

North Platte Chokepoint

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Platte River Recovery Implementation Program

North Platte Chokepoint Planning Workgroup Meeting

April 13, 2021

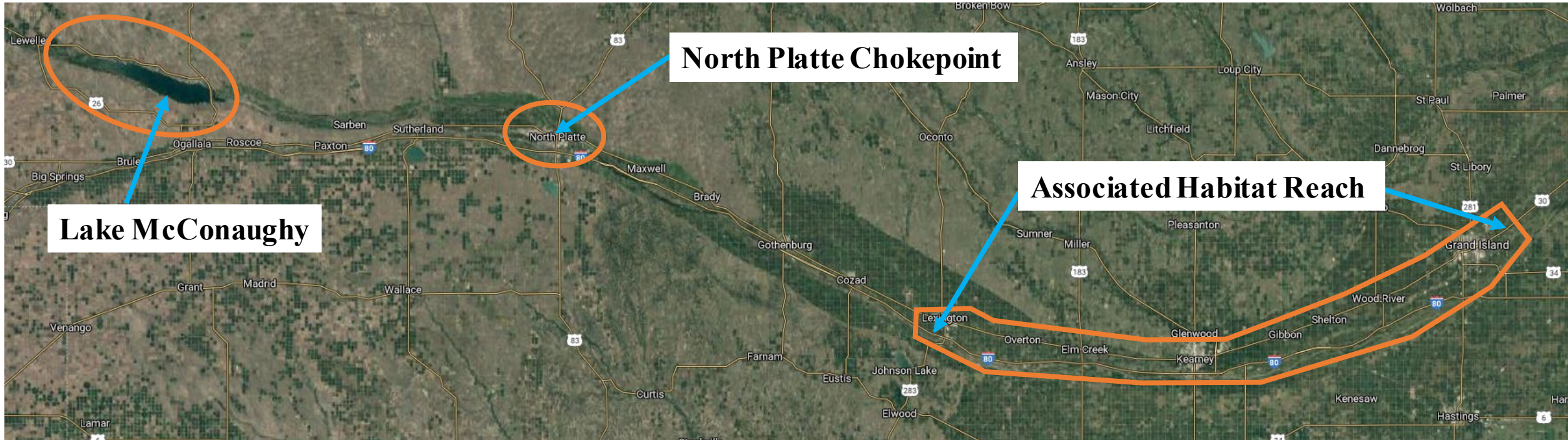
Overview

- Purpose of meeting
- Program goals at chokepoint
- Diminished flow capacity at North Platte
- Early Program efforts at the chokepoint
- Institutional and engineering solutions
- Conclusions
- Vegetation treatment options

2020 Chokepoint Test Report – Next Steps

- Revisit engineering solutions
 - Dedicated bypass canal
 - Improvements to existing canals
 - Channel widening, dredging, construction of jetties
 - New outlet from NPPD system to South Platte River
- Modification of Program Document + Property buyouts and/or flood easements
- Vegetation (phragmites) management
- Work within existing flood stages and discharges (i.e., “let science guide”)

North Platte Chokepoint



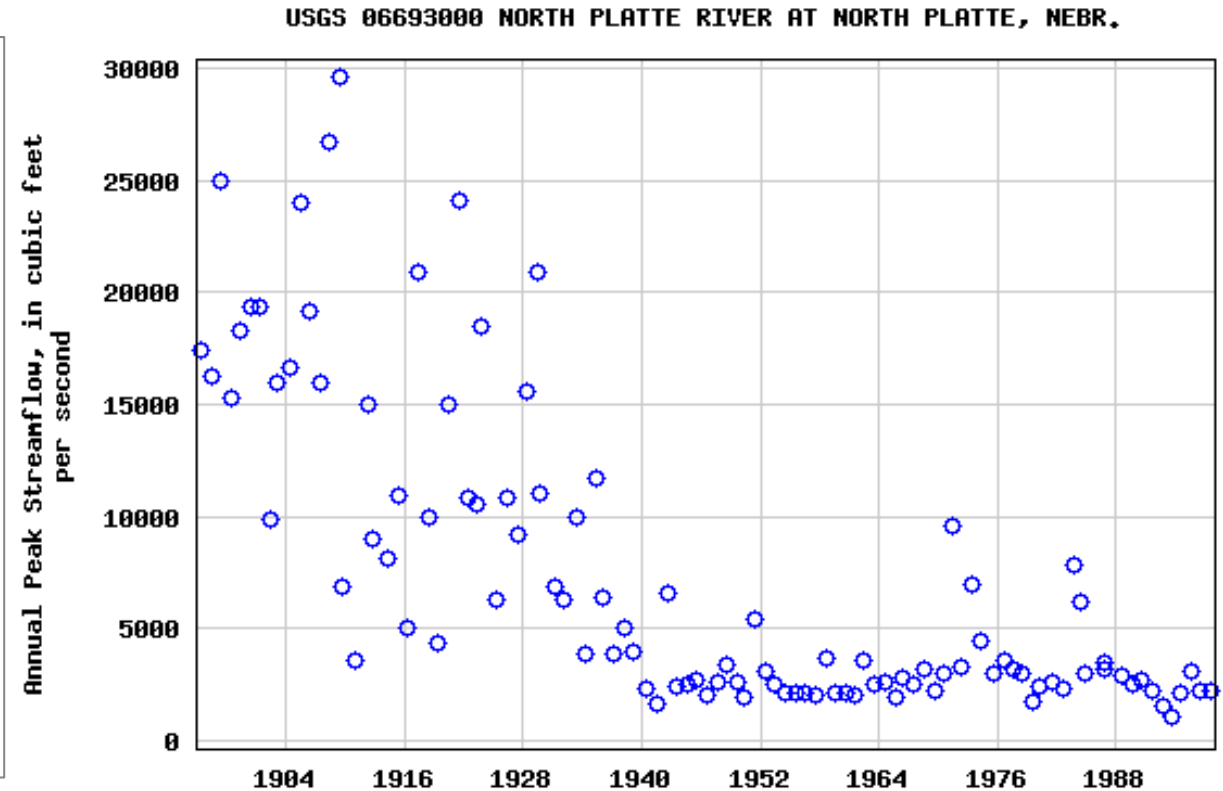
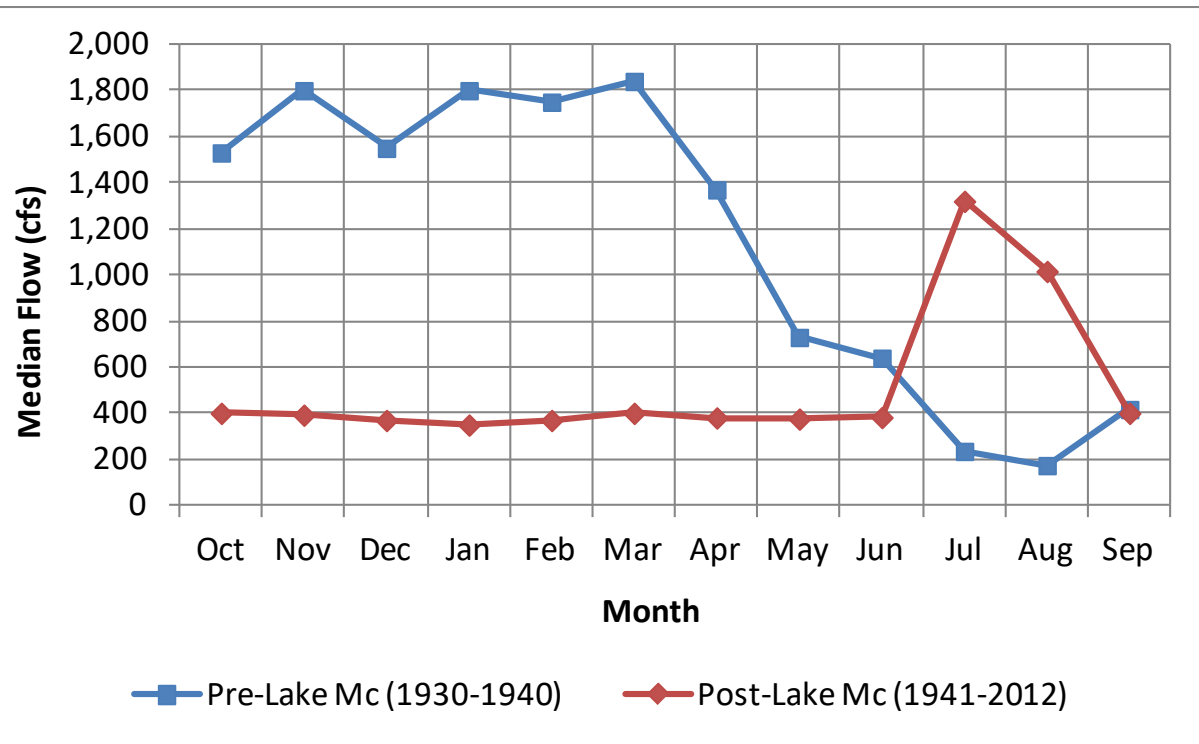
Program Goals

