Papio-Missouri River NRD

Missouri River Floodplain Management And Flood Prevention

Presented by
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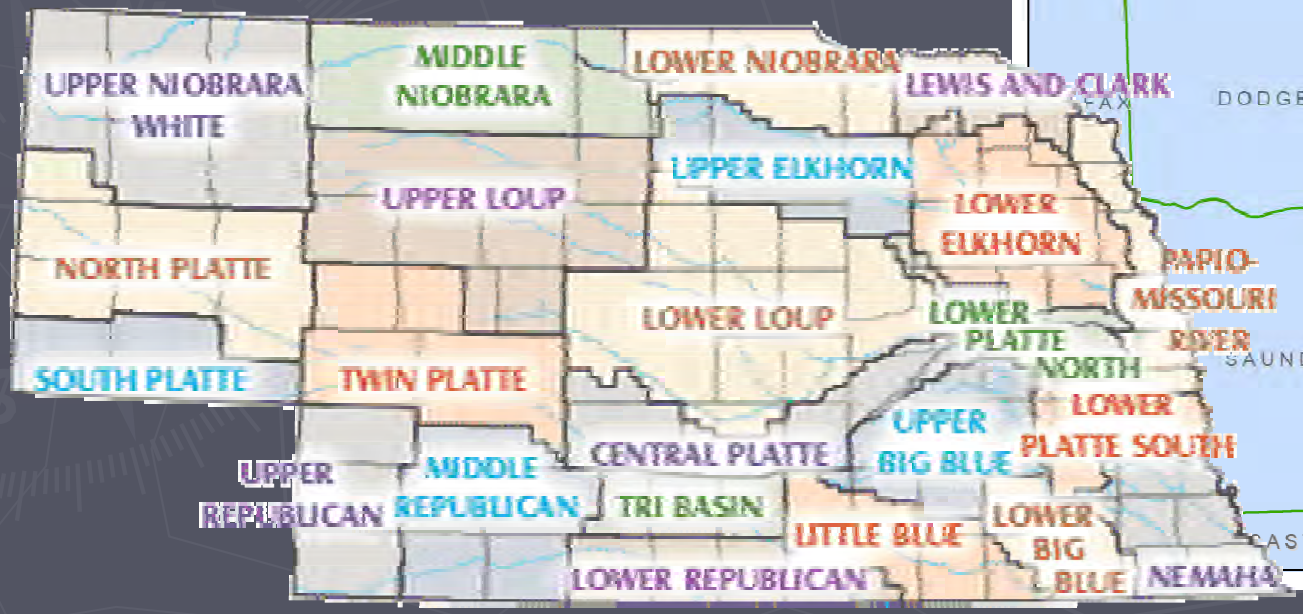
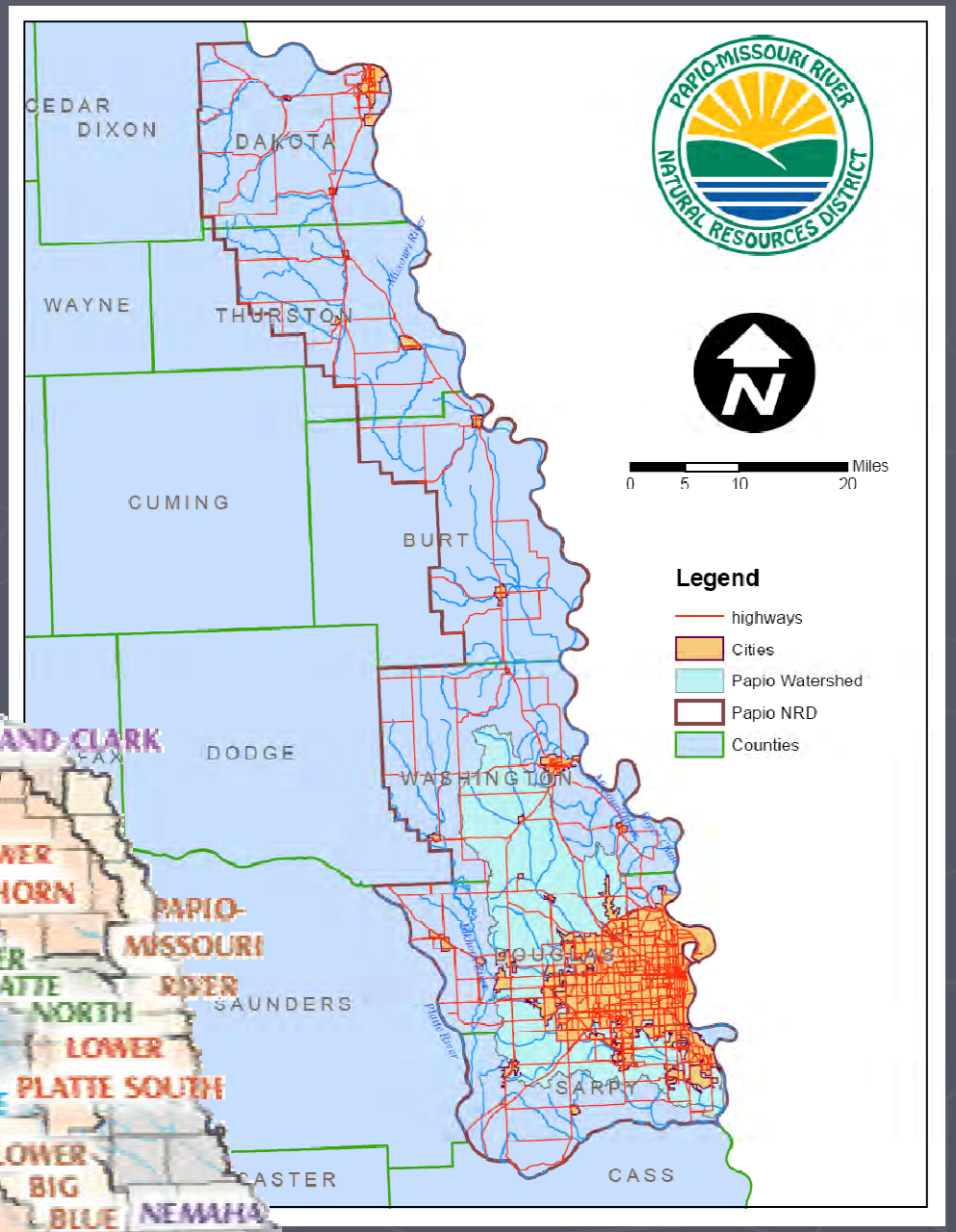
Introduction

