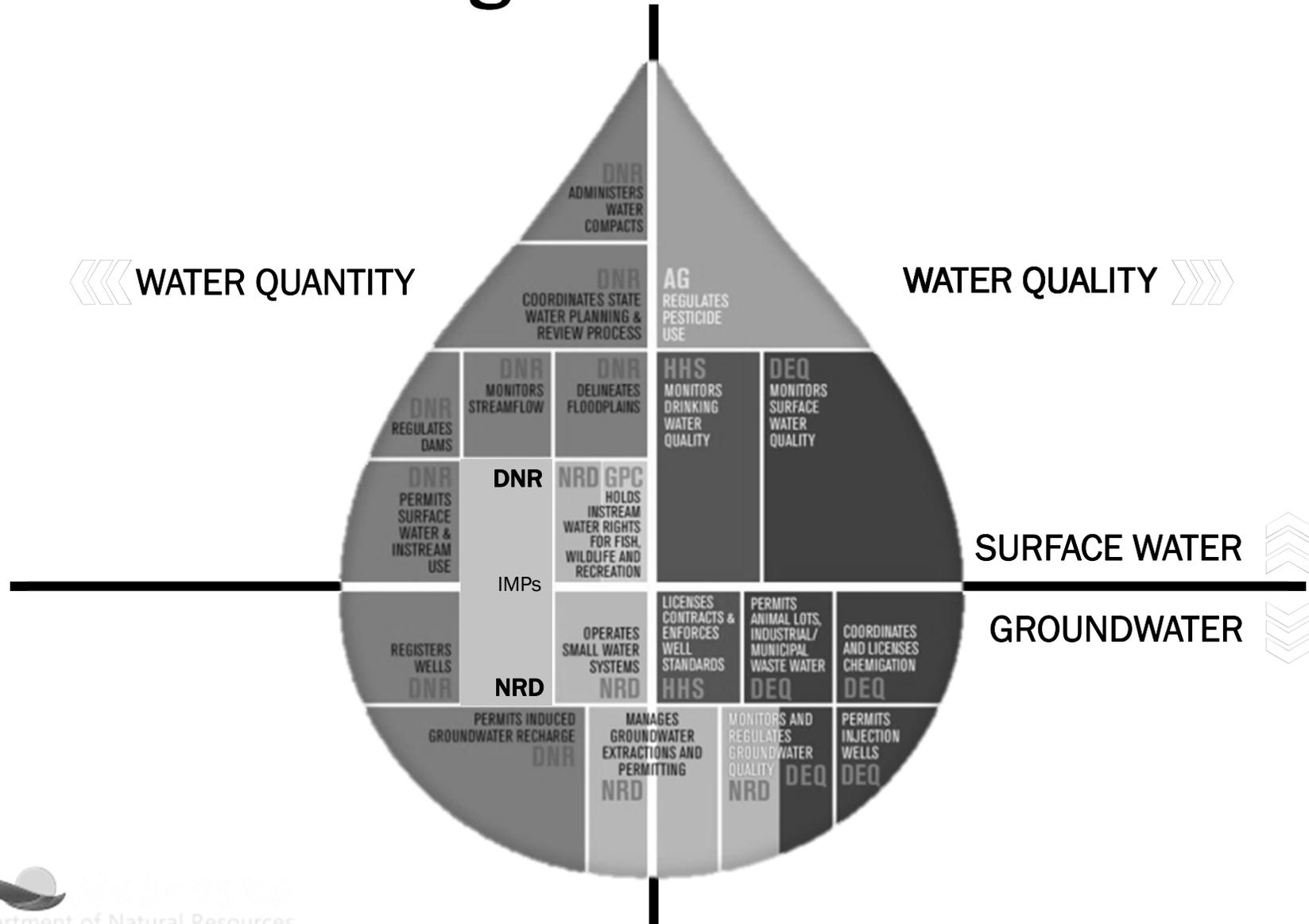




INTEGRATED MANAGEMENT PLANNING OVERVIEW

An IMP is a proactive, collaborative approach to managing hydrologically connected surface and groundwater

Water Planning in Nebraska



Integrated Water Management

IMPLEMENTATION

Water Management
Projects

Strategic Planning Actions

PLANNING
AND PUBLIC
PARTICIPATION

Goals and Objectives
for Water Planning

Stakeholder Involvement

Water Availability and Water
Shortages

Water Supplies and Water Uses

SCIENCE

Hydrologic Models, Data, and Analyses

Integrated Management Planning: What is it?

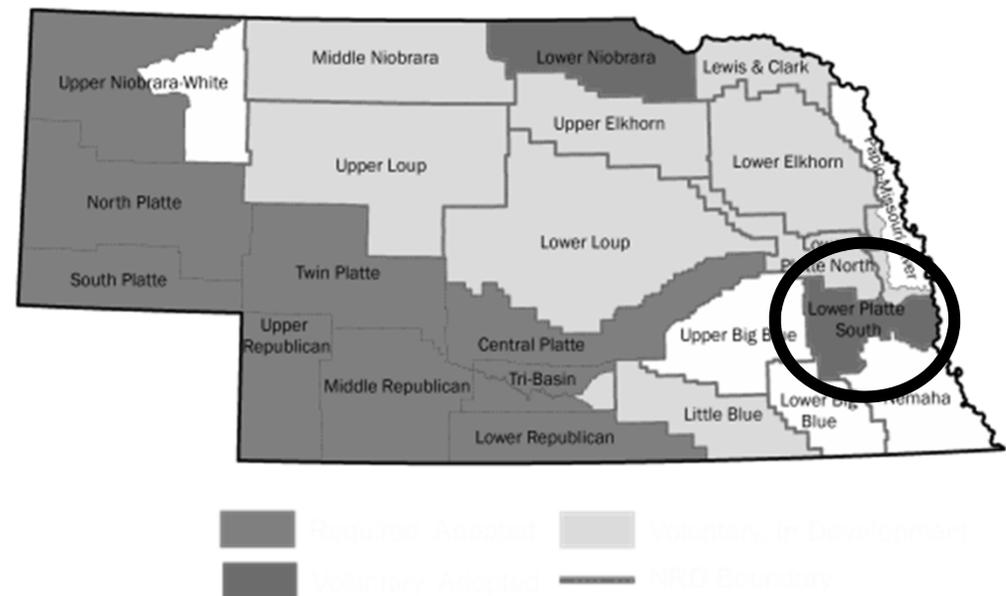
- Surface water and groundwater management
- Proactive
- Protects existing investments
- Adaptive management
- Jointly developed with NRD
- Suited to local conditions



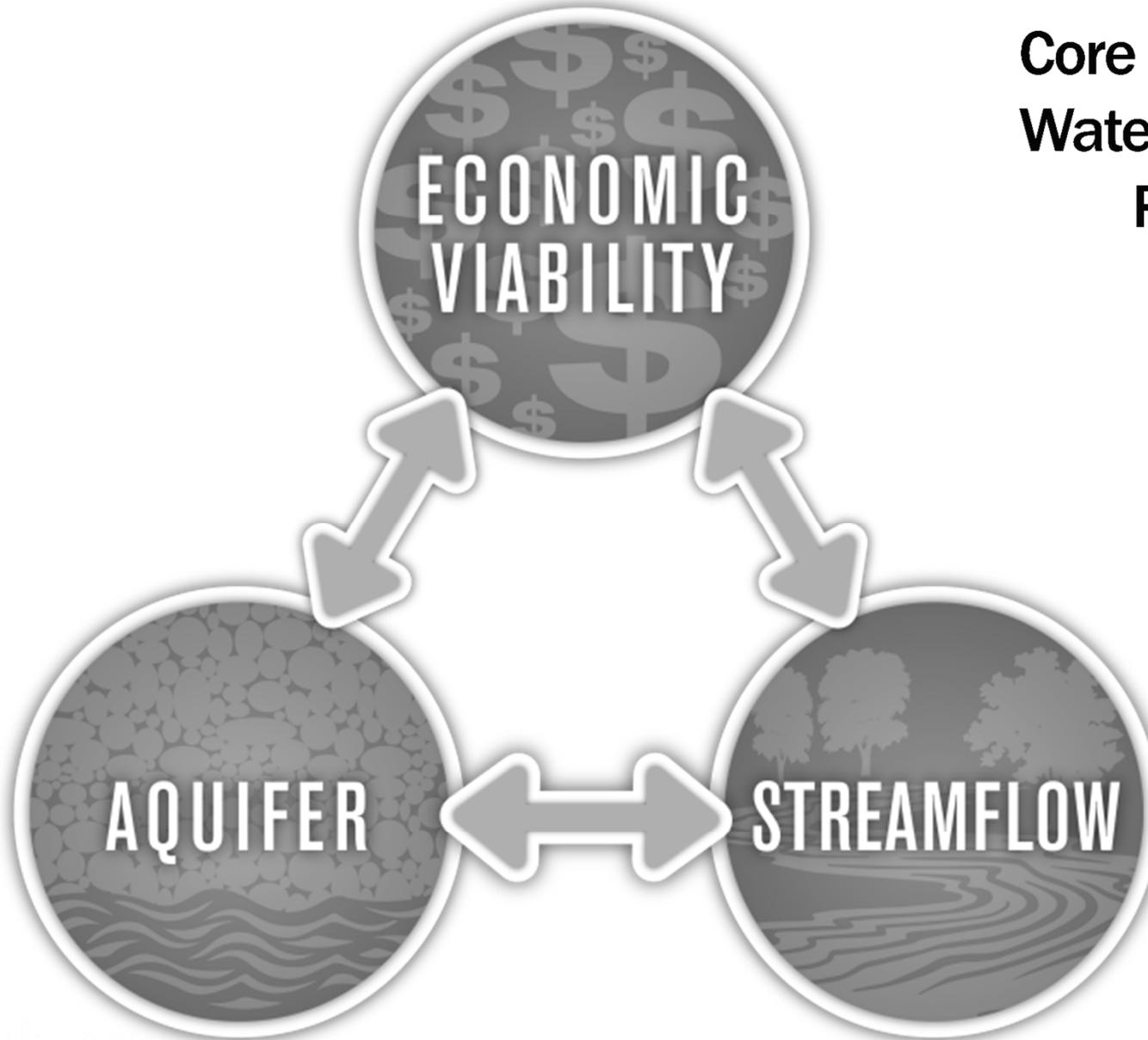
Integrated Management Planning is a Collaborative Process