- Achieve and maintain 3,000 cfs through North Platte chokepoint
 - Governance Committee Alternative in FEIS (2006)
 - Program Document, Section III.E.2.d.iii (2006)
 - Addendum to the Program Document – First Increment Extension, Section II.B. (2017)
- Based on need for 5,000 cfs pulse flow
 - ~2,000 cfs from CNPPID system
 - Assume low baseflows, South Platte River inflows
 - Need 3,000 cfs from North Platte River
- Must remain below NWS flood stage
 - Program Document (Adaptive Management Plan, Environmental Account)
 - CNPPID's 1998 FERC license

Diminished flow capacity at North Platte

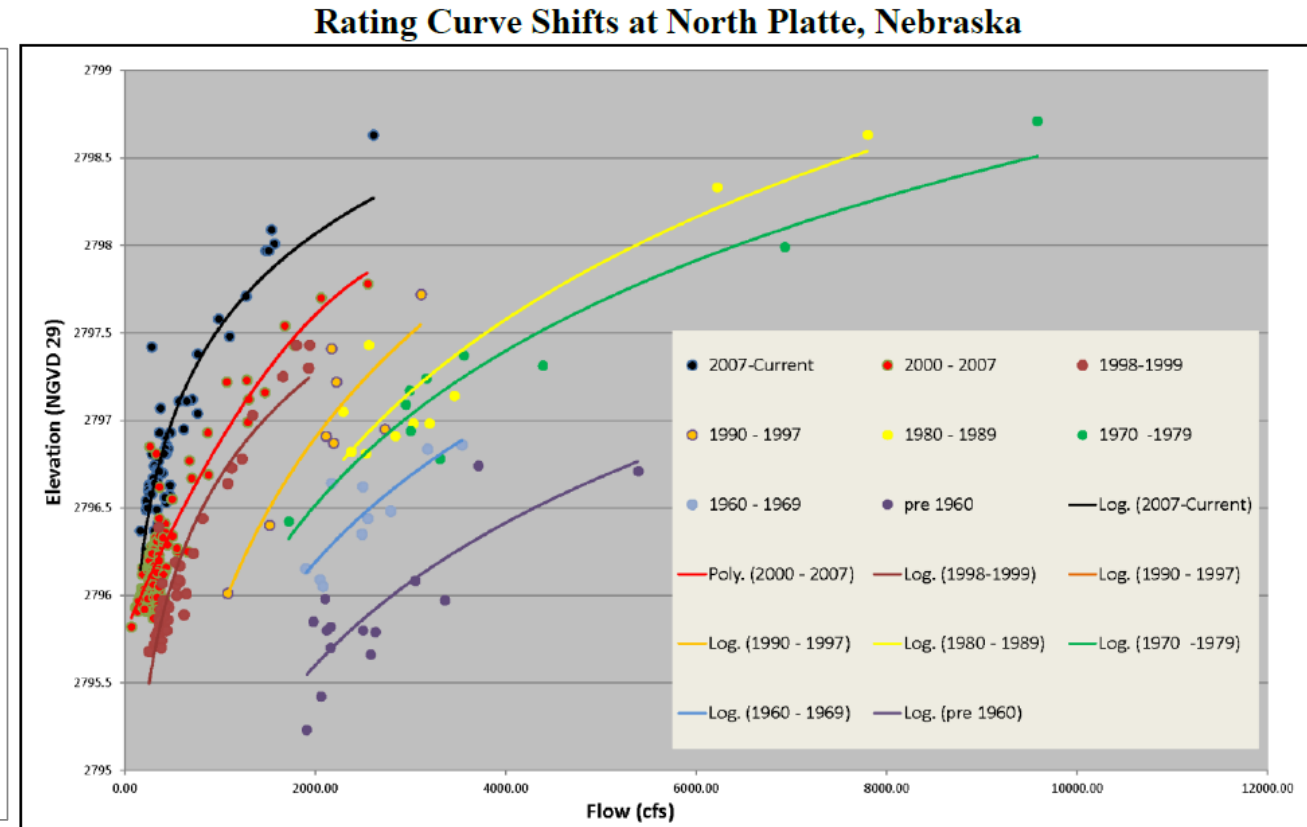
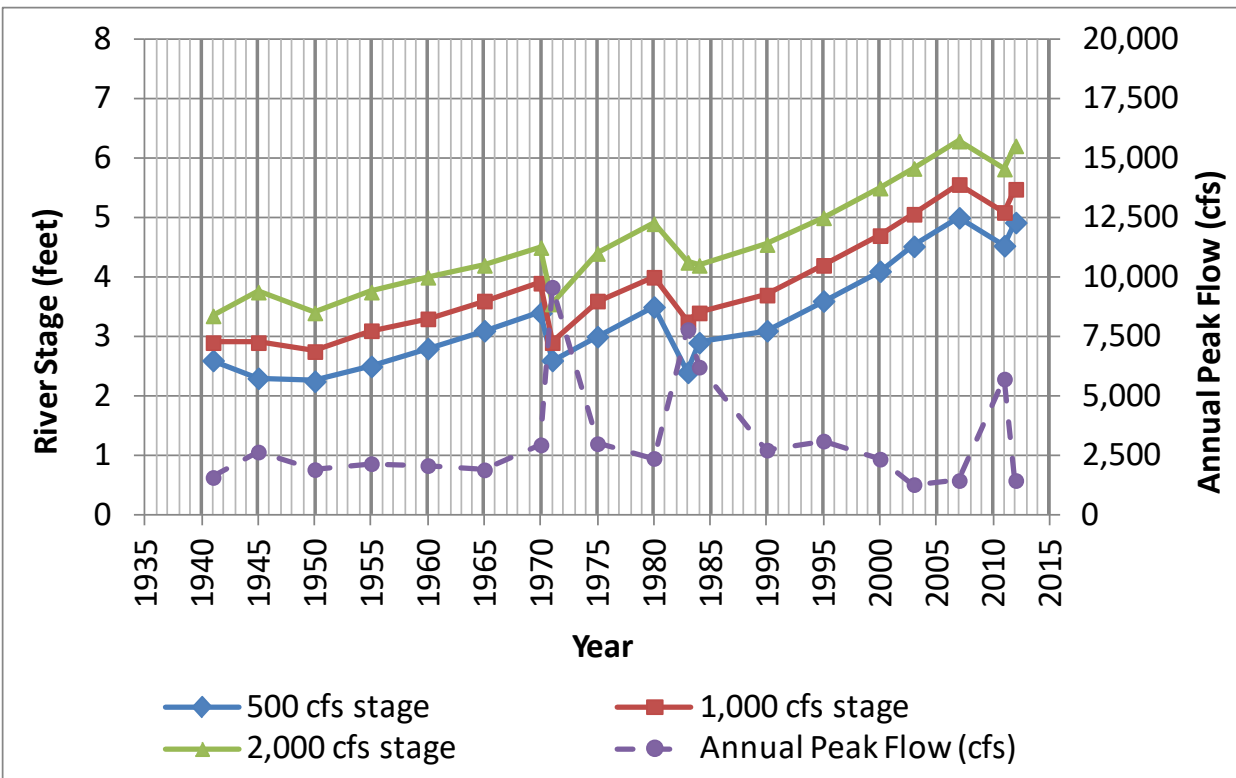
- Reduced median and peak flows
- Increased sediment deposition
- Development in the floodplain
- Bridge narrowing
- Vegetation growth, primarily phragmites

