

# RECLAMATION

*Managing Water in the West*

**Nebraska-Kansas Area Office**

**Report**

**To The**

**Republican River**

**Compact Administration**

**Burlington, Colorado**



— BUREAU OF —  
RECLAMATION

U.S. Department of the Interior  
Bureau of Reclamation  
Missouri Basin Region  
Nebraska-Kansas Area Office

August 31, 2023

## REPUBLICAN RIVER COMPACT MEETING

August 31, 2023  
Burlington, Colorado

### 2022 Operations

As shown on the attached Table 1, precipitation in the Republican River Basin varied from 82 percent of normal at Medicine Creek Dam to 47 percent of normal at Trenton Dam. Total precipitation at Reclamation project dams ranged from 9.56 inches at Trenton Dam to 20.59 inches at Lovewell Dam.

Inflows varied from 29 percent of the most probable forecast at Bonny Reservoir to 73 percent of the most probable forecast at Harry Strunk Lake. Inflows into Bonny Reservoir totaled 1,492 AF while inflows at Harlan County Lake totaled 64,506 AF.

Average farm delivery values for total irrigable acres were as follows:

<u>District</u>	<u>Farm Delivery</u>
Frenchman Valley	0.2 inches
Frenchman-Cambridge	6.7 inches
Almena	1.9 inches
Bostwick in NE	7.0 inches
Kansas-Bostwick	9.9 inches

### 2022 Operation Notes

**Bonny Reservoir** – Remained empty at elevation 3638.00 feet, 34.0 feet below the top of conservation. The annual computed inflow totaled 1,492 AF, the lowest on record. Reservoir inflows were bypassed the entire year as ordered by the State of Colorado. No water was bypassed into Hale Ditch in 2022.

**Enders Reservoir** – The reservoir level began the year at a level of 3,080.81 feet (31.5 feet below the top of conservation). This was the lowest start of the year elevation recorded since initial filling. The reservoir level increased gradually during the spring to a peak elevation of 3,081.59 feet on March 29th. Evaporation decreased the reservoir level from June through mid-November reaching elevation 3,077.83 feet on November 23. This was the lowest elevation observed since initial filling of the reservoir. Due to the extremely low water supply available, no water was released from Enders Reservoir during the irrigation season. The end of the year reservoir level was 3,078.21 feet (34.1 feet below the top of conservation). This was the lowest end of year level recorded since initial filling. The Frenchman Valley Irrigation District diverted 3,788 AF of natural flow from Frenchman Creek in 2022. In 2022, H&RW Irrigation District, who's contract expired in 2021, notified Reclamation of their intent to disband the district.

**Swanson Lake** – The lake level began the year at elevation 2,735.70 feet (16.4 feet below the top of conservation) and gradually increased throughout the late winter and spring. The peak elevation occurred on May 9th at 2,738.32 feet (13.7 feet below the top of conservation). The reservoir level decreased throughout the irrigation season and reached an elevation of 2,727.51 feet on December 21. The district diverted 21,898 AF into Meeker-Driftwood Canal. At the end of the year, the reservoir level was at 2,727.58 feet (24.4 feet below the top of conservation).

**Hugh Butler Lake** – The reservoir level at the first of the year was 2,566.13 feet (15.7 feet below the top of conservation). Late winter, spring and summer inflows gradually increased the lake level to a summer peak of 2,567.89 feet on May 12th. Due to extremely dry conditions, Reclamation approved the district's request to lower the irrigation pool elevation. The district diverted 5,451 AF into Red Willow Canal. Late summer and early fall evaporation exceeded inflows, decreasing the lake level to 2,559.87 feet on October 18th. The end of year elevation was 2,560.72 feet (21.1 feet below the top of conservation).

**Harry Strunk Lake** – The reservoir level at the beginning the year was 2,361.83 feet (4.3 feet below the top of conservation). The reservoir filled to top of conservation on April 11th. Irrigation releases started May 11th. The reservoir level peaked at elevation 2,366.98 feet on May 13th. The district diverted 26,873 AF into Cambridge Canal. The end of year elevation was 2,361.83 feet at the end of the year (10.8 feet below the top of conservation).

**Keith Sebelius Lake** – The reservoir elevation was 2,294.90 feet (9.4 feet below the top of conservation) at the first of the year. Late winter, spring and summer inflows gradually increased the lake level to a summer peak of 2,295.31 feet on June 9th. Irrigation releases began July 3rd and finished for the season on July 19th. Approximately 3,023 AF was released from Norton Dam for irrigation. 2,108 AF was diverted into the Almena Canal. Inflows in December exceeded evaporation, gradually increasing the elevation to the end of year elevation of 2,290.62 feet (13.7 feet below the top of conservation).

