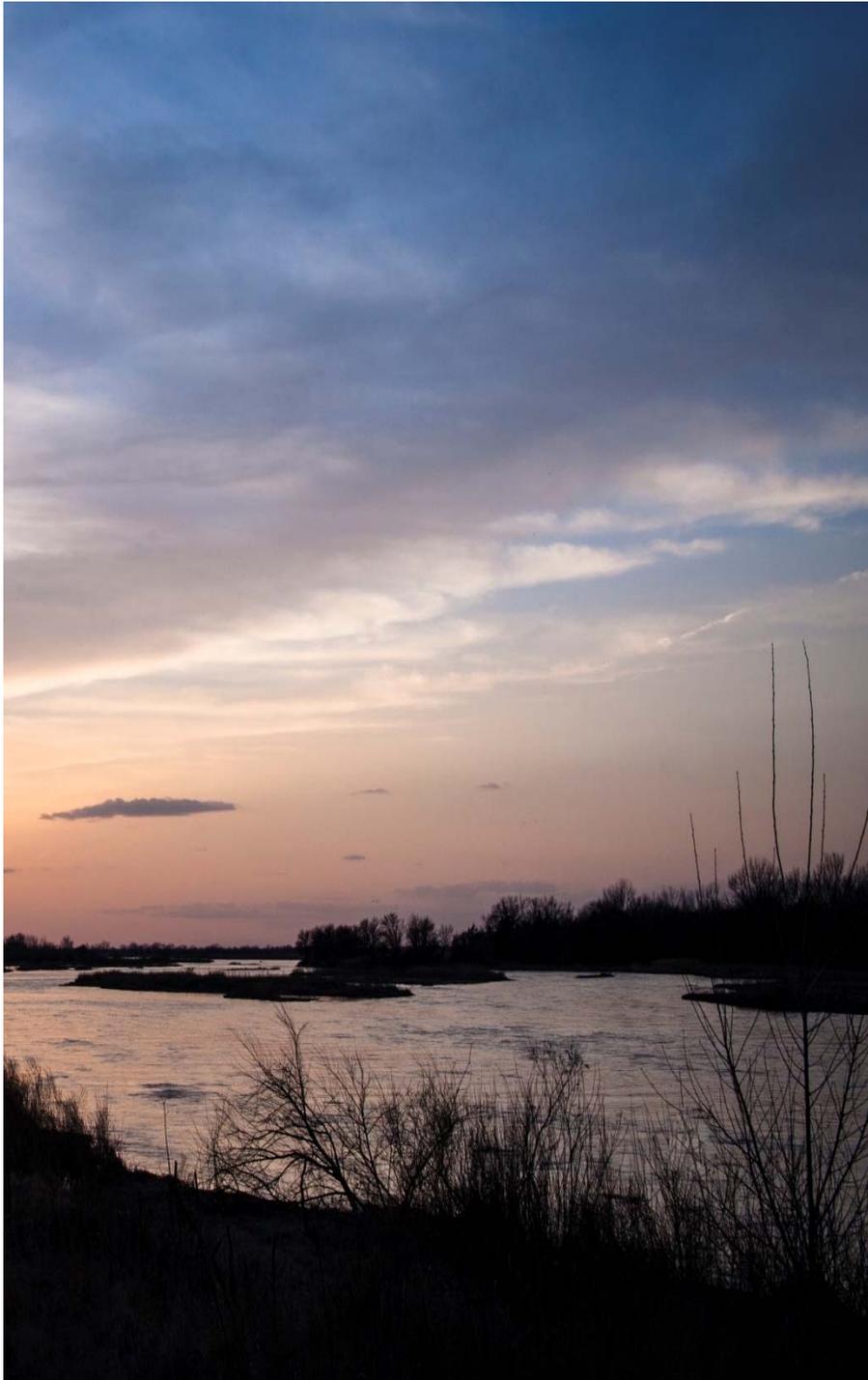


LOWER PLATTE RIVER BASIN COALITION WATER MANAGEMENT PLAN

Water Banking Workshop

March 10, 2015





01 Overview

02 Example Water Banks

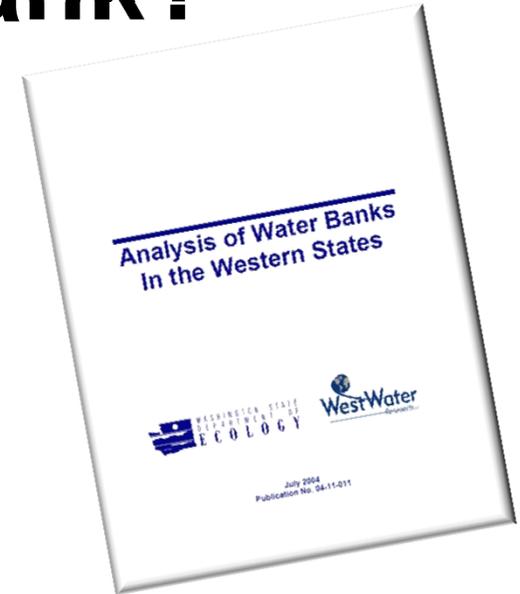
03 Preview of 2nd Workshop



What is a Water Bank?



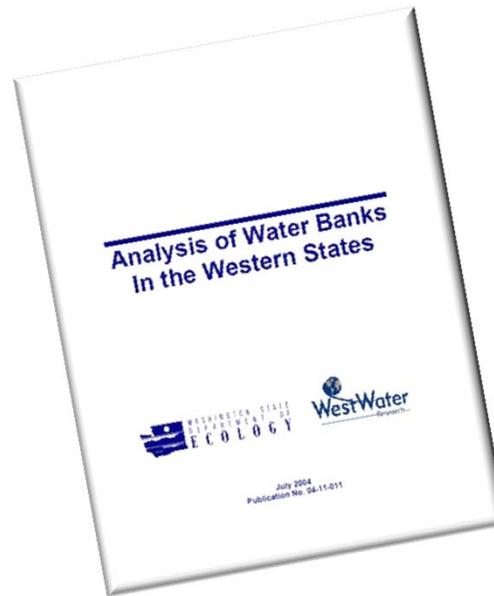
Lawrence MacDonnell



“Water banking in its most generalized sense is an institutionalized process specifically designed to facilitate the transfer of developed water to new uses. Broadly speaking, a water bank is an intermediary. Like a broker, it seeks to bring together buyers and sellers. Unlike a broker, however, it is an institutionalized process with known procedures and with some kind of public sanction for its activities.”

Lawrence J. MacDonnell, “Water Banks: Untangling the Gordian Knot of Western Water,” 1995.

What is a Water Bank?



“...water banking is broadly defined as an institutional mechanism that facilitates the legal transfer and market exchange of various types of surface, groundwater, and storage entitlements. In effect, the bank acts as an intermediary—or broker—bringing together buyers and sellers. In addition, the banking administrator can provide a host of administrative and technical functions..”

What is a Water Bank?

Water Supply Clients

Multiple clients sell/lease water to the bank



Regulatory Body

Regulates bank operations
Certifies quantity

Water Demand Clients

Multiple clients purchase/lease water from the bank



Water Bank

Forms contracts with suppliers
Forms contracts with demanders
Acts as an intermediary with clients and regulator
May set Price
Manage the bank
Market-maker/clearinghouse/broker

What is a Water Bank?

- Means different things in different places
- Definition probably has become broader over time
- Usually refers to a mechanism used to facilitate the transfer of water between parties, often using market-driven transactions
- Can be institutional, physical, or both
- Water banks in Nebraska evolving to meet unique State hydrology and legal structure



Nebraska Law



- No Nebraska statutory language currently specifically governing water banks
- Statute governs surface water and ground water transfers
- Additional statute related to intentional underground storage and groundwater controls for transfers

Nebraska Revised Statute	Topic
§ 46-290 to 46-294.05	Intrabasin surface water transfers
§ 46-288 to 46-289	Interbasin surface water transfers
§ 46-691	Agricultural groundwater transfers
§ 46-691.01	Domestic groundwater transfers
§ 46-638 to 46-650	Municipal and rural domestic groundwater transfers
§ 46-675 to 46-690	Industrial groundwater transfers
§ 46-295 to 46-2106	Besides the standard permit to divert surface water, banking operations may also require a permit for intentional underground water storage
§ 46-242	In order to then use, or "recover" the intentionally stored underground water, a separate permit may be required
§ 46-739	Groundwater controls for designated management areas (includes transfers)

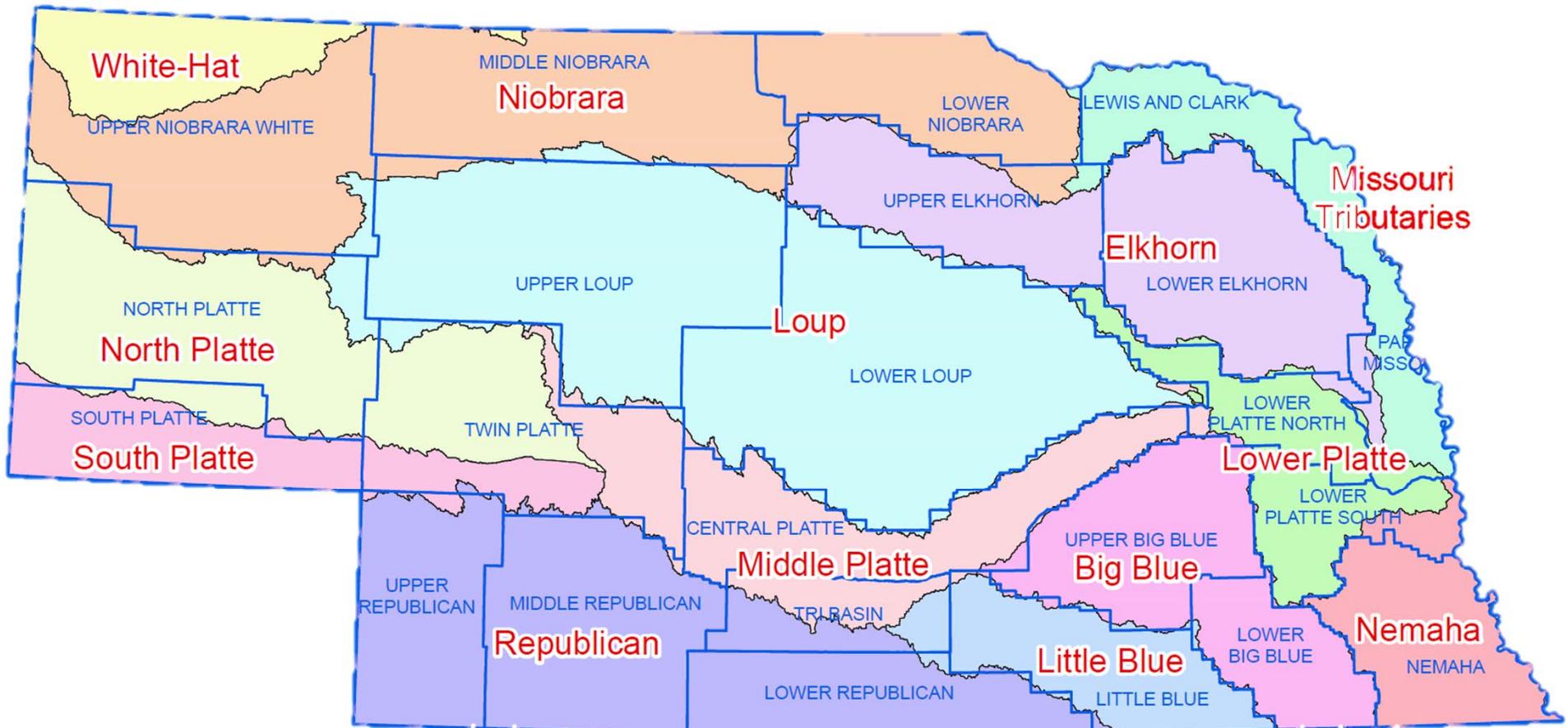


Nebraska Law



River basins with respect to Interbasin Transfers (Neb. Rev. Stat. § 46-288):

(a) The White River and Hat Creek basin; (b) the Niobrara River basin; (c) the Platte River basin, including the North Platte and South Platte River basins, except that for purposes of transfer between the North and South Platte River basins each shall be considered a separate river basin; (d) the Loup River basin; (e) the Elkhorn River basin; (f) the Republican River basin; (g) the Little Blue River basin; (h) the Big Blue River basin; (i) the Nemaha River basin; and (j) the Missouri tributaries basin.



Water Banking “Checklists”

- University of Arizona, Bonnie Colby



Bonnie Colby



Water Transaction Guidebooks for Water Professionals and Stakeholders (2009 – 2013)



Water Banking “Checklists”

- ***Water Banks: A Tool for Enhancing Water Supply Reliability*, Jan. 2010**
- **Includes “checklist” to consider when creating a water bank**
- **Used to help categorize sample existing water banks in Nebraska and other states**

Water Banking Creation and Operation Checklist Below is a checklist of major issues to consider when creating a water bank.

Management and Operation

- Determine appropriate entity to manage/operate the bank:
 - Public organization
 - Private non-profit organization
 - Private for-profit organization
 - Public-private partnership
- Create a system of education and outreach:
 - Public awareness campaign created?
 - Is there a manner in which individuals may conduct water bank inquiries?
- Include key community members in the decision-making and/or management processes.

Strategic Policy

- Develop long term strategic policy.
- Should the bank be designed to store water in a physical location?
 - If yes, should the bank utilize reservoir storage or underground storage?
 - If no, should the bank be designed to accommodate brokerage services or institutional (trust) services?
- Should the bank have the ability to purchase water entitlements on its own, or should the bank operate in a more administrative capacity?
- Set a fee for service structure.
 - Set flat participation fee?
 - Charge a fee per transaction?
 - Set different fees depending on the types of transactions or transaction volumes?
- Set an equitable and efficient dispute resolution mechanism.

Geographic Area and Participant Eligibility

- From what area should participation be allowed?
 - Large enough are to encourage robust participation, but not so large make administration and transportation costs overly burdensome.
- Which entitlements should be allowed to participate?

Operational Policy and Market Creation

- Establish a method of verifying bankable quantity, type of entitlement, and transfer capability of water entitlements.
- Determine what type of market (or pricing) structure to utilize:
 - Unilaterally set prices per volume of water?
 - Utilize a bulletin board method for pricing?
 - Utilize an auction method?
 - Single sided or double sided?
 - Allow a contingent contract (option contract) structure?

Encourage Irrigator Participation

- Utilize outreach activities to target irrigators and irrigation districts.
- Explain that irrigators may directly benefit from both the purchase and sale of entitlements.

Environmental and Third Party Impacts

- Has instream flows been legally classified as a beneficial use?
- Will water banking create negative environmental or third party impacts?
 - Should a mitigation fund be developed to compensate for negative environmental or third party impacts?

Cost of Administration and Monitoring

- Design a system of record-keeping and reporting.
- Implement a system of monitoring and enforcing following agreements

Water Banking “Checklists”

- **Project Need**
- **Management and Operation**
- **Strategic Policy**
- **Geographic Area and Participant Eligibility**
- **Operational Policy and Market Creation**
- **Encourage Irrigator Participation**
- **Environmental and Third Party Impacts**
- **Cost of Administration and Monitoring**

Water Banking “Checklists”

Project Need

- Protect existing uses and infrastructure
- Prevent fully appropriated status in future
- Allow for future development
- Achieve sustainability in non-hydrologically connected areas
- Provide consistency in water accounting across entire Coalition area, and prevent “moving targets”
- Meet specific flow need at specific time
- Always maintain local control over banking

Water Banking “Checklists”

Project Need - Assignment

- **Prior to next workshop, come up with your own list of project needs**
- **What would YOU like a water bank to do for you?**

Questions?

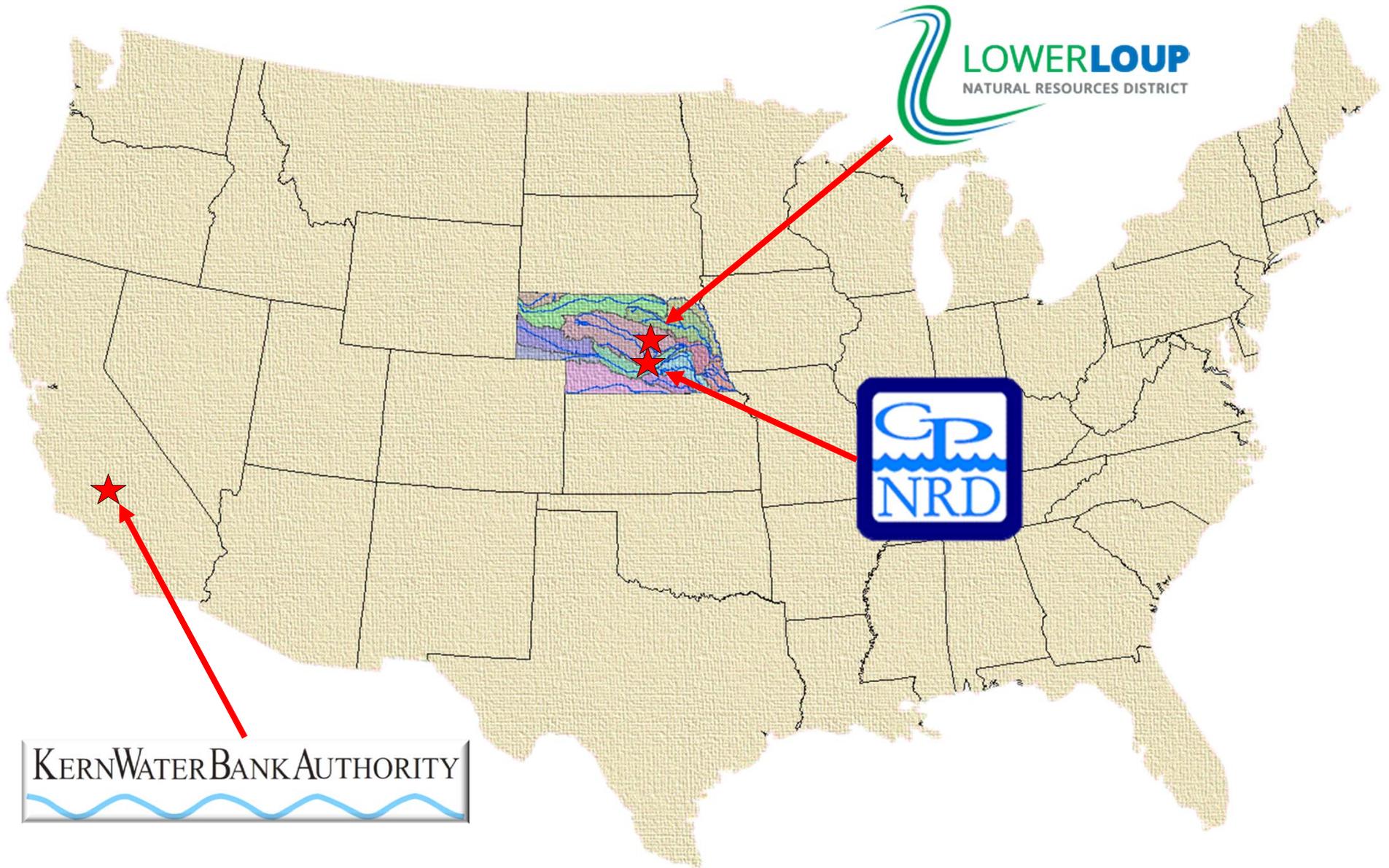




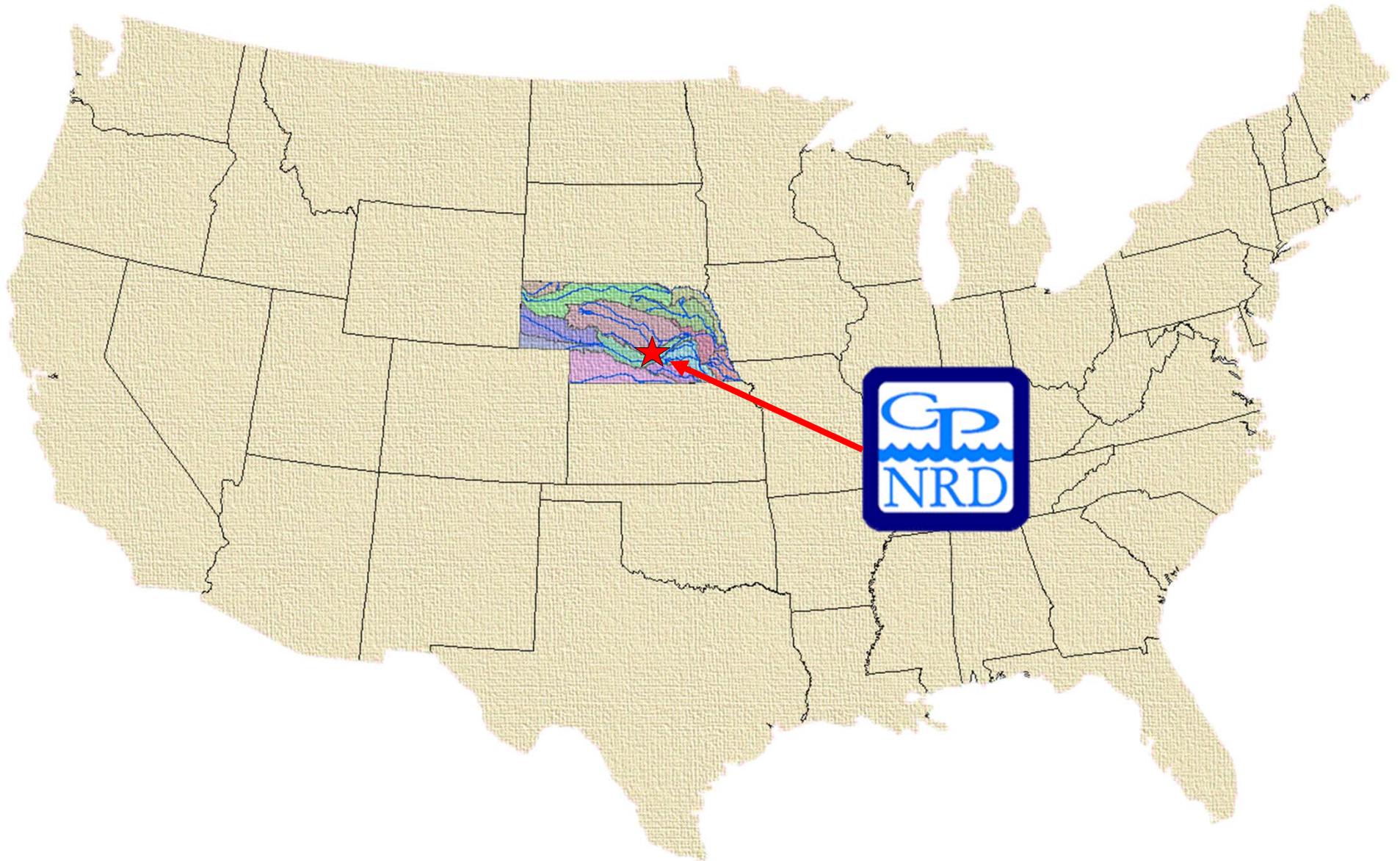
02

Example Water Banks

Water Banking “Checklists”

