



## PRRIP Water Update

### I. WATER PLAN UPDATE

Water Plan goals for the 13-year First Increment (2007-2019) of the Platte River Recovery Implementation Program (PRRIP or Program) were as follows:

- **First Increment water objective:** Provide water capable of reducing shortages to [U.S. Fish and Wildlife Service] target flows by an average of 130,000-150,000 acre-feet per year.
- **Milestone 4:** The Reconnaissance-Level Water Action Plan, as may be amended by the Governance Committee, will be implemented and capable of providing at least an average of 50,000 acre-feet per year of shortage reduction to target flows, or for other Program purposes, by no later than the end of the First Increment.

For the First Increment Extension, the water goals were slightly modified to reflect both the Program's budgetary constraints and the more complicated than expected reality of securing the necessary water supplies. The Program remains committed to achieving average annual shortage reductions of 130,000 AFY. However, the course of action will be to reach 120,000 AFY as quickly as possible during the First Increment Extension, then conduct the science necessary to determine if the next 10,000 AFY is needed to achieve target species management objectives.

#### A. Water Plan Progress

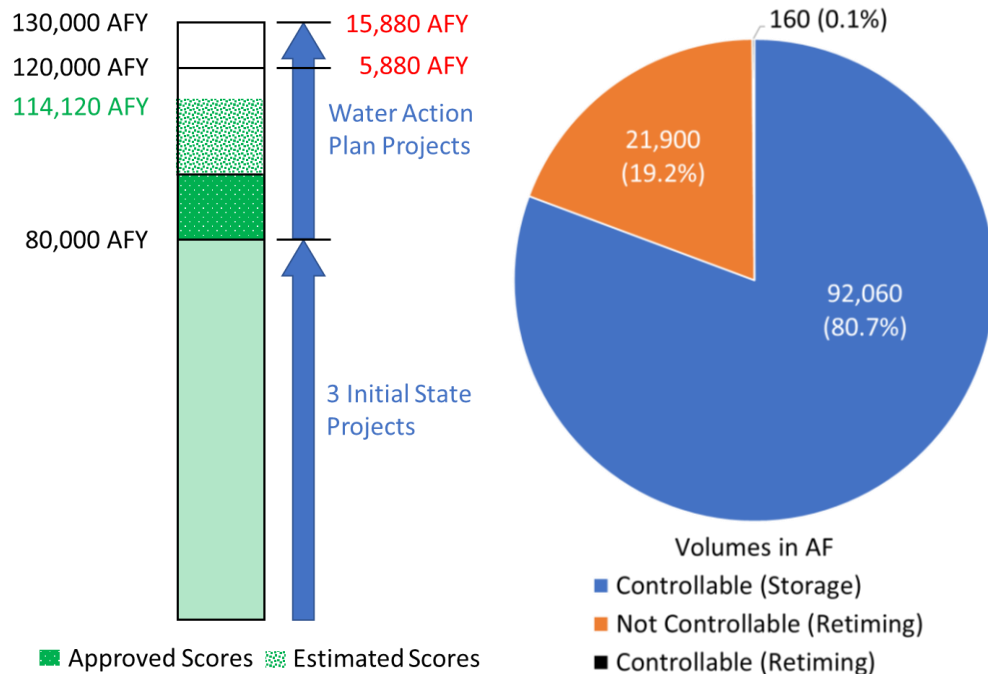
Table 1 shows the individual Water Action Plan (WAP) projects with approved or estimated scores that collectively exceed 34,000 AFY. A water project's score is its capacity to reduce target flow deficits at Grand Island based on 1947-1994 hydrology and other analytical assumptions and methods approved by the Program's Governance Committee (GC). Overall, the cumulative score from the three initial water projects—80,000 AF from the Lake McConaughy Environmental Account (EA), Pathfinder EA, and Tamarack groundwater recharge—and the 11 active WAP projects is estimated to be 114,120 AFY.