Reduced median and peak flows



Source: USGS

Increased sediment deposition

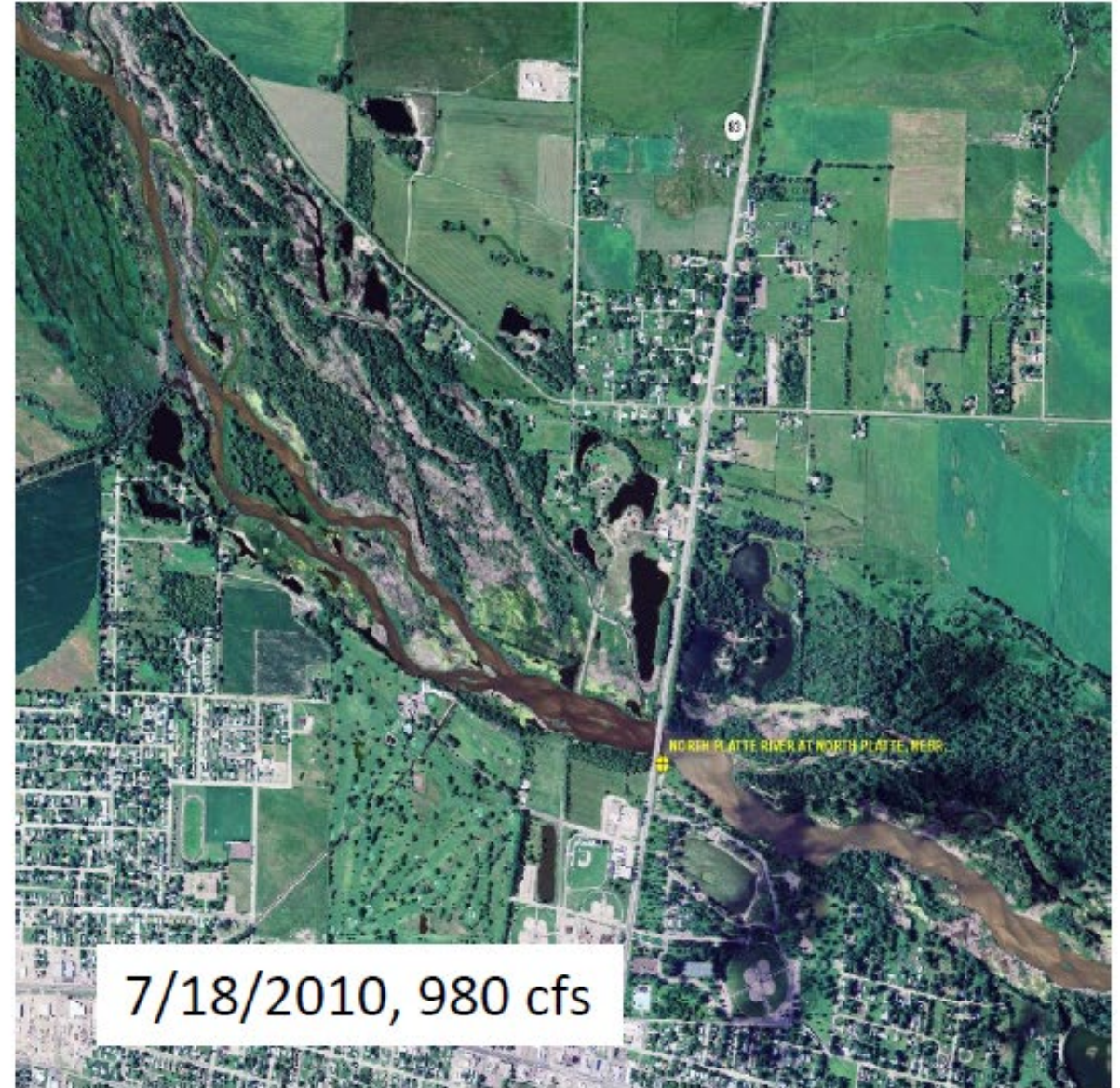


Source: Nebraska Silver Jackets 2012

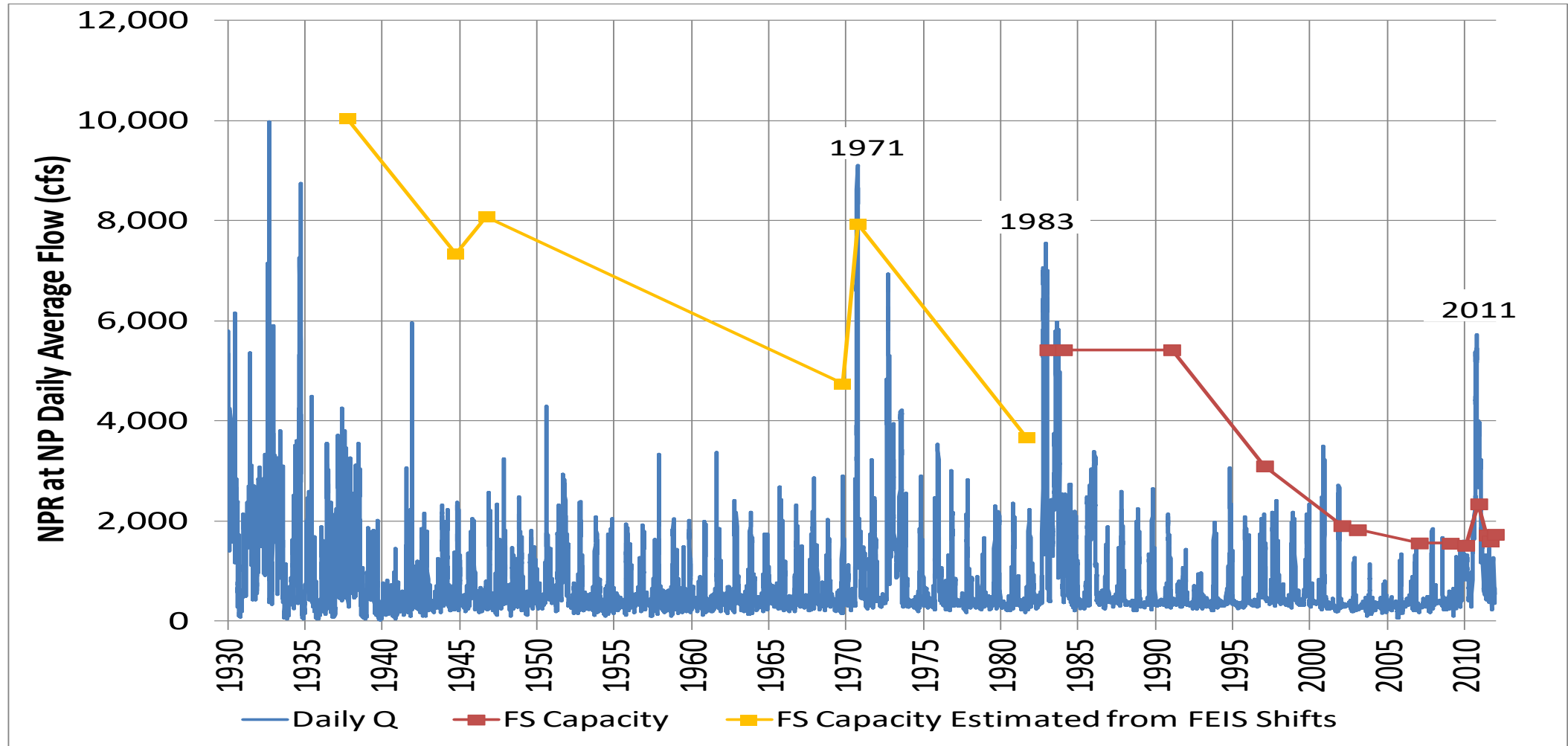
Development in flood plain



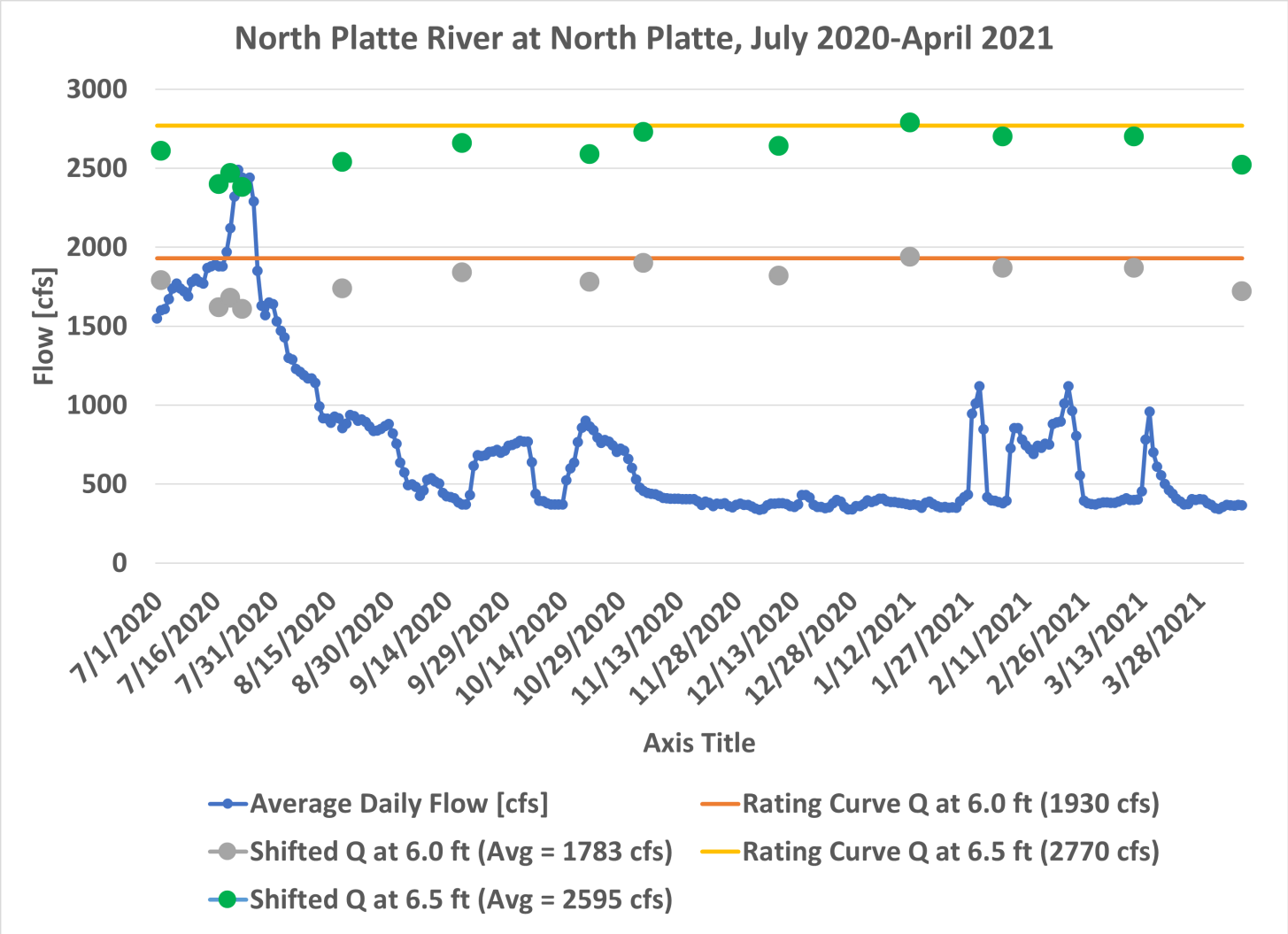
Bridge narrowing, vegetation growth



Discharge at flood stage



Discharge at flood stage



Early Program efforts at chokepoint

- J.F. Sato (2005)
 - State Channel
 - Open channels
 - Construct ditches
 - Remove sandbar
 - Remove phragmites
- Program Document (2006)
- SEH (2008)
 - Staff gages and monitoring
 - HEC-RAS model
 - Revise flood stage