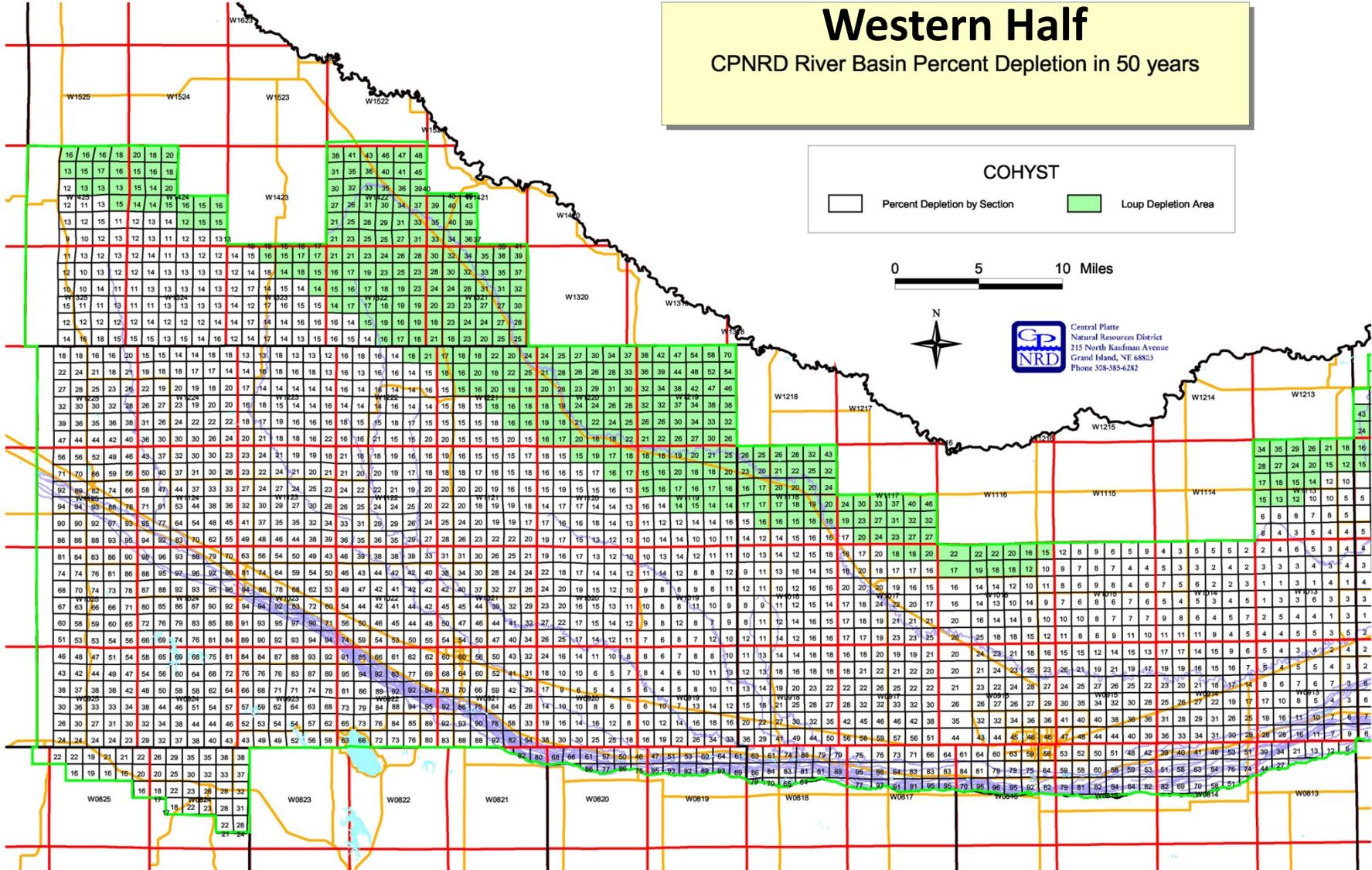


Water Banking “Checklists”





Central Platte NRD Water Bank





Central Platte NRD Water Bank

Eastern Half

CPNRD River Basin Percent Depletion in 50 years

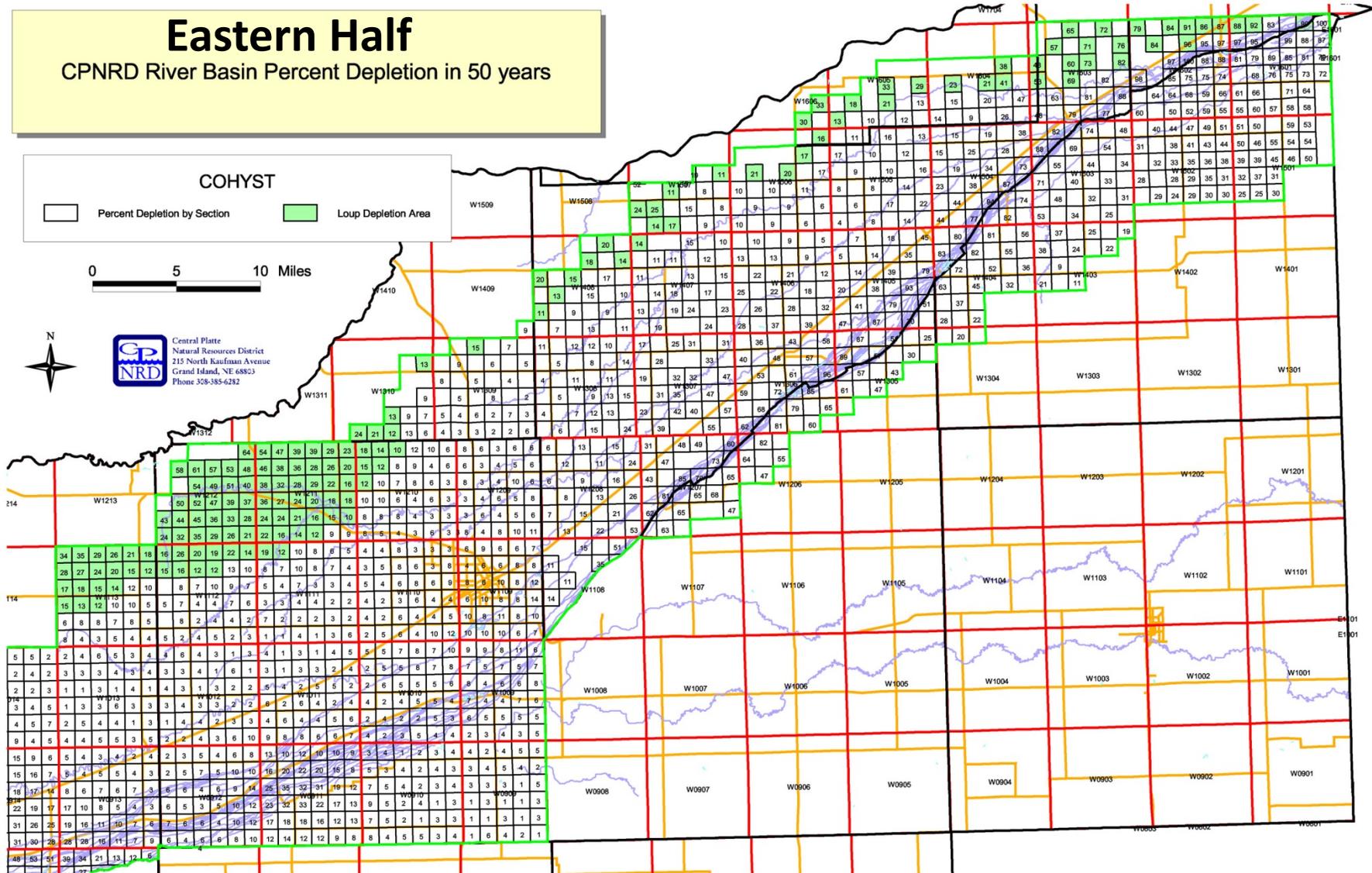
COHYST

Percent Depletion by Section Loup Depletion Area

0 5 10 Miles



Central Platte
Natural Resources District
215 North Kaufman Avenue
Grand Island, NE 68823
Phone 308-385-6282





Central Platte NRD Water Bank

- **Project Need**
- **Management and Operation**
- **Strategic Policy**
- **Geographic Area and Participant Eligibility**
- **Operational Policy and Market Creation**
- **Encourage Irrigator Participation**
- **Environmental and Third Party Impacts**
- **Cost of Administration and Monitoring**



Central Platte NRD Water Bank

Project Need

- **Overappropriated and Fully Appropriated directives to reduce depletions to Platte River**
- **Platte River Recovery and Implementation Program (PRRIP) target flow responsibilities for critical reach**
- **Flexibility in allowing future development while meeting depletion goals**



Central Platte NRD Water Bank

Management and Operation

- **Owned by NRD**
- **Water Bank is linked with transfer program – similar to LLNRD**
- **Permanent conservation easements used to retire groundwater irrigation**
- **Temporary water bank deposits would be protected by exception to 2 out of 10 rule**
- **Surface water may be included in future**



Central Platte NRD Water Bank

Strategic Policy

- **Reduce the need to regulate irrigators via voluntary transfers**
- **Water Bank accounting used in transfers and conjunctive use actions**
- **Permanent retirement of groundwater use includes title search and lienholder check (usually about \$350)**
- **Other charges on case-by-case basis**



Central Platte NRD Water Bank

Geographic Area and Participant Eligibility

- **Any certified surface water rights, groundwater irrigated lands, or comingled irrigated lands within OA or FA areas eligible**
- **Preference given to areas in overappropriated reach above Elm Creek**



Central Platte NRD Water Bank

Operational Policy and Market Creation

- **Certification process, along with stream depletion estimates, establishes bankable quantities**
- **NRD sets price for water bank transactions (currently \$8,000/af of depletion) using land rental rates and other information**



Central Platte NRD Water Bank

Encourage Irrigator Participation

- Initial roll-out of water bank included educational outreach
- Now, word-of-mouth and experience continues to generate significant activity (about 2,400 af banked as of Aug. 2014)
- Transfer program used by irrigators
- Temporary water bank enrollments could be used by irrigators in future



Central Platte NRD Water Bank

Environmental and Third Party Impacts

- **CPNRD Water Bank designed to enhance Platte River flows through depletion reductions**
- **Third party impacts (from reduced irrigated acres) likely much smaller than economic impacts from large-scale regulation**



Central Platte NRD Water Bank

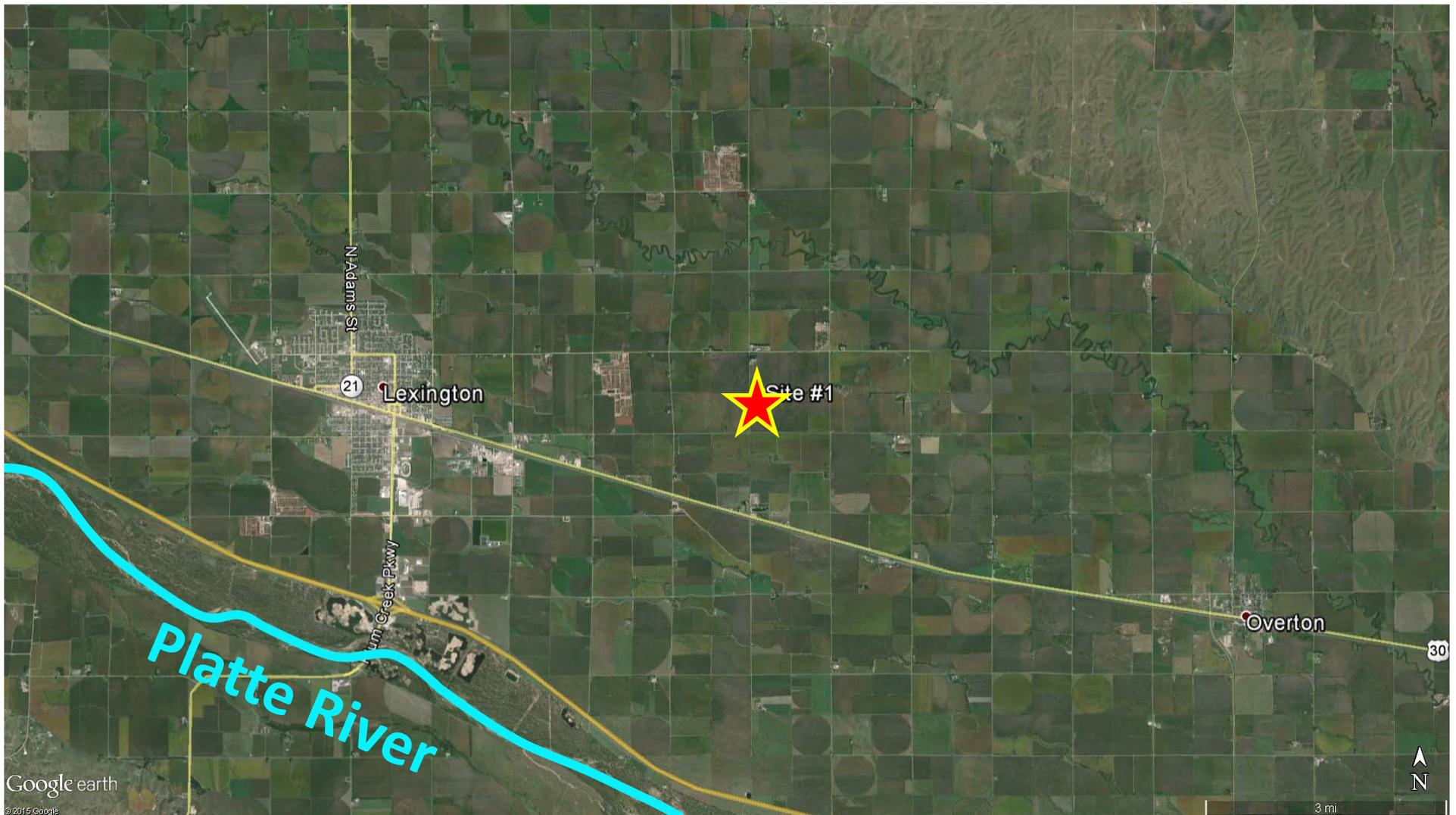
Cost of Administration and Monitoring

- **NRD staff maintains records of water transfer amounts, and tracks deposits made into water bank**
- **Annual aerial flyovers using digital infrared imagery**
- **Field checks performed when necessary to confirm irrigation status**