- Missouri River Flooding History
- P-MRNRD Floodplain Management Strategies
  - Missouri River Levees
  - Drainage Districts
  - Floodway Purchase Program
  - Improved Floodplain Management & Mapping

Papio-Missouri River NRD

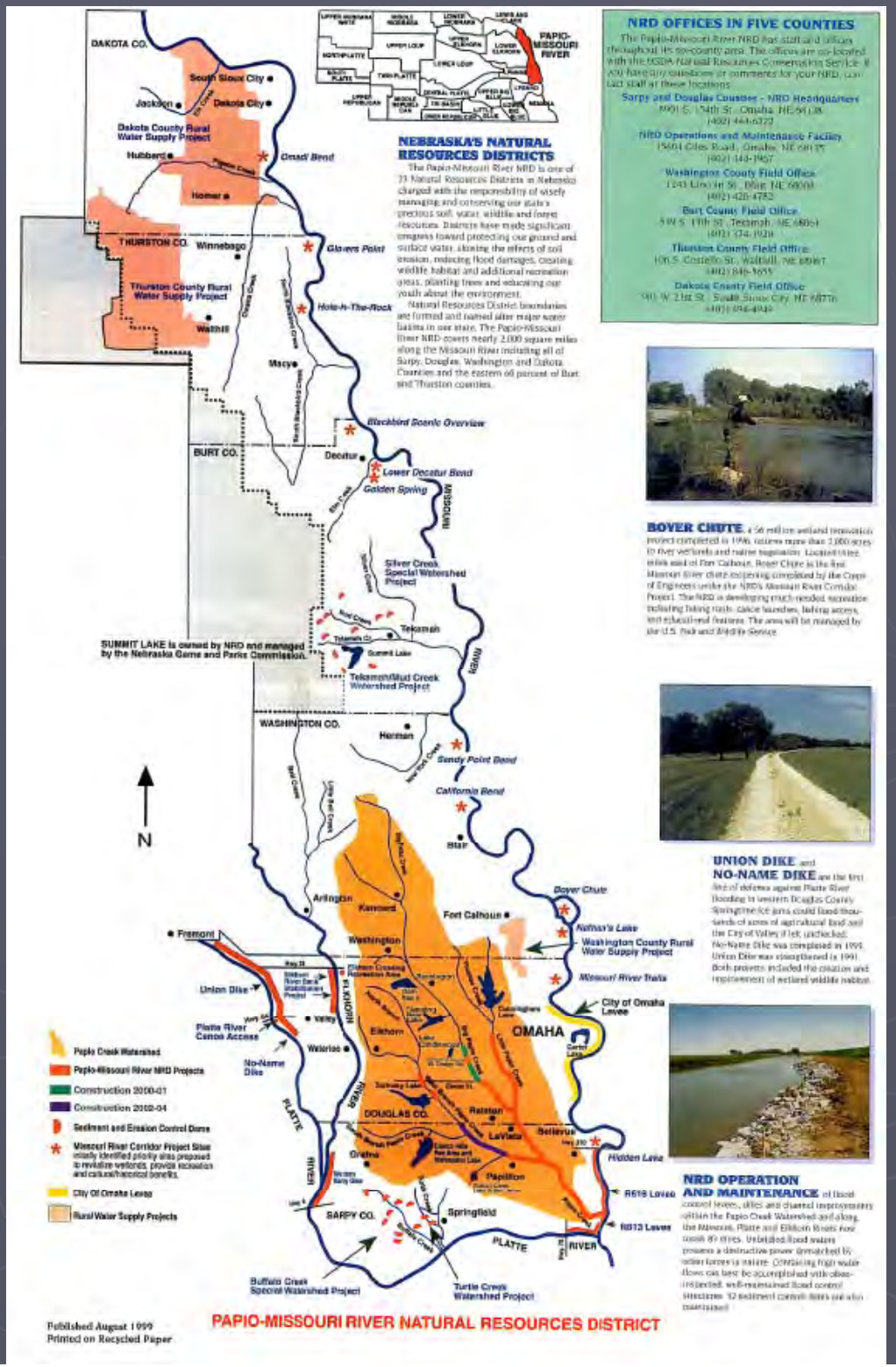
THE MISSION
of the Papio-Missouri River NRD is to wisely Conserve, Manage and Enhance our soil, water, wildlife, and forest resources for the good of all people residing within the District's boundaries.