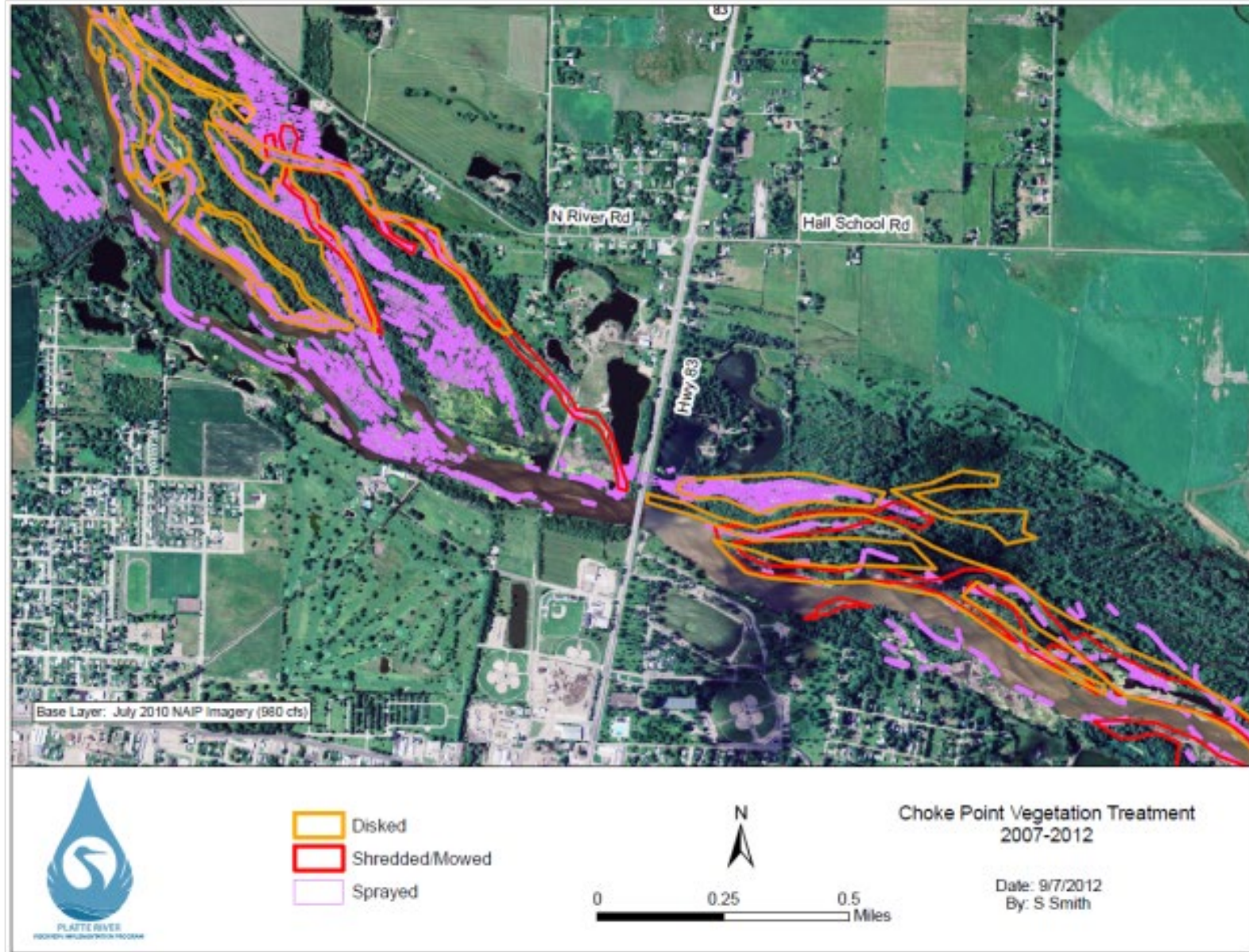


Early Program efforts at chokepoint

- 2009 Flow Routing Test
 - Chokepoint a problem!
 - Phragmites a problem!
- SEH (2009, 2010)
 - Remove vegetation
 - Flushing flows
 - Maybe downstream sediment?
- HDR and Tetra Tech (2011)
 - Reach between bridges
 - HEC-RAS, sediment transport models
 - No alternatives lowered 3,000 cfs stage



Vegetation treatment, 2007-2012



2011-2012: Refocus approach

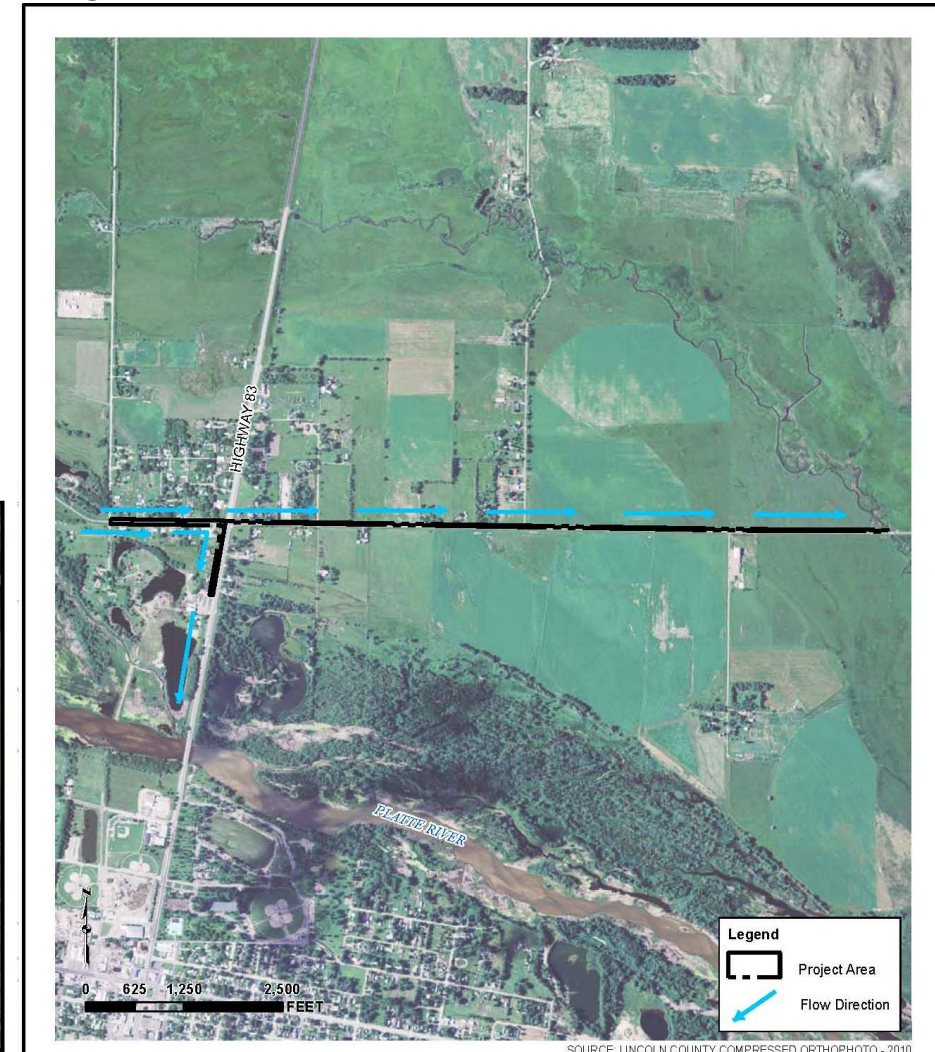
- Institutional solutions – basis for raising NWS flood stage to 6.5 ft
 - Implement flood-proofing projects
 - Buyouts or flood easements on properties impacted by flooding
- Engineering solutions
 - Modify North Platte River channel to increase capacity
 - Route water around the North Platte chokepoint

Flood-proofing projects

- Fall 2011
 - Discussions with City of North Platte and Lincoln County
 - Problem area north side of river, west of Highway 83, around North River Road & North Washboard Road
- Spring 2012
 - Discussions with NWS about possibility of raising flood stage
 - WAC in favor of flood-proofing projects, approved expenditures
- Three options
 - Whitehorse Creek drainage project – completed 2014
 - Reactivate State Channel – completed 2018
 - Gravel pit outlet – not implemented

Whitehorse Creek drainage project

- Installed driveway culverts along North River Road
- Improved drainage to east towards Whitehorse Creek
- Drain high groundwater and surface floodwaters
- Project completed early 2014



EA Engineering,
Science, and
Technology, Inc.