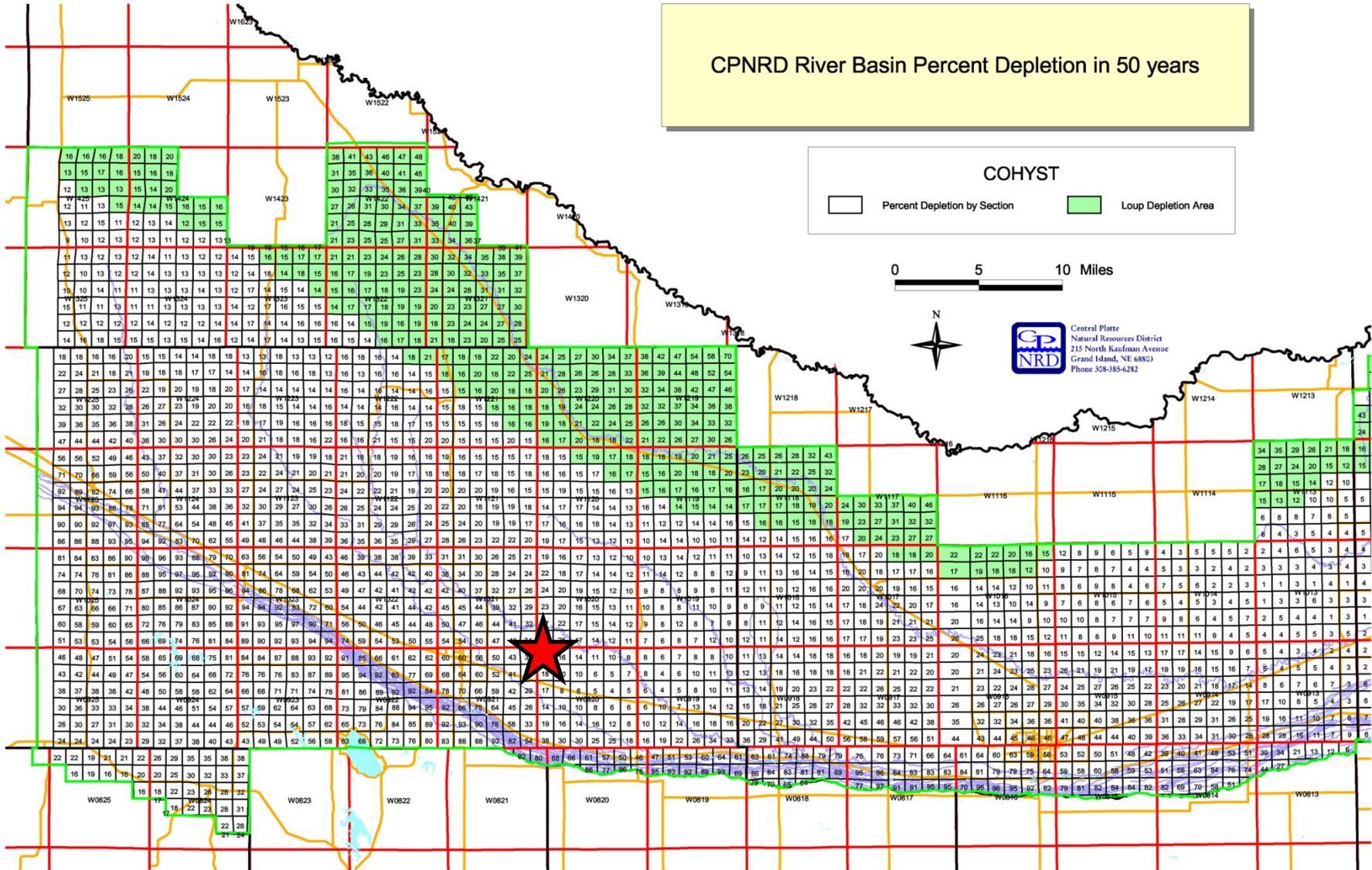
Central Platte NRD Water Bank

Example Water Bank Transaction



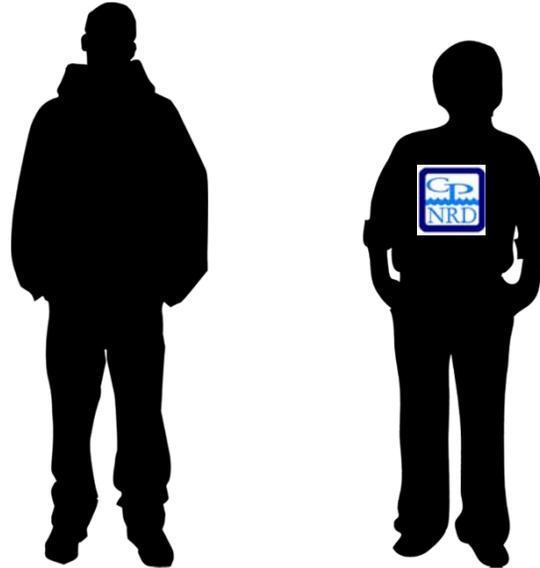


Central Platte NRD Water Bank





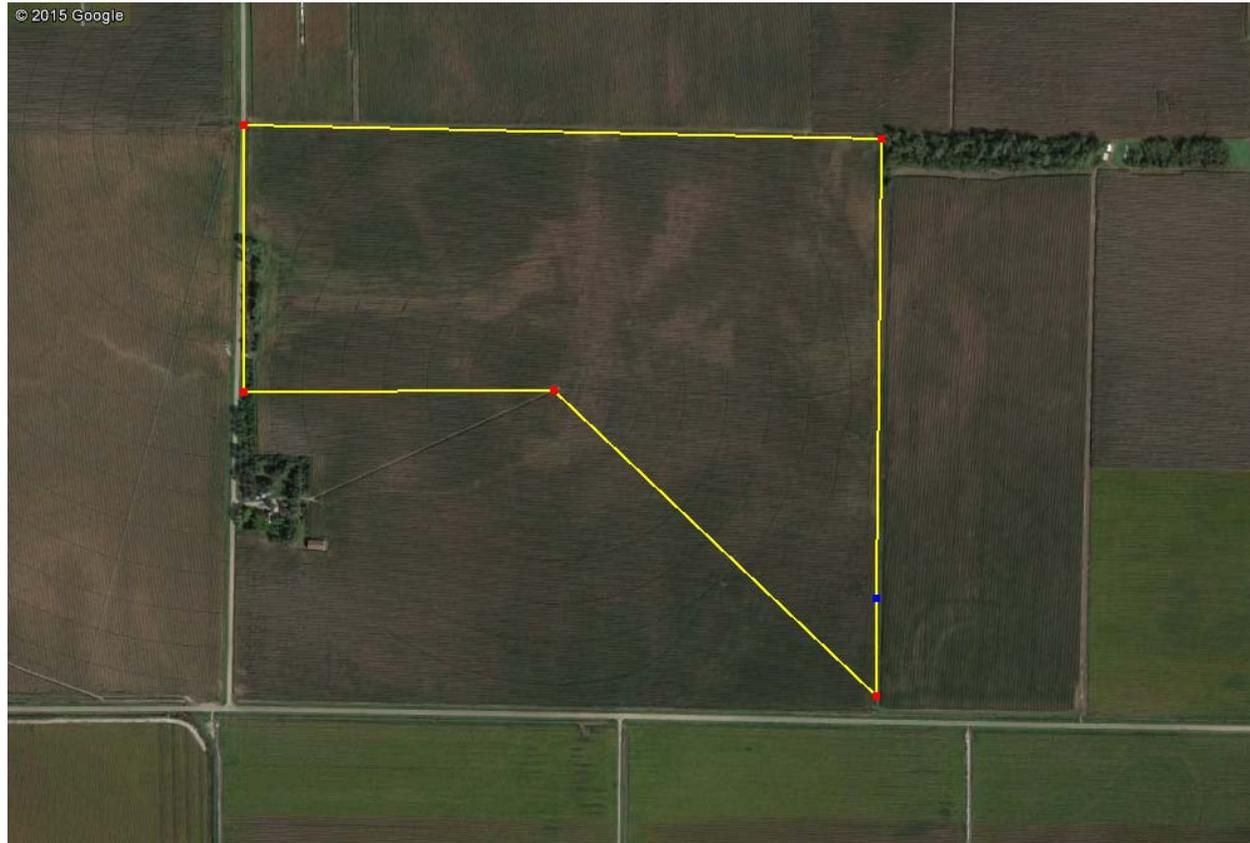
Central Platte NRD Water Bank



- **Irrigator initiates process – voluntary**
- **CPNRD Staff evaluates particular tract to determine change in depletions to river**



Central Platte NRD Water Bank



- **100 certified acres**
- **Convert from irrigated to dryland corn**



Central Platte NRD Water Bank

Present Conditions

Township	Range	Section	Crop	Acres	
<input type="text" value="9"/>	<input type="text" value="20"/>	<input type="text" value="6"/>	<input type="text" value="Irrigated Corn"/>	<input type="text" value="100"/>	<input type="button" value="⊖"/>

Future Conditions

Township	Range	Section	Crop	Acres	
<input type="text" value="9"/>	<input type="text" value="20"/>	<input type="text" value="6"/>	<input type="text" value="Dryland Corn"/>	<input type="text" value="100"/>	<input type="button" value="⊖"/>

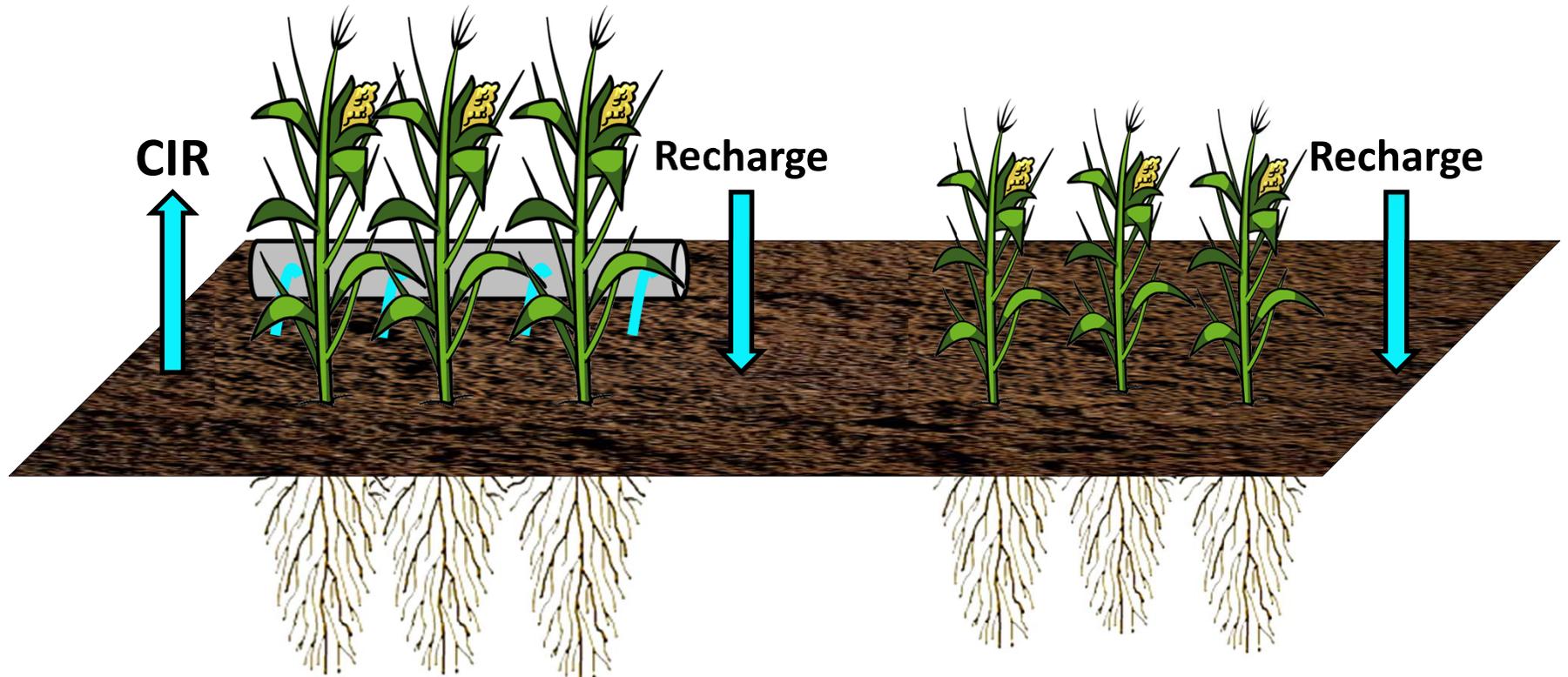
Computed CIR Offsets										
Township	Range	Section	Crop(ID)	Acres	CIR(IN)	Recharge(IN)	GW Withdrawal(AF)	Platte River Depletion (Percent)	Estimated Net Depletion (AF)	
Present Conditions										
9	20	6	Irrigated Corn (icrn)	100	10.33382	7.2	26.11517	24	6.26764059	
Total Present Conditions				100			26.11517		6	
Future Conditions										
9	20	6	Dryland Corn (dcrn)	100	0	1.5	-12.5	24	-3	
Total Future Conditions				100			-12.5		-3	
Net Value (AF)							-9			



Central Platte NRD Water Bank

Irrigated

Dryland



CIR = 10.33 in
Recharge = $\frac{7.20 \text{ in}}{}$
Net Groundwater Withdrawal = 3.13 in

CIR = 0 in
Recharge = $\frac{1.50 \text{ in}}{}$
Net Groundwater Recharge = 1.50 in

$3.13 \text{ in} \times (1 \text{ ft}/12 \text{ in}) \times 100 \text{ acres} = 26.1 \text{ af}$

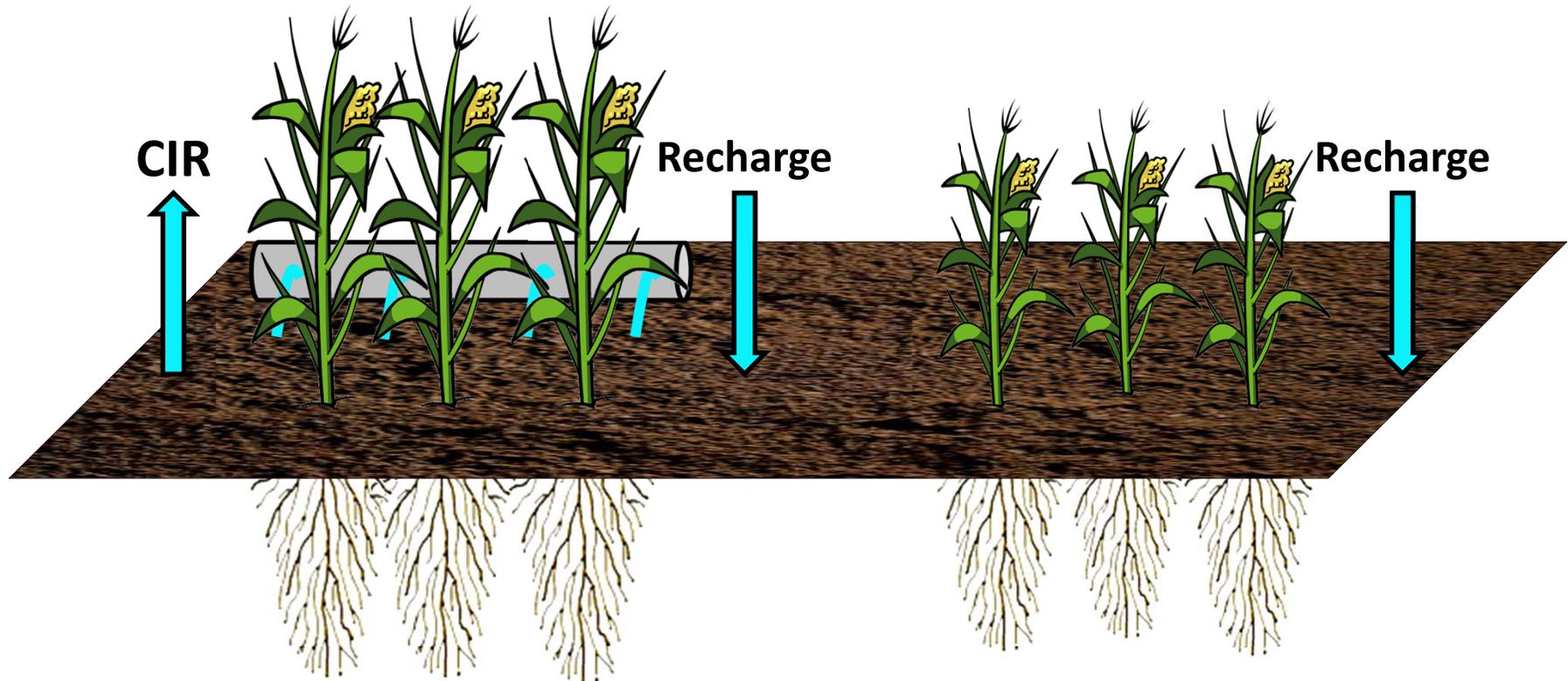
$1.5 \text{ in} \times (1 \text{ ft}/12 \text{ in}) \times 100 \text{ acres} = 12.5 \text{ af}$



Central Platte NRD Water Bank

Irrigated

Dryland



Net Groundwater Withdrawal = 26.1 af Net Groundwater Recharge = 12.5 af

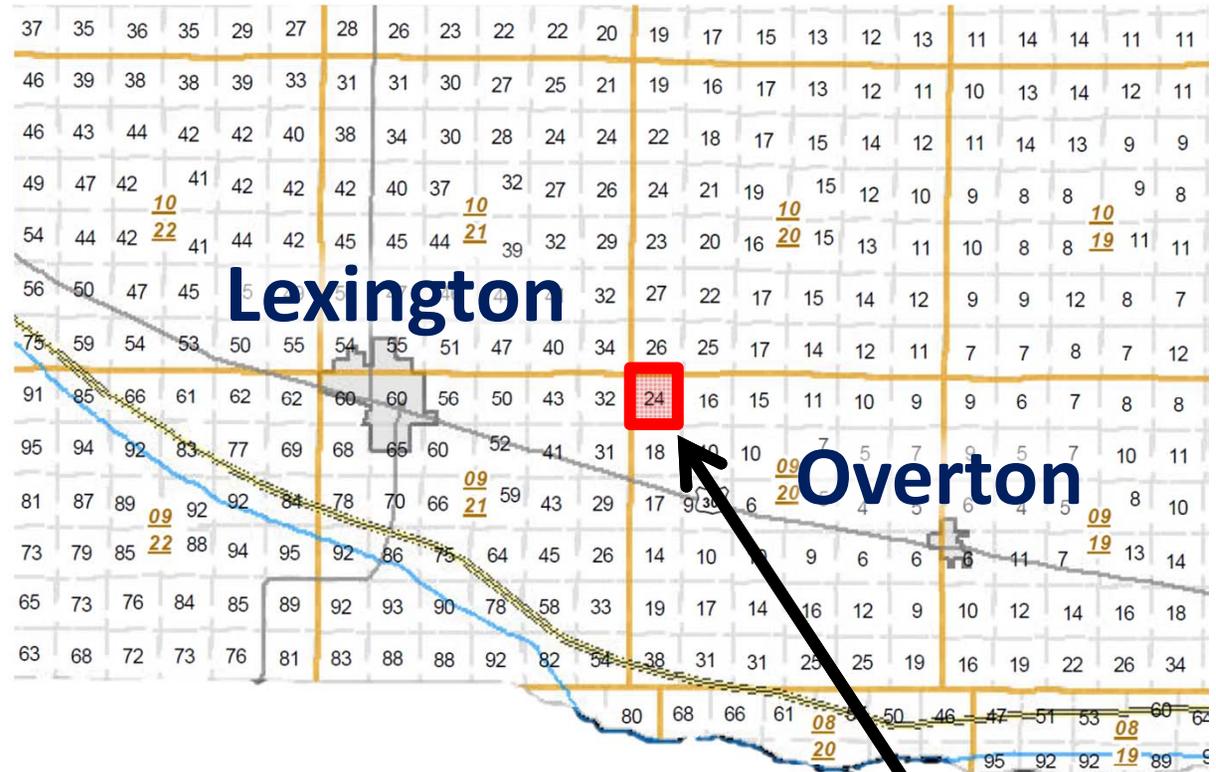
Net Change to Aquifer = Aquifer Withdrawal + Groundwater Recharge
= 26.1 af + 12.5 af = 38.6 af



Central Platte NRD Water Bank

38.6 af × 24%

9.27 af
reduction in
depletions



Stream Depletion Factor (SDF) = 24%

Net Change to Aquifer = Aquifer Withdrawal + Groundwater Recharge
 = 26.1 af + 12.5 af = **38.6 af**



Central Platte NRD Water Bank

- **Current water bank price \$8,000/af**
- **Previously able to coordinate with AWEP (Agricultural Water Enhancement Program) in some situations to enhance payments**
- **Potential for similar coordination with new Regional Conservation Partnership Program (RCPP) created by new farm bill**



Central Platte NRD Water Bank

- Assume only CPNRD funds available
 - $\$8,000/\text{af} \times 9.27 \text{ af} = \$74,160$





Central Platte NRD Water Bank

- Water Bank form for permanent transfer – sign with notary
- Agreement for Sale & Purchase of Conservation Easement
- Title search and insurance
- County resolution approving easement
- Closing Statement, and additional forms

IRRIGATION CPNRD 1/08

REQUEST FOR VARIANCE/TRANSFERS LOCATION OF USE
of the Rules and Regulations of the Central Platte Natural Resources District for Closing the Management Area to the Issuance of New Well Permits and for Preventing Expansion of Irrigated Acres

NRD USE ONLY Request #: _____ Date received: _____ X for Permit #: _____ Field ID #: _____ Well Permit #: _____	1. NAME _____ ADDRESS _____ CITY, STATE, ZIP _____ PHONE NUMBER _____
---	--

2. REASON FOR REQUESTING VARIANCE _____

3. INDICATE THE USE (circle one) Domestic Livestock Irrigation Other (specify) _____

4. IDENTIFY LOCATION OF LAND WATER WILL BE TRANSFERRED TO
County: _____
Field ID #: _____ 1/4 of the _____ 1/4 of the _____ 1/4 of Section _____ Township _____ north Range _____ west
If not crop land, indicate present use: _____
Number of proposed new acres to be irrigated: _____
*Indicate the land that will be irrigated at new location on attached aerial photo of the section.
Also indicate with an "X" the location of any existing and proposed (new) well(s) on attached aerial photo.
-This permit does not allow applicant to violate statutory spacing-*
NRD Use % of depletion _____

5. IDENTIFY LOCATION OF LAND WATER WILL BE TRANSFERRED FROM (OFFSET)
County: _____
Field ID #: _____ 1/4 of the _____ 1/4 of the _____ 1/4 of Section _____ Township _____ north Range _____ west
(If more than one location, use Attachment A on Page 3 to list those acres and list by priority.)
Number of irrigated acres used for offset: _____
Field ID #: _____ (if applicable)
Crop Type: _____
NRD Use % of depletion _____

PAGE 1 OF 5



Central Platte NRD Water Bank

- **Any well decommissioned or changed to stock well (less than 50 gpm)**
- **Deed of Conservation Easement and County Resolution filed with County Register of Deeds**
- **Aerial infrared photography (annual) and field checks can be used to confirm permanent dryland operations**

