Nebraska New Depletion Plan Overview and Update

PRRIP Governance Committee Meeting

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Jennifer J. Schellpeper,
Water Planning Division Manager

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Review of Nebraska New Depletion Plan (NNDP)

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Review of NNDP Requirements – Overarching Premises

- State Moratoriums
  - New surface water appropriations in the Platte River Basin upstream of the confluence of the Platte River with the Loup River
    - Implemented in 90's
  - New groundwater well permits greater than 50 gpm in the 5 Upper Platte NRDs
    - Implemented subsequent to 2004 (LB 962)

- NNDP Location of New Use Limitations:
  - For Groundwater: In the watershed of the Platte River upstream of Chapman Nebraska and within the 28/40 area
  - For Surface Water: In the watershed of the Platte River upstream of the confluence with the Loup River

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Review of NNDP Requirements – Overarching Premises

- New use:
  - Groundwater and surface water uses begun or expanded between July 1, 1997 and 2006
    - That causes a depletion to the Platte River or tributary thereof
    - Which impacts
      - USFWS “target flows”
      - “state-protected flows”
    - Will be offset
- Permitted New Use Activities:
  - DNR or NRD permitted activities post-2005 will require an offset
  - Annual report of permitted activities and their required offsets
- Unpermitted Activities:
  - Sandpits, unpermitted small reservoirs, wells less than 50 gpm, not covered by Federal Depletions Plan
    - https://upjointplanning.nebraska.gov/media/RobustReview/B.2_SandpitsAndSmallReservoirs_updated20190612.pdf

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Annual Update - 2022 permitted activities

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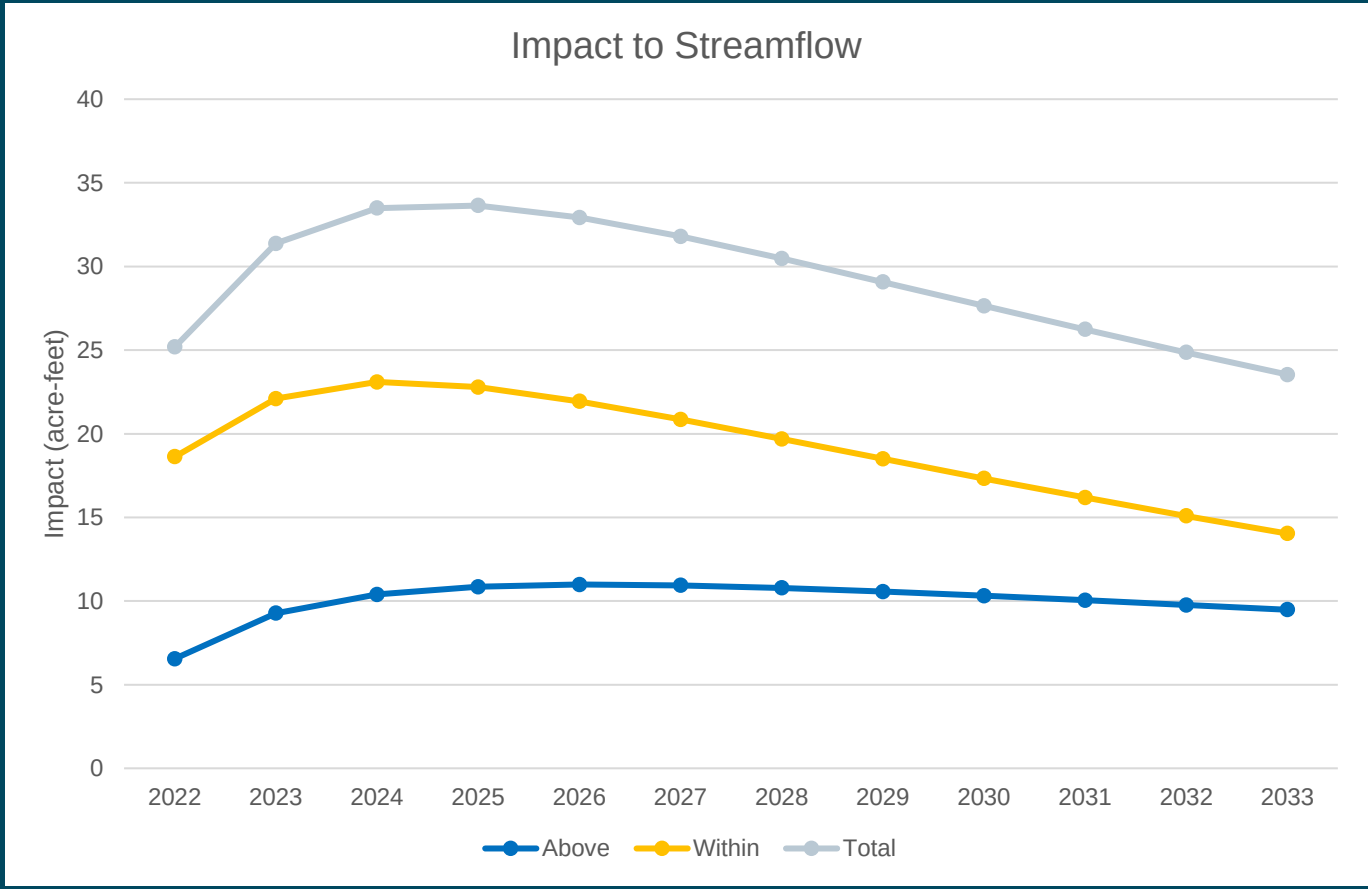
2022 Permitted Water Uses