Papio-Missouri River NRD

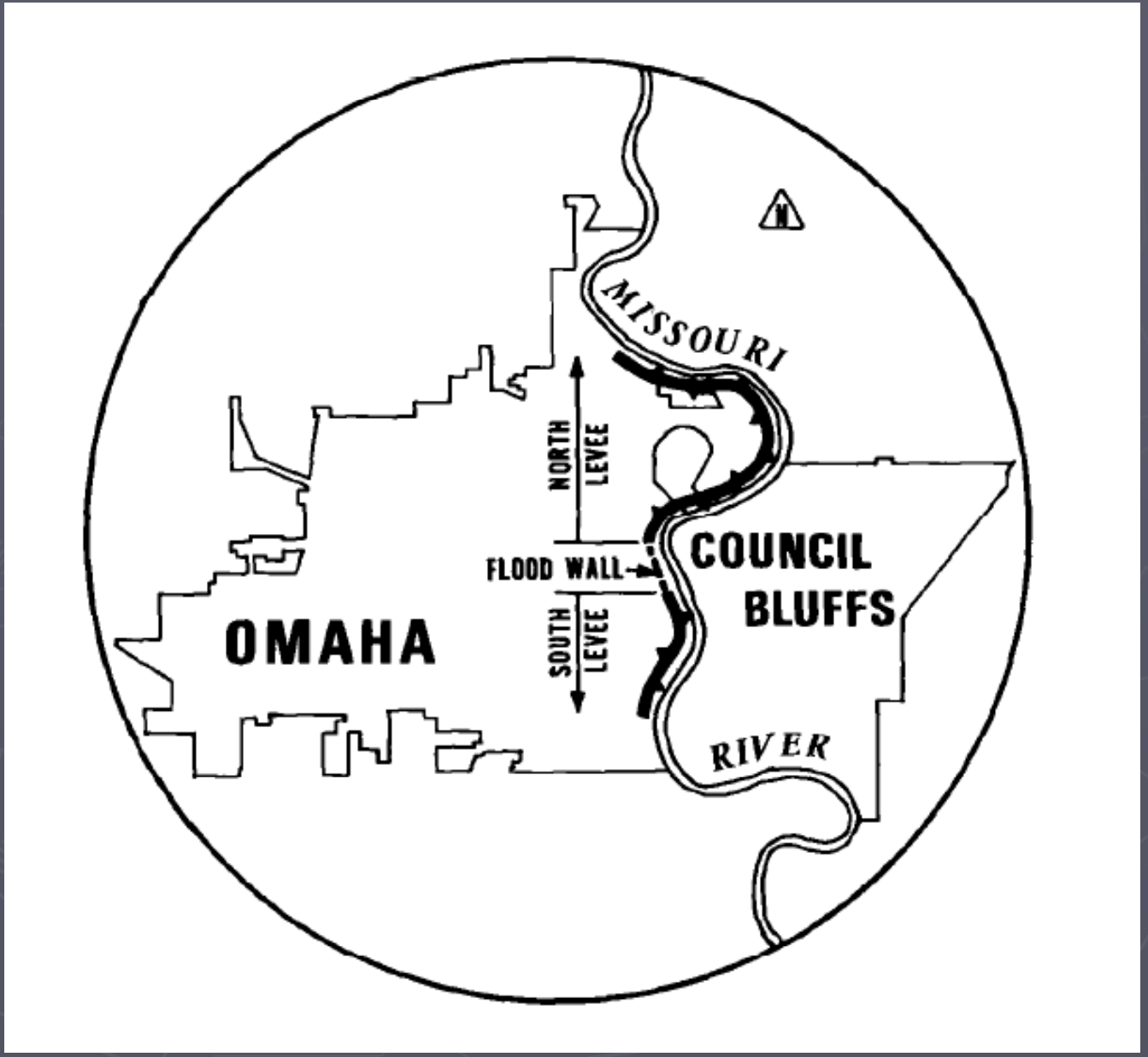
“Meeting the Challenge”



Historic Missouri River Flooding

- Over 500,000 sq mile drainage area
- Six main stem dams and Omaha's floodwall constructed in early 1960s control most floods
- Flood of Record for Omaha in 1952 -River Stage 40.2 ft (Flood Stage = 29 ft)
- All of South Sioux City and Dakota City were evacuated in 1952
- 1993 flooding reached highest stages since 1952

Omaha Missouri River Levee



Omaha Missouri River Levee

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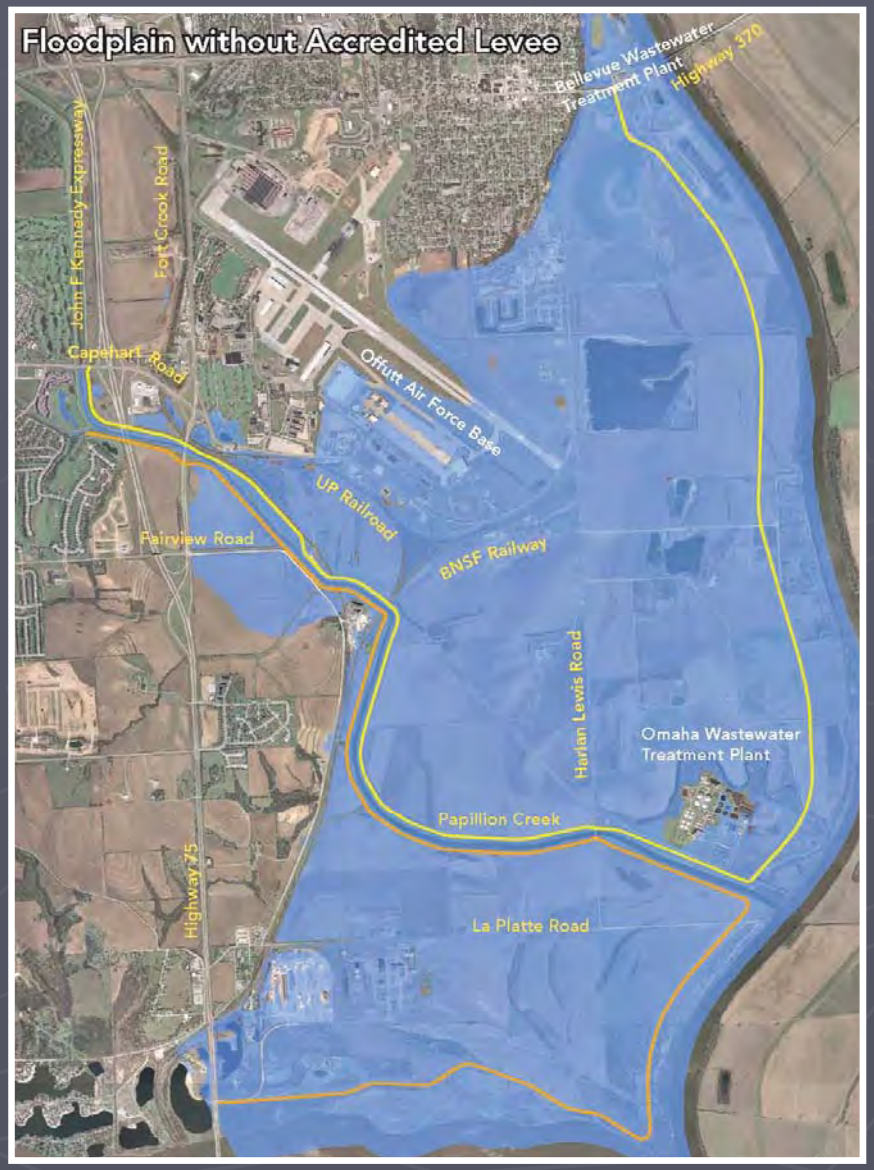
P-MRNRD Missouri River Flood Control Levees R-613 & R-616



Burt Washington Drainage District (105 sq mi)

DRAINAGE SYSTEM

BURT-WASHINGTON DRAINAGE DISTRICT, TEKAMAH, NEBR.