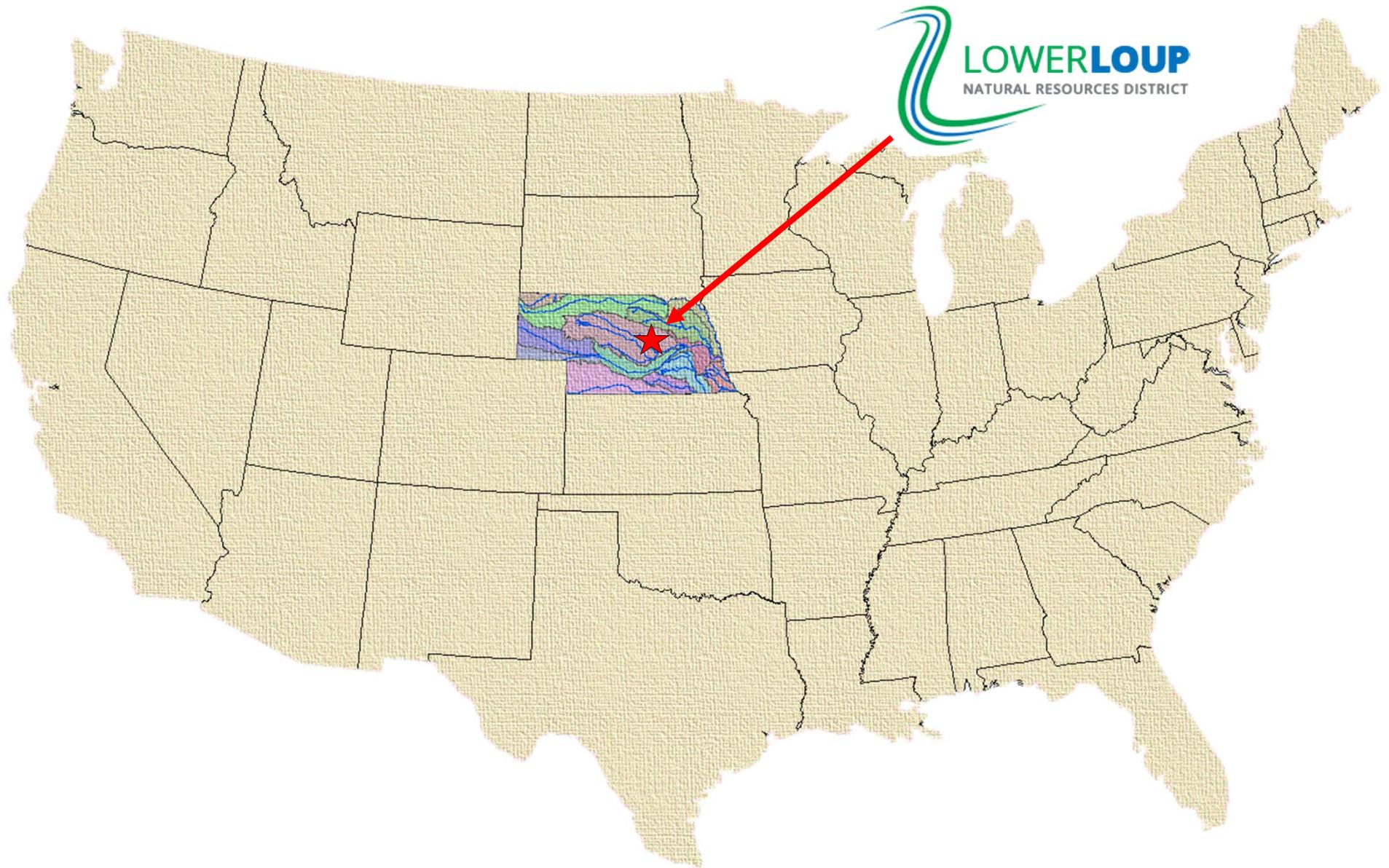


Central Platte NRD Water Bank

Summary

- **Established bank that uses consistent accounting methods with water transfer program**
- **Created to respond to IMP and Platte Program requirements**
- **Evolving to provide additional flexibility with new sources and additional purposes**

Water Banking “Checklists”

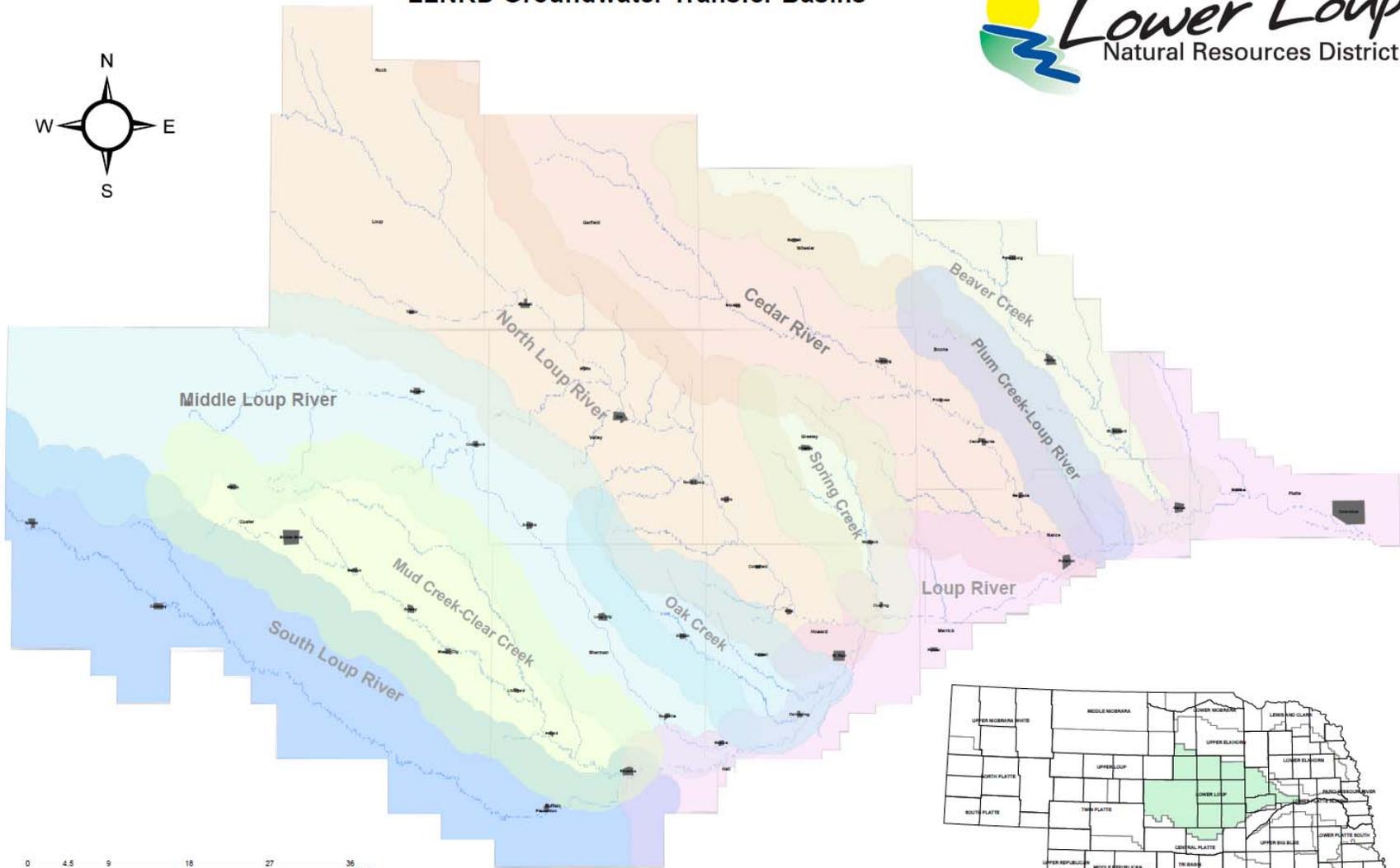
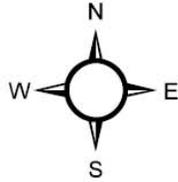




Lower Loup NRD Water Bank

Draft 12/7/2010

LLNRD Groundwater Transfer Basins





Lower Loup NRD Water Bank

- **Project Need**
- **Management and Operation**
- **Strategic Policy**
- **Geographic Area and Participant Eligibility**
- **Operational Policy and Market Creation**
- **Encourage Irrigator Participation**
- **Environmental and Third Party Impacts**
- **Cost of Administration and Monitoring**



Lower Loup NRD Water Bank

Project Need

- **2008 Fully Appropriated Determination**
- **April 8, 2009 DNR Reversal Order**
- **LB 483 (April 6, 2009) provisions limiting expansion of irrigated acres**
- **Transfer Program, and Water Bank, established in part to allow for growth, while encouraging efficiency**



Lower Loup NRD Water Bank

Management and Operation

- **Owned by NRD**
- **Water Bank is component of transfer program**
- **NRD not a broker, but provides information on transfer opportunities**
- **Mainly groundwater uses deposited into bank, but some transfers involving relinquishment of surface water right**



Lower Loup NRD Water Bank

Strategic Policy

- **Allow for growth, along with efficiency**
- **Could provide offsets if NRD ever determined fully appropriated**
- **Title searches required for transfers, along with \$300 per transaction fee**
- **Some transfers require case-by-case arrangements, and may require variances and additional fees**



Lower Loup NRD Water Bank

Geographic Area and Participant Eligibility

- Any part of NRD can be involved in water transfers, as long as certified acres
- Only can transfer downstream, and within same basin
- No increase in irrigated acres from transfer
- Right to irrigate cannot be transferred to wellfield protection area
- Certified groundwater use is primary water source for transfers, but surface water can play a role in the case of surface water relinquishment



Lower Loup NRD Water Bank

Operational Policy and Market Creation

- **Infrared photography via annual flyovers can be used to verify transfer activities**
- **Transfer prices determined between buyer and seller, so water bank deposits also do not include a set price**
- **NRD only collects fees associated with administrative costs – not related to worth of water**



Lower Loup NRD Water Bank

Encourage Irrigator Participation

- **NRD provides educational materials on water transfer program**
- **Most of outreach occurred via word-of-mouth**
- **Irrigators can benefit directly from transfer program**
- **Banked water currently being reserved to meet future needs**



Lower Loup NRD Water Bank

Environmental and Third Party Impacts

- **Transfer actions may be creating environmental benefits, through transferring water from marginal ground to more stable, productive ground**
- **All transfers now require NRCS consultation to determine if land that water is transferred to is Highly Erodible Land (HEL). If so, conservation plan required. Plans are tied to deed.**



Lower Loup NRD Water Bank

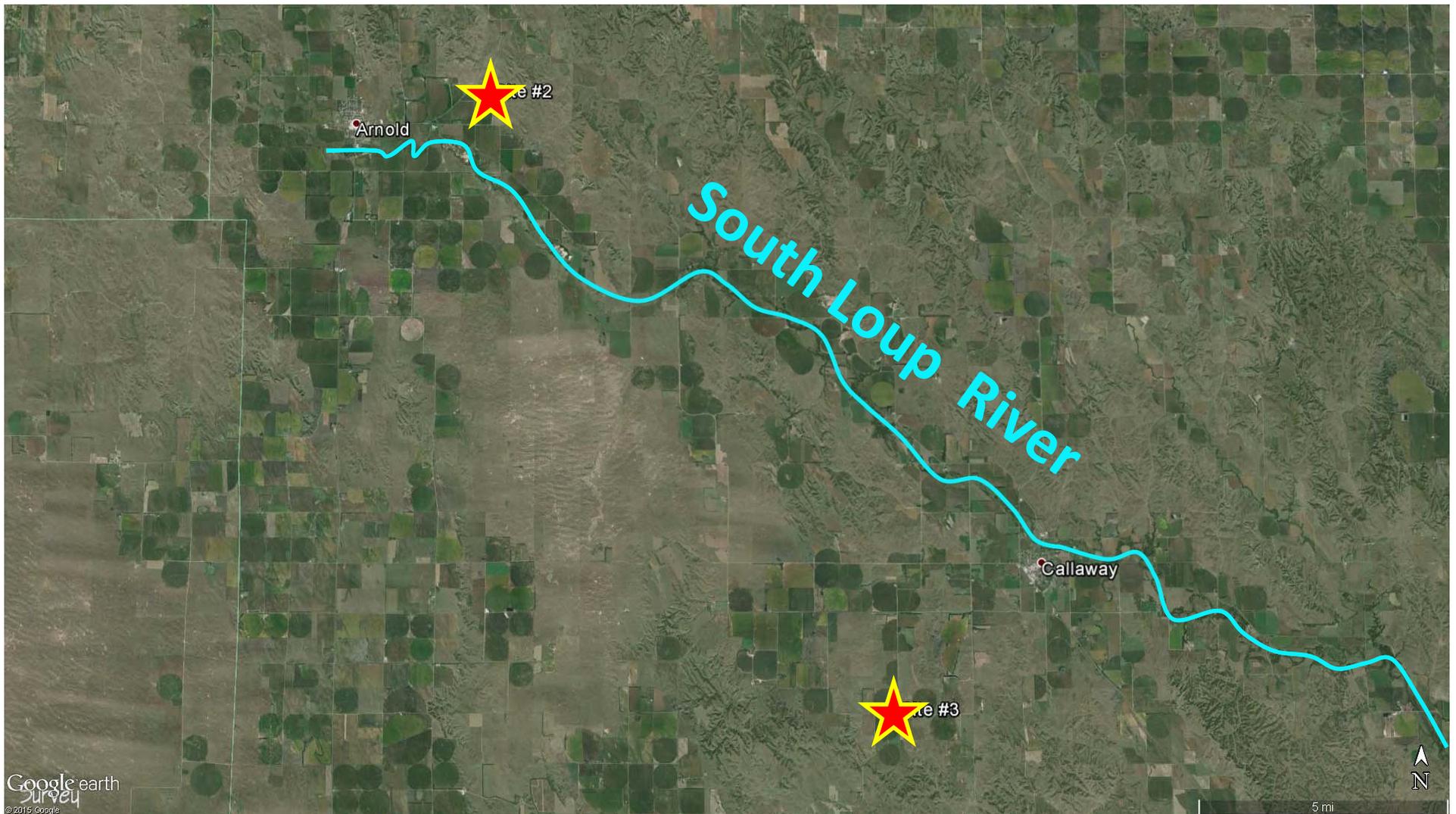
Cost of Administration and Monitoring

- **NRD staff maintains records of water transfer amounts, and tracks deposits made into water bank**
- **Field verification and infrared aerial flyovers some of monitoring and enforcement tools used with transfers**



Lower Loup NRD Water Bank

Example Water Bank Transaction

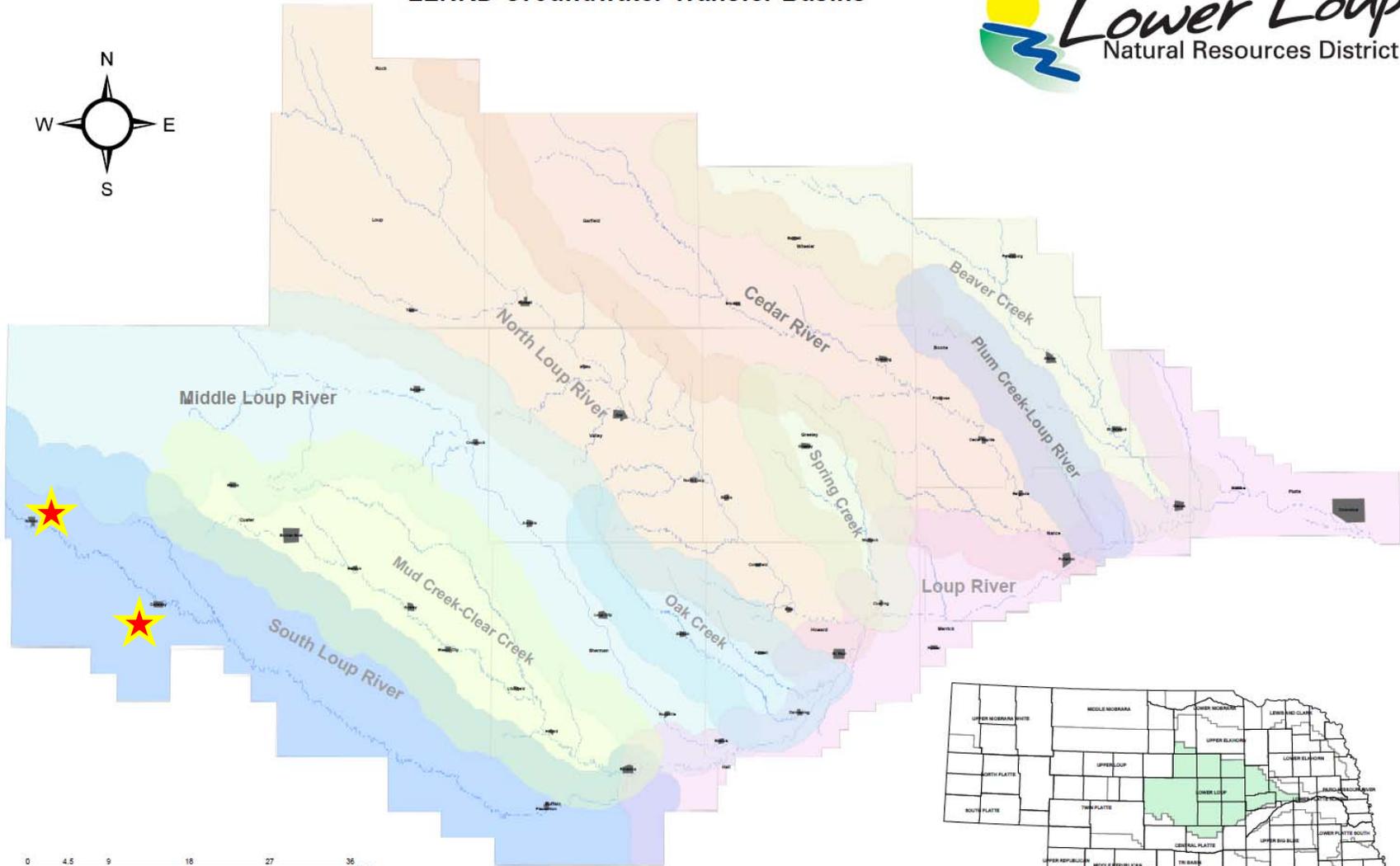
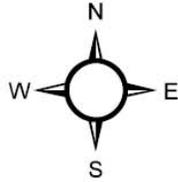




