RECLAMATION

Managing Water in the West

Nebraska-Kansas Area Office

Report

To The

Republican River

Compact Administration

Colby, Kansas

— BUREAU OF —
RECLAMATION

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

August 28, 2024

REPUBLICAN RIVER COMPACT MEETING

August 28, 2024
Colby, Kansas

2023 Operations

As shown on the attached Table 1, precipitation in the Republican River Basin varied from 90 percent of normal at Lovewell Dam to 143 percent of normal at Red Willow Dam. Total precipitation at Reclamation project dams ranged from 21.34 inches at Bonny Dam to 28.81 inches at Norton Dam.

Inflows varied from 34 percent of the most probable forecast at Bonny Reservoir to 170 percent of the most probable forecast at Swanson Lake. Inflows into Bonny Reservoir totaled 1,659 AF while inflows at Harlan County Lake totaled 95,417 AF.

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

District	Farm Delivery
Frenchman Valley	0.0 inches
Frenchman-Cambridge	3.3 inches
Almena	0.0 inches
Bostwick in NE	6.2 inches
Kansas-Bostwick	11.1 inches

2023 Operation Notes

Bonny Reservoir – Remained empty at elevation 3638.00 feet, 34.0 feet below the top of conservation. The annual computed inflow totaled 1,659 AF. Reservoir inflows were bypassed the entire year as ordered by the State of Colorado. No water was bypassed into Hale Ditch in 2023.

Enders Reservoir – The reservoir level began the year at a level of 3,078.21 feet (34.1 feet below the top of conservation). This was the lowest start of the year elevation recorded since initial filling and is 1.79 feet below the outlet works intake (Deadpool). The reservoir level increased gradually during the spring to a peak elevation of 3,081.74 feet on July 11th. 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 3,080.75 feet (31.5 feet below the top of conservation). The Frenchman Valley Irrigation District did not divert natural flow from Frenchman Creek in 2023.

Swanson Lake – The lake level began the year at elevation 2,727.58 feet (24.4 feet below the top of conservation) and gradually increased throughout the late winter and spring. Numerous precipitation events in May caused the lake to rapidly rise approximately 7.6 feet. The district did not divert into Meeker-Driftwood Canal in 2023. The end of the year elevation of 2,738.64 feet (13.4 feet below the top of conservation) was the peak elevation for the year.

Hugh Butler Lake – The reservoir level at the first of the year was 2,560.72 feet (21.1 feet below the top of conservation). Late winter, spring and summer inflows gradually increased the lake level to a summer peak of 2,567.31 feet on August 9th. Due to a low reservoir content at the beginning of the year the district did not make releases for Red Willow Canal. The end of year elevation was 2,566.63 feet (15.2 feet below the top of conservation). Bartley Canal diverted 7,099 AF of natural flow in 2023.

Harry Strunk Lake – The reservoir level at the beginning the year was 2,361.96 feet (4.1 feet below the top of conservation). The reservoir did not fill for the first time since 2013. Irrigation releases started June 25th. The reservoir level peaked at elevation 2,365.91 feet on June 25th. The district diverted 22,285 AF into Cambridge Canal. The end of year elevation was 2,361.96 feet at the end of the year (4.1 feet below the top of conservation).

Keith Sebelius Lake – The reservoir elevation was 2,290.62 feet (13.7 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 yearly peak of 2,294.91 feet on September 24th. No irrigation releases were made in 2023. Inflows in December exceeded evaporation, gradually increasing the elevation to the end of year elevation of 2,294.55 feet (9.8 feet below the top of conservation).

Harlan County Lake – Harlan County Lake began the year at 1,938.50 feet (7.2 feet below the top of conservation). The conservation pool did not fill in 2023 but did peak at 1941.31 feet (4.4 feet below top of conservation) on June 8th. The conservation pool was split May 30th as irrigation releases began. The projected irrigation supply at the end of June was 119,000 AF. It was determined that Water Short Year Administration would not be in effect in 2023. Bostwick in Nebraska Irrigation District diverted 34,500 AF in 2023. Kansas-Bostwick Irrigation District diverted 56,340 AF in 2023. A ten-year summary of Harlan County Lake operations is shown on Table 3. The end of year elevation was 1,937.98 feet (7.8 feet below the top of conservation).