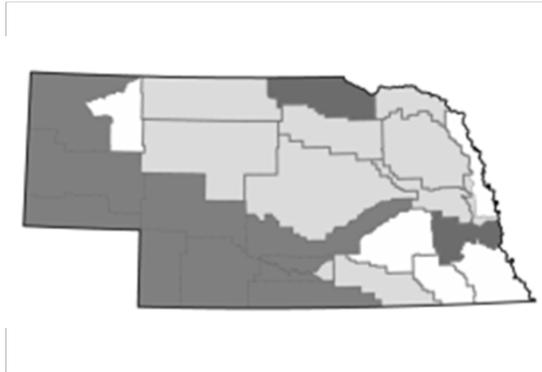
- DNR + a Natural Resources District (NRD)
 - IMP development
 - Plan implementation
- Stakeholder input

IMP Areas



Core Goals of Water Supply Planning



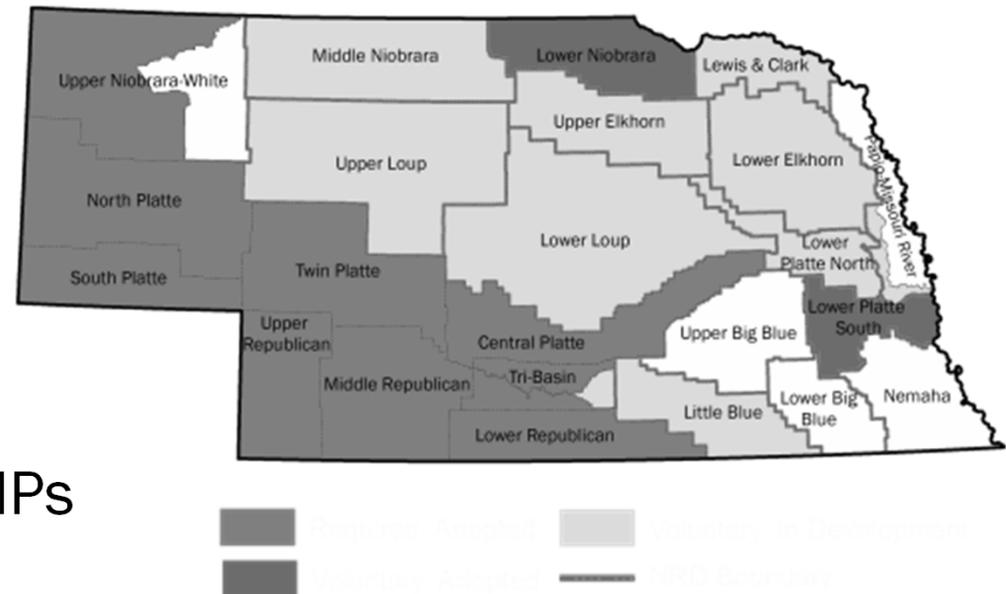


VOLUNTARY IMPS AND THE PLANNING PROCESS

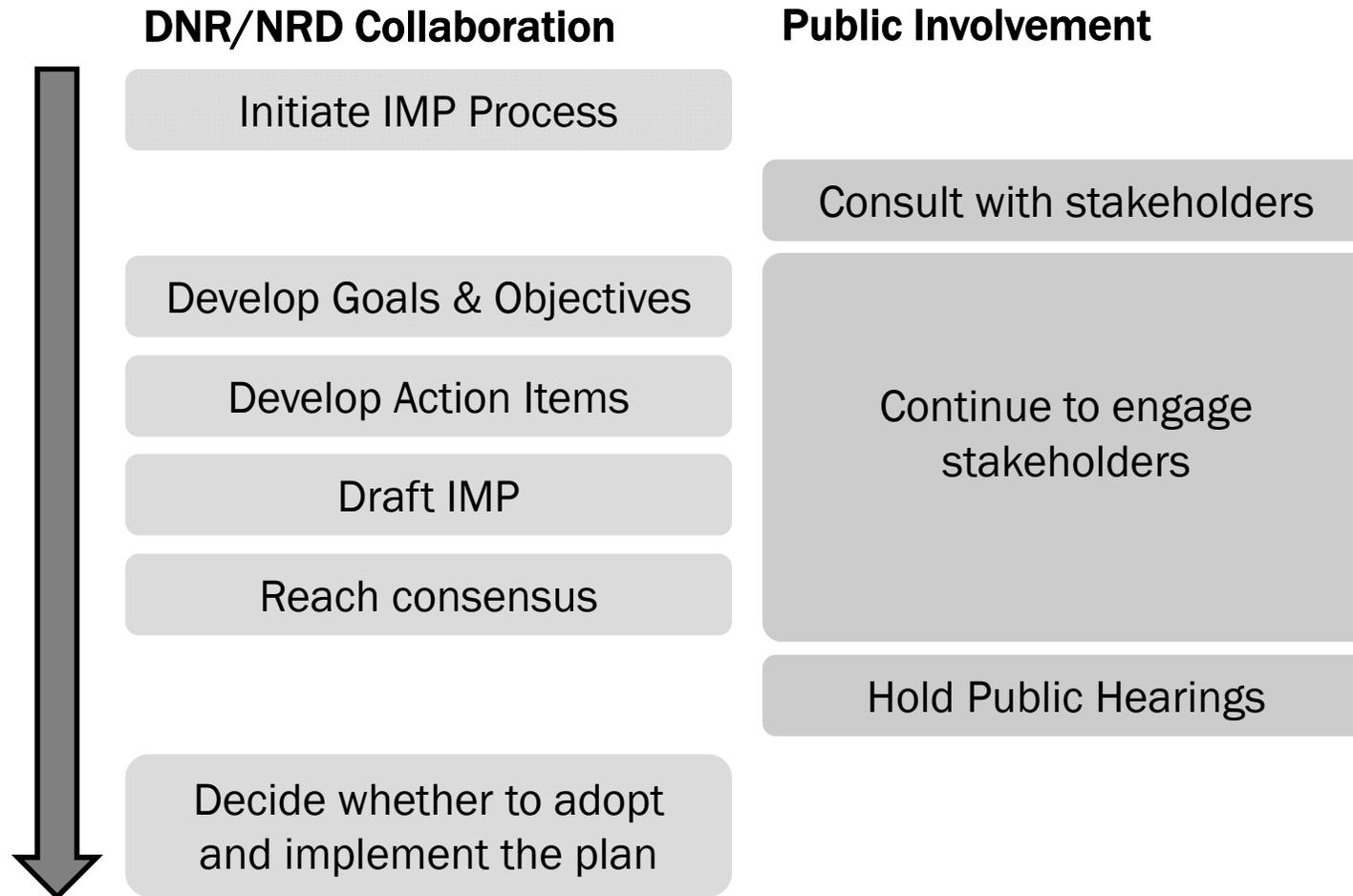
Voluntary IMPs

- LB962 (2004)
 - IMP required if fully or overappropriated
 - No mechanism for voluntary IMPs
- LB764 (2010)
 - Authorized voluntary IMPs
- LB1098 (2014)
 - Water Sustainability Fund

IMP Areas



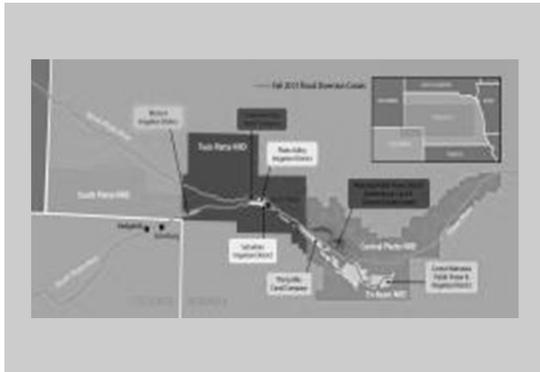
IMP Development Process



IMP Implementation

- Action Items
- Monitoring Program
 - Tracking action items in context of achieving goals & objectives
- Evaluation
 - Are action items achieving desired goals?
 - Are water supply and demand changing?
 - Have goals changed?
 - Has fully appropriated status changed?
- Adaptive Management