Lower Loup NRD Water Bank

Draft 12/7/2010

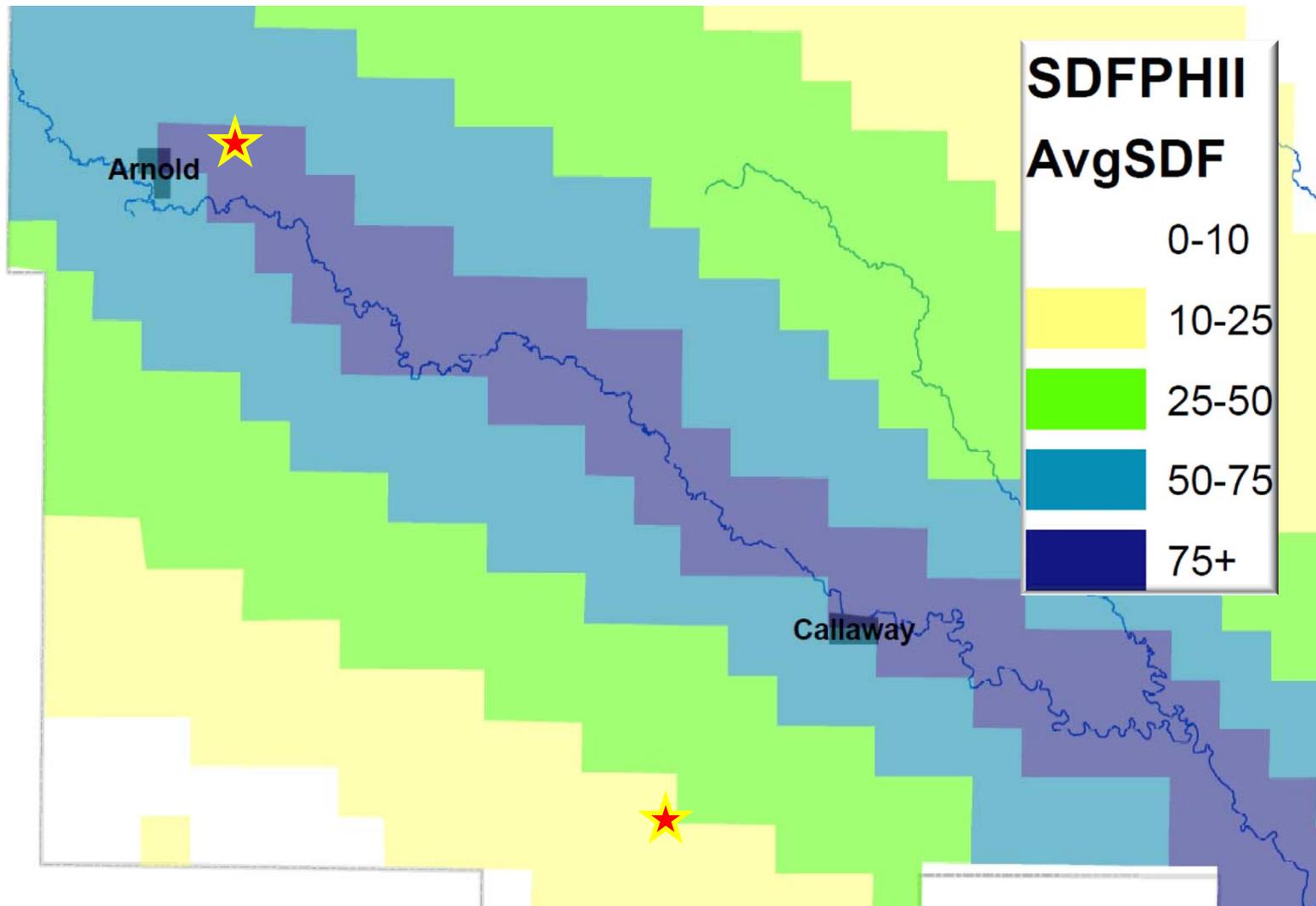
LLNRD Groundwater Transfer Basins





Lower Loup NRD Water Bank

Example Water Bank Transaction





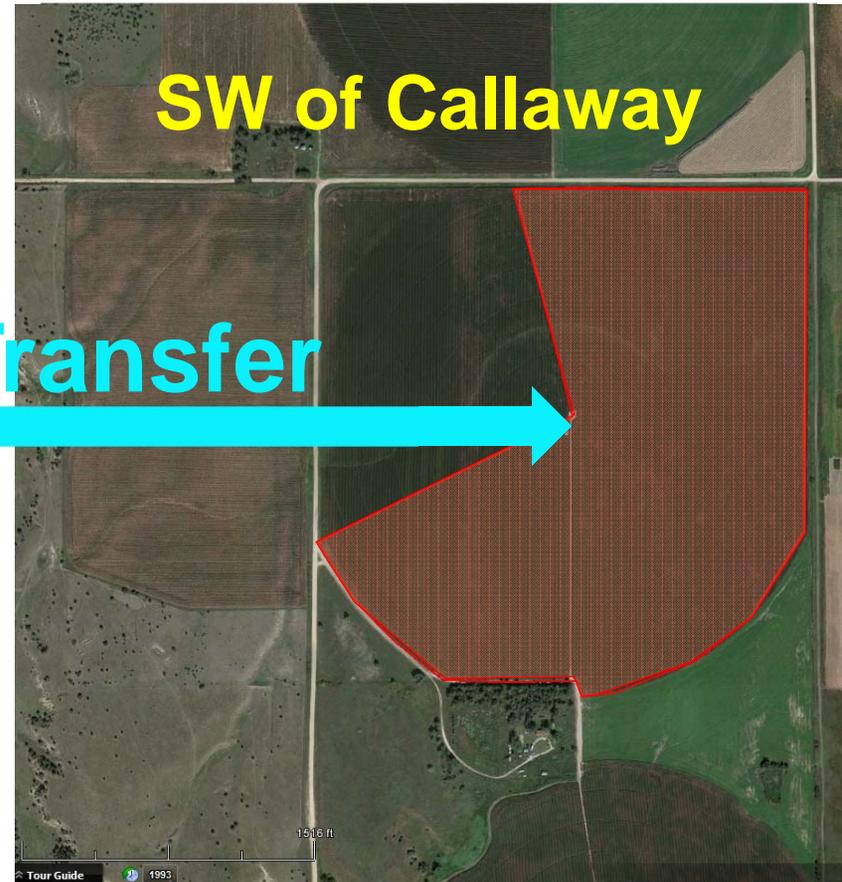
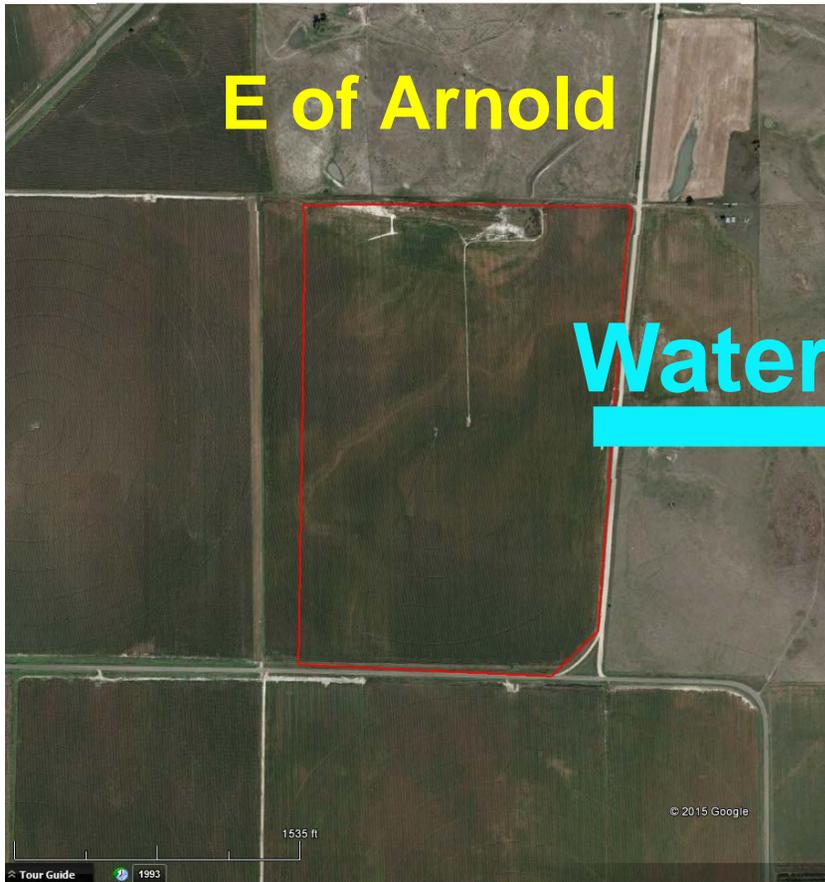
Lower Loup NRD Water Bank



- **Irrigators initiate transfer process between each other**
- **LLNRD can help irrigators locate transfer properties and facilitate transfers**



Lower Loup NRD Water Bank



Water Transfer



100 certified acres
Convert to dryland



100 dryland acres
Convert to irrigated



Lower Loup NRD Water Bank

- **Submit *Request for Transfer* form with \$300 fee**

REQUEST FOR TRANSFER

	2620 Airport Drive, POB 210 Ord, Nebraska 68862 Phone (308) 728-3221 Fax (308) 728-5669 www.llnrd.org
---	--

Prior to submittal of this request, all certified acres in question must be certified correctly.
 All requests for transfer must be accompanied by the \$300 transfer fee.
 NRD will have a title search completed on the Receiving and Transferring legals. Cost of title search is NOT included in the \$300 fee. It is extra and each landowner will be responsible for payment of the search done on their property.

Landowner Receiving Acres from Transfer: Please list name as it appears on the Title.

Landowner: _____ Phone#: _____
 Address: _____ Email: _____
 Contact if other than listed above: _____
 Field Information: _____
 _____ Section _____ Township _____ Range _____ County _____

Landowner Providing Acres for Transfer: Please list name as it appears on the Title.

Landowner: _____ Phone#: _____
 Address: _____ Email: _____
 Contact if other than listed above: _____
 Field Information: _____
 _____ Section _____ Township _____ Range _____ County _____

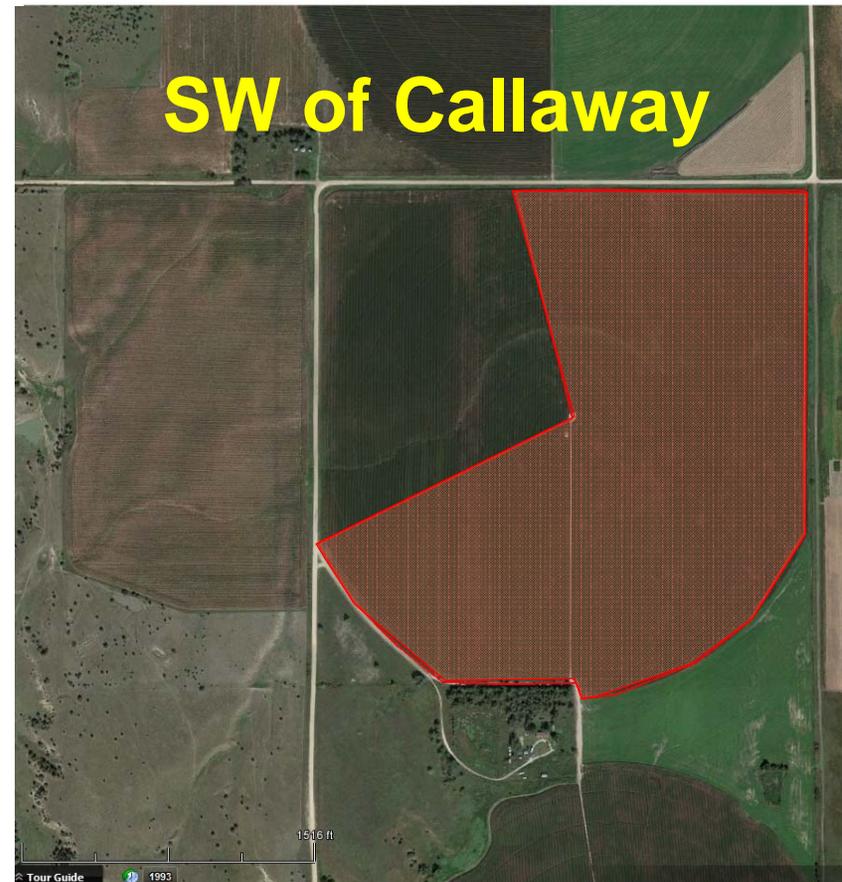
Explanation of Transfer Request: Include number of acres. Use additional pages if needed.

I agree to allow the Lower Loup NRD access to my NRCS records.
 Applicant Signature _____ Date _____



Lower Loup NRD Water Bank

- **Highly Erodible Land (HEL) determination from NRCS** 
- **If land found to be highly erodible, a conservation plan is required**
- **HEL determination and conservation plan filed with NRD**





Lower Loup NRD Water Bank

E of Arnold

SW of Callaway

- Title search completed for both tracts
- Irrigators pay for title search costs as well
- Any liens require lienholder consent





Lower Loup NRD Water Bank

E of Arnold

17	17	25	W	17-17-25W	SouthLoup	75%
18	17	25	W	18-17-25W	SouthLoup	74%
19	17	25	W	19-17-25W	SouthLoup	66%
20	17	25	W	20-17-25W	SouthLoup	71%
21	17	25	W	21-17-25W	SouthLoup	74%
22	17	25	W	22-17-25W	SouthLoup	75%
23	17	25	W	23-17-25W	SouthLoup	77%
24	17	25	W	24-17-25W	SouthLoup	77%
25	17	25	W	25-17-25W	SouthLoup	83%
26	17	25	W	26-17-25W	SouthLoup	79%
27	17	25	W	27-17-25W	SouthLoup	74%
28	17	25	W	28-17-25W	SouthLoup	68%
29	17	25	W	29-17-25W	SouthLoup	62%
30	17	25	W	30-17-25W	SouthLoup	56%

SW of Callaway

22	15	23	W	22-15-23W	SouthLoup	41%
23	15	23	W	23-15-23W	SouthLoup	47%
24	15	23	W	24-15-23W	SouthLoup	53%
25	15	23	W	25-15-23W	SouthLoup	43%
26	15	23	W	26-15-23W	SouthLoup	38%
27	15	23	W	27-15-23W	SouthLoup	33%
28	15	23	W	28-15-23W	SouthLoup	29%
29	15	23	W	29-15-23W	SouthLoup	25%
30	15	23	W	30-15-23W	SouthLoup	22%
31	15	23	W	31-15-23W	SouthLoup	21%
32	15	23	W	32-15-23W	SouthLoup	23%
33	15	23	W	33-15-23W	SouthLoup	24%
34	15	23	W	34-15-23W	SouthLoup	27%
35	15	23	W	35-15-23W	SouthLoup	31%



77% Stream Depletion Factor



22% Stream Depletion Factor



Lower Loup NRD Water Bank

E of Arnold

- x acres at 77% SDF?
- $0.77x = 0.22(100)$
- $x = 28.57$ acres
- But transferring 100 acres!
- $100 - 28.57 = 71.43$ acres banked

SW of Callaway

- 100 acres at 22% SDF





Lower Loup NRD Water Bank

- ***An Agreement to Transfer Certified Acres & Right to Use Groundwater*** signed by irrigators and NRD
- **Both landowners sign updated *Certification of Irrigated Acres* forms**
 - **Any changes require updated assessor's document**
- **Forms sent to Register of Deeds to reflect transfer, including any conservation plan**

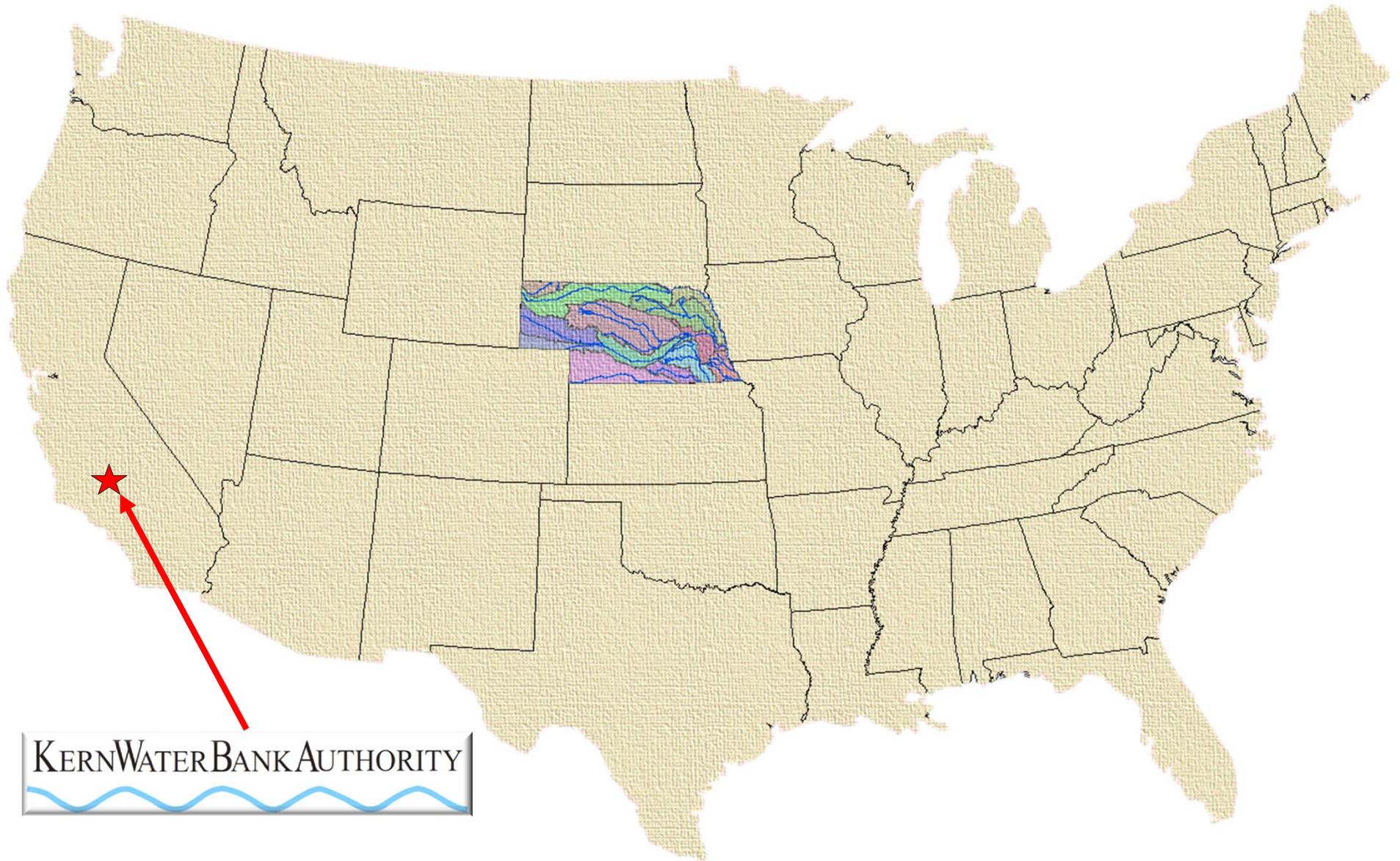


Lower Loup NRD Water Bank

Summary

- **Water bank primarily a component of the larger water transfer program, which has had a great deal of activity**
- **Water bank has banked around 24,000 acres**
- **Created in response to preliminary FA determination and reversal (and LB 483 requirements)**
- **Desire to protect banked acres, while considering new uses for bank**

Water Banking “Checklists”