Use	Upstream of AHR	Within AHR	Total
GW Transfer	23	24	47
Replacement Well	14	11	25
Irrigation	4	-	4
Supplemental GW	3	4	7
Dewatering	-	8	8
Observation	1	-	1
GW Variance	16	-	16
SW Temp Recharge	8	-	8
SW Temp Manufacture	1	-	1
Total	**70**	**47**	**117**

Effects to Streamflow from 2022 Permitted Activities in Acre-feet

Year	Upstream of AHR			Within AHR			Both Reaches
	Mitigations	New Uses	Net Effect	Mitigations	New Uses	Net Effect	Net Effect
2022	26.82	-20.26	6.56	22.41	-3.79	18.63	25.19
2023	39.88	-30.6	9.28	39.23	-17.14	22.1	31.37
2024	48.43	-38.03	10.39	52.05	-28.96	23.09	33.49
2025	54.76	-43.91	10.85	61.55	-38.76	22.79	33.64
2026	59.77	-48.79	10.98	68.98	-47.04	21.94	32.92
2027	63.89	-52.96	10.94	75.03	-54.17	20.86	31.8
2028	67.37	-56.59	10.78	80.1	-60.41	19.69	30.48
2029	70.36	-59.79	10.57	84.43	-65.93	18.5	29.07
2030	72.98	-62.66	10.32	88.19	-70.86	17.33	27.65
2031	75.29	-65.24	10.05	91.5	-75.31	16.19	26.24
2032	77.35	-67.58	9.77	94.44	-79.35	15.09	24.86
2033	79.21	-69.72	9.49	97.09	-83.05	14.04	23.53

Net Effect to Streamflow from 2022 Permitted Activities



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NNDP: “Robust Review”

NNDP: Nebraska will conduct a new land use inventory and will collect such other information as is necessary to assess the sufficiency of the combined NRD required and state offset measures implemented because of new and expanded uses of surface water and groundwater subject to this plan.

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Review of NNDP Requirements – Overarching Premises

- Nebraska's will develop and maintain the hydrologic tools used by the state and the NRDs to determine the amount, timing, and location of depletions to state-protected flows, and target flows, and also to evaluate the effectiveness of proposed offset projects.

- In all cases, the offset objective will be to replace the water depleted in the amounts needed and at the times and locations needed to prevent harm to the water uses and/or the target flows for which such flow protection is required.

- All offset measures shall be constructed and operated or implemented so that they do not cause additional shortages to either target flows or state protected flows.