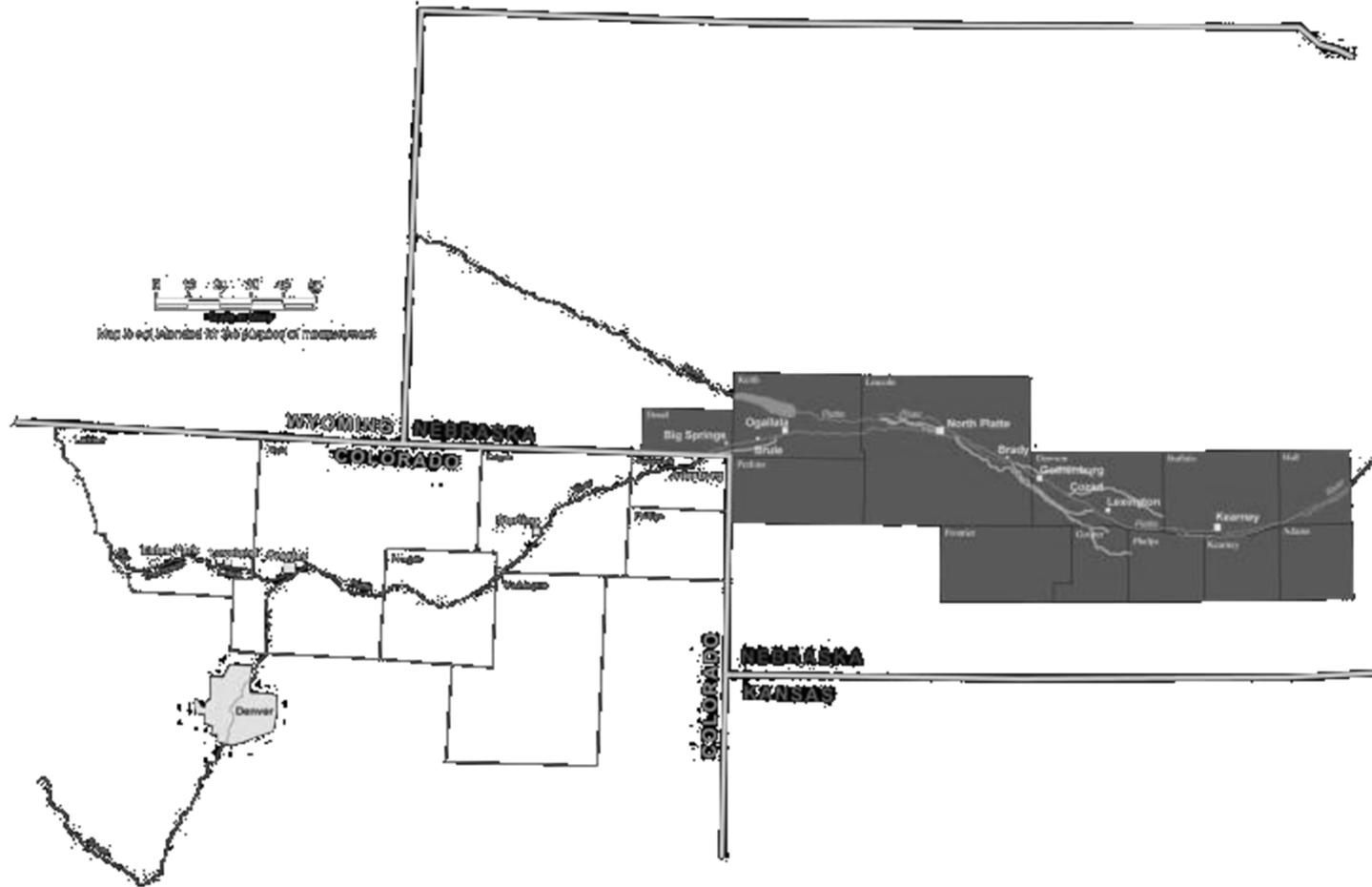




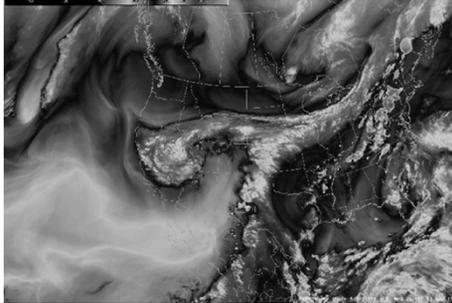
IMPLEMENTATION EXAMPLE

Partnerships formed through the IMP process facilitated diversion of Platte River floodwaters for recharge

Implementation Example: Using Excess Flows for Recharge



Flooding Begins in Colorado



- Week long precipitation event September 9-16, 2013

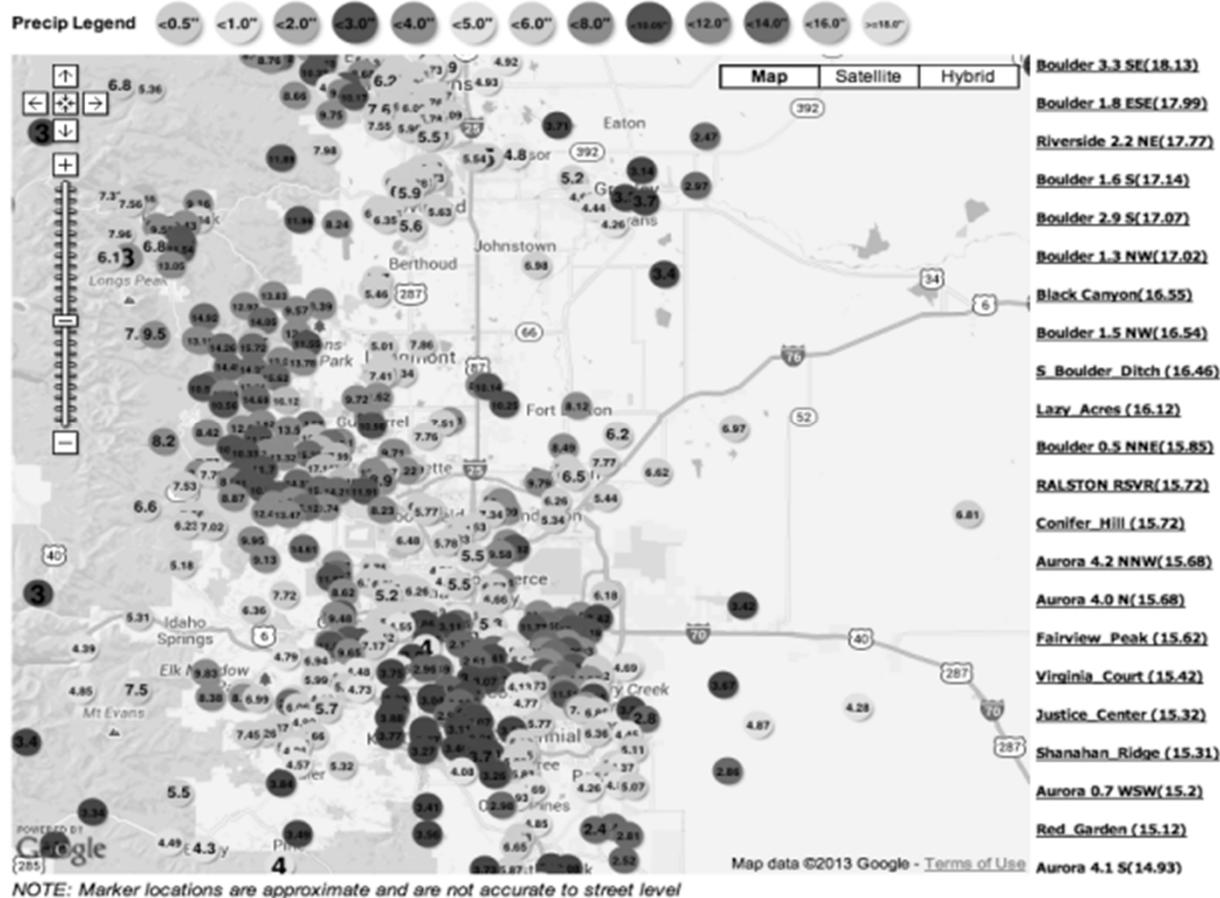


- Stream gages washed away from CO bridges
- Unknown floodwaters headed to NE



Precipitation Total in Colorado

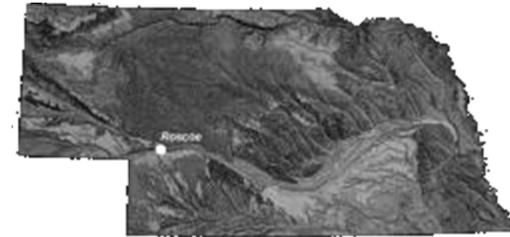
Precipitation Totals - 7 Day Totals - Sept 9th thru Sept 15th (2013)



A Google Map with information from Boulder National Weather Service Forecast office.