Designed by The Towl Engineering Co., of Omaha, Neb., June 1, 1915

The following recommendations, if adopted by the District, will be carried out and all ditches, levees, settling basins and other work done as soon as practicable.

The required area for all settling basins will be within the boundaries and locations indicated on the accompanying map. In all cases more land has been designated than will be actually used.

On nearly all streams settling basins will be provided to remove the flood mud and debris before the flood waters are allowed to enter the main ditches, except where the creeks are diverted and carried across the drainage system to the river.

All existing ditches will either be cleaned out or reconstructed so as to secure sub-drainage and adequate relief.

For convenience we shall refer to the different streams by paragraphs as follows:

1. Blair Creek. This is the name which we have given to a creek which enters the District in Section 2, T. 18, R. 11. Very little, if any, work is required for this stream, it being near the outlet of the Cameron Ditch, which, when re-constructed by deepening, will have a good outlet to the river.

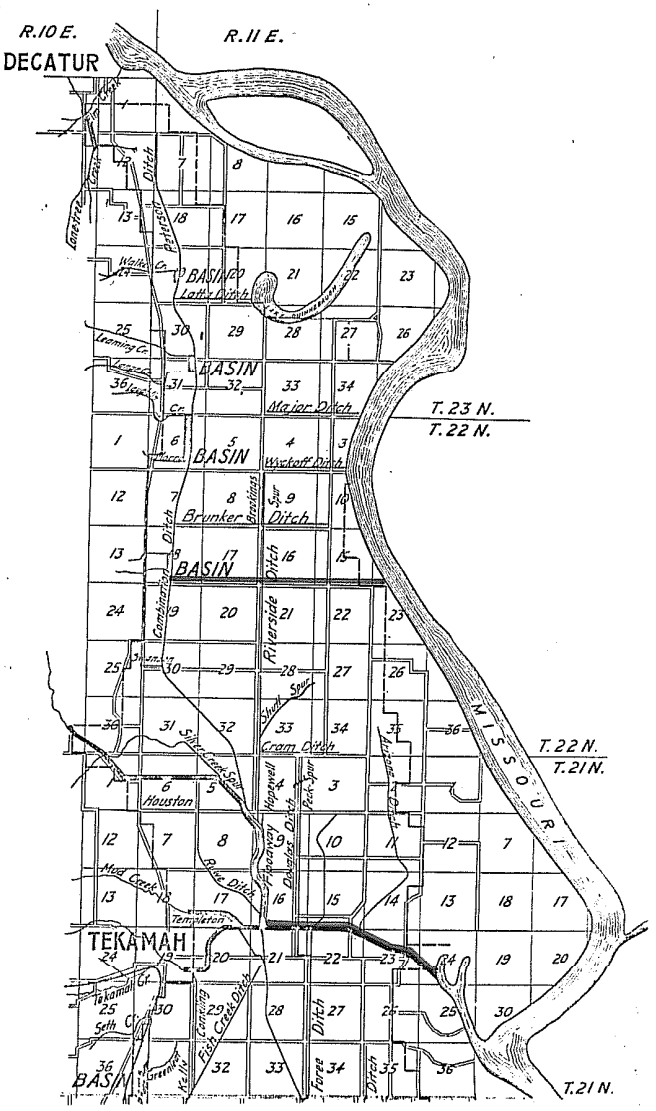
2. South Creek will not require any considerable work as it enters the Cameron Ditch in good condition.

3. North Creek does not damage the Cameron Ditch by filling. However, the amount of flooding of the land along the Railroad will be limited to a silt basin covering 10 acres and the outlet changed so as to enter the Cameron Ditch at the "Cuming City" road.

4. Stewart and Lippincott Creeks enter the District in one channel and flood the land from the railroad to the Cameron Ditch, which land will be included in a silt basin, and extended north to take in the flood waters of York Creek.

5. York Creek will be diverted from the Cameron Ditch into a silt basin lying between the Railroad and the Cameron Ditch and extending from the township line to the mouth of Stewart and Lippincott Creeks. The low flooded land within those boundaries exceeds 640 acres. It is advisable at this time to take 300 acres for a silt basin.

6. Herman Creek is taken care of in a satisfactory manner and will require no additional work.



Burt Washington Drainage District

7. Hill Creek carries a large amount of silt and will be provided with a silt basin of 40 acres, either on the land of J. H. Cameron or the Woods-Updike Land Company, at the mouth of the Hill Creek ditch and along the Cameron Ditch.

8. Davis Creek loses its silt before entering the District and will not require any work at this time.

9. Carr Creek will require a silt basin of 40 acres which will be located either North or South of its junction with the Cameron Ditch on the land of William and A. F. Sydow.

10. Crannell Creek will have a silt basin of 20 acres on the low ground at its mouth.

11. Whittier Creek will have a silt basin of 20 acres on the low ground at its mouth.

12. Seth Creek will have a silt basin of 10 acres on the West side of Adams Spur.

13, 14 and 15. Tekamah Creek, Mud Creek and Silver Creek will all be diverted to the Missouri River, east of the town of Tekamah and with an outlet through the "Arizona Slough" to a chute of the Missouri River.

Silver Creek will be diverted through the center of Sections 5 and 6 to the low ground immediately adjoining the Combination Ditch, which will be taken and confined with continuous levees, connecting the Silver Creek and Tekamah Creek flood ditches. The Tekamah Creek diversion ditch will provide an ample outlet and the drainage waters on the east and West sides of the flood system will be carried in separate drainage ditches which will find outlets in the present Combination Ditch.

This plan will separate the flood waters of Silver, Mud and Tekamah Creeks from the drainage and will utilize the low ground to the best advantage.