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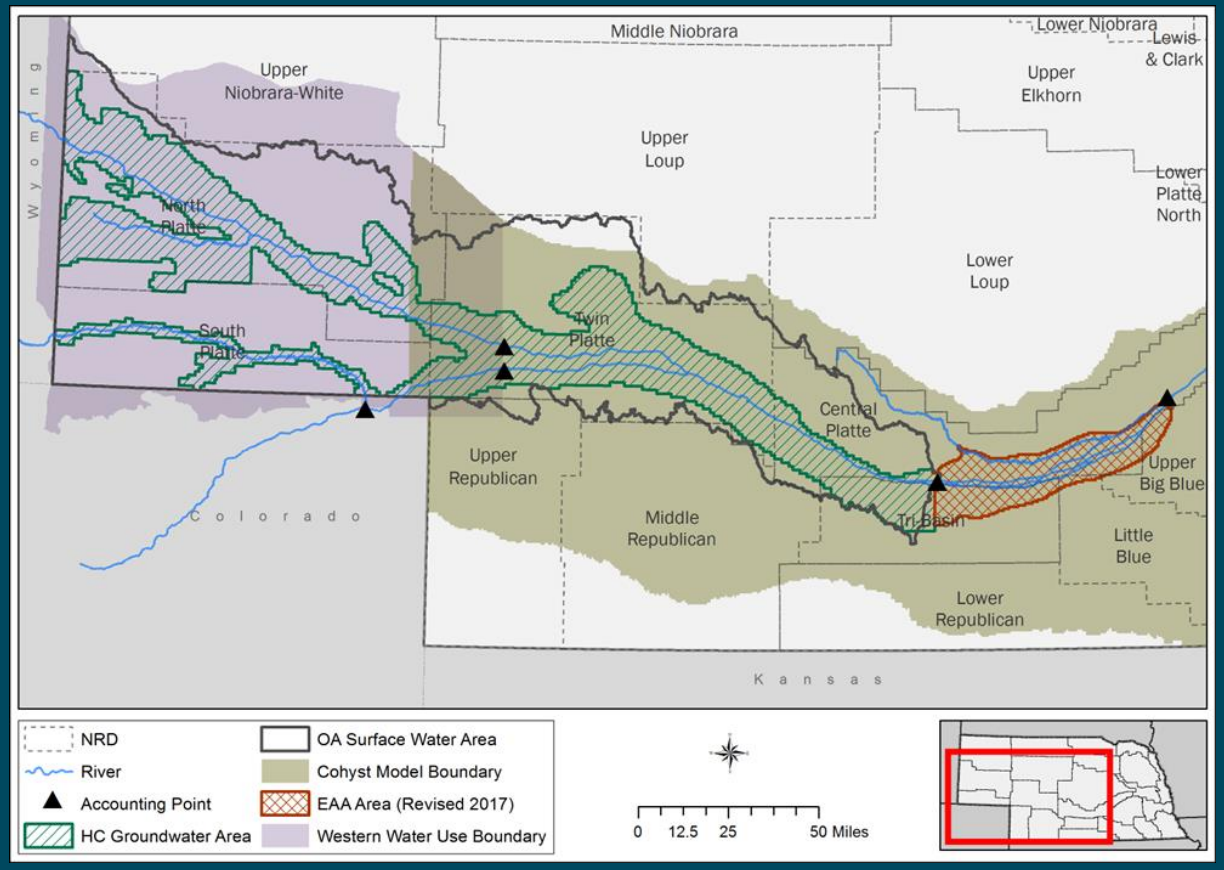
Review of NNDP Requirements – Implementation Tasks

A. Refine the COHYST models as needed…;

B. Determine the extent of any increase in irrigated acreage in the COHYST modeled area;



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Review of NNDP Requirements – Implementation Tasks

C. Determine the extent of any increase in average annual consumptive water use by municipalities, industries, rural domestic and other new water related activities in the COHYST modeled area subsequent to 1997;

D. Determine the amount, timing and location of any depletions to the Platte River or a base flow tributary because of any increase described in b. or c. above;

E. Determine what measures will be utilized to offset, in amount, timing and location, the depletions quantified above;

F. Adopt and implement, in at least six natural resources districts, integrated management plans governing the initiation of new water related activities and the expansion of water related activities that have been initiated through 2005; such plans will encompass **at least** the geographic area that is within the Platte River Basin and inside the 28% in 40-year lines for the Platte and base flow tributaries.

