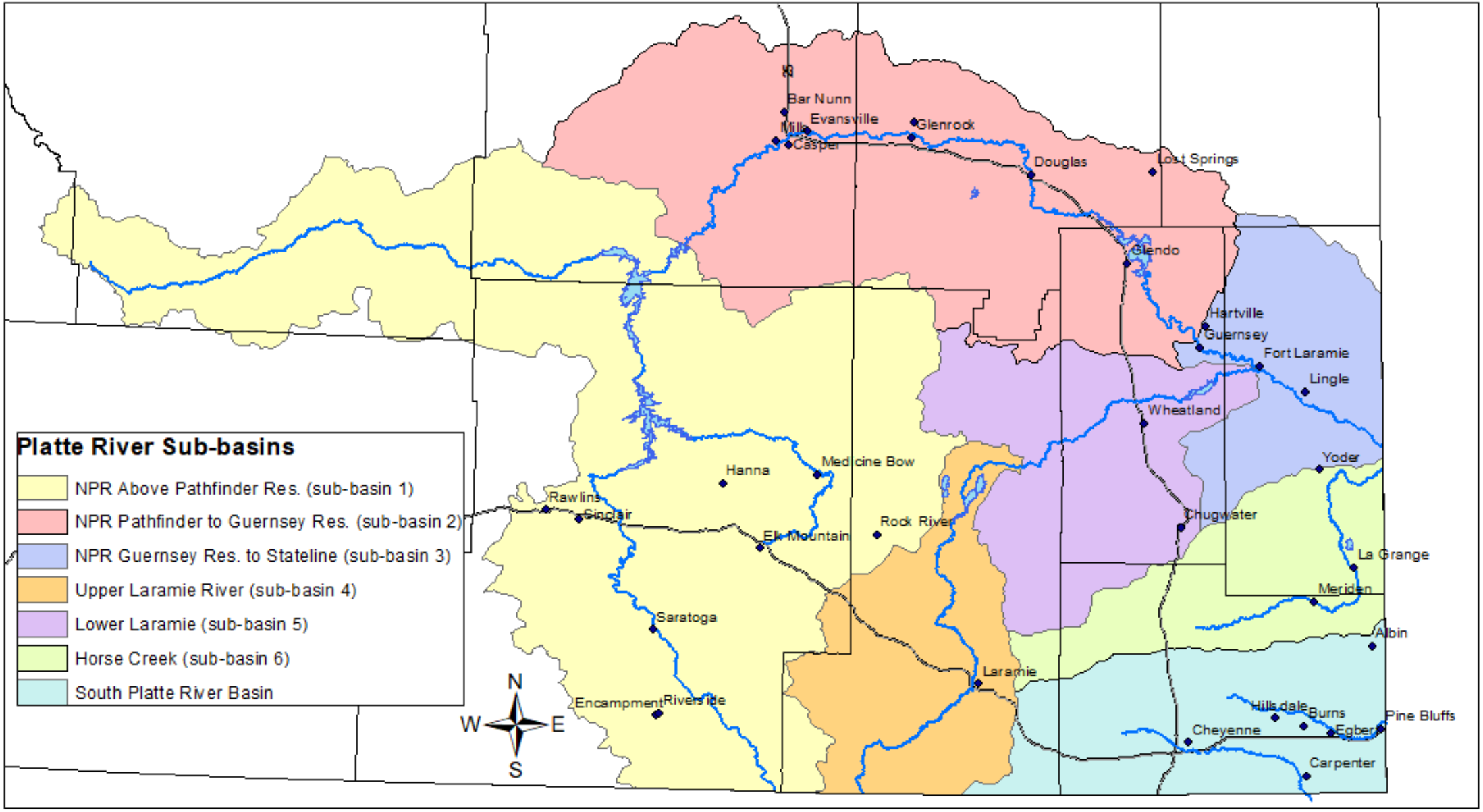
Overview of Wyoming Depletions Plan and Water Year 2023 Report

PRRIP Governance Committee Meeting

June 12, 2024

Michelle Hubbard

Sub-basins Defined by the Depletions Plan



Baselines Under the Wyoming Depletions Plan

Baseline No. 1

The only water use associated with Baseline No. 1 is irrigation in the North Platte River Basin (NPRB) Above Guernsey Reservoir.

This baseline is associated with Wyoming's compliance with the Final Settlement Stipulation and Modified North Platte Decree.

Baseline No. 2

Water use under Baseline No. 2 is associated with:

- Irrigation water below Guernsey reservoir to the Stateline and the Laramie River.
- Existing benchmarks for municipal and industrial users, and rural domestic water use for the entire NPRB
- Post-1997 Activities

Baseline No. 3

The only water use category under Baseline No. 3 is new on-channel reservoir storage in the South Platte River Basin.

Baseline No. 1: Irrigation Above Guernsey Reservoir

1. Compliance with the Modified North Platte Decree
   - Benchmark: 226,000 acres of intentional irrigation
   - Annually, Wyoming reports the number of intentionally irrigated acreage Above Guernsey Reservoir to the GC.
   - In 2023, the intentionally irrigated acreage was 206,386 acres above Guernsey Reservoir.