16. Latta Creeks. This is the name given the small streams in Section 18, T. 22, R. 11, where a silt basin of 10 acres will be provided.

17 and 18. Morrow Spur and Laughlin Creeks will require a silt basin of 40 acres which will be obtained on low ground adjoining the Combination Ditch.

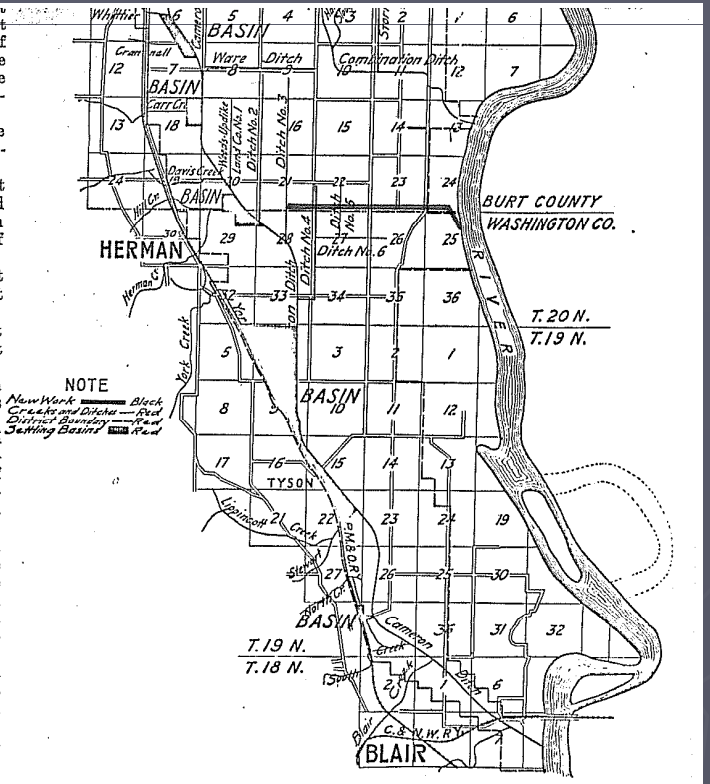
19 and 20. Lange and Leaming Creeks are shown in Section 31, T. 23, R. 11 and will be accomodated with a silt basin of 10 acres.

21. Walker Creek will have a silt basin of 5 acres at its mouth.

22. Lone Tree Creek will be diverted into Elm Creek.

Following is an estimate of cost based upon cleaning out all ditches and the Diversion of Tekamah Creek, Mud Creek and Silver Creek through the same outlet to the river.

Tekamah Creek Ditch and outlet to River: 675,000 cubic yards @ 8c	$ 54,000.00
Silver Creek Ditch and floodway along Combination Ditch to the junction with Tekamah Creek outlet: 365,000 cubic yards @ 8c	29,200.00
Right of Way, Bridges, etc	60,000.00
Dams, Culverts, Spillways, etc.	10,000.00
Lone Tree Creek Diversion.	2,500.00
Cleanout and Reconstruction Work:	
Extension of Peterson Ditch	2,150.00
Reconstruction of Peterson Ditch and Combination Ditch to Morrow Spur...	8,600.00
Clean-out of Combination Ditch and Spurs.....	11,520.00
Cameron Ditch.....	21,120.00
Adams Spur.....	4,320.00
Fish Creek Ditch.....	3,600.00
Silt Basins, if leased for 10 years	14,100.00
Additional cost of condemnation of lands for Silt Basins where leases may not be granted.....	16,000.00
Levees and control works for Silt Basins.....	10,000.00
Engineering and Legal Expense	12,890.00
Total	$260,000.00