The left side of **Figure 1** illustrates the water objective as modified for the First Increment Extension. The right side of the figure reframes the 114,120 AFY cumulative score in terms of whether Program water projects are controllable or not controllable. More than 80 percent of Program water is controllable, nearly all of which ends up in the Lake McConaughy EA. These controllable supplies will be essential to the success of water-related Science Plan activities during the Extension.

**Table 1.** PRRIP Water Action Plan Projects.

Project	Project Type	Year of First Operations	Score [AFY]	Score Status
NCCW (No Cost)	Other	2007	260	Approved
Phelps County Canal	Nebraska groundwater recharge	2011	2,700	Approved
Pathfinder Municipal Account Lease	Other	2012	6,350	Approved
CPNRD Canals	Nebraska groundwater recharge	2013	600	Estimated
CPNRD Canals	Nebraska water leasing	2015	10,800	Estimated
Elwood Reservoir	Nebraska groundwater recharge	2015	2,800	Approved
NPPD Canals	Nebraska groundwater recharge	2015	1,800	Estimated
CNPPID Irrigators	Nebraska water leasing	2016	1,900	Approved
Cook Recapture Well	Nebraska groundwater recharge	2016	160	Approved
NPPD Canals	Nebraska water leasing	2019	2,750	Estimated
Broad-Scale Recharge	Nebraska groundwater recharge	2020*	4,000	Estimated
WAP Projects (6) Approved Score =			14,170 AFY	
WAP Projects (5) Estimated Score =			19,950 AFY	
WAP Projects (11) Total Score =			34,120 AFY	

\* Construction of the Cottonwood Ranch broad-scale recharge project was completed in October 2019, and test fill operations occurred July-September 2020.



**Figure 1.** (Left) Modified First Increment water objective and overall progress through 2021. (Right) Controllable (storage) and non-controllable (recharge) Program water supply.



Additional water projects providing just under 6,000 AFY of score credit are still needed and prospects are good for the Program to reach 120,000 AFY between 2022 and 2025. Two types of potential future WAP projects constitute the most likely path forward:

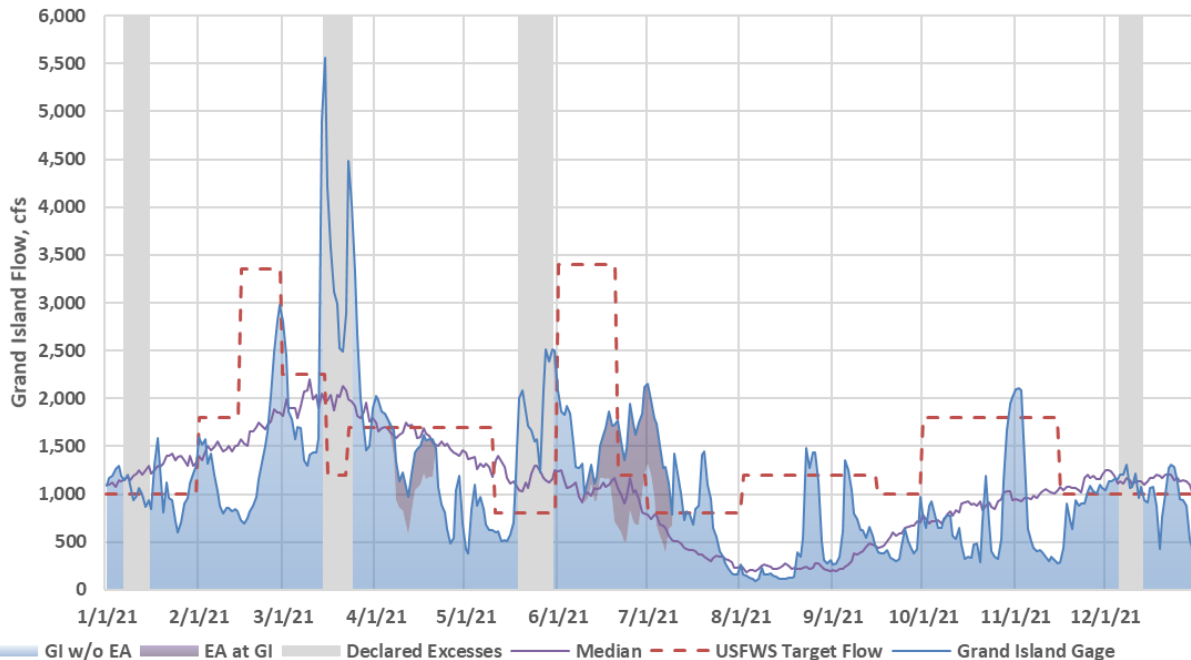
- **Recapture wells:** Accretions to the Platte River from the Program's groundwater recharge projects are expected to occur as continuous low flow rate contributions to baseflow over periods of decades. Recapture wells can be used to accelerate these return flows with controllable operations timed to coincide with target flow shortages. Through the end of 2020, about 46,000 AF recharged through the Phelps and Elwood projects south of the Platte River had not yet returned to the river and remained available in the aquifer for recapture, less any subsequent accretions and/or depletions from pumping. In addition to the existing Cook recapture well, the Program began construction in late 2021 of a pilot-scale network of seven recapture wells located on the northeast side of the Cottonwood Ranch broad-scale recharge project. This new recapture network is expected to be completed and operational by spring 2022. The pilot project is estimated to have a score in the 1,000-1,500 AFY range; future expansions of the recapture well network could achieve higher total scores.
- **Leasing of storage or other surface water sources:** The Program may also be able to lease storage water in variable amounts up to 10,000 AF each year depending on the October 1 total storage volume in Lake McConaughy. These storage or other surface water leases would add to the controllable water supply available in the Lake McConaughy EA.