**Harlan County Lake** – Harlan County Lake began 2022 at 1,943.11 feet (2.3 feet below the top of conservation). The conservation pool was filled May 25th. The conservation and accumulated flood pool were split June 11th as irrigation releases began. The projected irrigation supply at the end of June was 130,000 AF. It was determined that Water Short Year Administration would not be in effect in 2022. Bostwick in Nebraska Irrigation District diverted 39,402 AF in 2022. Kansas-Bostwick Irrigation District diverted 59,333 AF in 2022. A ten-year summary of Harlan County Lake operations is shown on Table 3. The end of year elevation was 1,938.50 feet (7.2 feet below the top of conservation).

**Lovewell Reservoir** – The reservoir elevation at the beginning of 2022 was 1,580.92 feet (1.7 foot below top of conservation). Rains in late May totaling 2.89" raised the lake elevation to a yearly peak of 1583.41 (0.8 feet above top of conservation). All flood water accumulations were utilized for irrigation. Irrigation releases for canal seasoning/flushing began May 19th with releases in earnest beginning starting mid-June and continued until September 16th. Irrigation releases lowered the lake to an annual low of 1574.07 (8.5 feet below conservation) on September 16th. Republican River flow was diverted via the Courtland Canal into

Lovewell Reservoir after the irrigation season. The pool level at the end of the year was 1,578.59 feet (4.0 foot below top of conservation).

**Current Operations (As of 7/31/23)**

**Bonny Reservoir** – The reservoir is currently empty. No water has been released into Hale Ditch in 2023. Bonny Dam has recorded 16.97 inches of precipitation during the first seven months of the year (143% of average).

**Enders Reservoir** - The reservoir level is currently 30.8 feet below full and 1.53 feet above last year at this time. Enders Dam recorded 18.03 inches of precipitation during the first seven months of the year (136% of normal). This is also the twentieth consecutive year that Frenchman Valley Irrigation District has not received storage water for irrigation.

**Swanson Lake** – The lake level is currently 13.7 feet from full and is 5.6 feet above last year at this time. Precipitation for the year is at 134% of normal (18.14 inches). No irrigation releases are being made due to low initial reservoir elevation.

**Hugh Butler Lake** – The lake level is currently 15.58 feet below full and is 3.11 feet above last year at this time. No irrigation releases are being made due to low initial reservoir elevation. The precipitation total so far this year is 21.17 inches (162% of normal).

**Harry Strunk Lake** – The lake level is currently 2.1 feet below the top of conservation. Precipitation at the dam during the first seven months of the year was 15.10 inches (107% of normal). Irrigation releases began on June 25<sup>th</sup>. The lake level is currently 4.7 feet above last year at this time.

**Keith Sebelius Lake** – The lake is currently 9.9 feet below full. Lake level is 2.2 feet above last year at this time. Precipitation at the dam during the first seven months of the year was 17.7 inches (111% of normal).

**Harlan County Lake** – The lake level is approximately 5.5 feet below full. The lake level is 4.0 feet below last year at this time. Harlan County Dam has recorded 16.96 inches of precipitation so far this year (112% of normal). Irrigation releases started on May 30<sup>th</sup>. The available irrigation supply from Harlan County Lake on June 30<sup>th</sup> was 119,000 AF.

**Lovewell Reservoir** – The reservoir level is currently 4.6 feet below the top of conservation and approximately 2.0 feet below last year's elevation at this time. Lovewell Dam recorded 12.11 inches of precipitation during the first seven months of the year (69% of average). Canal releases began on May 30<sup>th</sup>.

A summary of data for the first seven months of 2023 is shown on Table 2.