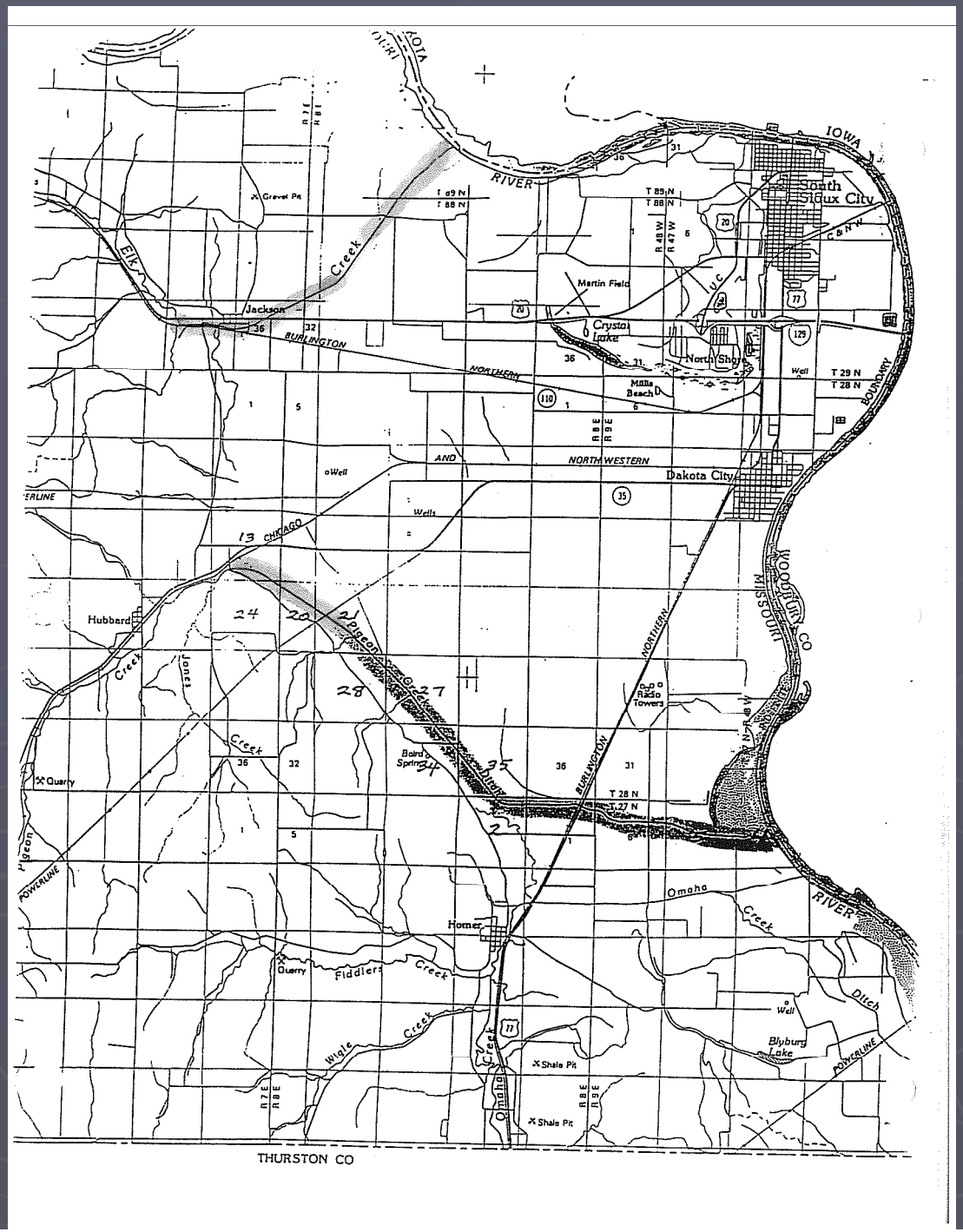


Since the recent floods from the 23rd to the 26th of May, 1915, the writer has made a careful inspection of the District and finds no reason for making any changes in the plan of drainage, it being contemplated in all improvements from Blair to Decatur to provide for every drainage ditch, main ditch and outlet so that the flood waters will not fill up the drainage ditches and render them useless. Where the flood waters from Silver, Mud and Tekamah creeks are carried across the valley to the river, the drainage ditch crossings will be made with reinforced concrete culverts so that the land will be drained during the flood periods without any interruption and the drainage will not in any way be held back or affected by the flood waters.

Spillways will be provided at the points of diversion and at the crossing of the Combination Ditch so as to regulate the amount of water which will have to be carried by the flood ditches and to protect the levees from damage.

The benefits will far exceed the cost of construction and the land benefited by any one improvement will have to bear the cost of that particular improvement.

Elk Pigeon Drainage District (31 sq mi)

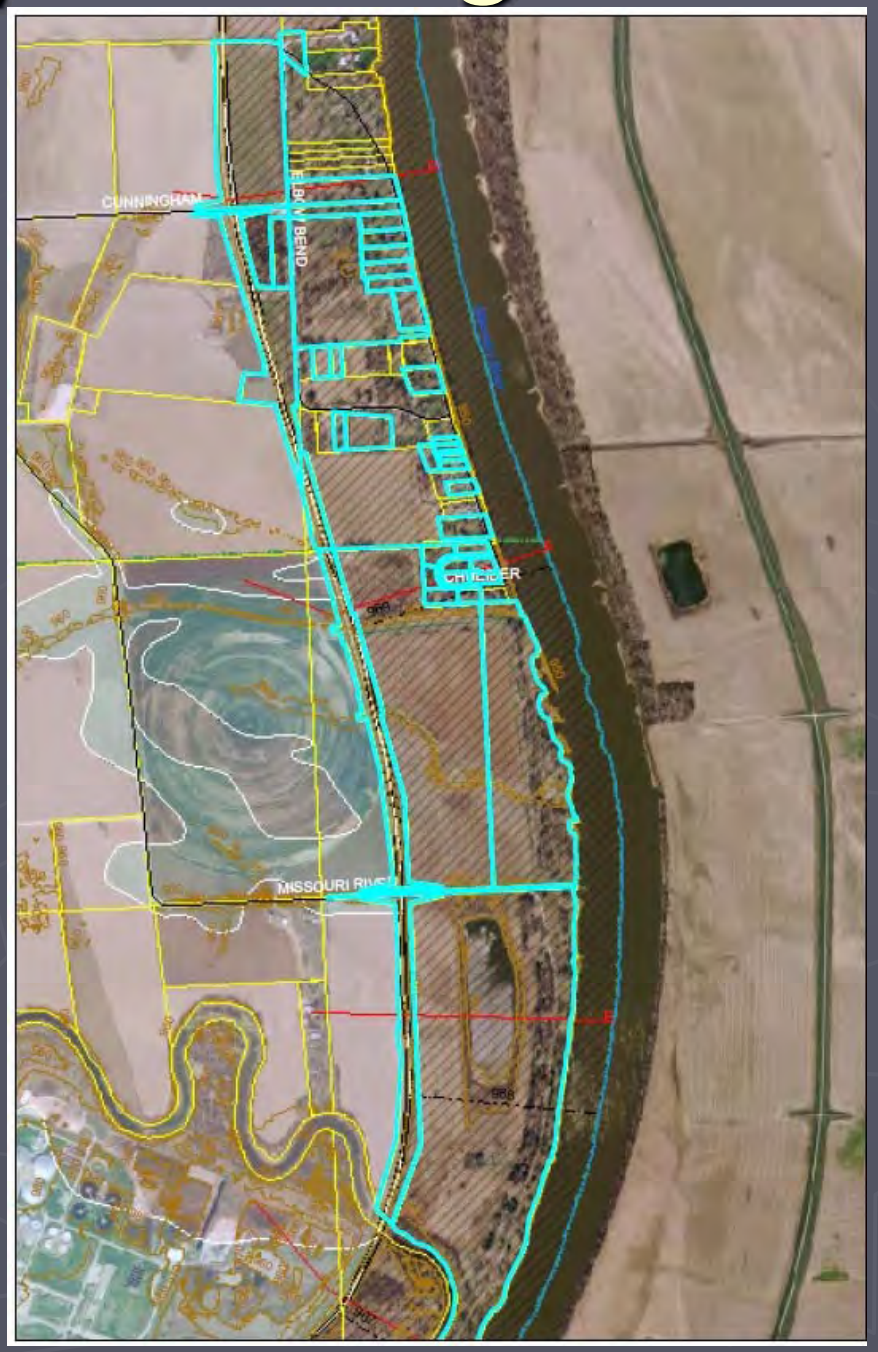


Missouri River Buyout Program

- On June 18, 1990, 15-30 homes had floodwater 2-4 feet deep at Iske Park and Holub's Place Subdivisions
- P-MRNRD acquired and demolished homes in the Holub's Place and neighboring Elbow Bend Subdivisions after they were severely flooded again in 1993