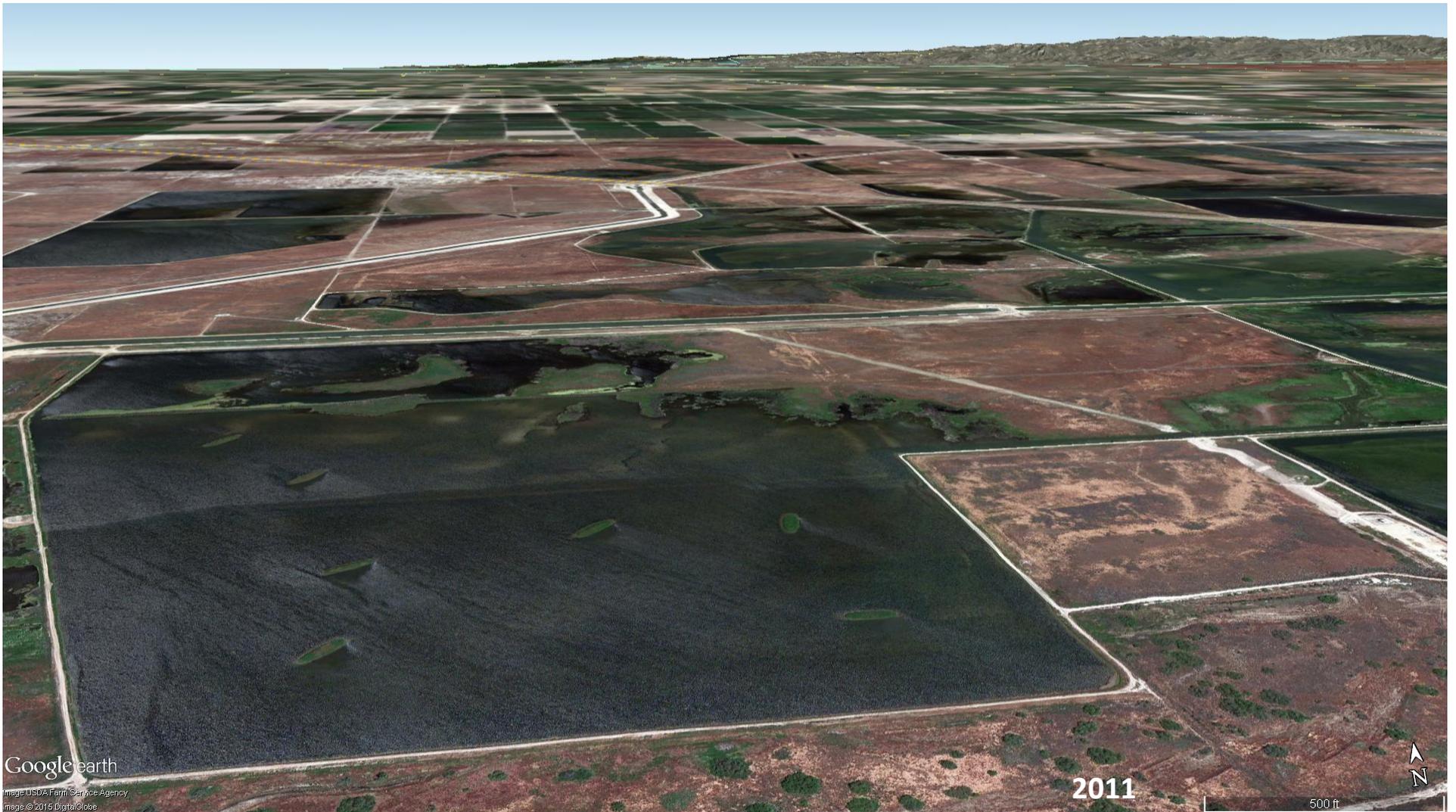


KERN WATER BANK AUTHORITY

KERN WATER BANK AUTHORITY



Kern Water Bank



Google earth

Image: USDA Farm Service Agency
Image © 2015 DigitalGlobe

2011

500 ft



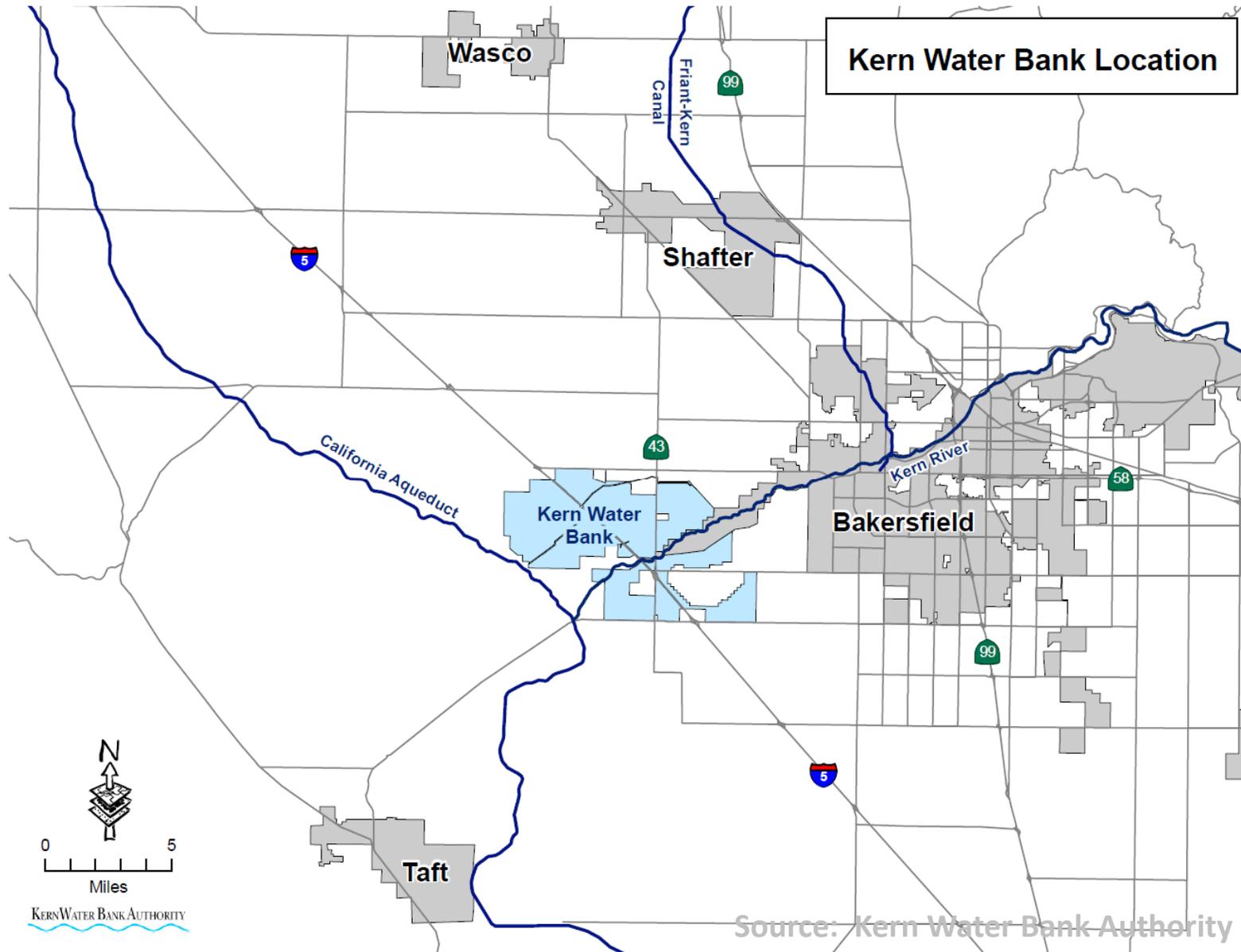
Kern Water Bank



- Established 1995
- Construction Capital Costs: \$77.1 M

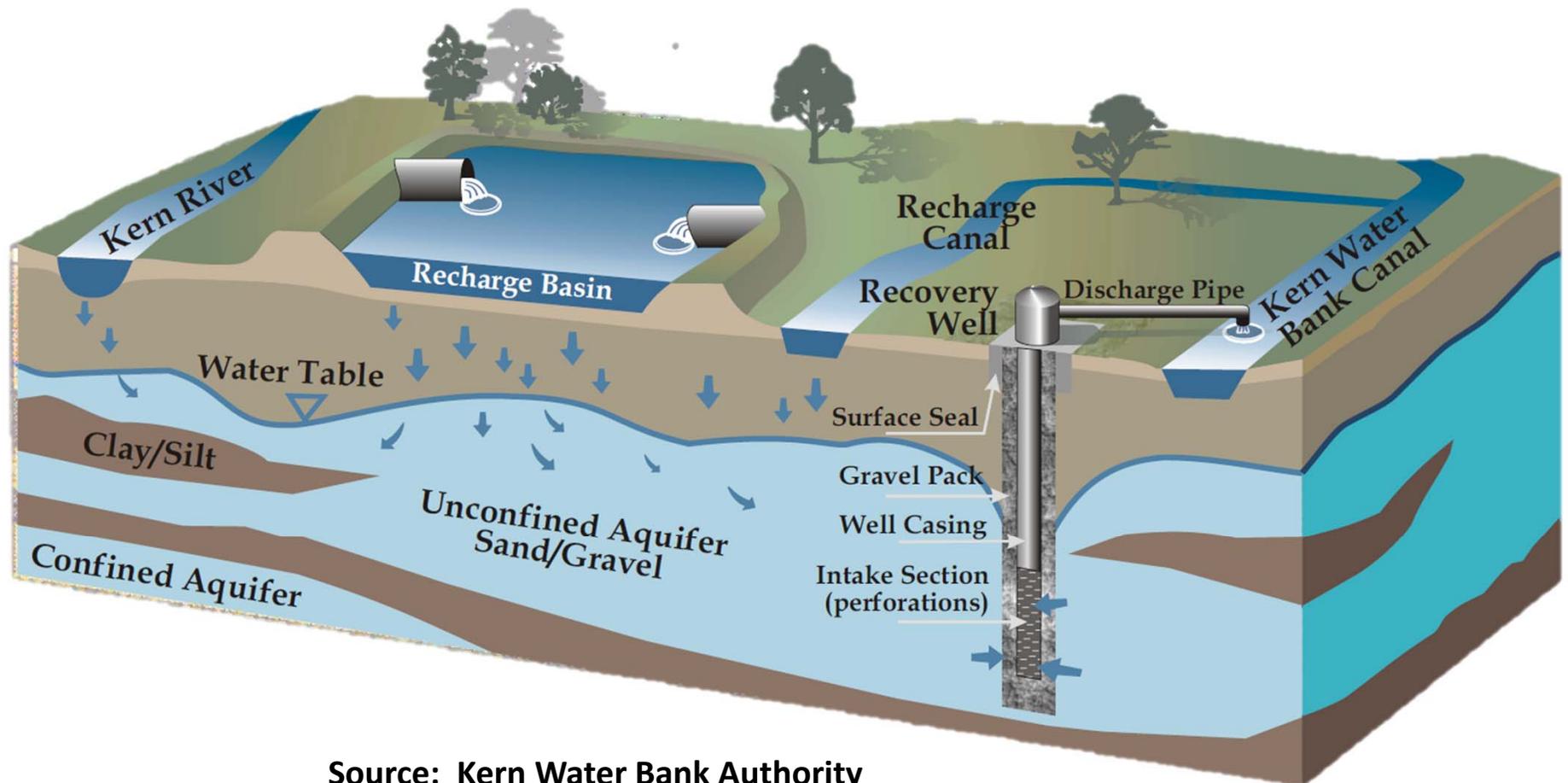
Kern Water Bank

Kern Water Bank



Source: Kern Water Bank Authority

Kern Water Bank

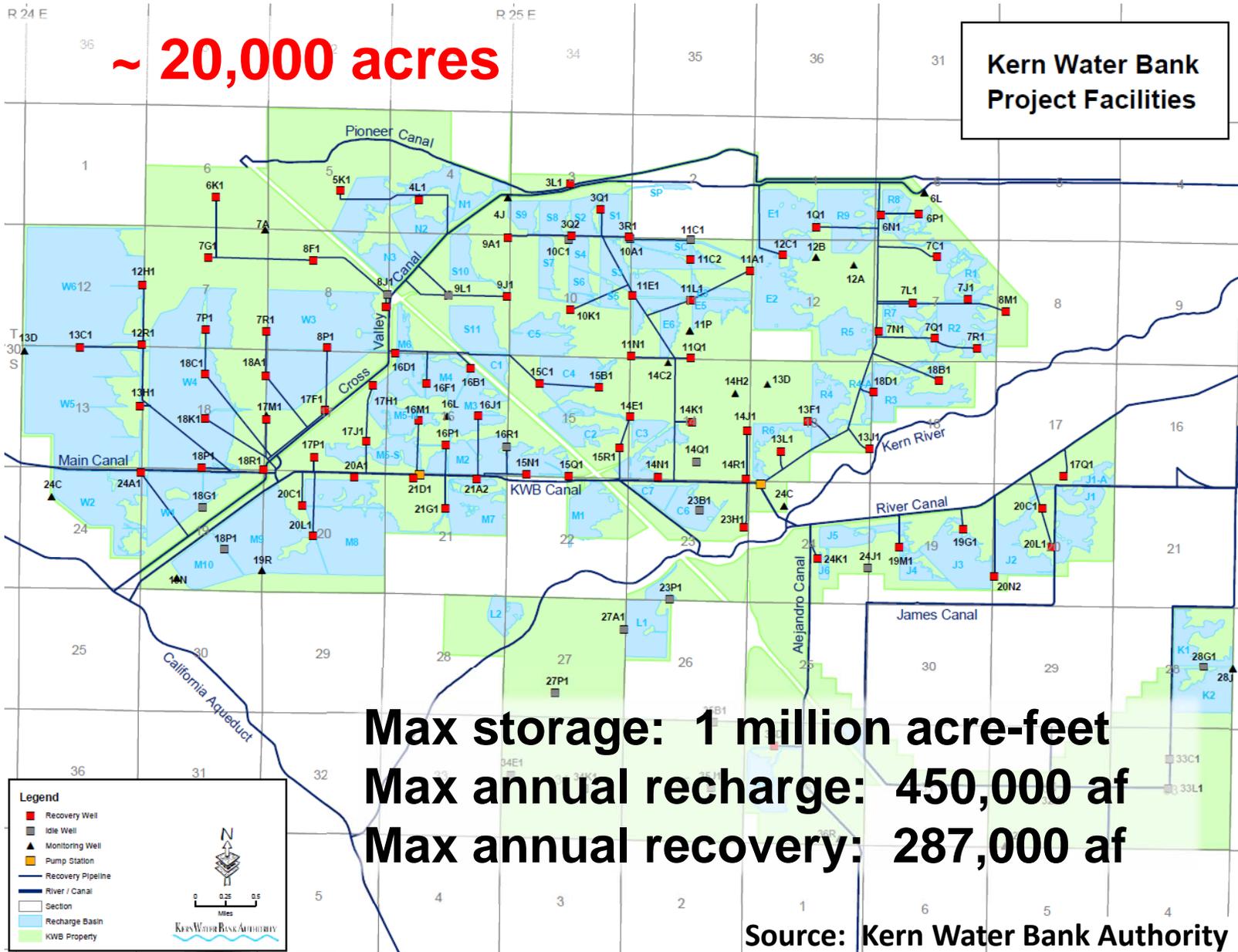


Source: Kern Water Bank Authority

Kern Water Bank

~ 20,000 acres

Kern Water Bank
Project Facilities



Max storage: 1 million acre-feet
Max annual recharge: 450,000 af
Max annual recovery: 287,000 af

Source: Kern Water Bank Authority



Kern Water Bank

- **Project Need**
- **Management and Operation**
- **Strategic Policy**
- **Geographic Area and Participant Eligibility**
- **Operational Policy and Market Creation**
- **Encourage Irrigator Participation**
- **Environmental and Third Party Impacts**
- **Cost of Administration and Monitoring**



Project Need

- **Drought in early 1990s**
- **State Water Project facilities had difficulty meeting demands**
- **1994 Monterey Agreement led to land transfer to local agencies**
- **Need for better flexibility in moving and storing water throughout region**



Management and Operation

- **Owned by Kern Water Bank Authority, a non-profit Joint Powers Authority (JPA)**
- **JPA members include 4 water districts, 1 water agency, 1 mutual water company**
- **Board of Directors governs Authority and oversees operation of Water Bank**
- **Extensive public outreach and education**
- **Monthly public Board meetings**



Strategic Policy

- **Augment available water supplies – particularly in dry years**
- **Underground storage, canals, pipelines, and recharge ponds**
- **Water stored on behalf of members**
- **Per acre-ft charges for recharge and recovery**



Geographic Area and Participant Eligibility

- **Constrained to 6 participating members, but water supplies can originate from vast distances**
- **Three storage accounts**
 - **State Water Project**
 - **Friant-Kern**
 - **Kern River (ephemeral)**



Operational Policy and Market Creation

- **Accounting methodologies established over several decades, with local, state, and federal oversight**
- **Much of infrastructure used to bring water to and from bank is owned by government agencies, who participate in operations of the Bank**



Encourage Irrigator Participation

- **Over 400 farmers benefit directly from the Bank, since member entities include water districts that serve ag water users**



Source: California Department of Water Resources



Environmental and Third Party Impacts

- **California recognizes instream flows as a beneficial use**
- **Construction of water bank created large wetland areas, used by a wide variety of waterfowl (including endangered species)**
- **3,267 acres of Kern Water Bank designated as a Conservation Bank to mitigate for other projects in Valley**



Cost of Administration and Monitoring

- **Kern Fan Monitoring Committee, with assistance from Kern County Water Agency, records and produces annual reports on operations**



Kern Water Bank

Summary

- **Bank is infrastructure-focused (canals, recharge ponds, recovery wells, etc.)**
- **Also established to help with a particular challenge (drought in 1990s), but now being used for multiple purposes**
- **Current litigation challenging the way in which bank used – provide more statewide benefits?**

SUMMARY

- **Water banking means different things in different places**
- **Can be an effective way to facilitate transfers, while protecting existing and future uses of water, with managed oversight**
- **Potential for a broad basinwide accounting system to provide consistency across Coalition, while maintaining local control at NRD level**

Questions?





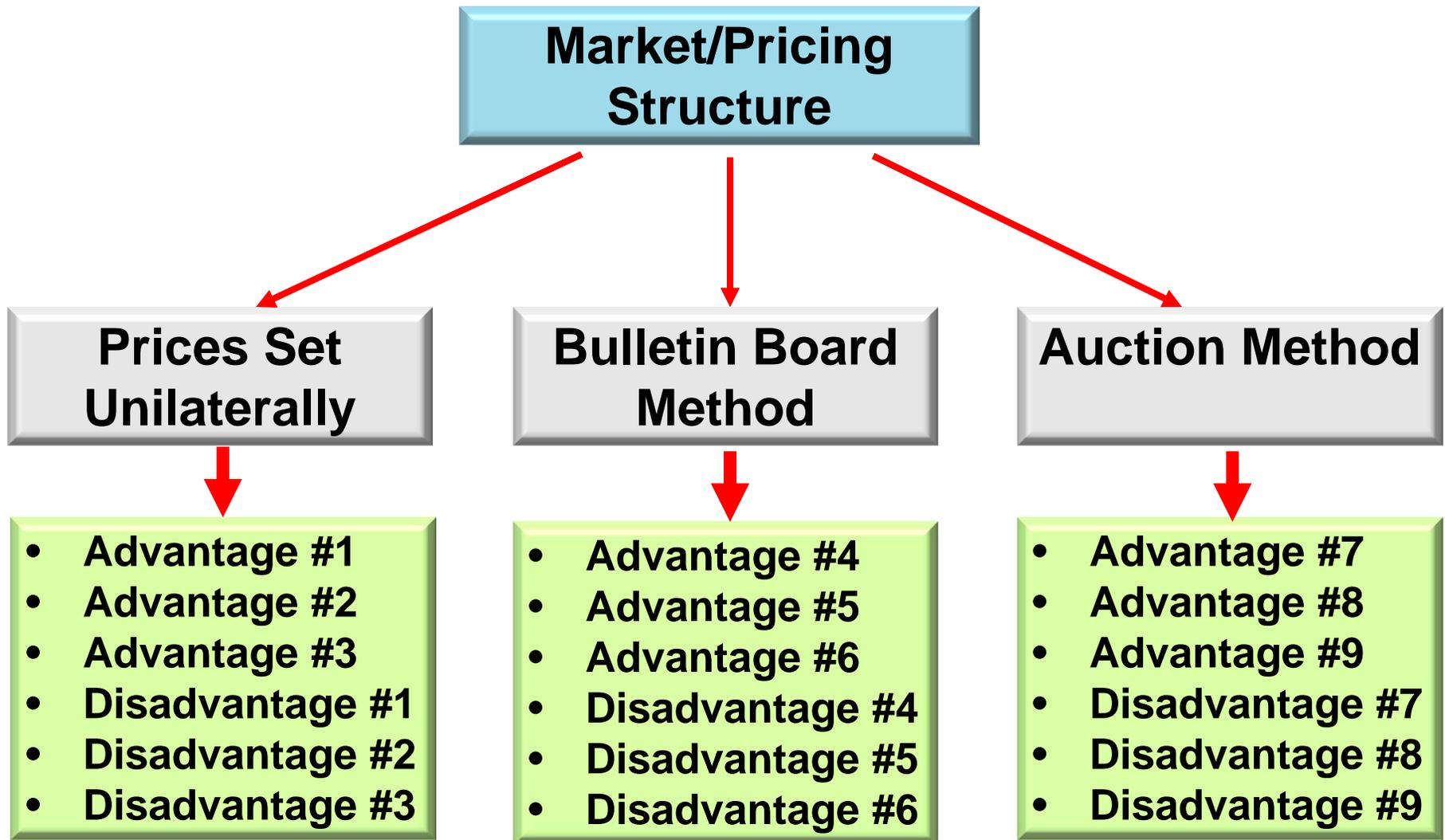
03

Preview of 2nd Workshop

Menu of Options

- **Emphasize importance of identifying Project Need**
- **Introduce alternative water banking structures, using checklist components as a guide**
- **Discuss advantages and disadvantages of various menu “combinations”**
- **Include examples from other established water banks where possible**
- **Consider possible example water banking options for the Coalition and NRDs to consider**

Menu of Options



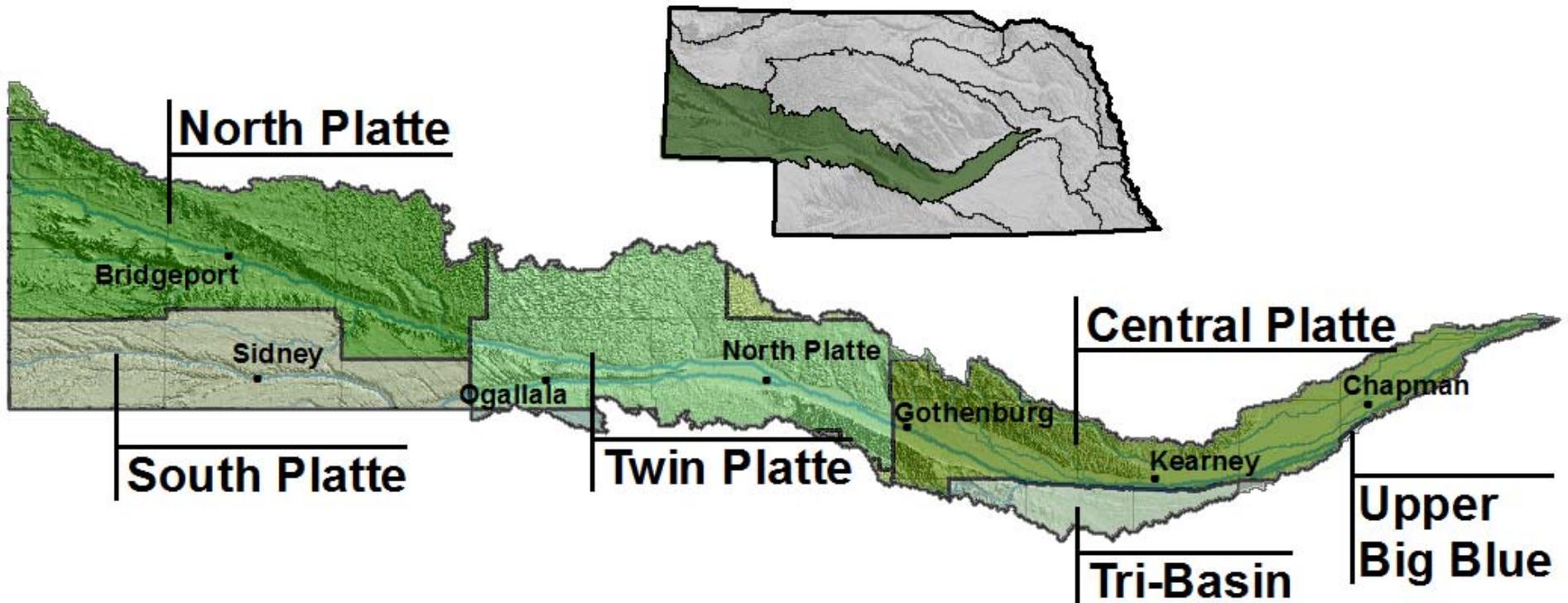
Questions?