**TABLE 1**  
**NEBRASKA-KANSAS PROJECTS**  
**Summary of Precipitation, Reservoir Storage and Inflows**  
**CALENDAR YEAR 2022**

Reservoir	Total Precip. Inches	Percent Of Average %	Storage 12-31-21		Gain or Loss AF	Maximum Storage Content		Storage Date	Minimum Storage Content		Storage Date	Total Inflow AF	Percent Of Most Probable %
			AF	AF		AF	AF		AF	AF			
Box Butte	16.53	96	10,681	9,113	-1,568	16,831	7/10	7/10	6,860	9/7	15,657	102	
Merritt	14.72	69	60,966	61,533	567	66,320	5/30	5/30	33,185	9/11	201,345	106	
Calamus	14.09	56	92,689	96,605	3,916	123,571	5/2	5/2	51,478	9/18	267,875	99	
Davis Creek	14.92	57	13,024	12,838	-186	31,651	6/5	6/5	12,133	3/21	65,259	135	
Bonny	12.56	71	0	0	0	0	#N/A	#N/A	0	#N/A	1,492	29	
Enders	11.32	59	7,983	6,545	-1,438	8,449	3/29	3/29	6,351	11/23	3,405	68	
Swanson	9.56	47	46,186	24,473	-21,713	54,545	5/9	5/9	24,315	12/21	14,318	57	
Hugh Butler	12.07	61	15,811	10,986	-4,825	17,599	5/12	5/12	10,315	10/18	6,355	62	
Harry Strunk	17.26	82	27,646	19,165	-8,481	36,296	5/13	5/13	12,856	9/9	29,388	73	
Keith Sebelius	14.15	57	17,753	12,322	-5,431	18,343	6/9	6/9	12,267	12/20	4,119	63	
Harlan County	17.02	73	280,385	225,470	-54,915	317,555	6/11	6/11	225,025	12/12	64,506	62	
Lovewell	20.59	74	30,861	23,703	-7,158	38,135	5/29	5/29	15,495	9/16	38,720	73	
Kirwin	19.70	82	85,227	70,612	-14,615	95,738	6/13	6/13	70,240	11/29	21,128	73	
Webster	14.69	61	62,254	44,193	-18,061	70,562	6/13	6/13	44,112	12/22	12,766	66	
Waconda	19.33	76	220,177	159,307	-60,870	233,146	6/10	6/10	158,517	11/18	94,772	68	
Cedar Bluff	11.46	54	98,996	83,230	-15,766	99,041	1/2	1/2	83,152	12/27	6,024	52	

**TABLE 2**  
**NEBRASKA-KANSAS AREA OFFICE**  
**Summary of Precipitation, Reservoir Storage and Inflows**

**JANUARY - JULY 2023**

Reservoir	Precip. Inches	Percent Of Average %	Storage		Storage 7/31/2022	Gain or Loss AF	Inflow AF	Percent Of Most Probable %
			7/31/2023	AF				
Bonny	16.97	143	0	0	0	0	1,052	29
Enders	18.03	136	7,510	8,406	8,406	896	3,958	136
Swanson	18.14	134	37,523	54,612	54,612	17,089	36,047	180
Hugh Butler	21.17	162	12,999	15,900	15,900	2,901	7,591	117
Harry Strunk	15.10	107	24,133	31,055	31,055	6,922	20,092	75
Keith Sebelius	17.68	111	14,126	16,996	16,996	2,870	8,078	172
Harlan County	16.96	112	282,145	233,787	233,787	(48,358)	64,215	86
Lovewell	12.11	69	26,889	21,656	21,656	(5,233)	26,261	140

Inflow at Swanson Lake includes water from augmentation (pumping) projects.

**TABLE 3  
HARLAN COUNTY LAKE**

Year	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precipitation			End of Year Content (AF)	Projected Irrig. Water Supply On June 30th (AF)
				Precip. (Inches) (% of Average)	Harlan County Dam* (% of Average)	Rep. Basin Dams (% of Average)		
2013	48,794	75,355	40,042	17.46	75%	83%	124,522	81,400
2014	92,209	35,502	32,387	18.53	80%	105%	148,842	59,000
2015	106,728	54,502	33,652	28.85	125%	115%	167,416	79,600
2016	126,679	63,972	35,920	27.82	120%	109%	194,203	103,500
2017	118,889	52,764	36,081	26.60	115%	104%	224,247	111,600
2018	120,146	53,451	35,914	29.61	128%	128%	255,028	106,600
2019	402,546	272,471	55,374	30.94	134%	132%	329,729	139,716
2020	125,674	130,068	45,704	17.38	75%	74%	279,631	143,392
2021	130,998	88,222	42,022	28.22	121%	91%	280,385	141,404
2022	64,506	70,579	48,842	17.02	73%	66%	225,470	130,000

NOTE: On June 30, 2023 Projected Irrigation Water Supply was 119,000 AF.  
\* Average Annual Precipitation at Harlan County Dam is 23.13 inches