NORTH PLATTE FLOOD PROOFING
WHITEHORSE CREEK
HIGHWAY 83
NORTH PLATTE, LINCOLN COUNTY, NEBRASKA

PROJECT AREA

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FIGURE
DS	RL	JP	JDM	AS SHOWN	FEB 2013	1482203	1



PLATTE RIVER
RECOVERY IMPLEMENTATION PROGRAM

State Channel reactivation

- Project elements
 - Restored berm
 - Closed breach, installed culvert
 - Consistent channel width
- Permitting hurdles
 - Individual permit
 - Mitigation wetlands
- Construction completed in 2018



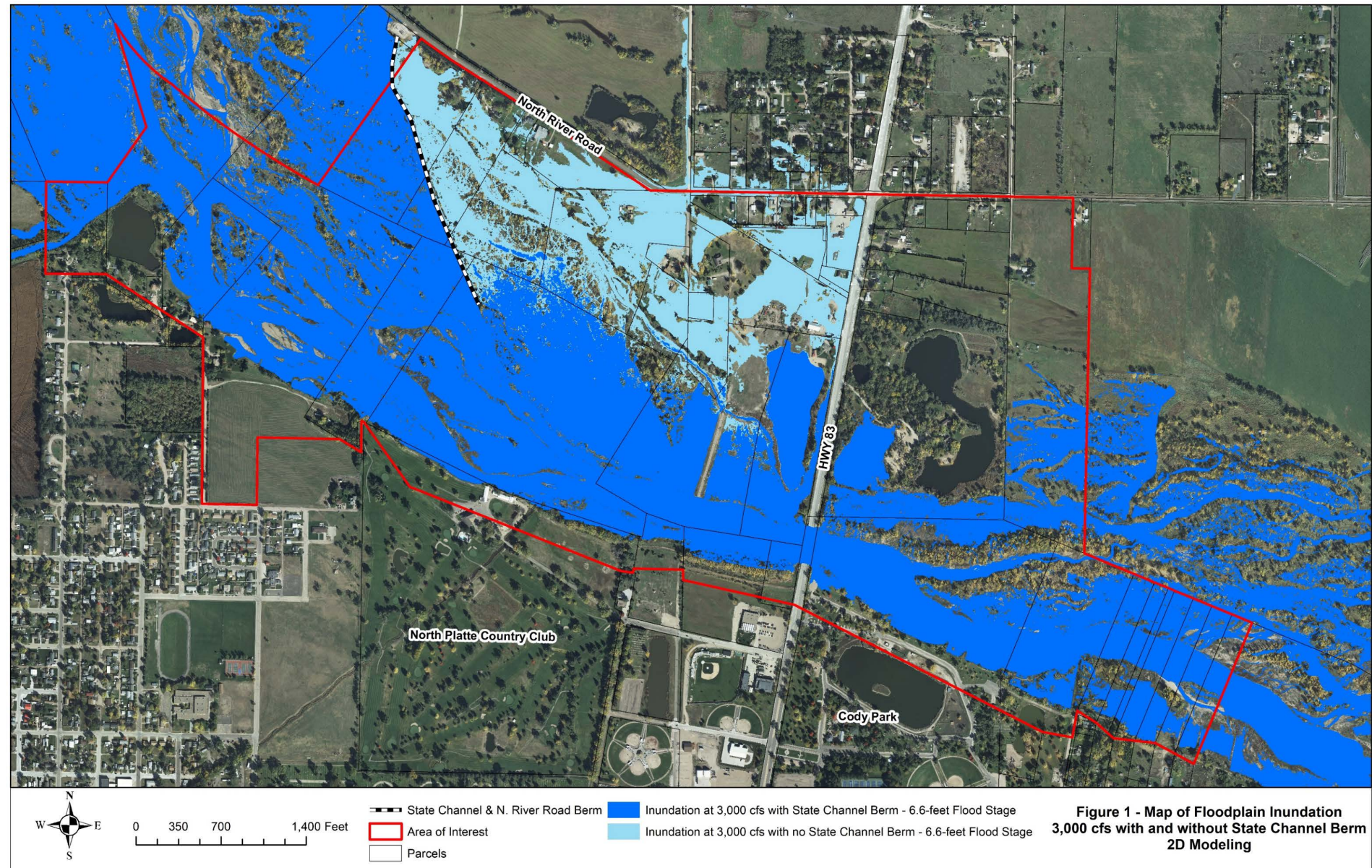
State Channel reactivation



State Channel reactivation

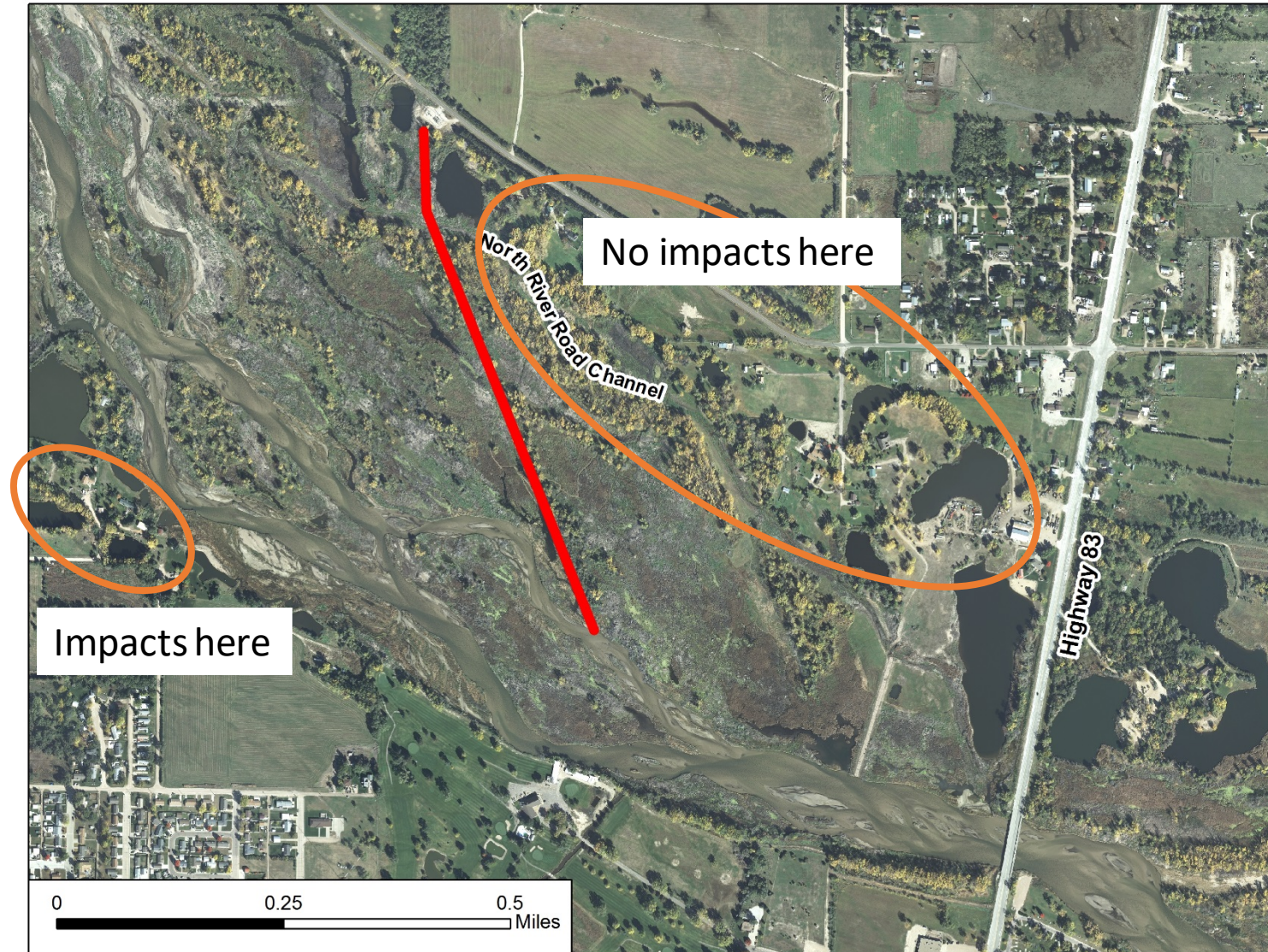


Inundation at 3,000 cfs (6.6 ft)



Chokepoint flow test

- After completion of flood-proofing projects
 - Planned for 2019, delayed by flooding
 - Planned and conducted in spring-summer 2020
- Observations
 - EA release July 13-24, 2020
 - Stages from 6.0 ft to > 6.5 ft
 - Flood-proofing projects worked
 - No water anywhere in north side neighborhood
 - New impacts along south bank
- NWS declined to raise flood stage, revised flood impacts definitions



Buyouts and flood easements

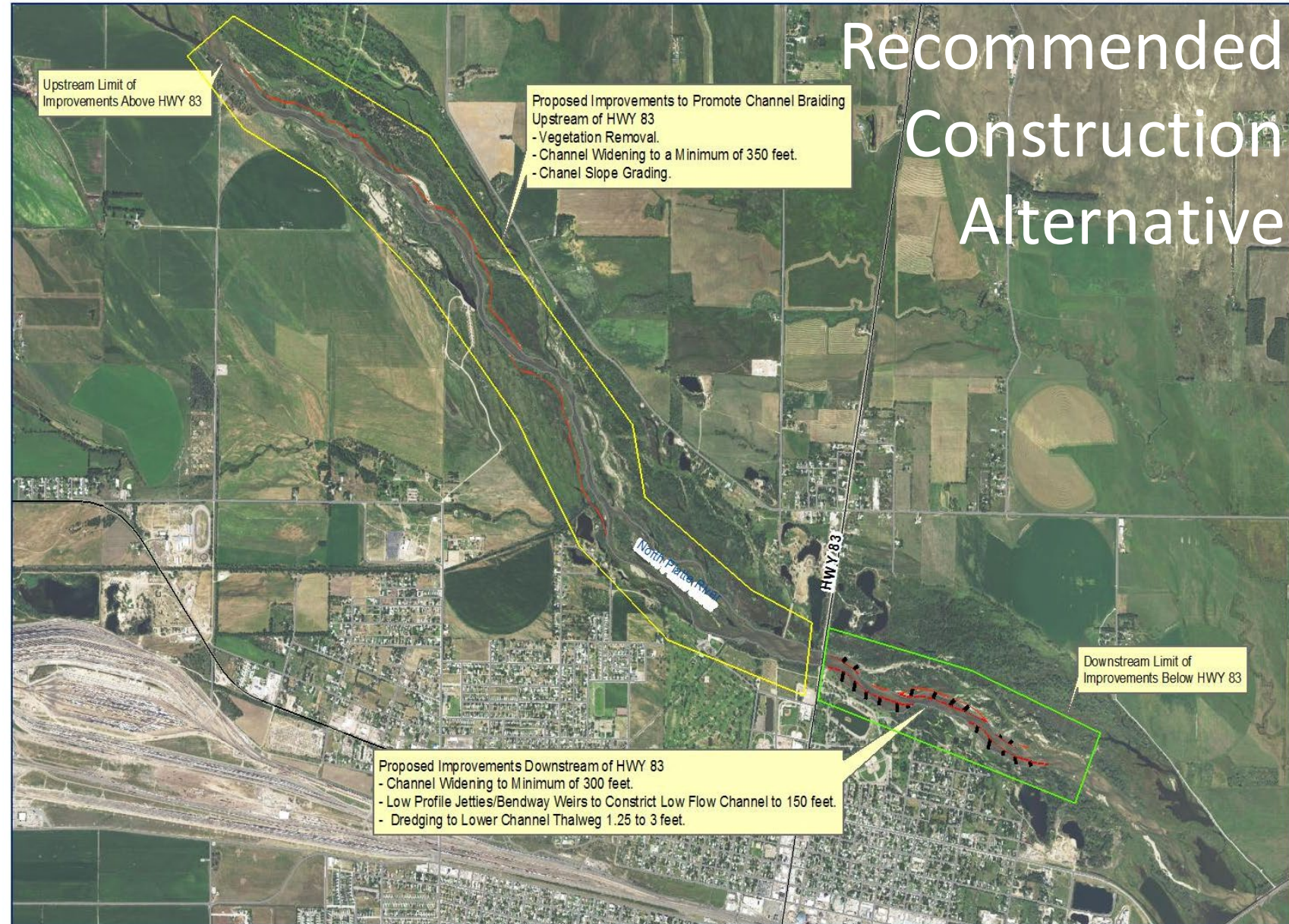
- Purchase lands impacted by flooding or compensate for damages
- Several iterations of analysis between 2012 and 2018
 - Buyouts alone
 - Flood easements alone