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Review of 2019 Nebraska Basinwide Plan and Integrated Management Plans

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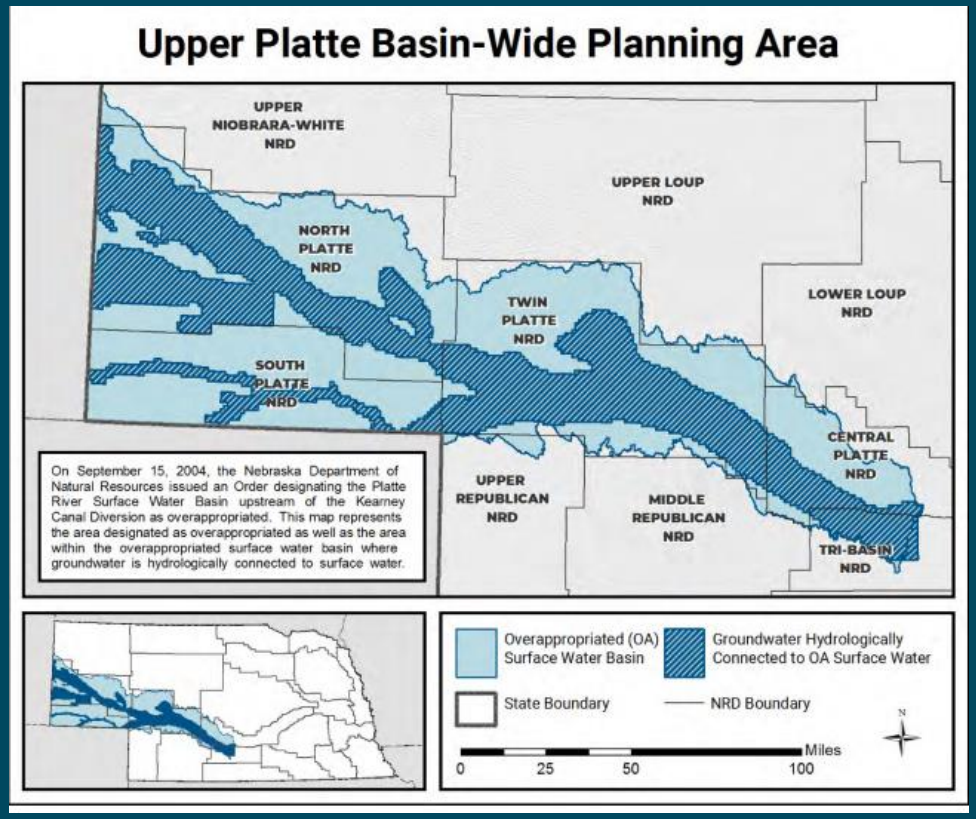
Review of Nebraska Basin Wide Plan Goals

- Ensure compliance with PRRIP through the NNDP
- Incrementally work to achieve a fully appropriated condition (required under state law)
- Work with M&I users to maximize water use efficiency
- Identify and resolve disputes among water users
- Improve information and data sharing



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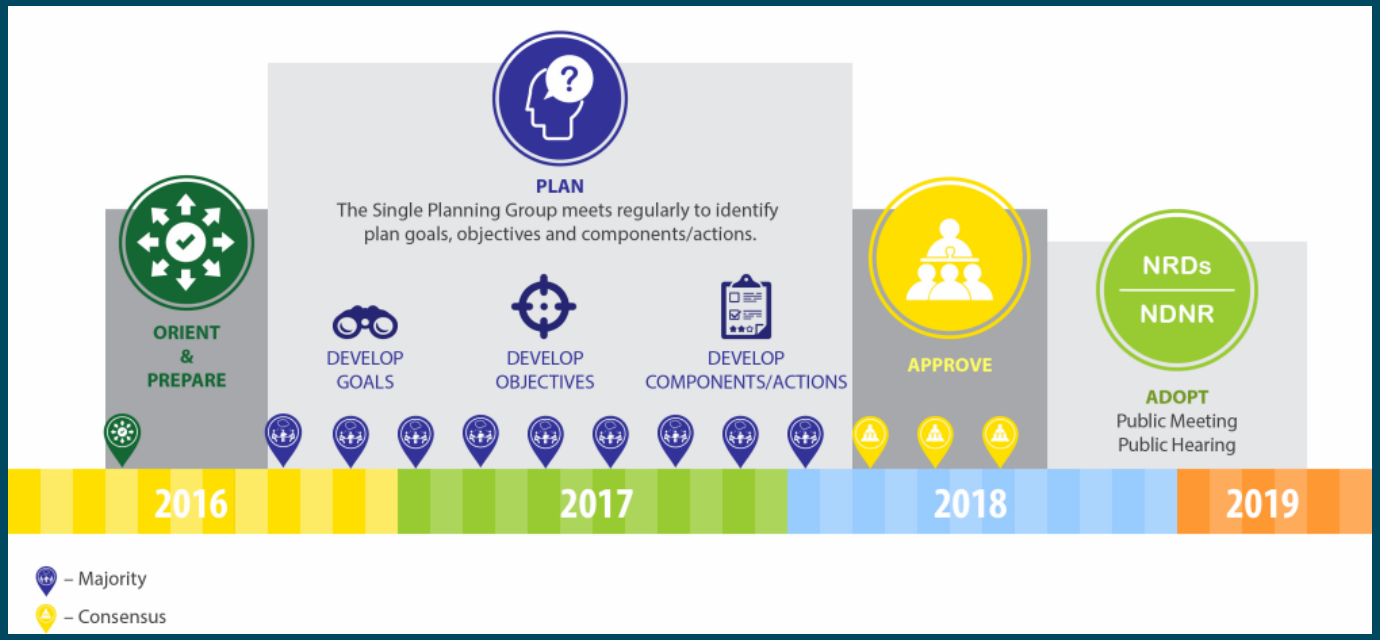
Basin-Wide and Integrated Management Plans