2. Kendrick Project (Casper Alcova Irrigation District; CAID)
   - Benchmark: 24,249 acres
   - Each year the Bureau of Reclamation (BOR) reports the number of acres irrigated.
   - In Water Year 2023, the BOR reported 24,249 acres of irrigation under the Kendrick Project.

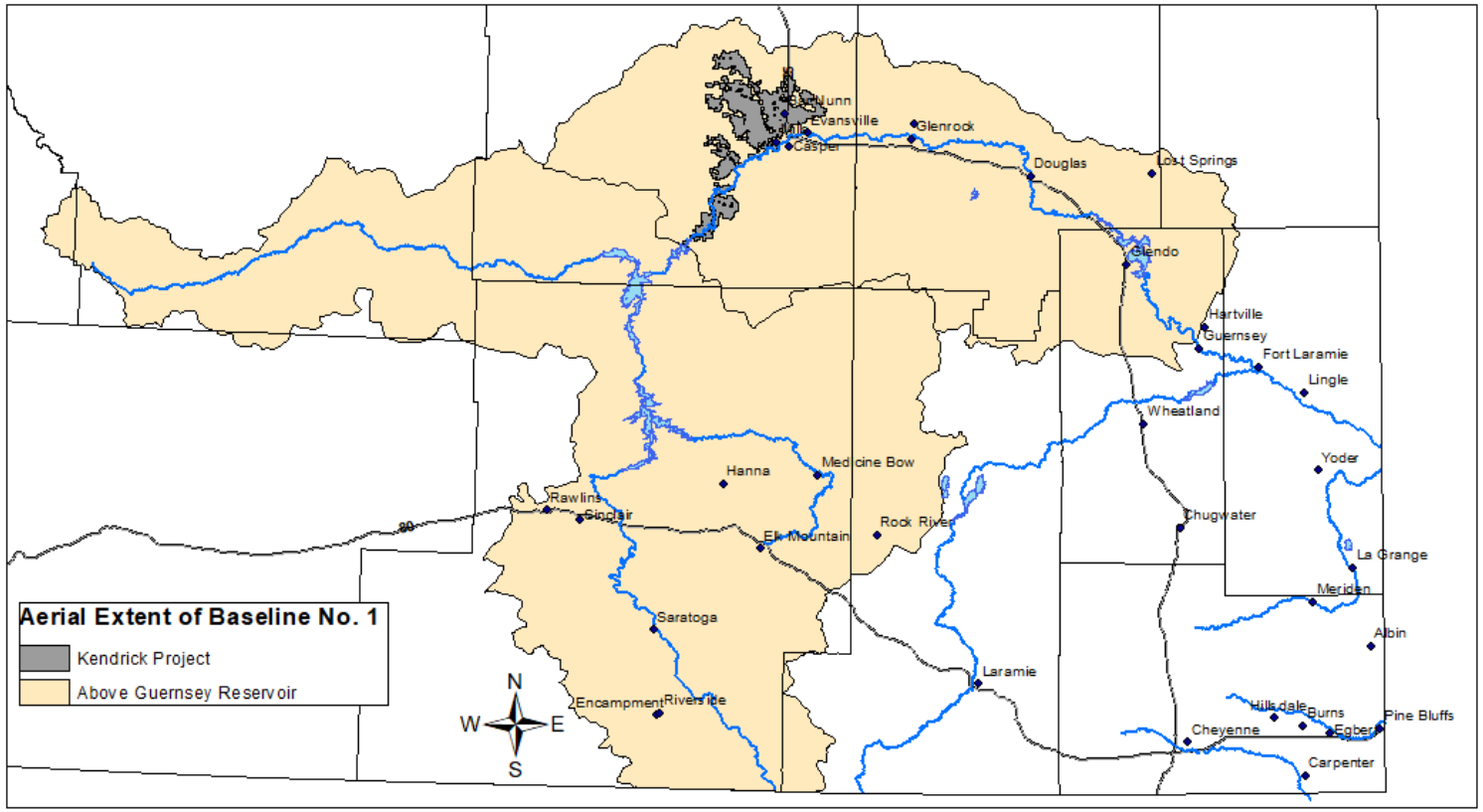


Table I. Existing Water Related Baseline No. 1

Decree Category	Benchmark Acreage	2023	Difference Acreage
Irrigated Acreage – Above Guernsey	226,000	206,386	19,614
Irrigated Acreage - Kendrick	24,249	24,249	0

Baseline No. 2 Water Use Categories

- Existing Water Use:
  - Irrigation
  - Municipal
  - Industrial
  - Rural Domestic
- Retired/Mitigation
- Post-1997 Water Related Activities