 - Combinations of both
 - With and without flood-proofing projects
- Costs
 - Easements = \$92,000 - \$375,000 (one-time payment only)
 - Buyouts = > \$4 million

Buyouts and flood easements

- Buyouts politically unacceptable
 - Exhaust all other options
 - Prove that SDHF necessary to achieve Program objectives
- Nearly 30 individual parcels, almost as many landowners
 - Most property owners unwilling to participate
 - Conflicts with Program's "willing seller" policy
- NWS would not consider when setting flood stage
- Policy conflicts
 - Program Document
 - CNPPID's 1998 FERC license
- Impacted areas may change over time (e.g., 2020 chokepoint flow test)

Modify North Platte River channel

- Downstream of Hwy 83
 - Channel widening
 - Dredging
 - Jetties/bendway weirs
- Upstream of Hwy 83
 - Vegetation removal
 - Channel widening
 - Channel slope grading
- Cost
 - \$3.34 million
 - \$30,500 annual O&M
- 3-4 years for permitting and construction



Bypass options

- NPPD system
 - Limited extra capacity
 - Best option
 - Sutherland East Reservoir (\$50 million)
 - New outlet to South Platte River via Fremont Slough (\$10 million)
 - Outlet to South Platte River either side of Paxton Siphon
- Pipeline
 - Headgate wells to divert from North Platte River
 - 18-inch pipeline, 22 cfs capacity
 - \$1.5 million