- Maintain first increment progress
- Sharpen focus on drought contingency planning
- Other key components left unchanged from the first increment
- Implement incentive-based and regulatory-based management actions to achieve the goals
- Update targets for post-1997 depletions (Robust Review)

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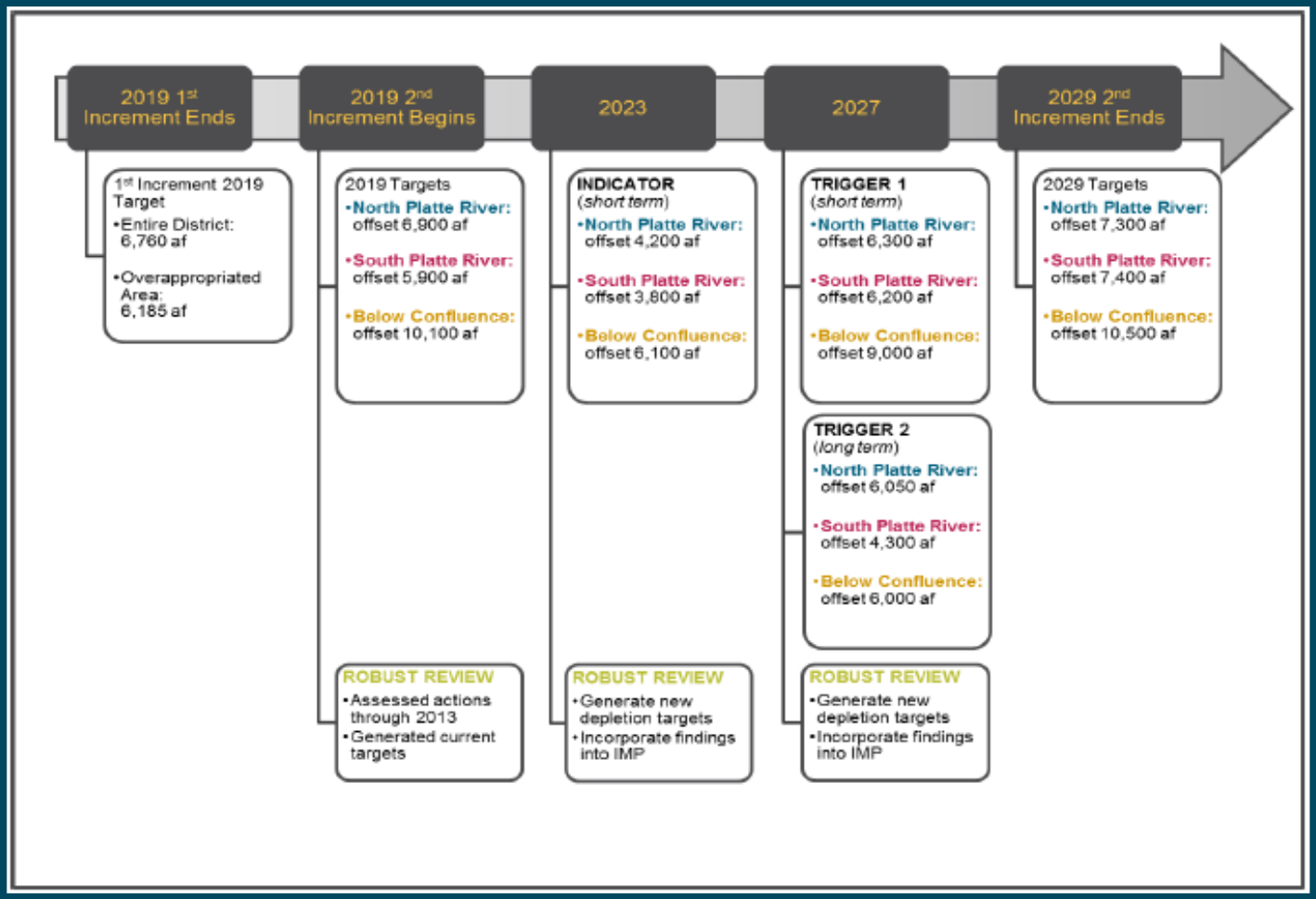
IMP Targets and Robust Review