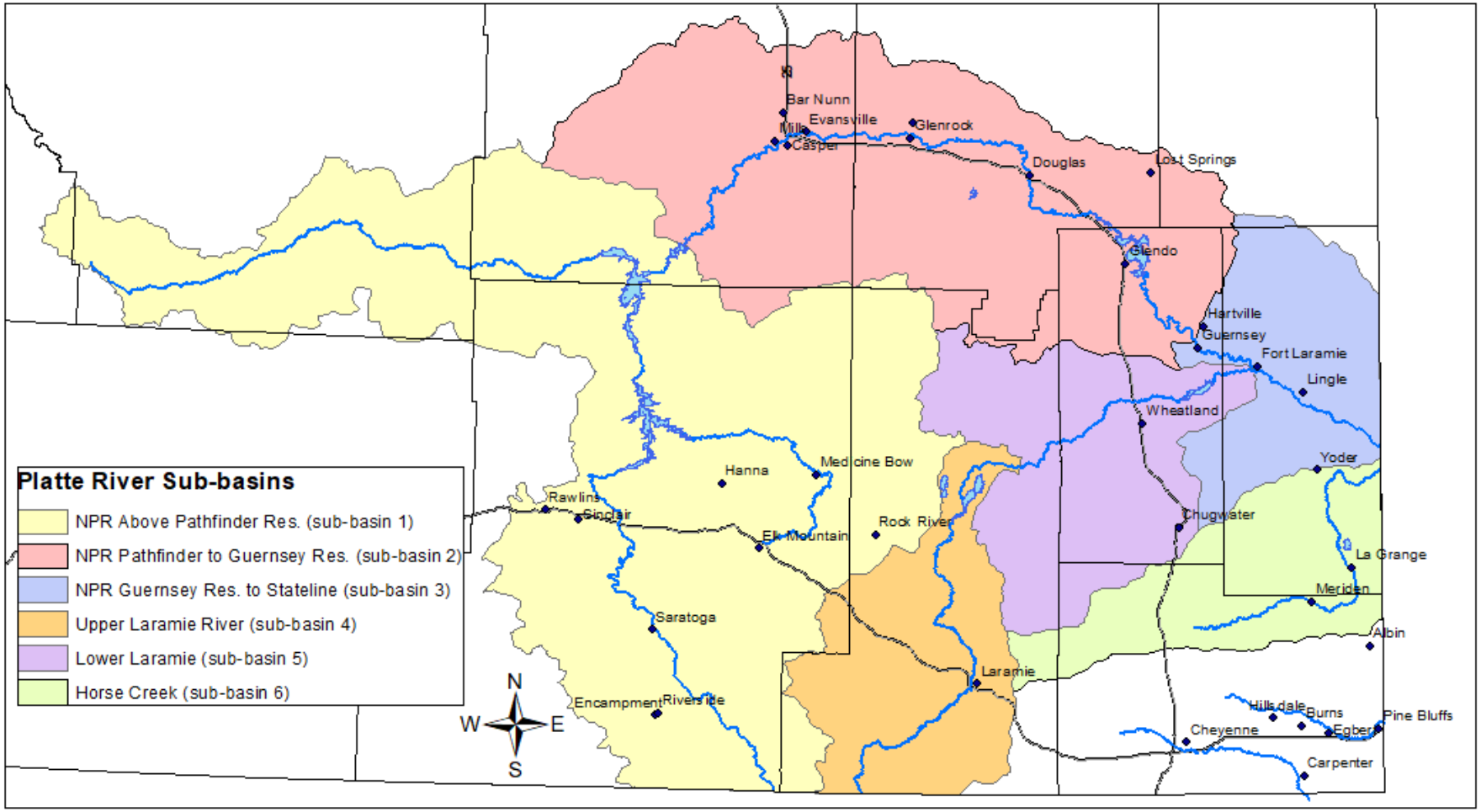


Table 2.4 summarizes the water uses described under Baseline No. 2 of the Wyoming Depletions Plan for the irrigation and no-irrigation season.