Missouri River Buyout Program

- Floodway Purchase Program for properties riverward of the MO River Levee
- 107 of 164 properties acquired by the P-MRNRD (64%)
- Holub's Place, Elbow Bend and Bellevue Queen

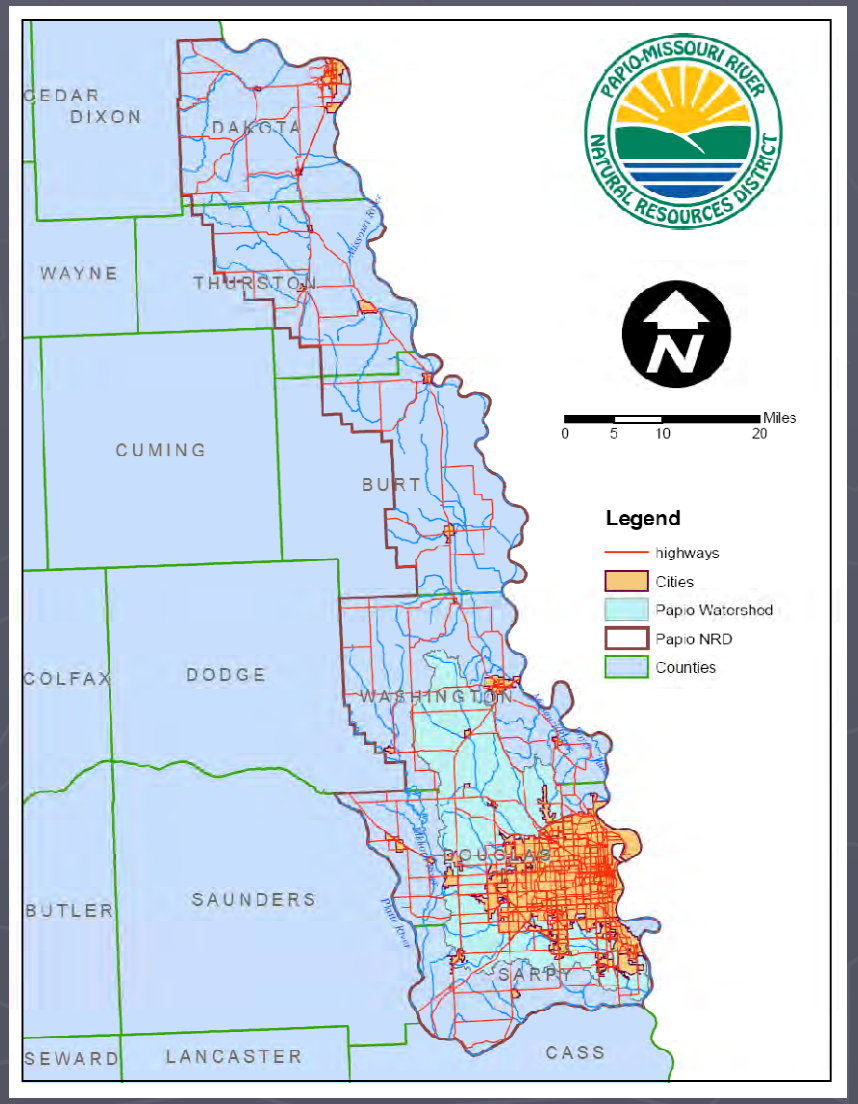


Improved Floodplain Management and Mapping

- Regulatory Floodplain for many counties in P-MRNRD District Based on late 1970s Land use Conditions and Hydrology
- Opportunity to provide more accurate data for floodplain maps with FEMA funding
- Provide technical assistance to manage floodplains and to encourage community participation in NFIP
- Make digital maps easily accessible