Department Preparation

Peak flow in CO determined by Bridgeport Field Office



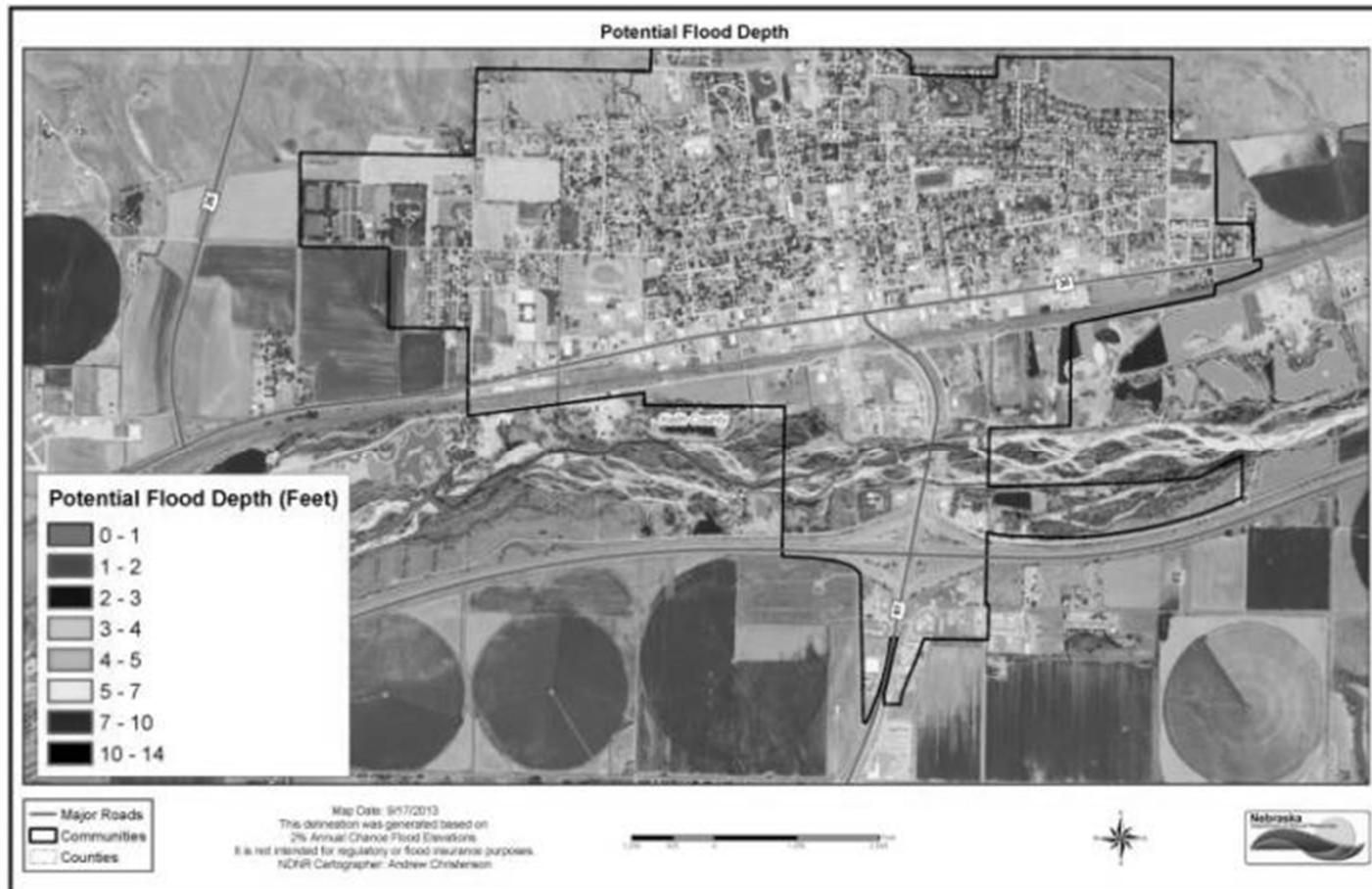
Roscoe, Nebraska



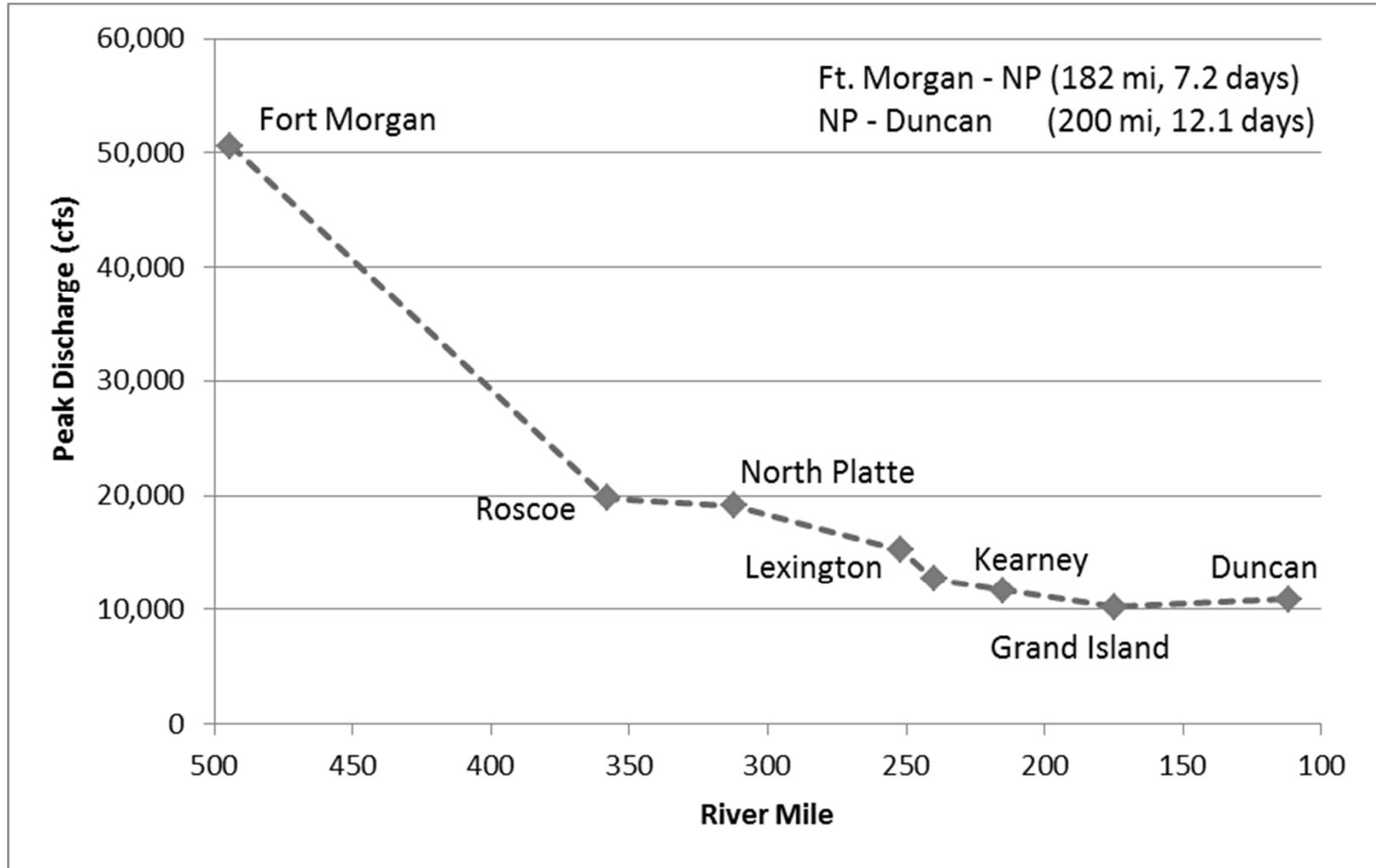
Credit: National Weather Service Web Site

Department Preparation

Potential Flood Inundation Depth Map



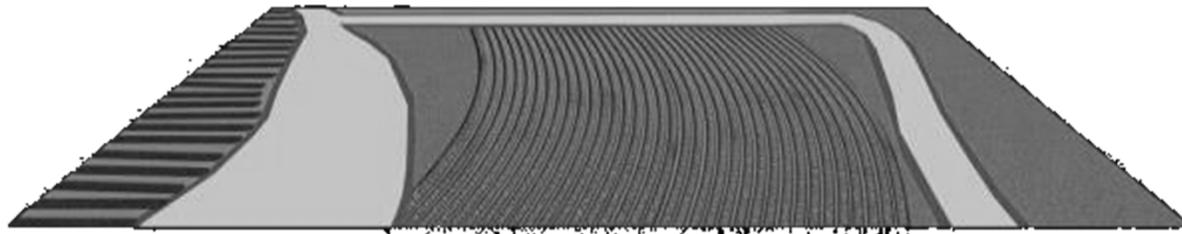
Peak Discharges of South Platte and Platte Rivers