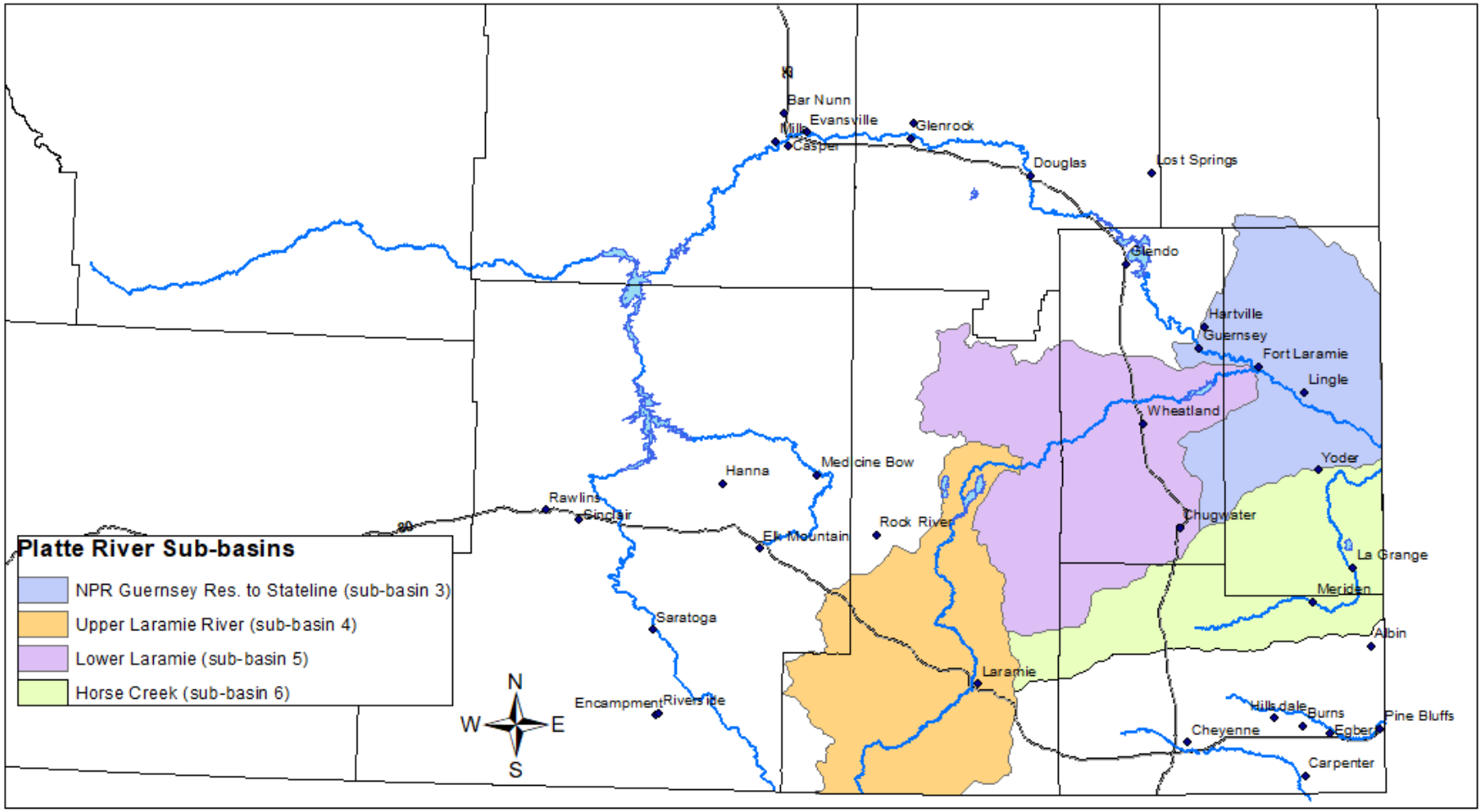
Sub-basin	Table 2.4 - Irrigation Season - Overruns / Underruns AF							Tracking Factors Table I	Effects State Line (AF)
	Irrigation Use	Municipal Use	Industrial Use	Rural Domestic	Retired / Mitigation	Post 1997 Activities	Total		
	1	2	3	4	5	6	7	8	9
Above Pathfinder	-----	-1,297.84	338.58	-75.07	-1.29	160.32	-875.30	0.90	-787.77
Pathfinder to Guernsey	-----	-1,143.42	-3,370.03	24.13	-40.90	301.55	-4,228.67	0.98	-4,122.95
Guernsey to State Line	-25,291.20	-792.66	-28.37	2.13	514.24	58.67	-25,537.18	1.00	-25,537.18
Horse Creek	-----	-30.31	0.00	32.20	-1.95	40.12	40.06	0.00	0.00
Upper Laramie	-3,264.28	-883.55	0.00	96.73	-0.79	53.41	-3,998.48	0.25	-999.62
Lower Laramie	-30,904.21	-315.47	0.00	-16.73	-0.62	119.51	-31,117.53	0.50	-15,558.76
WY 2023 Total	-59,459.69	-4,463.25	-3,059.82	63.40	468.69	733.58	-65,717.09		-47,006.28

Sub-basin	Table 2.4 - Non-Irrigation Season - Overruns / Underruns AF							Tracking Factors Table II	Effects State Line (AF)
	Irrigation Use	Municipal Use	Industrial Use	Rural Domestic	Retired / Mitigation	Post 1997 Activities	Total		
	1	2	3	4	5	6	7	8	9
Above Pathfinder	-----	-275.83	474.68	-37.53	-662.11	73.12	-427.67	0.93	-397.74
Pathfinder to Guernsey	-----	90.30	-3,976.23	12.07	-19.16	255.56	-3,637.46	1.00	-3,637.46
Guernsey to State Line	-----	-311.16	-1,135.46	6.07	0.00	41.34	-1,399.21	1.00	-1,399.21
Horse Creek	-----	-30.56	0.00	16.10	0.00	34.91	20.45	1.00	20.45
Upper Laramie	-----	-53.49	0.00	53.37	0.00	37.89	37.77	0.50	18.88
Lower Laramie	-----	-73.06	0.00	-8.37	0.00	56.22	-25.20	1.00	-25.20
WY 2023 Total	-----	-653.79	-4,637.01	41.70	-681.28	499.04	-5,431.34		-5,420.28

The volumetric effects of “overruns/underruns” in AF at the state line are reported to the GC annually each year as described by the Wyoming Depletions Plan. Overruns/Underruns = Benchmark - Annual reported use.