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Goal of "Robust Review"

- Update net depletions due to new or expanded uses of water subsequent to July 1, 1997
  - Evaluated outside of Groundwater Model
    - Small reservoirs/sand pits (unpermitted) changes
    - Rural domestic population and livestock changes (<50 gpm wells)
  - Evaluated using a Groundwater Model
    - Groundwater irrigated acre changes
    - M&I changes
    - Crop-type changes
    - Producer Practices/Conservation Measures
  - Management actions (regulatory and non-regulatory)
    - Canal recharge (gw model)
    - Augmentation (combination)
    - Allocation (gw model)
    - Retirements/leases (combination)

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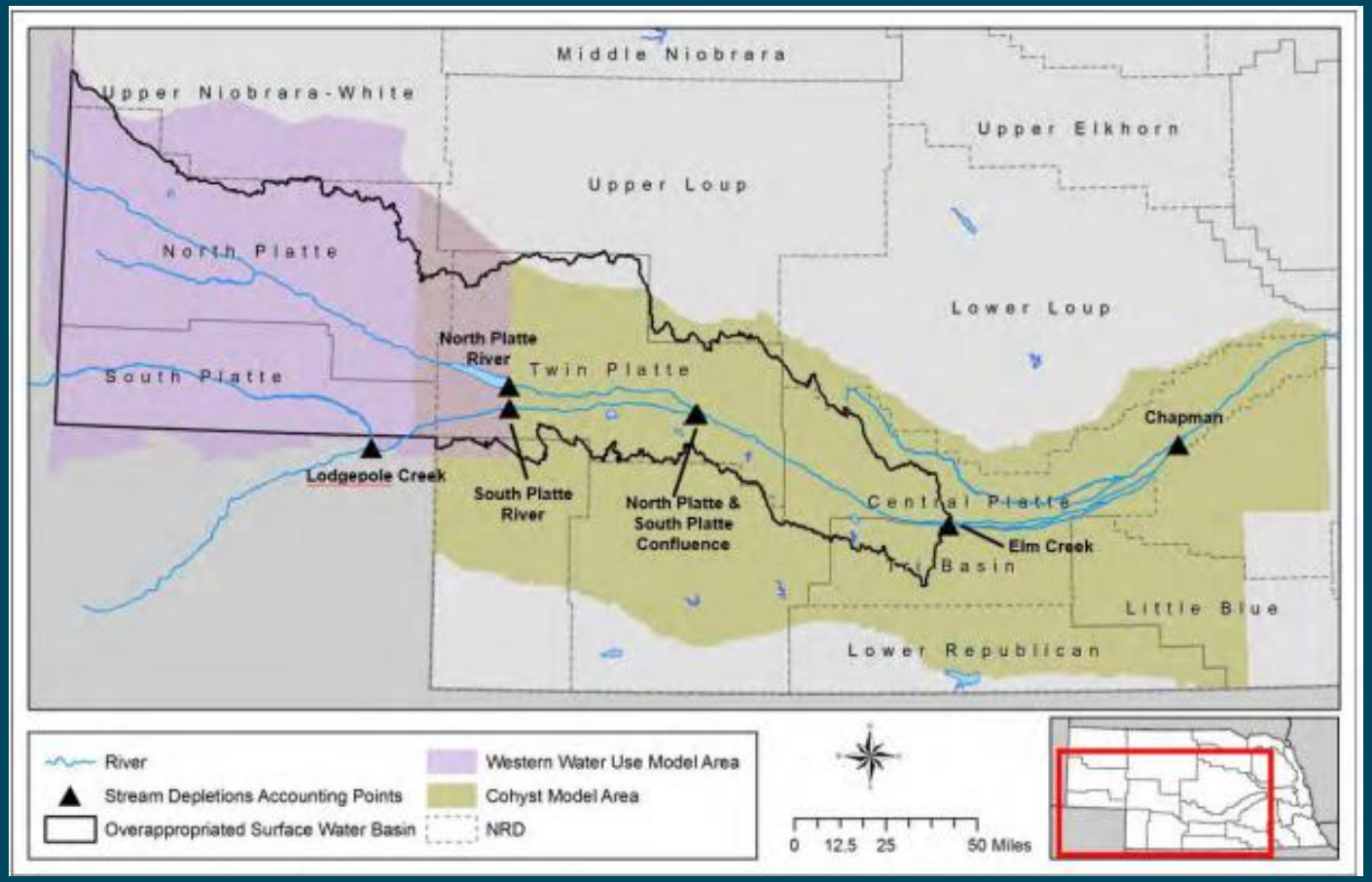
Robust Review Model Area