#### B. 2021 Water Project Operations

Figure 2 illustrates the hydrologic context for 2021 water project operations, including the time series of Grand Island flow and target flows as determined by the real-time hydrologic condition. Releases from the Lake McConaughy EA (purple-shaded) are made about eight days before appearing as increased flow at the Grand Island gage. Two EA releases were made in 2021:

- **Spring whooping crane release:** March 30-April 13. 12,496 AF released; 10,788 AF reached Grand Island.
- **Germination suppression release:** May 24, June 2-July 2. 57,880 AF released; 42,670 AF reached Grand Island.

Gray-shaded areas in Figure 2 were the periods during which the Nebraska Department of Natural Resources declared that there were excess flows available for diversion into Program recharge projects.



**Figure 2.** Platte River near Grand Island (06770500), January 1-December 31, 2021

## II. NORTH PLATTE CHOKEPOINT

The 2017 Addendum to the Program Document calls for the Program to “aggressively continue to implement channel conveyance improvements at [the] North Platte choke point through efforts directed toward achieving and maintaining at least 3,000 cfs conveyance capacity while remaining below flood stage, with additional capacity developed as practicably achievable with available resources.” Based on the current rating curve for the North Platte River at North Platte gage (06693000), the flow at the minor flood stage of 6.0 ft is estimated to be about 1,930 cfs; a discharge of 3,000 cfs occurs at a stage of about 6.63 ft. However, based on measurements taken between July 2020 and December 2021, the average shift-adjusted flow at 6.0 ft is only about 1,775 cfs.

In July 2020, the Program conducted a flow test of Program flood-proofing projects at the North Platte chokepoint in an effort to increase National Weather Service (NWS) flood stage to 6.0 ft. The flood control projects performed as designed but NWS declined to increase flood stage due to impacts observed at properties along the south bank of the river.

The North Platte Chokepoint Planning Workgroup was reconvened in 2021 to determine next steps following the unsuccessful pursuit of an increased minor flood stage. The workgroup recommended (in addition to short-term vegetation control measures) revisiting large bypass canal concepts that were developed and presented to the GC in 2016. The EDO has initiated preliminary investigation and evaluation of this concept in conjunction with downstream channel-width modeling analyses. In particular, the EDO is using a simplified “flow routing tool” to determine the extent to which a bypass canal with a capacity to deliver up to 1,500 cfs from the North Platte River to the South Platte River would help to achieve a germination suppression flow target of 1,500 cfs from mid-June to mid-July, particularly in drier years.