Baseline No. 2 Existing Water Use: Irrigation

- Guernsey Reservoir to Stateline, Upper Laramie, Lower Laramie, and Horse Creek sub-basins irrigation use is included in Baseline No. 2.



Baseline No. 2 Existing Water Use: Irrigation

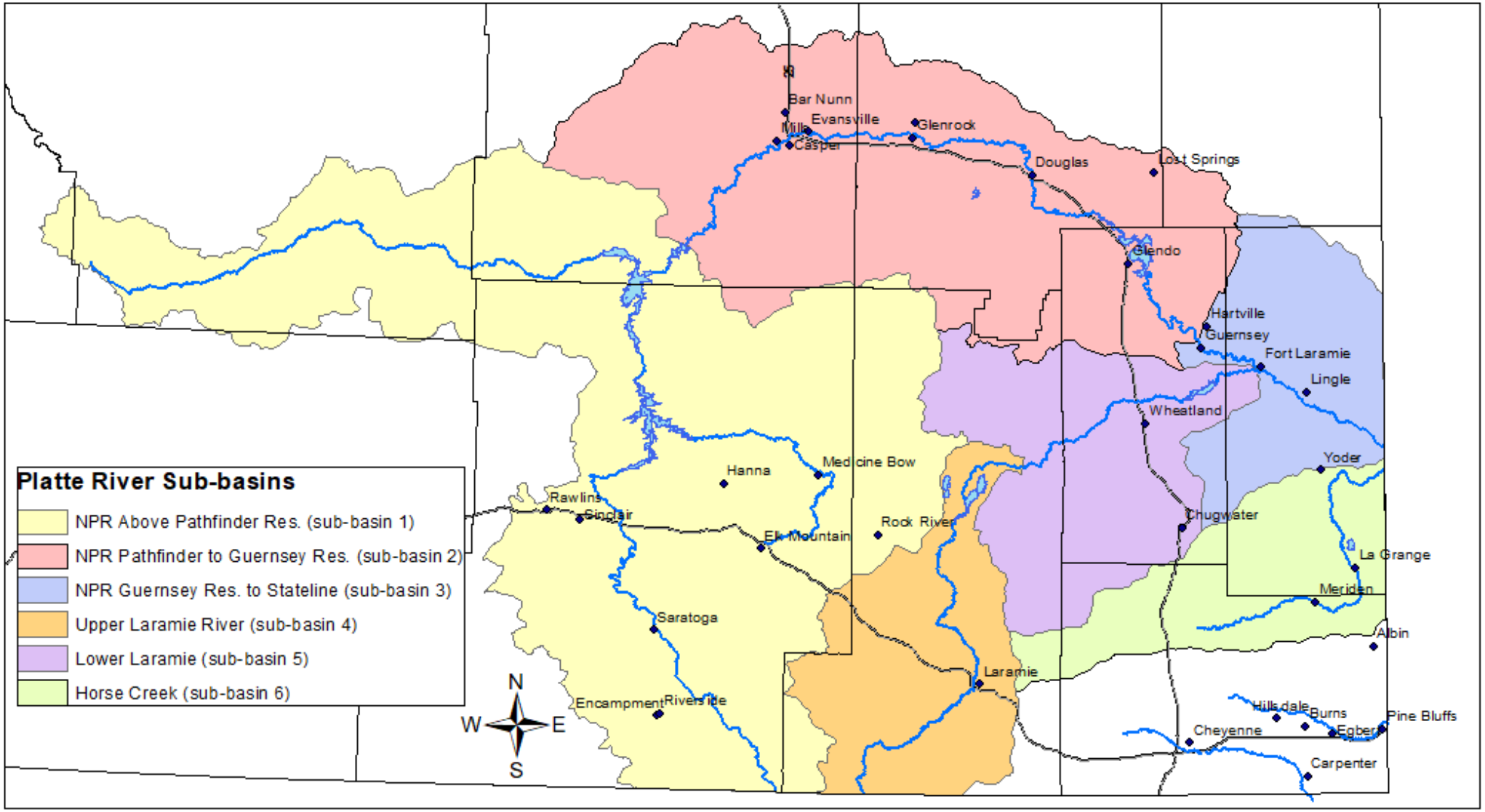
- Guernsey Reservoir to Stateline, Upper Laramie, Lower Laramie, and Horse Creek sub-basins irrigation use is included in Baseline No. 2.
- Each sub-basin has an associated benchmark based on irrigation use between 1995-1997.
- Each year the number of acres irrigated for each sub-basin are determined by field inspections. Average unit consumptive use (CU) values specific to each sub-basin are then applied to acreage totals to determine the depletions.
- The overruns/underruns are reported annually to the GC.