- COHYST and WWUM models
- Evaluation period 2020 - 2070 (50-years)

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Robust Review Model Simulations: Major 2023 Updates

- COHYST & WWUMM updated to Modflow 6
  - Updates to packages
  - Updates to geology in WWUMM
- Include changes in groundwater irrigated acres and crop types after 1997
  - Use metered pumping in SPNRD and NPNRD (allocations)
  - Updates to water use from 2013 through 2020
  - Future climate scenarios updated (representative of expected average conditions & based on available data)
  - Impacts of conservation practices (primarily tillage)
  - Updates to other producer practices (hybrids/planting and harvest dates, etc)
- Include changes in M&I pumping since 1997
- New management actions 2013 through 2020

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2023 Robust Review Results

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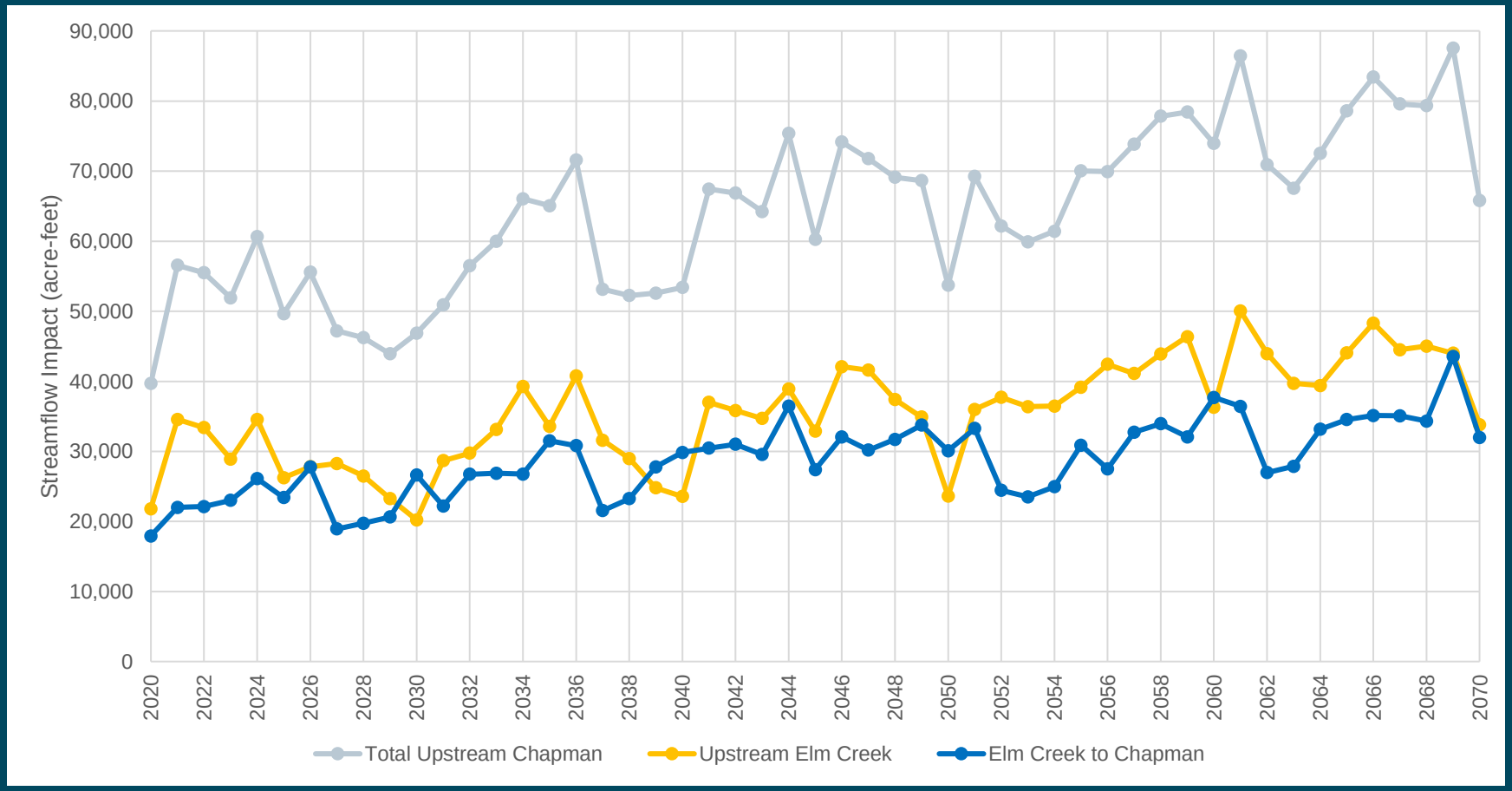
2023 Robust Review Results: Projected Streamflow Impacts

Year	Impacts Upstream Elm Creek (AF)	Impacts Elm Creek to Chapman (AF)	Combined Impacts Upstream Chapman (AF)
2022	33,400	22,100	55,500
2023	28,900	23,000	51,900
2024	34,600	26,100	60,700
2025	26,300	23,400	49,700
2026	27,800	27,800	55,600
2027	28,300	18,900	47,200
2028	26,500	19,800	46,300
2029	23,300	20,600	43,900
2030	20,200	26,600	46,800
2031	28,700	22,200	50,900
2032	29,800	26,700	56,500
2033	33,100	26,900	60,000

2023 Robust Review Results: Projected Streamflow Impacts