Bypass Options

- Use and improve existing canals
 - Keith-Lincoln, North Platte (PVID), Suburban
 - Tested during 2013 SDMF release, only 45% diverted reached South Platte
 - Considered new wasteway to increase North Platte delivery capacity
 - Overall limited capacity, even with improvements
- Anderson (2016) evaluated large bypass canals
 - New canal(s) parallel to existing (with road, RR, siphon crossings + land)
 - Up to 1,500 cfs capacity
 - Best option followed North Platte Canal alignment
 - \$13 million to construct + \$10,000 annual O&M

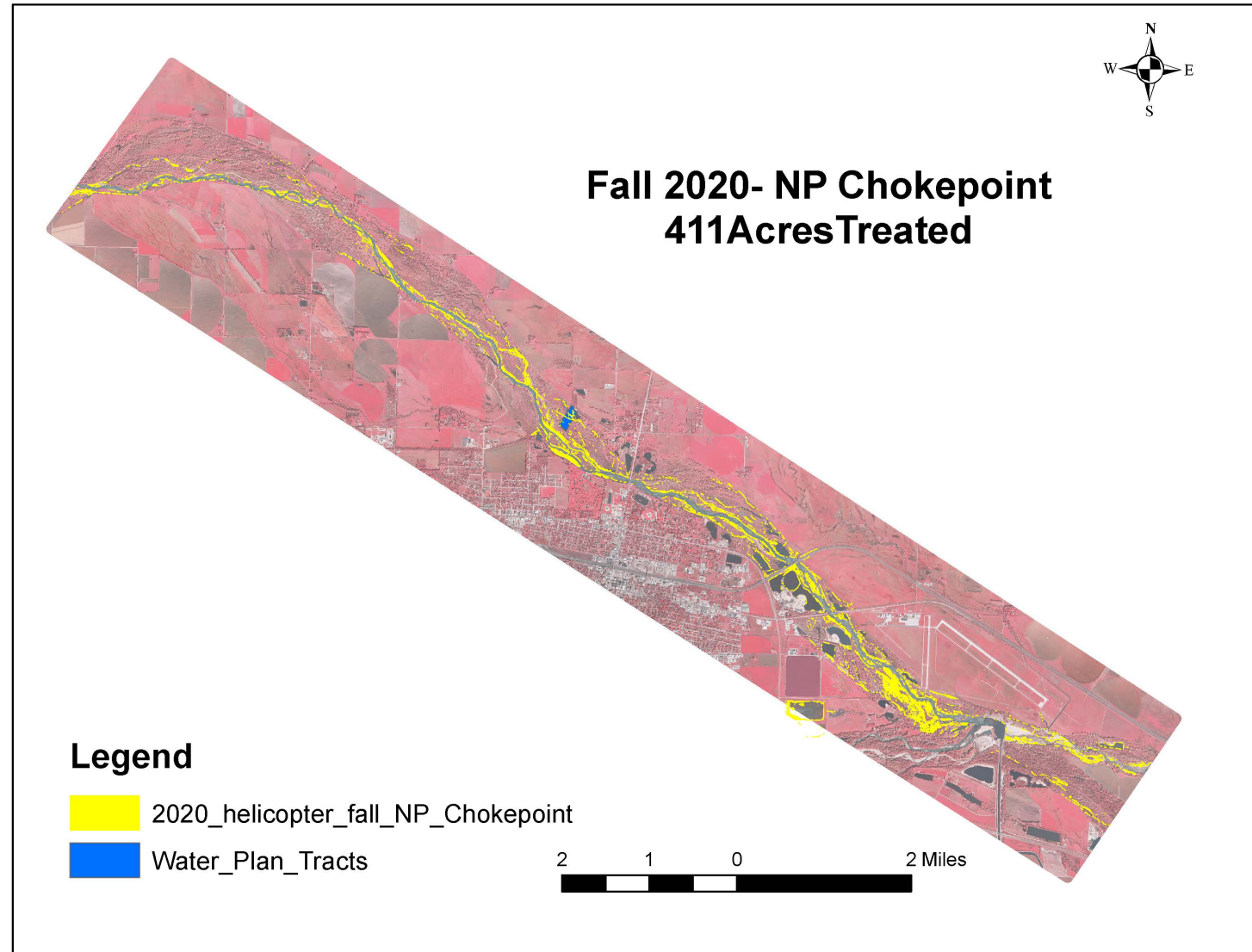
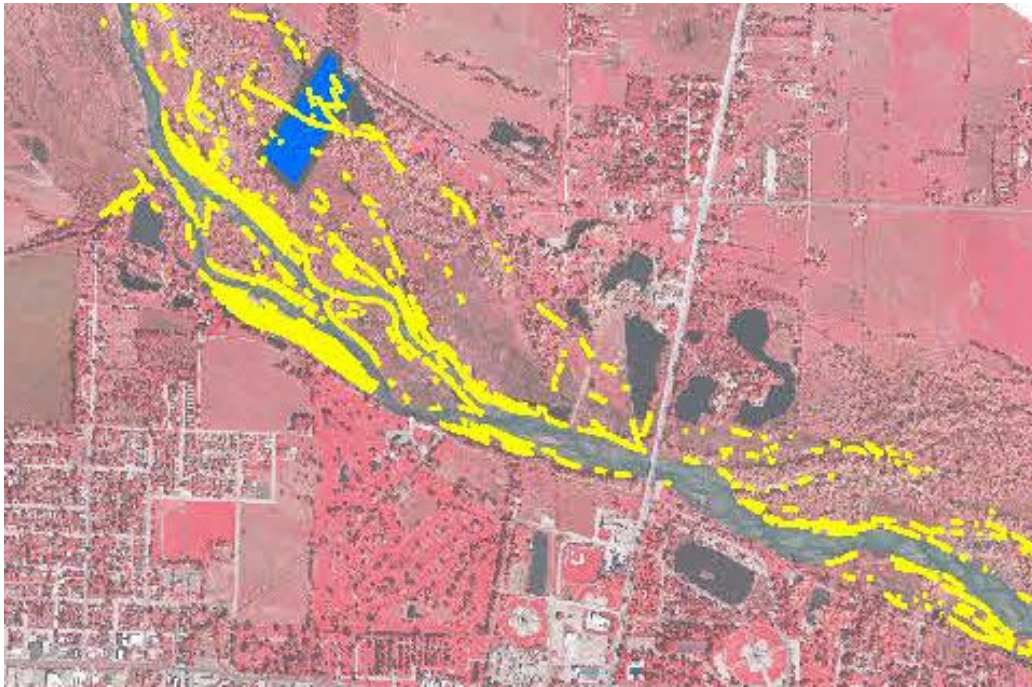
Conclusions

- Lots of alternatives evaluated, limited progress
- Flood-proofing
 - Completed 2 projects on north side of river
 - Successful mitigation of flooding
 - Did not result in flood stage increase to 6.5 ft
 - Process took much longer than anticipated
- Other projects (buyout/easements, channel mods, bypass routing)
 - Prohibitive costs
 - Permitting
 - Landowner issues
 - Long durations to implement
 - Repeat maintenance requirements
 - Policy conflicts

Back to original premise...

- 5,000 cfs pulse flows at upper end of AHR
 - 2,000 cfs from Central Platte reservoir
 - 3,000 cfs via North Platte
- J-2 Regulating Reservoirs project unsuccessful, no comparable replacement options
- 2019 State of the Platte: SDHF not effective for intended target species habitat benefit
- Ongoing AMP activities and flow experiments can guide actual capacity needs

Vegetation treatment options



Questions and Discussion

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