Table 2.2: Existing Water Related Baseline No. 2 – Irrigation Water Use

Sub-basin	Acreage Benchmark (acres)	2023 reported (acres)	Overruns/ Underruns (acres)	Unit C.U. (AF/acre)	Overrun/ Underrun (AF)
Guernsey-Stateline	106,221	87,061	-19,160	1.32	-25,291.20
Horse Creek*	41,179	*		1.16	
Upper Laramie	91,255	87,123	-4,132	0.79	-3,264.28
Lower Laramie	85,711	62,120	-23,591	1.31	-30,904.21
TOTAL	**324,366**	**236,304**	**-46,883**		**-59,459.69**

* Since Horse Creek sub-basin depletions have no affect at the State-Line during the irrigation season therefore irrigated acres were not counted in WY 2023.

The remaining Baseline No. 2 Existing and Post-1997 Activities describe water use in all of the sub-basins in the NPRB.



Baseline No. 2 Existing Water Use: Municipal

- Each municipality in the NPRB has a benchmark based on maximum annual depletions during 1992-1996. These benchmarks are totaled for each sub-basin, as shown below, for both the irrigation and non-irrigation season.
- Each year, municipalities report annual water diverted and return flows to the WY PRRIP coordinator. These values are then used to calculate depletions. The depletions for each municipality are then totaled for each sub-basin as overruns/underruns.
- The overruns/underruns for each sub-basin are reported to the GC for both irrigation and non-irrigation season.

Sub-basin	Depletions Benchmark (AF)	2023 Depletions (AF)	Overruns/ Underruns (AF)	Depletions Benchmark (AF)	2023 Depletions (AF)	Overruns/ Underruns (AF)
		Irrigation Season			**Non-Irrigation Season**	
Above Pathfinder	2,290.0	992.2	-1,297.8	1,040.0	764.2	-275.8
Pathfinder to Guernsey	8,265.0	7,121.6	-1,143.4	1,555.0	1,645.3	90.3
Guernsey-Stateline	2,405.0	1,612.3	-792.7	860.0	548.8	-311.2
Horse Creek	95.0	64.7	-30.3	55.0	24.4	-30.6
Upper Laramie	2,990.0	2,106.5	-883.6	670.0	616.5	-53.5
Lower Laramie	935.0	619.5	-315.5	325.0	251.9	-73.1
TOTAL	**16,980.0**	**12,516.7**	**-4,463.3**	**4,505.0**	**3,851.2**	**-653.8**

Baseline No. 2 Existing Water Use: Industrial

- The six major industrial users in the NPRB have a benchmark based on maximum annual depletions during 1992-1996. These benchmarks are totaled for each sub-basin, shown below, for both the irrigation and non-irrigation season.
- Each year, these industrial water users report annual water diverted and return flows to the WY PRRIP coordinator. These values are then used to calculate depletions. The depletions for each user is then totaled for each sub-basin as overruns/underruns.
- The overruns/underruns for each sub-basin are reported to the GC for both irrigation and non-irrigation

Sub-basin	Depletions Benchmark (AF)	2023 Depletions (AF)	Overruns/ Underruns (AF)	Depletions Benchmark (AF)	2023 Depletions (AF)	Overruns/ Underruns (AF)
		Irrigation Season			Non-Irrigation Season	
Above Pathfinder	1,110.0	1,448.6	338.6	1,340.0	1,814.7	474.7
Pathfinder to Guernsey	7,515.0	4,145.0	-3,370.0	7,375.0	3,398.8	-3,976.2
Guernsey-Stateline	40	11.6	-28.4	1,140.0	4.5	-1,135.5
Horse Creek	0	0	0	0	0	0
Upper Laramie	0	0	0	0	0	0
Lower Laramie	0	0	0	0	0	0
TOTAL	**8,665.0**	**5,605.2**	**-3,059.8**	**9,855.0**	**5,218.0**	**-4,637.0**

Baseline No. 2 Existing Water Use: Rural Domestic

- The rural domestic category addresses the water used by the population in each sub-basin outside service areas of the municipal water supply systems. These users can be served by individual wells or centralized systems for rural subdivisions.
- The Wyoming Depletions Plan defines the depletions associated with these rural users as 0.10 AF per person per year.
- Annually, the PRRIP coordinator works with the Wyoming Department of Administration and Information to determine the growth/decline in rural populations throughout the NPRB. The rural population for each sub-basin is then multiped by 0.10 AF (per person per year) to determine the rural water use for each sub-basin. The cumulative sub-basin overruns/underruns are reported to the GC each year.

Sub-basin	Depletions Benchmark (AF)	2023 Depletions (AF)	Overruns/ Underruns (AF)	Depletions Benchmark (AF)	2023 Depletions (AF)	Overruns/ Underruns (AF)
	Irrigation Season			Non-Irrigation Season		
Above Pathfinder	160	85	-75	80	42	-38
Pathfinder to Guernsey	360	384	24	180	192	12
Guernsey-Stateline	270	272	2	130	136	6
Horse Creek	80	112	32	40	56	16
Upper Laramie	270	367	97	130	183	53
Lower Laramie	200	183	-17	100	92	-8
TOTAL	**1,340**	**1,403**	**63**	**660**	**702**	**42**

Baseline No. 2 Water Use: Retired/Mitigation

Retired Water Use:

- Water right abandonments derived from searching the Wyoming Board of Control records for permanently retired water uses in that water year.
- Annually, the PRRIP coordinator reviews any depletions associated with abandonments of water rights in the NPRB.