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Robust Review Summary

- Nebraska remains in full compliance with NNDP and achieving Milestone 9 of the Extension document
- IMPs have resulted in state-wide compliance in excess of post-1997 mitigation requirements
- Next Robust Review planned for 2027

Other Basin-wide Activities

- Multiple NRDs will be pursuing IMP updates
- Upper Platte River Drought Contingency Plan anticipated completion on or before December 31, 2024
- 3rd Increment of BW plan will start in 2029

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Questions?

Jennifer J. Schellpeper
jennifer.schellpeper@nebraska.gov
Office: 402-471-2899

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Links to More Information:

- https://dnr.nebraska.gov/water-planning/upper-platte-basin-wide-plan
  - links to robust review documentation, basin-wide plan, and stakeholder presentations
- https://dnr.nebraska.gov/water-planning/central-platte-nrd
- https://dnr.nebraska.gov/water-planning/north-platte-nrd
- https://dnr.nebraska.gov/water-planning/south-platte-nrd
- https://dnr.nebraska.gov/water-planning/tri-basin-nrd-0
- https://dnr.nebraska.gov/water-planning/twin-platte-nrd

- links to each respective NRDs IMP page with copies of plans and stakeholder materials

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301 Centennial Mall South
PO Box 94676
Lincoln, NE 68509-4676
402-471-2363

https://dnr.nebraska.gov

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