Alternative Ways to Move Water

Republican R. and Platte R. Comparison

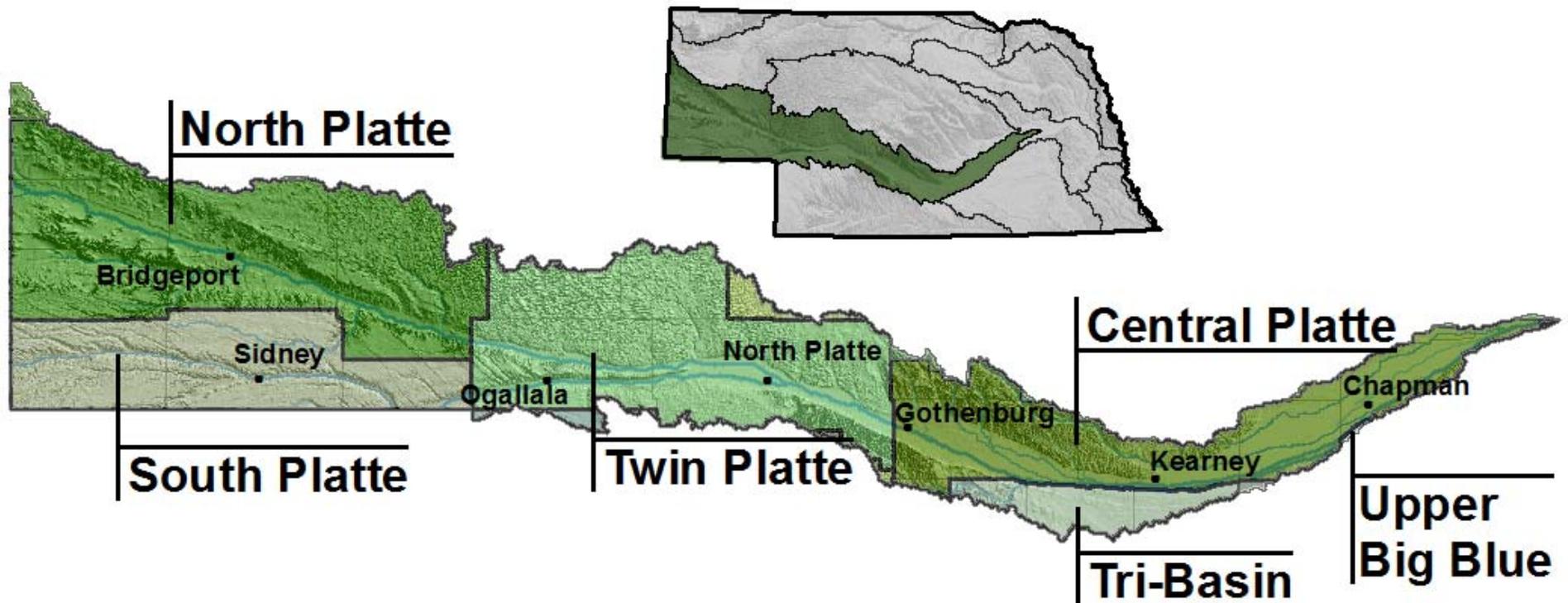
- Platte initial effort in spring and fall of 2011
- Diverted excess flows to mitigate flooding and provide delayed recharge benefits



Alternative Ways to Move Water

Republican R. and Platte R. Comparison

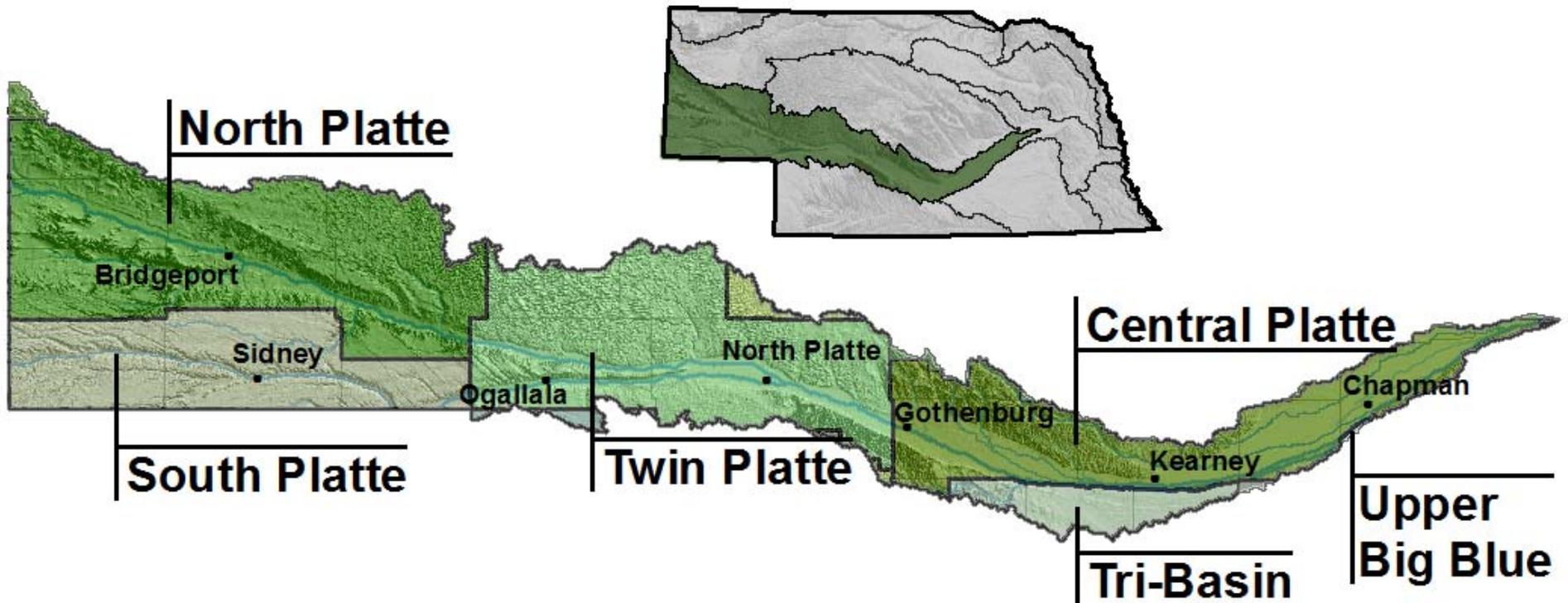
- Temporary permitting obtained through Nebraska DNR for junior diversion right



Alternative Ways to Move Water

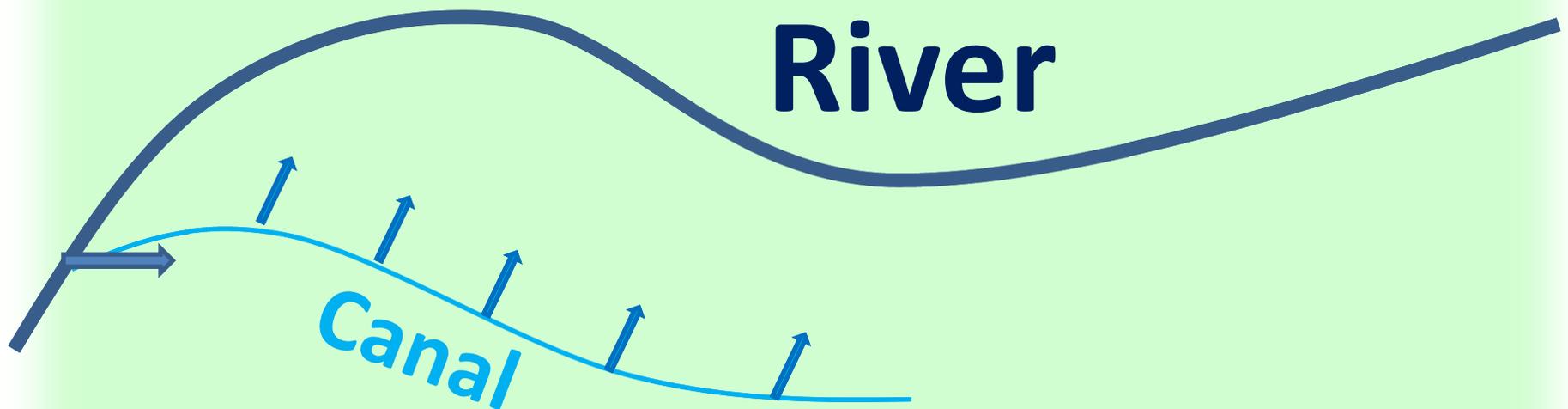
Republican R. and Platte R. Comparison

- Basinwide IMP set framework to allow for cooperation. NRDs worked out details.



Alternative Ways to Move Water

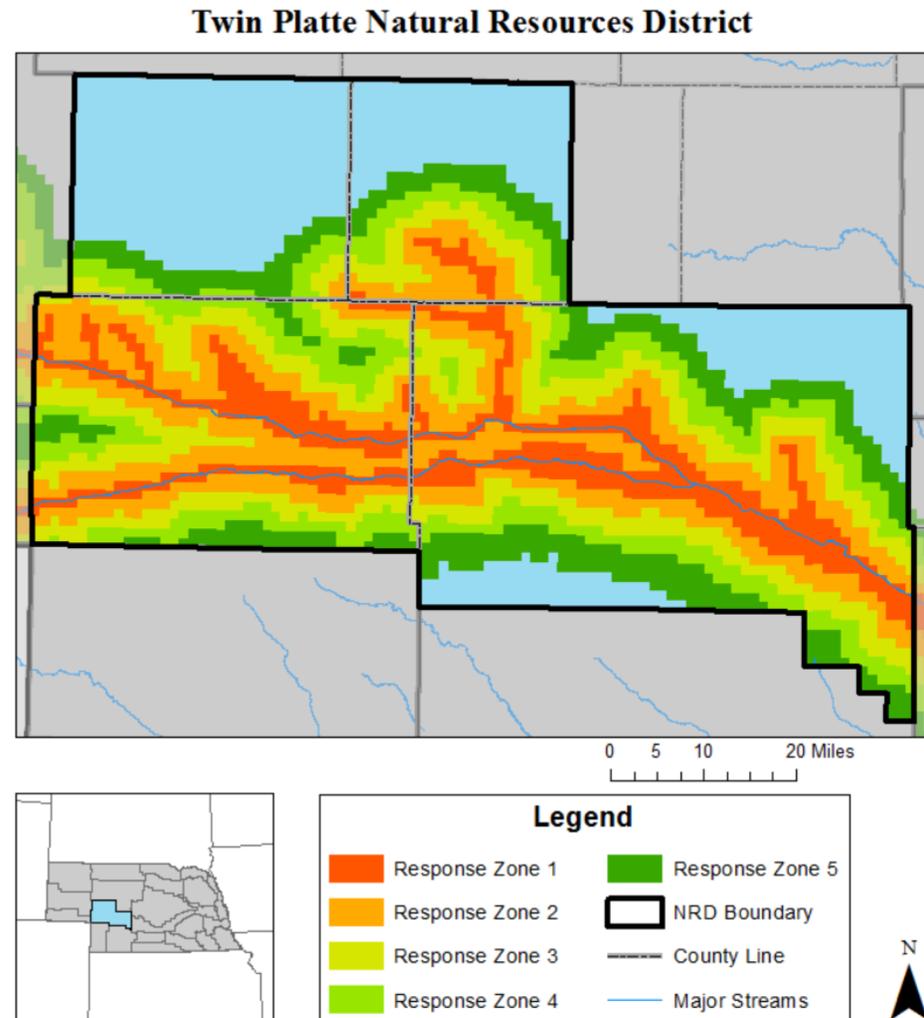
Republican R. and Platte R. Comparison



Alternative Ways to Move Water

Republican R. and Platte R. Comparison

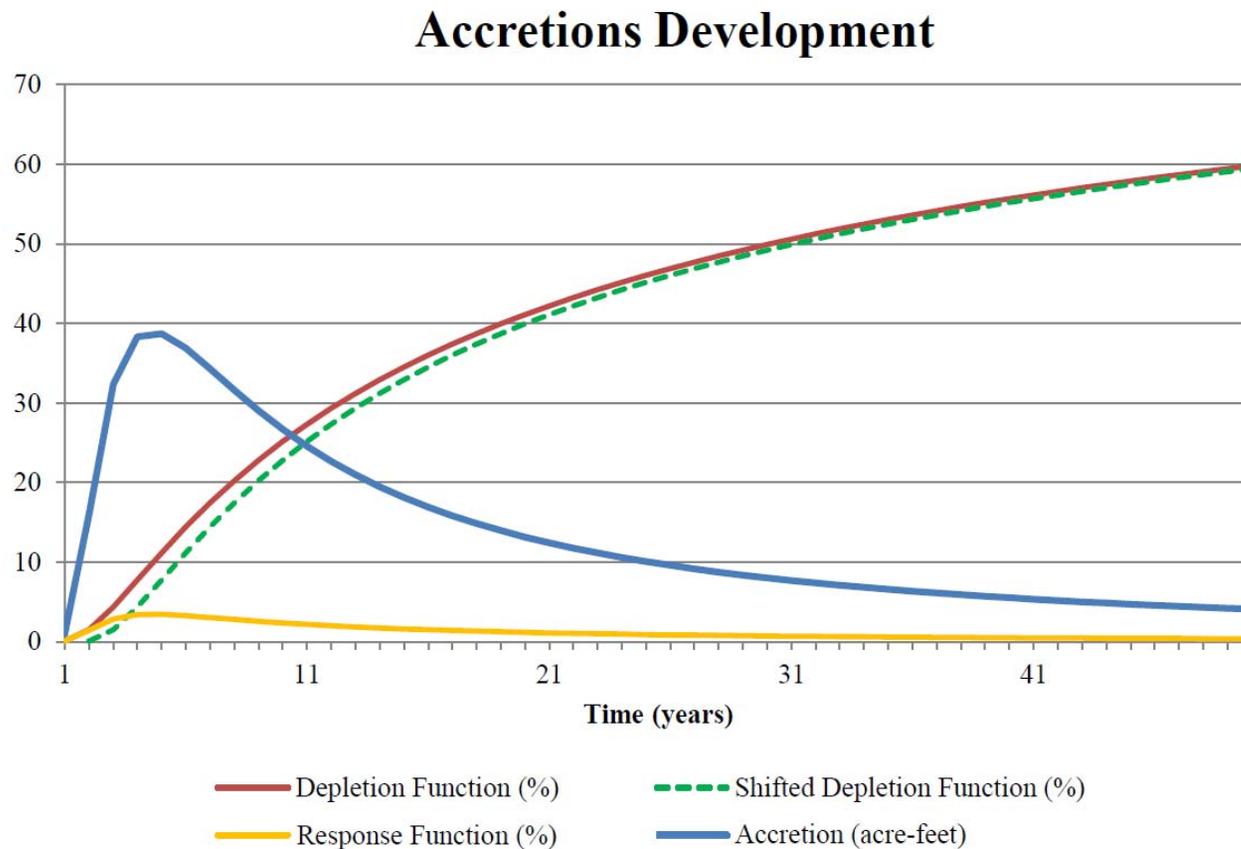
- Determine canal loss and recharge volume
- Use aquifer properties to estimate response function



Alternative Ways to Move Water

Republican R. and Platte R. Comparison

- Estimate accretions to river



Alternative Ways to Move Water

Republican R. and Platte R. Comparison

- Estimate accretions to river
- Accretions can be used by NRDs to credit towards IMP responsibilities
- Reducing depletions to 1997 levels for overappropriated areas)
- Reaching or maintaining fully appropriated depletion levels

Year	Accretion (acre-feet)
2011	15
2012	200
2013	550
2014	1,200
2015	3,500
2016	3,600
2017	2,300
2018	2,000
2019	1,750

Alternative Ways to Move Water

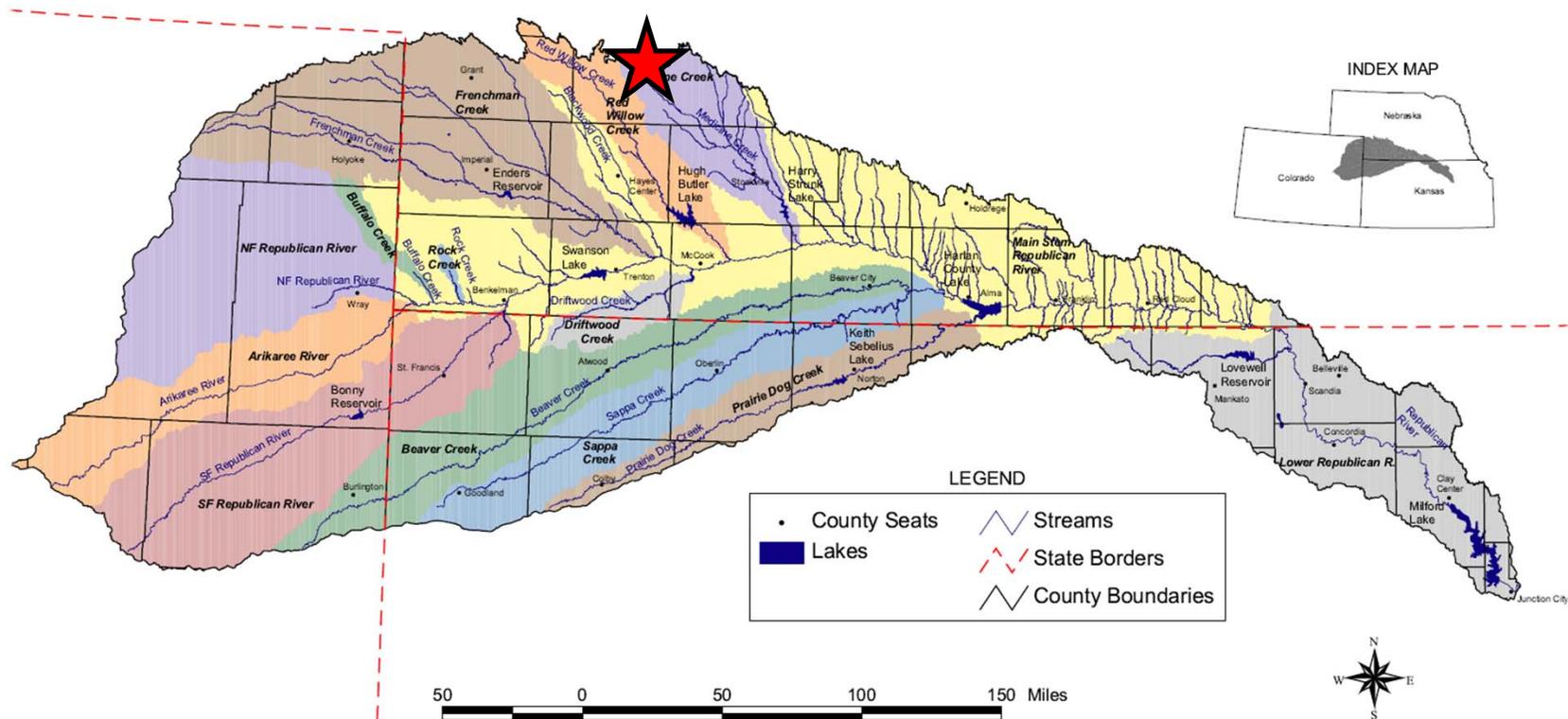
Lessons Learned from Platte River Recharge