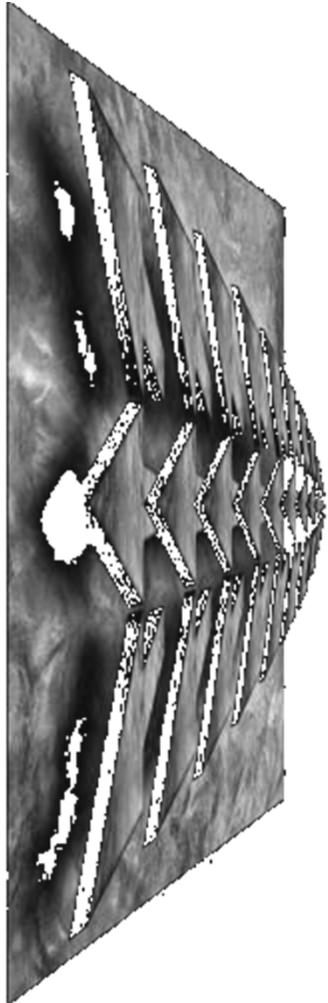
Source: Platte River Recovery and Implementation Program

Department Preparation

Work with Irrigation Districts to Divert Floodwaters for Recharging the Aquifer

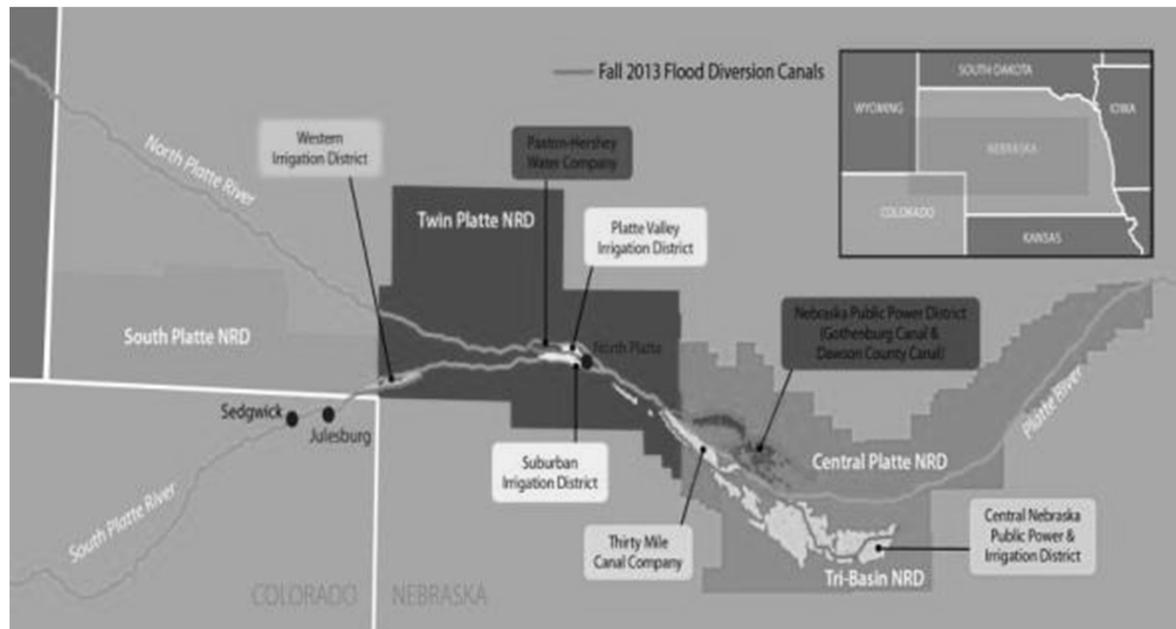


Flood Flow Diversion Management



- Collaborative effort
- Contact potential partners to divert floodwaters
 - Canals
 - Irrigation Districts
- Agreements developed quickly with partners
- Coordinated timing of diversions
- Potential to provide beneficial recharge

Diversions of Fall 2013 Floodwaters



Total Diverted (9/15 to 10/31/2013)

44,100 AF

Total Recharged (Estimated)

29,900 AF

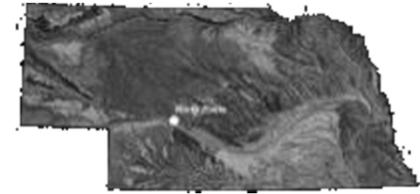
Total Cost

\$707,748

Cost per Acre-foot

\$24

Before the Flood Event & 26 Hours Later



South Platte River Bridge, Highway 83, North Platte, Nebraska
Friday, September 20, 2013, at 8:45 a.m.



South Platte River Bridge, Highway 83, North Platte, Nebraska
Saturday, September 21, 2013, at 11:00 a.m.

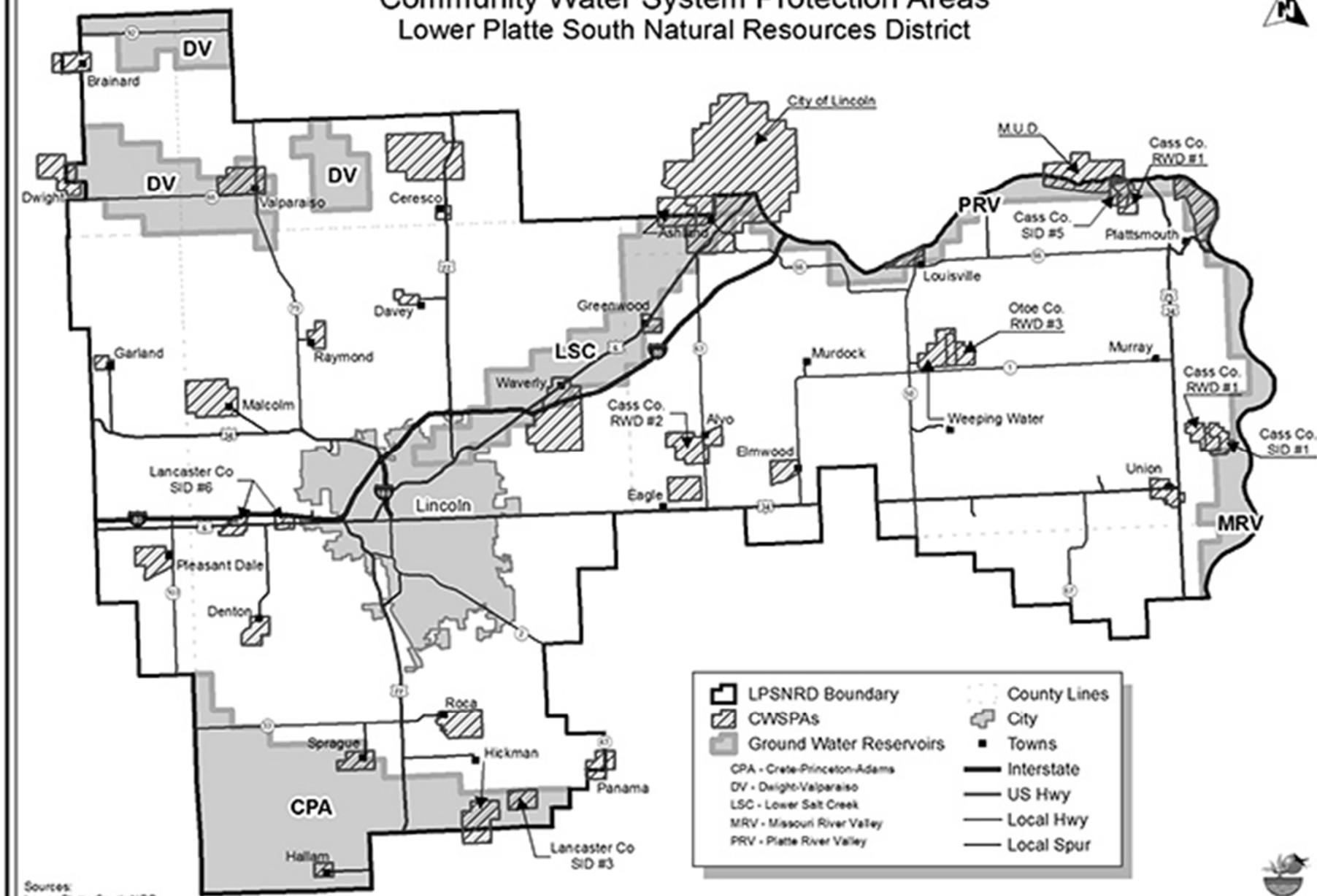


Lower Platte South
Natural Resources District
Integrated Management Plan

VOLUNTARY IMP FOR THE LOWER PLATTE SOUTH NRD

Prepared jointly by the District and the Department

Community Water System Protection Areas Lower Platte South Natural Resources District