Mitigation:

- The mitigation associated with any water project.

Baseline No. 2 Water Use: Post-1997 Activities

- New ground water and surface water applications are reviewed by the WY PRRIP coordinator to assess necessity of mitigation.
- Each year the WY PRRIP coordinator reviews ground water and surface water permits that were put to beneficial use during that water year.
- For these uses, the depletions associated with these permits are then added to the running total for each respective sub-basin.
  - For ground water permits, the associated depletion is the permitted volumetric quantity.
  - For surface water permits, the depletion is determined based on the end use or evaporative loss.

Existing Baseline No. 2 Water Usage in 2023

Sub-basin	Table 2.4 - Irrigation Season - Overruns / Underruns AF							Tracking Factors Table I	Effects State Line (AF)
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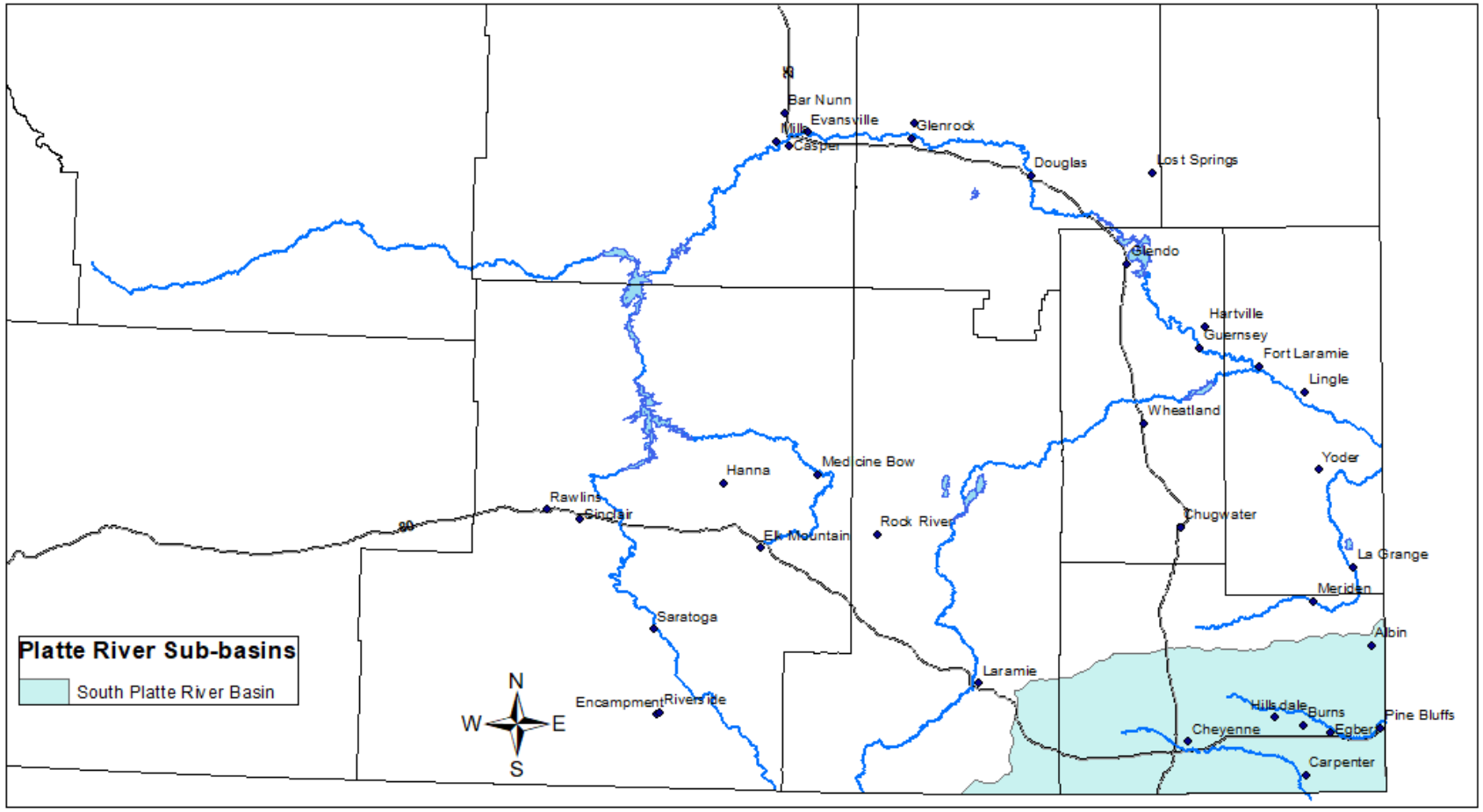
WY 2023 Total	-----	-653.79	-4,637.01	41.70	-681.28	499.04	-5,431.34		**-5,420.28**

The overall underrun during the Irrigation season was ~47,000 AF and ~5,400 AF during the Non-Irrigation season.