- **Basinwide IMP set up a framework for discussions between NRDs and DNR**
 - **Established overall goals and objectives**
 - **Established targets for reducing depletions**
- **Specifics for operation were established by NRDs**
- **Just one example of recharge opportunities – CPNRD setting up on more permanent basis**

Alternative Ways to Move Water

Republican R. and Platte R. Comparison

- Republican River N-CORPE Project
 - Pumping started in early 2014

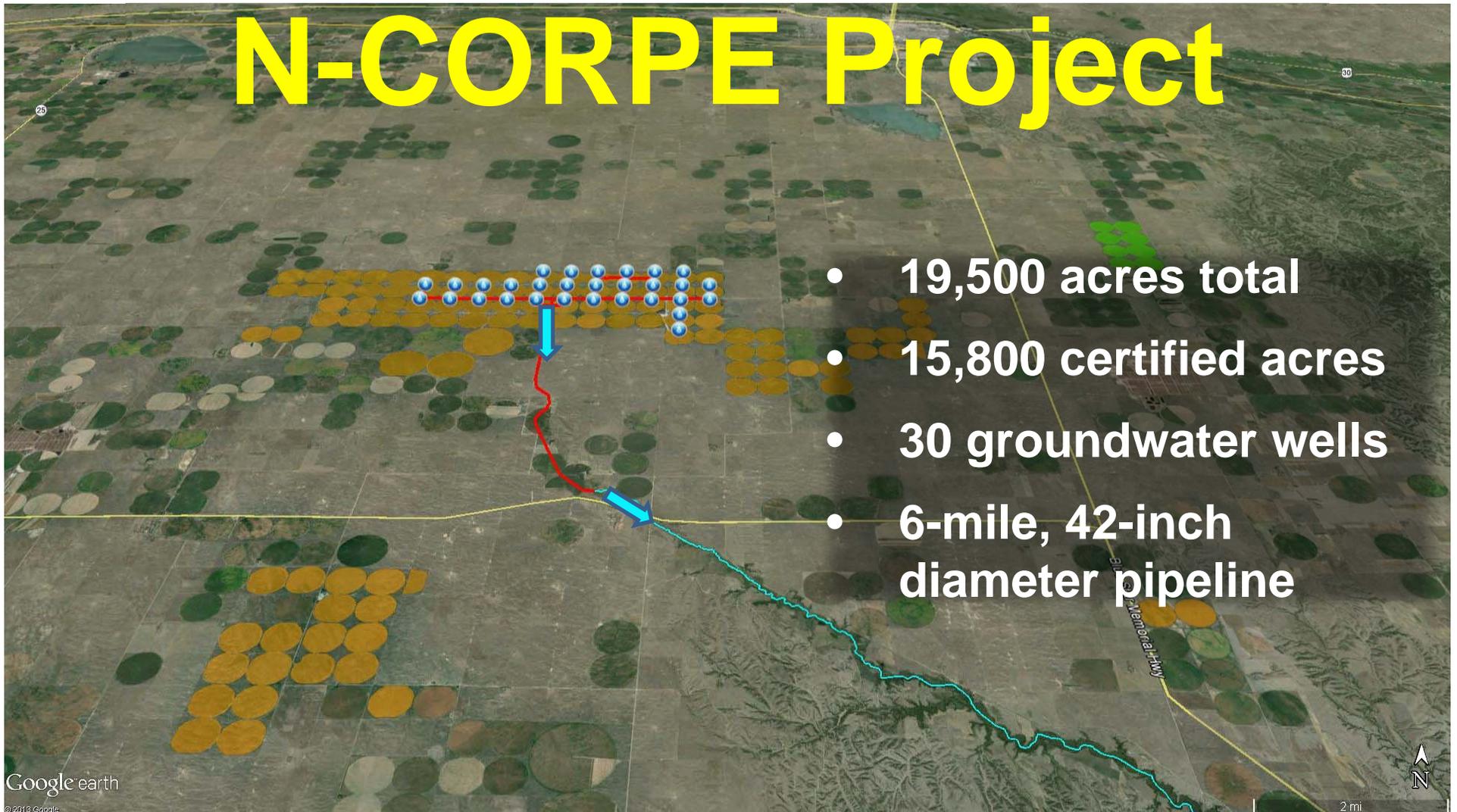


Alternative Ways to Move Water

Republican R. and Platte R. Comparison

N-CORPE Project

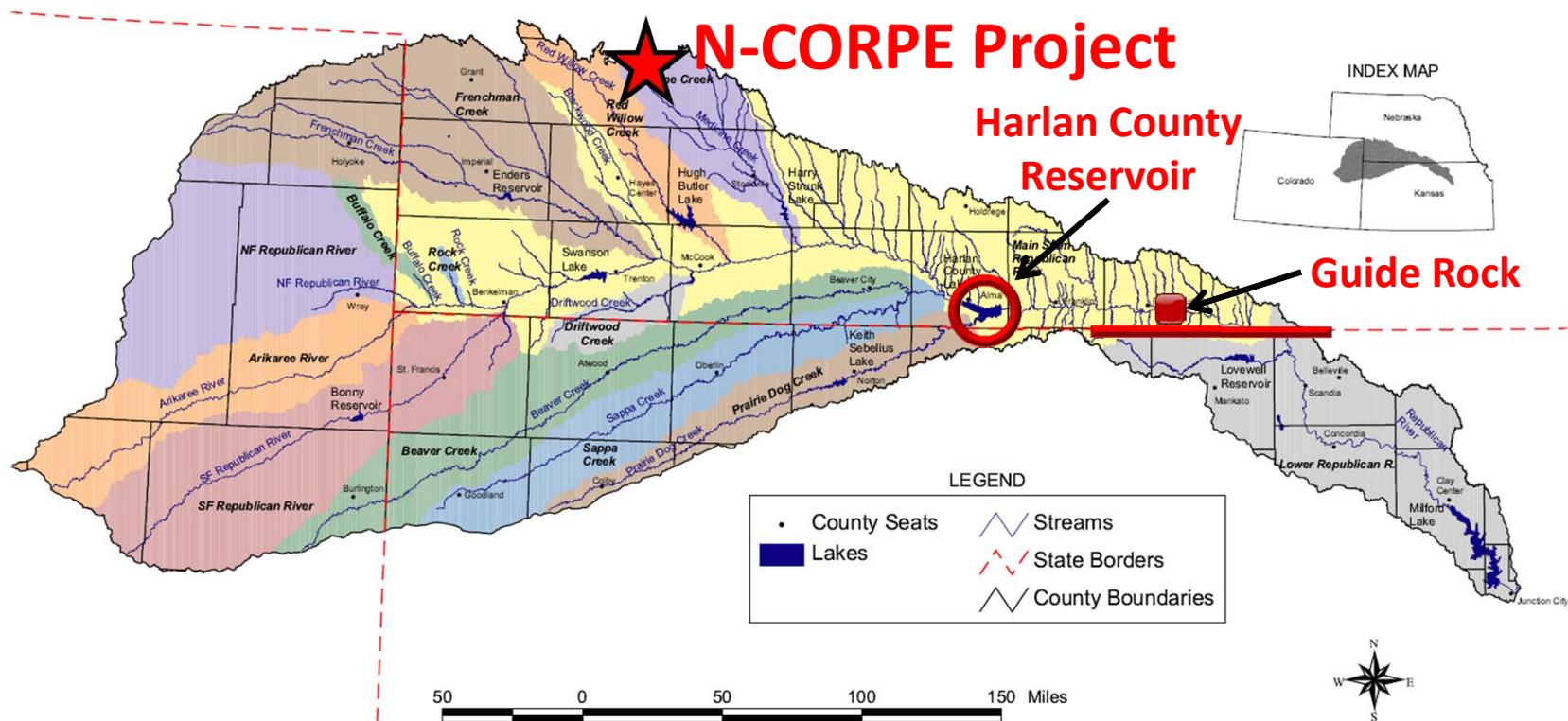
- 19,500 acres total
- 15,800 certified acres
- 30 groundwater wells
- 6-mile, 42-inch diameter pipeline



Alternative Ways to Move Water

Republican R. and Platte R. Comparison

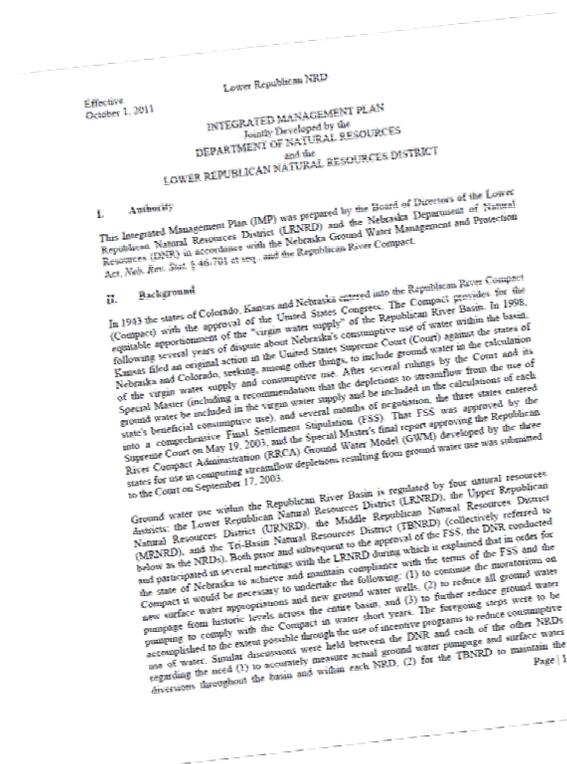
- Over 100 miles from project to Harlan County
- Over 150 miles from project to Guide Rock



Alternative Ways to Move Water

Republican R. and Platte R. Comparison

- Integrated Management Plans
- Annual Forecast (Jan. 1)
 - Estimate of available water supplies for the coming year
 - NRDs responsible for staying within their allowable depletions



- **URNRD** **44%**
- **MRNRD** **30%**
- **LRNRD** **26%**

Alternative Ways to Move Water

Republican R. and Platte R. Comparison

- Integrated Management Plans
- Annual Forecast (Jan. 1)
 - Estimate of available water supplies for the coming year
 - NRDs responsible for staying within their allowable depletions

NRDs can use augmentation pumping to offset depletions

- **URNRD** 44%
- **MRNRD** 30%
- **LRNRD** 26%

Alternative Ways to Move Water

Republican R. and Platte R. Comparison

- **Compact Call Years**
 - **If conditions require (low forecasted supplies versus expected water use), DNR may determine Compact Call Year**
 - **Results in additional requirements by NDRs**
 - **Potential shutdown in rapid response area**
 - **Augmentation can offset depletions**
 - **Surface water administration as needed by DNR**

Alternative Ways to Move Water

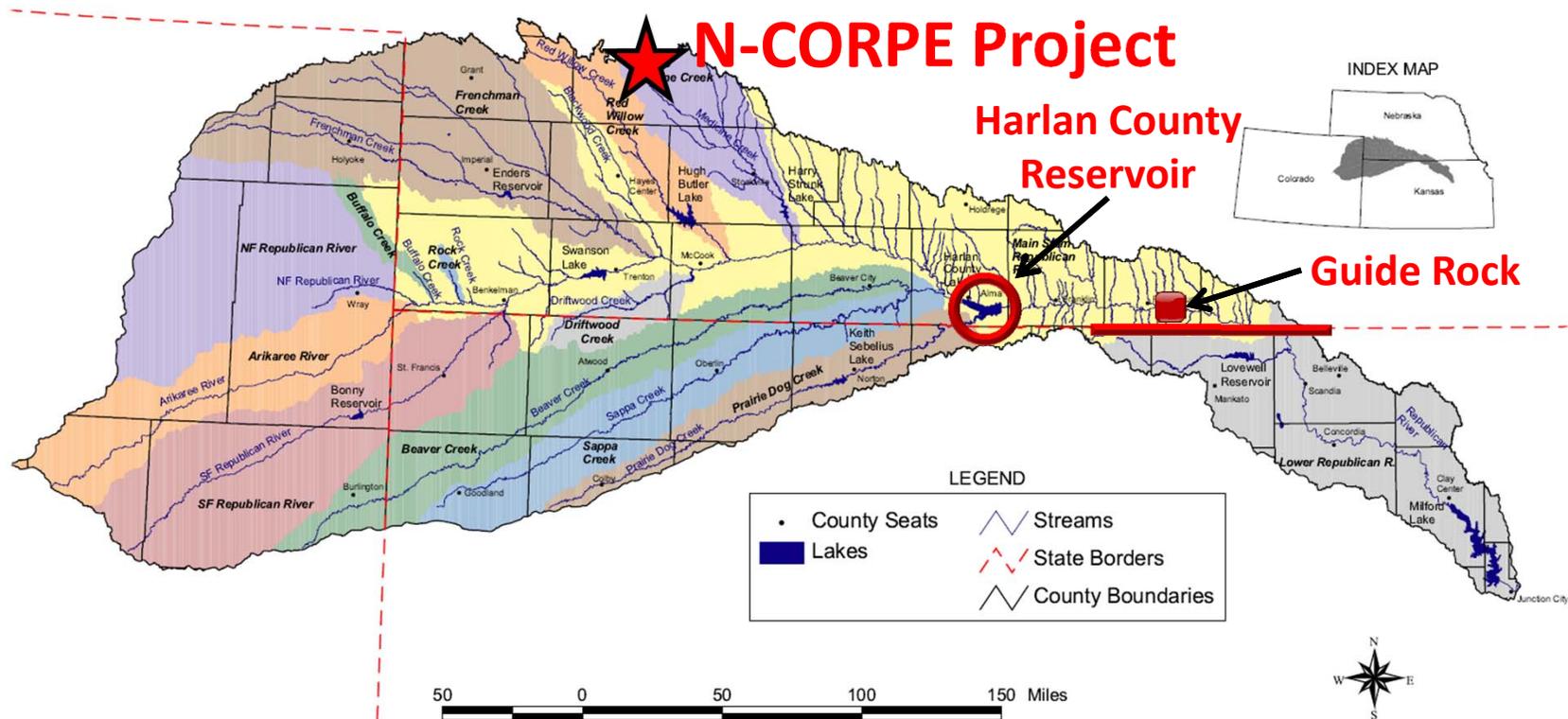
Republican R. and Platte R. Comparison

- **Compact Call Years**
 - **Initial estimate of required flow at Guide Rock determined on Jan. 1**
 - **Estimate updated over the course of the year as conditions changed**
 - **Surface water administration may be lifted during Compact Call Year if Guide Rock flows sufficient**

Alternative Ways to Move Water

Republican R. and Platte R. Comparison

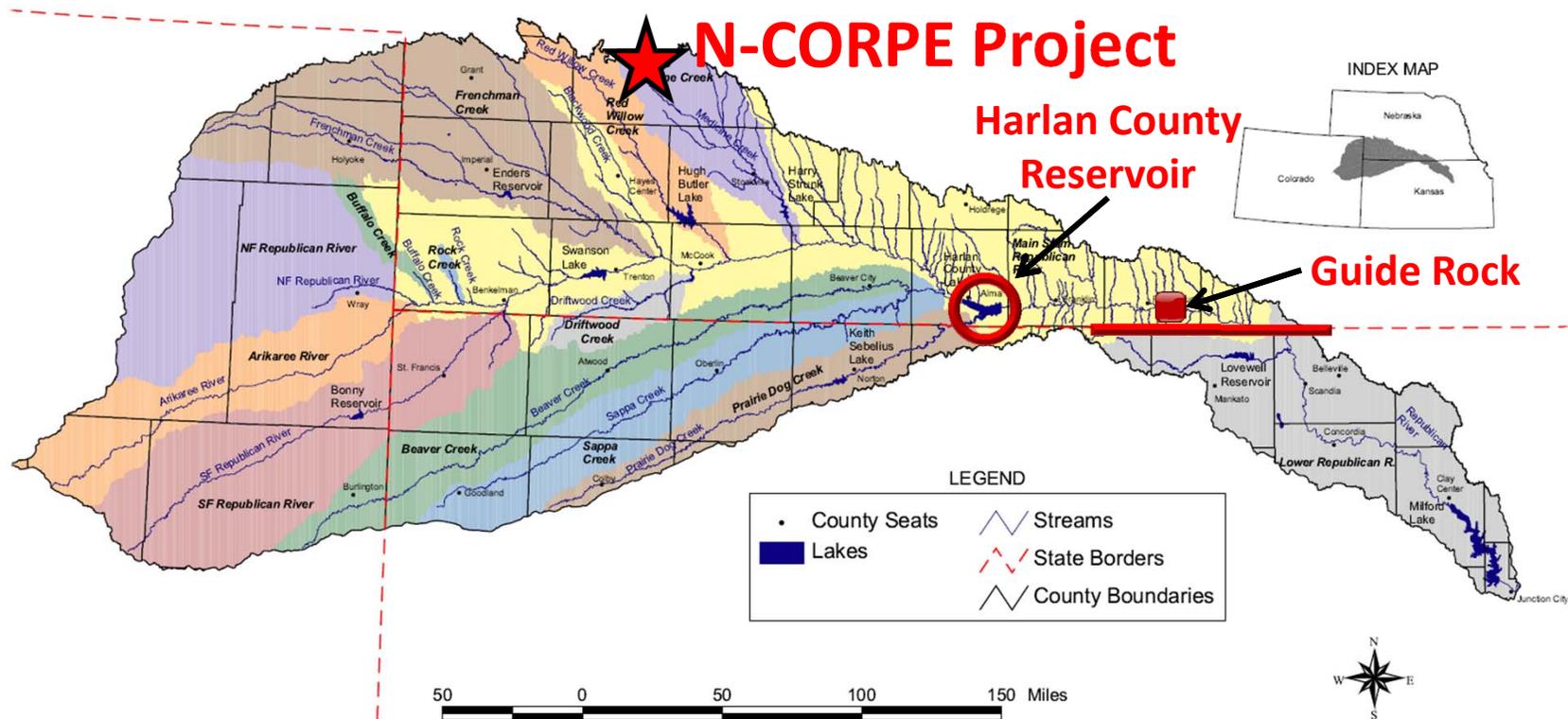
- No “shepherding” of water required



Alternative Ways to Move Water

Republican R. and Platte R. Comparison

- Surface water administration works in conjunction with NRD actions to ensure needed flows at Guide Rock, and overall compliance



Alternative Ways to Move Water

Lessons Learned from N-CORPE

- **Compact set up a framework for discussions between NRDs and DNR**
 - **Rigid constraints via established RRCA Accounting Procedures**
 - **NRDs wanted tool to provide flexibility in how to meet compliance standards**
- **States recently agreed to resolution adopting additional flexibility in meeting Compact compliance**

Alternative Ways to Move Water

Overall Lessons

- **Coalition in a “better” position than both Upper Platte and Republican River basins**
- **Basinwide IMP can provide overall goals and objectives, along with consistent accounting methods**
- **Basinwide principles can encourage cooperation between NRDs**
- **Leave flexibility and local control to individual NRDs to work out specifics to meet their particular needs**

Questions?