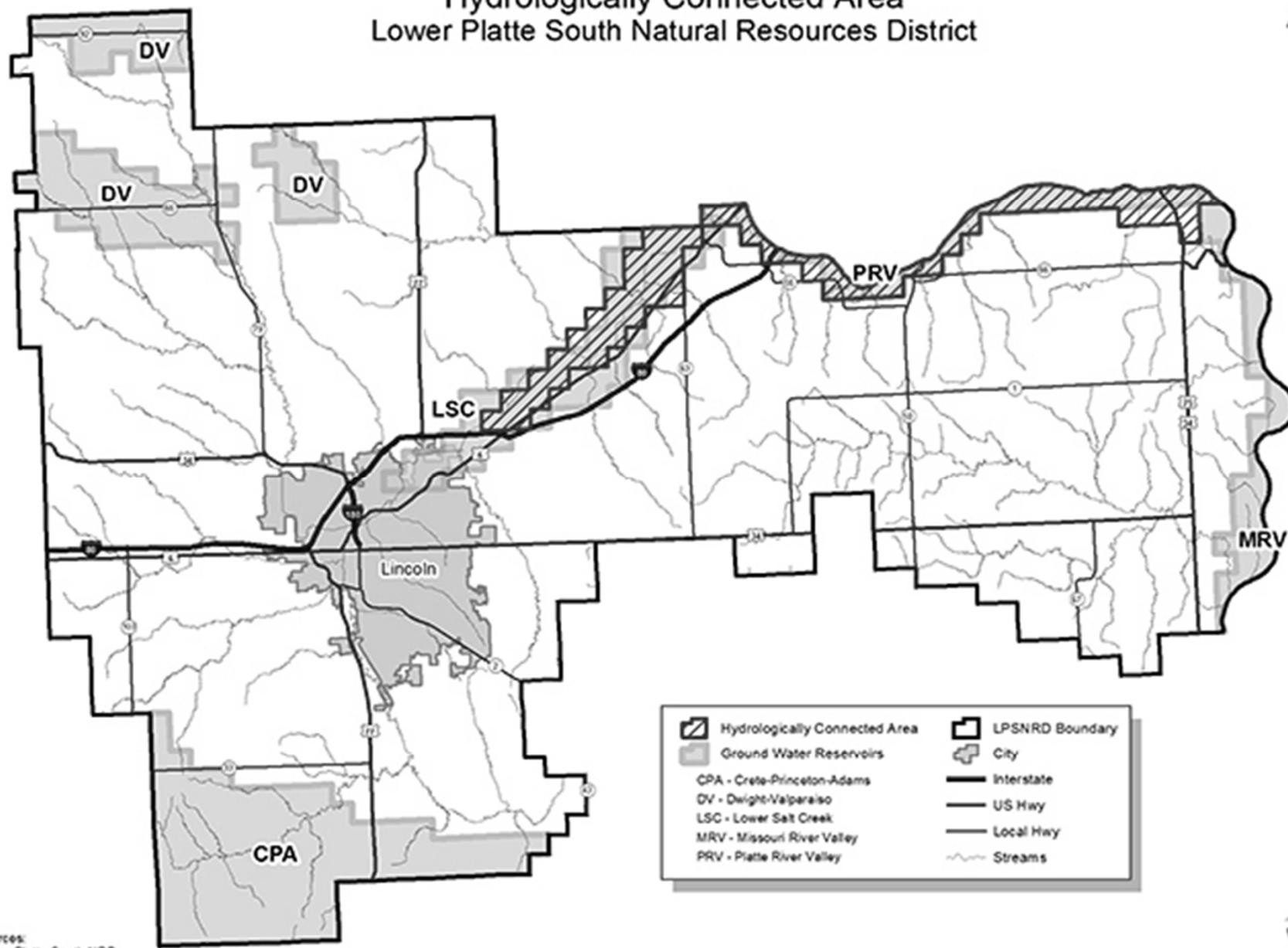
Sources:
Lower Platte South NRD;
Nebraska Dept. of Natural Resources;
Nebraska Dept. of Roads

0 5 10 15 Miles

Map Created By: Shauna D. Ross
Date Created: January 2014



Hydrologically Connected Area Lower Platte South Natural Resources District



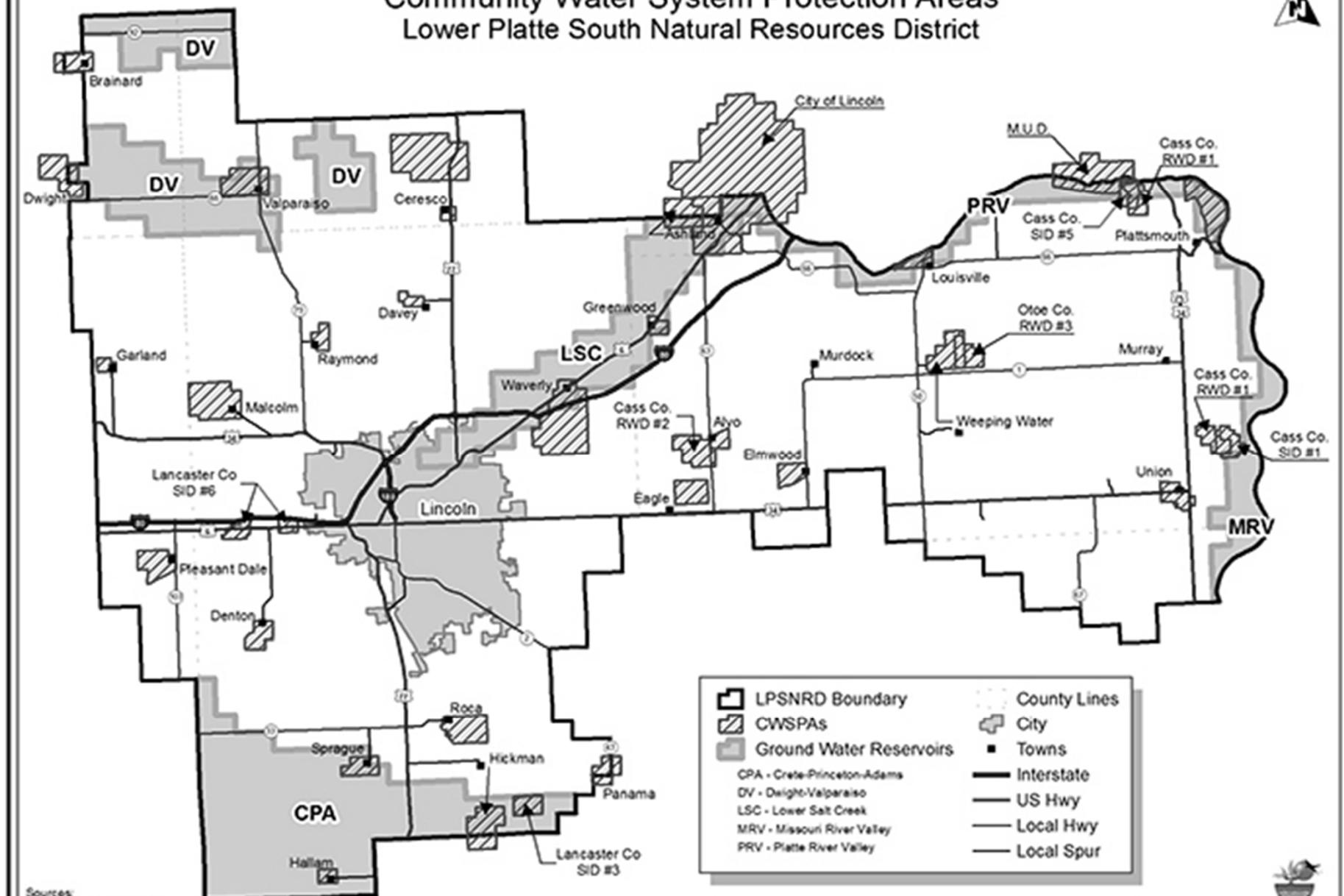
Sources:
Lower Platte South NRD;
Nebraska Dept. of Natural Resources;
Nebraska Dept. of Roads

0 5 10 15
Miles



Map Created By: Shaula D. Ross
Date Created: January 2011

Community Water System Protection Areas Lower Platte South Natural Resources District



	LPSNRD Boundary		County Lines
	CWSPAs		City
	Ground Water Reservoirs		Towns
CPA - Crete-Princeton-Adams			Interstate
DV - Deight-Valparaiso			US Hwy
LSC - Lower Salt Creek			Local Hwy
MRV - Missouri River Valley			Local Spur
PRV - Platte River Valley			