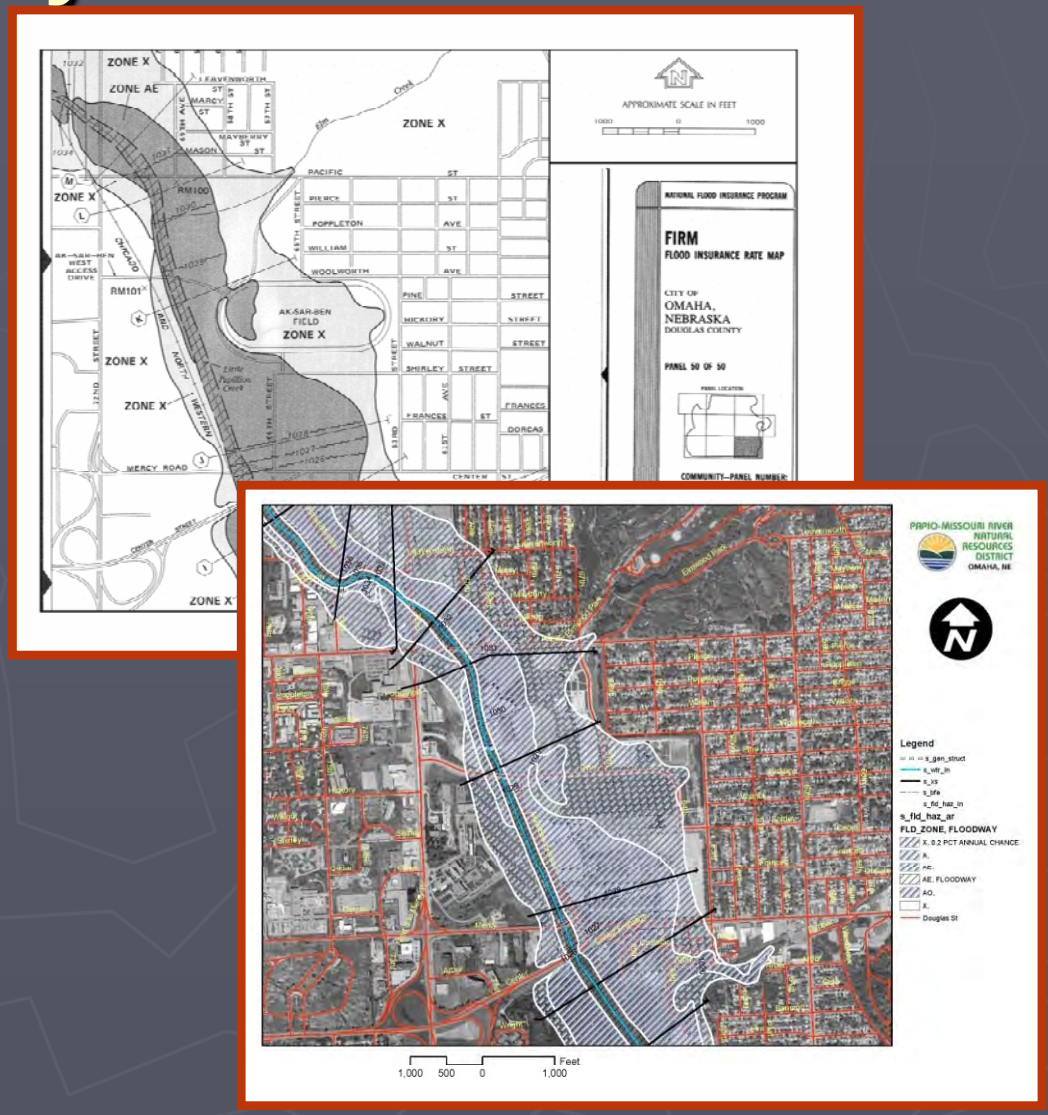
Floodplain Remapping Status

- Dakota County has preliminary maps expected to be effective in 2011
- Thurston County has preliminary maps completed by NDNR
- Washington County will have preliminary maps in May 2010
- Portions of Douglas and Sarpy County will have effective maps on May 3, 2010 and the rest of Douglas and Sarpy Counties will have updated maps in 2013



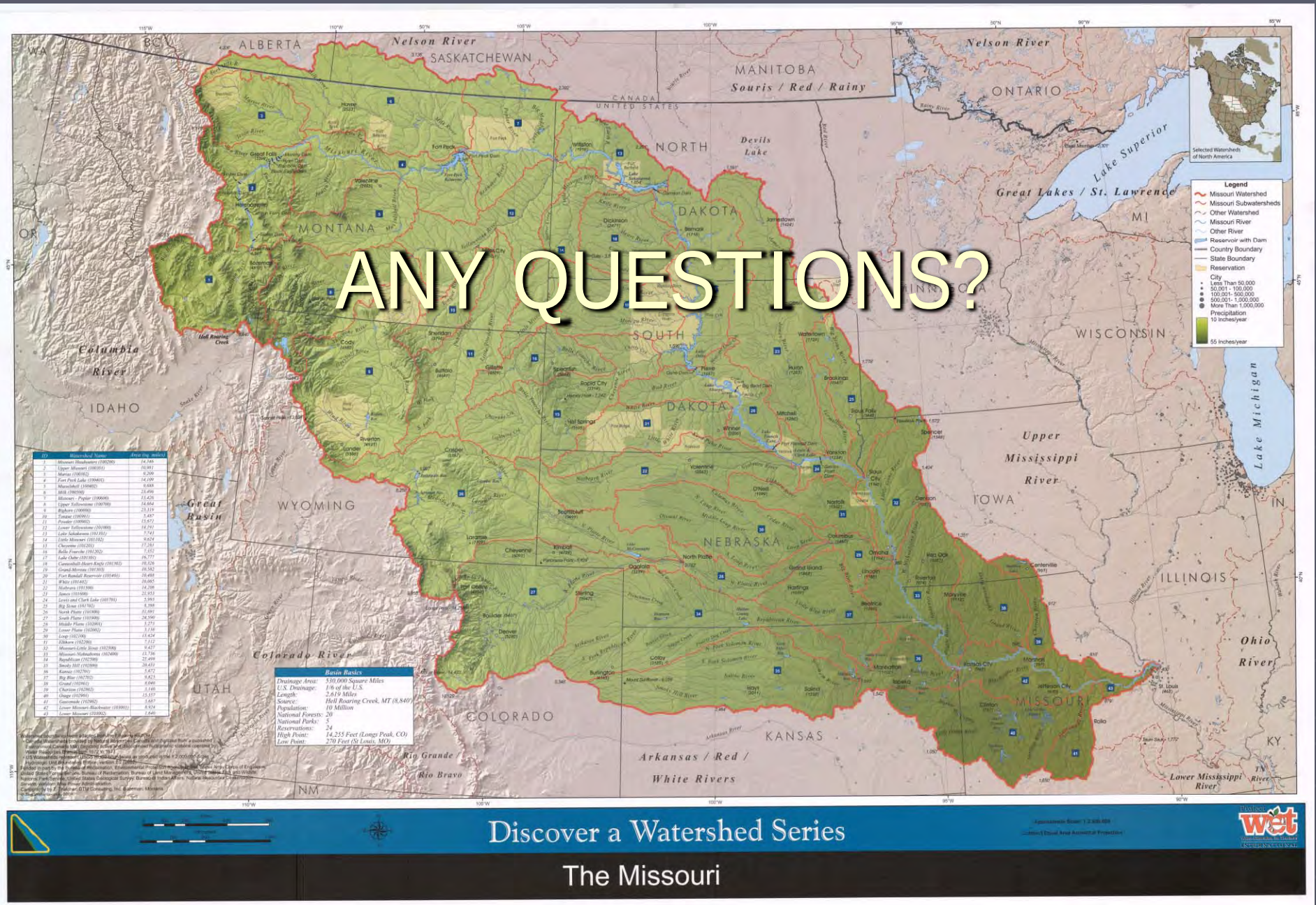
Dakota, Thurston, and Washington County DFIRMs

- Counties received updated digital maps through FEMA's Map Mod Program
- Updated USACE Missouri River (1997) study is included in each of the county's maps



Douglas and Sarpy Counties

- Will include 1997 Missouri River study from USACE when remapping is done.

The P-MRNRD's flood damage reduction strategies are integral with and are dependent upon the Missouri River mainstem dams and channel.

Missouri River Basin