Existing Baseline No. 3: On-Channel Storage in the South Platte River Basin (SPRB)

- In Wyoming, water rarely passes the Colorado and Nebraska state lines.
- Wyoming reports new on-channel storage reservoirs that were completed that water year.
- In Water Year 2023, the reported acre-feet of post-1997 storage in the SPRB was 100.82 AF.



Questions?

For comments, questions, or additional information please contact

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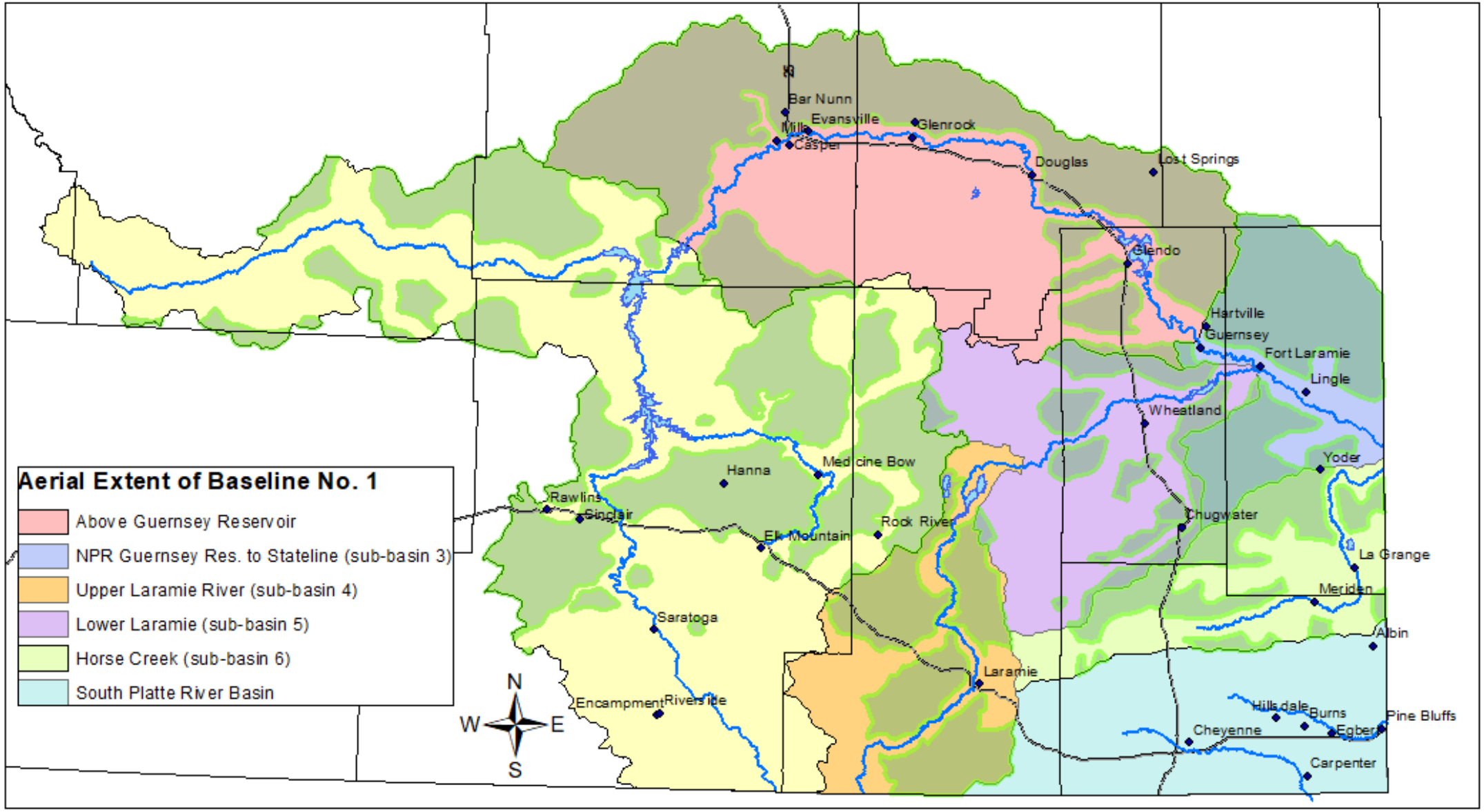
Aerial Extent of Baseline No. 1
Above Guernsey Reservoir
NPR Guernsey Res. to Stateline (sub-basin 3)
Upper Laramie River (sub-basin 4)
Lower Laramie (sub-basin 5)
Horse Creek (sub-basin 6)
South Platte River Basin
N
W
E
S
Bar Nunn
Evansville
Mills
Casper
Glenrock
Douglas
Lost Springs
Glendo
Hartville
Guernsey
Fort Laramie
Lingle
Wheatland
Yoder
Medicine Bow
Hanna
Rawlins
Sinclair
Rock River
Elk Mountain
Chugwater
La Grange
Meriden
Saratoga
Albin
Laramie
Encampment
Riverside
Hillsdale
Burns
Pine Bluffs
Cheyenne
Egbert
Carpenter