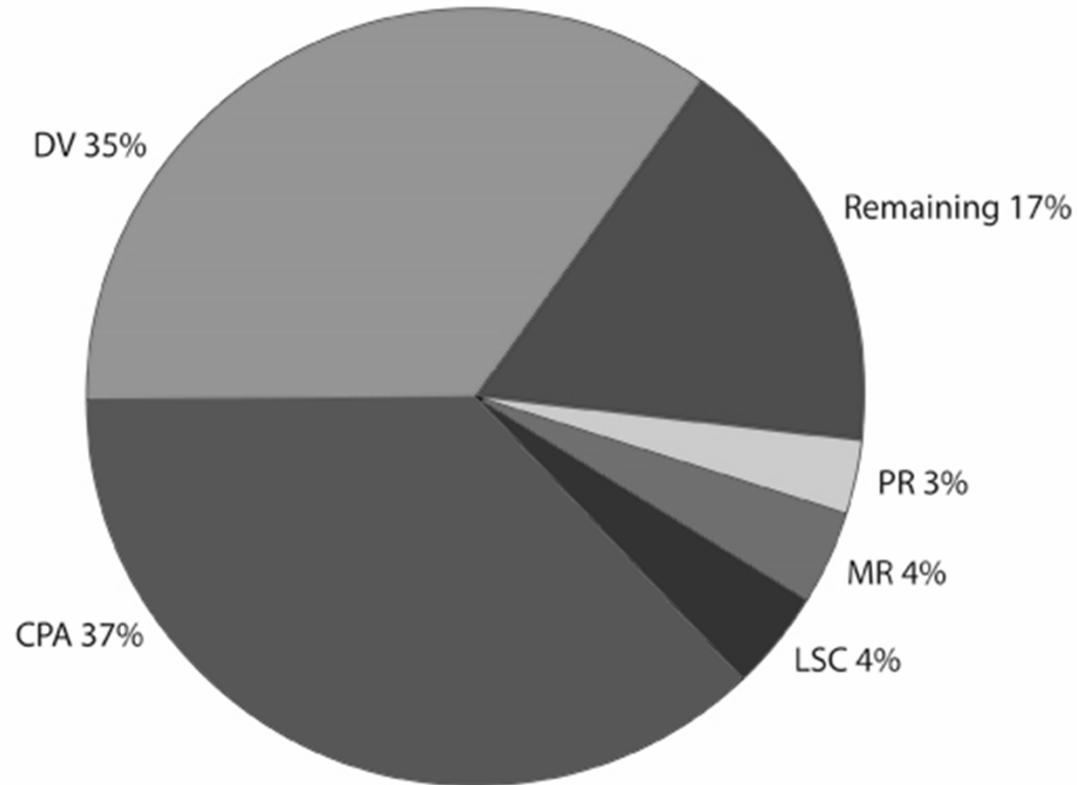
Sources:
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Map Created By: Shauna D. Ross
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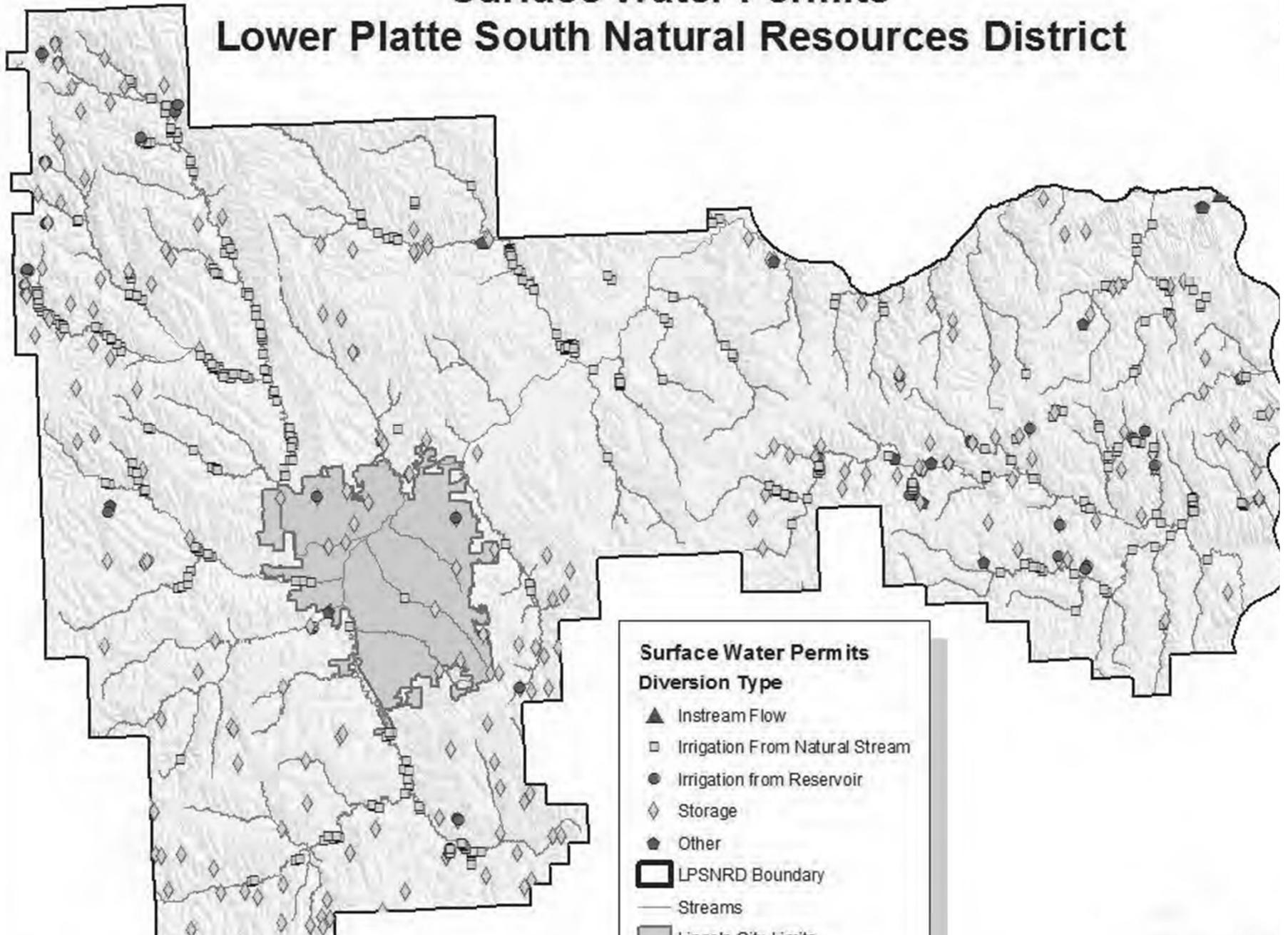


GROUND WATER AVAILABLE
GROUND WATER RESERVOIRS (4,000,000 ACRE-FEET)
LOWER PLATTE SOUTH NRD



Crete-Princeton-Adams, 1.5M AF; Dwight-Valparaiso, 1.4M AF; Remaining Area, 698,000 AF; Lower Salt Creek, 170,000 AF; Missouri River, 150,000 AF; and Platte River, 100,000 AF.

Surface Water Permits Lower Platte South Natural Resources District



Lower Platte River Basin

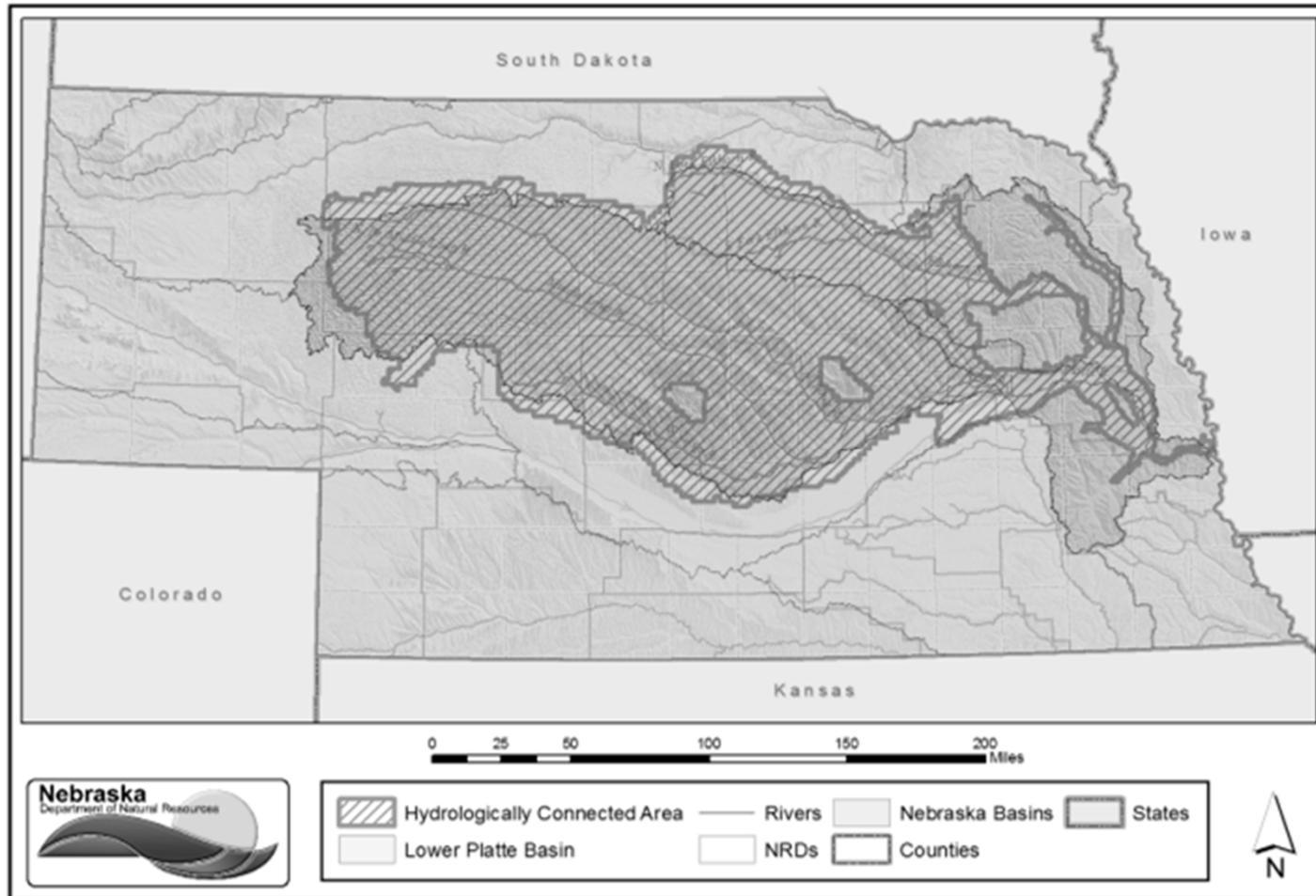


Table 3-6. Components of the Average Annual Water Balance Based on Current Land Uses in the LPSNRD

	Amount (KAF)	Period of Assessment
Inflows		
Precipitation	2,729	1980-2010
Surface water inflow	0	
Subsurface inflows	0	
Imported Water	40	1988-2010
Total	2,769	
Outflows		
Consumption	2,220	1980-2010 (based on 2005 land use)
Surface water outflow	395	1980-2010
Minor tributary outflow	124	1980-2010
Subsurface outflow		
Total	2,739	
Change in Storage		
Groundwater storage	-4	2000-2010
Surface water storage	-1	1993-2010
Total	-5	
Remainder	35	

What Were We Thinking??

- Proactive philosophy of Board
- Voluntary IMP was action item in LRIP in 2006
- Fully appropriated designation reversed in 2008, BUT....
- Bottom of the LPR Basin and destiny & responsibilities if fully appropriated
- Law didn't allow so lets change the law in 2010
- Notified NDNR of intent on Nov. 17 2010

What Were We Thinking?

- Board retreat in early 2011
- Stakeholder Perspective Survey
- Water Balance Study
- Contracted HDR to implement Public Involvement Plan
- 18 month plan development
- Effective date of Plan is May 14, 2014.



Who is Involved & What is Their Goal?



The Integrated Management Plan will:

- Develop a comprehensive inventory of all available ground and surface water supplies and all current water uses.
- Help to project future water needs.
- Identify potential sources and desired management and conservation programs.

• IMP Subcommittee

- Responsible for overseeing the planning process and to meet statutory requirements. The Subcommittee's charge is to recommend an IMP for adoption by the LPSNRD Board of Directors and DNR.

• Stakeholder Advisory Committee

- Ensures the planning process meets the goal of the Public Involvement Plan, provides a broad set of perspectives to ensure the IMP reflects diverse water management needs, makes recommendations to assist LPSNRD in meeting mandated requirements, engages stakeholders and encourages participation at public events.

• DNR

- A partner in the development of the IMP and the planning process. The DNR's role is to collaborate in carrying out the actions of the IMP.

• Agency Input/Public Input

- Throughout the process, both the general public and agencies in the District with water interests have been encouraged to participate and provide input regarding water uses, needs, demands, and future management for consideration by the IMP Subcommittee.

Public Involvement Process

- Comprehensive Public Involvement from start to adoption of Plan.
- Components:
 - Stakeholder Advisory Group (20 members)
 - Four Focus Groups
 - Agency coordination meetings
 - Virtual Town Hall meetings
 - Public Open House Prioritization Workshop
 - Social Media and Website

Vision

“Water uses and water supplies are in a managed balance, supporting economic viability, environmental sustainability and safe living conditions.”

The plan will be instrumental in identifying available water supplies and managing water quantity to meet the future water needs in the District.



Integrated Management Plan Goals

Water Inventory

Water Inventory includes the inflow, precipitation, and water storage available to the District along with the water use and outflows from the District.

Goal: Ensure the District has sufficient data to enable the achievement of a water supply that is in balance with current and future water demands in the District.

Water Supply Management

Water Supply Management is the management of water supply, both in and out of the District, through human efforts.

Goal: Ensure a sustainable water supply is available in the amounts and location of the demands through management actions to meet the District's short and long term needs.

Water Use Management

Water Use Management is the management of how water is used and consumed while meeting current and future demands.

Goal: Encourage all water users to minimize water use while optimizing benefits.

Water Inventory

- Comprehensive inventory of water supplies, uses and outflows
 - Study aquifers and connectivity to surface water
 - Estimate water use from unmetered wells
 - Estimate consumptive water uses
- Evaluate variations due to climate trends
- Study basin-wide inflows /outflows
- Project changes due to urban and rural growth
- Evaluate sources and effects of additional supplies
- Study extent of hydrologically connected waters

Water Supply Management

- Optimize location and design of wells for aquifer characteristics
 - Identify areas of potential conflicts
- Research & implement additional supply and storage opportunities within District
 - Integrated surface & ground water storage
 - Regional and collaborative domestic water supply & distribution systems
 - Collaborate on proactive water management, including dry year leasing

Water Supply Management

- Evaluate feasibility and benefits of water reuse
 - Rain barrels, stormwater and wastewater reuse
- Monitor impacts of vegetative growth on streamflows
- Collaborate in studies and planning to identify additional / regional water supplies outside the District

Water Use Management

- Determine best available irrigation technologies
 - Support BMPs, education, alternate crops, cover crops, technology innovations
 - Estimate future demands & consumptive uses
- Determine best available industrial technologies & practices
- Determine best applications of native & low water use landscapes
- Determine best indoor water conservation practices

Water Use Management

- Determine best water conservation programs, rates, & meters for all public water systems
- Evaluate benefits of greywater reuse, rainwater & stormwater harvesting & reuse, & reuse of irrigation water
 - Model sample watersheds for + and - impacts
 - Technology, support, & pilot projects
- Evaluate instream flow needs and benefits in the District

Water Use Management

- Manage expansion of new water uses so as not to adversely affect current users.
 - Develop thresholds for use expansion
 - Monitor changes in water use and land use
 - Effective communications with public water systems
- Expand education programs on water supplies and conservation measures
- Consider fees or incentives that encourage water conservation.

2014 Annual Report

- Includes the actions and progress made towards IMP action by the LPSNRD and NDNR in 2014.
 - Data collected, ground and surface water permits, and changes in uses
 - Action items accomplished and progress towards goals and objectives
 - Future action steps for 2015 and 2016
 - Potential modifications to the IMP

2014 ACTIONS & PROGRESS

➤ Monitoring and data collection

- 14 streamflow gages
- Surface water appropriation permits (4 new; 15 cancelled; voluntary water use reporting)
- Ground water (29 well permits/19 completed; water level monitoring in 139 wells, spring & fall with avg. declines of 1.12 feet; meters and water use reporting from 393 wells of 5.5+ M gals.)

2014 Actions & Progress

- Monitoring and data collection (continued)
 - Certified irrigated acres (HCA +48 to 3,172 acres; Remainder +1,636 to 23,058 acres)
 - Ground water rules variances (6 approved; one denied)
 - Water Banking / Transfers (no activity)

2014 Actions & Progress

➤ Moratoriums:

○ Ground Water

- HCA limitation on increasing irrigated acres
- DVB Special Management Area designated and moratorium lifted except for increasing irrigated acres

○ Surface Water

- HCA limitation on increasing irrigated acres

➤ Ground Water Allocations

- DVB SMA at 21 in/3 yrs/ac, not to exceed 9 in/yr for sprinkler irrigation and 30 in/3 yrs/ac, not to exceed 12 in/yr for gravity irrigation.

2014 Actions & Progress

➤ Non-regulatory:

- Interagency coordination including data sharing
- NRD provided ground water BMP cost-share incentives
- NDNR's release of INSIGHT tool for scientific water information
- Information & Education
 - Irrigation Certification Program
 - Earth Day, Waterfest celebrations
 - Website
 - NRD public awareness survey

2014 Actions & Progress

➤ Studies and Planning

- Completion of remaining IMP components
- ENWRA research & modeling, including collection of AWM data
- LPRB Coalition basin-wide water management planning, including water banking
- LPMT Model development for ground water & hydrologically connected areas

2015 & 2016 Actions

- Expansion of INSIGHT tool
- Continued participation in ENWRA and LPRBC planning
- Continue public outreach
- Monitoring of surface water permits & water use
- Evaluate need for more streamgages
- Monitoring of ground water levels
- Meter wells & require water use reports

2015 & 2016 Actions

- Adopt & implement additional IMP components
- Continue development of LPMT model
- Conduct study of effectiveness & feasibility of water conveyance via streams from upstream sources
- Develop recommendations for development & management of limited aquifers
- Continue discussions on regional water systems and water shortage action plans.



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THANK YOU

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