Lovewell Reservoir – The reservoir elevation at the beginning of 2023 was 1,578.59 feet (4.0 foot below top of conservation). Rains in late May and June raised the lake elevation to a yearly peak of 1583.45 (0.9 feet above top of conservation). All flood water accumulations were utilized for irrigation. Irrigation releases for canal seasoning/flushing began May 30th with releases in earnest beginning starting mid-June and continued until September 16th. Irrigation releases lowered the lake to an annual low of 1574.70 (7.9 feet below conservation) on September 15th. 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 1,580.13 feet (2.5 foot below top of conservation).

Current Operations (As of 7/31/24)

Bonny Reservoir – The reservoir is currently empty. No water has been released into Hale Ditch in 2024. Bonny Dam has recorded 13.51 inches of precipitation during the first seven months of the year (114% of average).

Enders Reservoir - The reservoir level is currently 31.2 feet below full and 0.37 feet below last year at this time. Enders Dam recorded 11.30 inches of precipitation during the first seven months of the year (85% of normal). This is also the twenty-first consecutive year that Frenchman Valley Irrigation District has not received storage water for irrigation.

Swanson Lake – The lake level is currently 12.3 feet from full and is 1.4 feet above last year at this time. Precipitation for the year is at 104% of normal (14.09 inches). Irrigation releases began on June 24th.

Hugh Butler Lake – The lake level is currently 16.48 feet below full and is 0.9 feet below last year at this time. Irrigation releases began on June 23rd. The precipitation total so far this year is 16.46 inches (126% of normal).

Harry Strunk Lake – The lake level is currently 3.7 feet below the top of conservation. Precipitation at the dam during the first seven months of the year was 16.88 inches (120% of normal). Irrigation releases began on May 7th. The lake level is currently 1.6 feet below last year at this time.

Keith Sebelius Lake – The lake is currently 10.5 feet below full. Lake level is 0.6 feet below last year at this time. Precipitation at the dam during the first seven months of the year was 18.44 inches (115% of normal).

Harlan County Lake – The lake level is approximately 5.0 feet below full. The lake level is 1.5 feet above last year at this time. Harlan County Dam has recorded 17.05 inches of precipitation so far this year (113% of normal). Irrigation releases started on June 13th. The available irrigation supply from Harlan County Lake on June 30th was 119,000 AF.

Lovewell Reservoir – The reservoir level is currently 2.8 feet below the top of conservation and approximately 1.7 feet above last year's elevation at this time. Lovewell Dam recorded 14.46 inches of precipitation during the first seven months of the year (83% of average). Canal releases began on May 30th.

A summary of data for the first seven months of 2024 is shown on Table 2.

TABLE 1
NEBRASKA-KANSAS PROJECTS
Summary of Precipitation, Reservoir Storage and Inflows
CALENDAR YEAR 2023

Reservoir	Total Precip. Inches	Percent Of Average %	Storage 12-31-21 AF	Storage 12-31-22 AF	Gain or Loss AF	Maximum Content AF	Storage Date	Minimum Content AF	Storage Date	Total Inflow AF	Percent Of Most Probable %
Box Butte	23.09	134	9,113	12,786	3,673	17,181	7/14	7,772	9/9	19,911	129
Merritt	26.27	123	61,533	61,451	-82	66,523	7/9	49,035	9/8	211,958	110
Calamus	26.31	104	96,605	100,936	4,331	121,663	5/15	55,832	9/17	288,124	106
Davis Creek	32.31	124	12,838	13,661	823	30,043	7/11	11,996	4/15	63,335	131
Bonny	21.34	120	0	0	0	0	#N/A	0	#N/A	1,659	34
Enders	22.70	118	6,545	7,948	1,403	8,539	7/11	6,550	1/1	5,003	102
Swanson	25.17	124	24,473	55,612	31,139	55,612	12/31	24,495	1/1	42,263	170
Hugh Butler	28.44	143	10,986	16,306	5,320	16,995	8/9	11,002	1/1	9,867	99
Harry Strunk	23.00	109	19,165	27,835	8,670	34,298	6/25	19,257	1/1	31,441	78
Keith Sebelius	28.81	115	12,322	17,260	4,938	17,767	9/23	12,334	1/1	10,750	165
Harlan County	28.30	121	225,470	219,693	-5,777	258,197	6/7	209,935	9/21	95,417	92
Lovewell	25.10	90	23,703	27,797	4,094	38,260	6/6	16,633	9/15	51,628	105
Kirwin	24.10	101	70,612	58,237	-12,375	75,125	6/22	57,252	11/14	17,777	59
Webster	20.39	85	44,193	30,064	-14,129	48,425	6/22	29,783	12/12	11,868	61
Waconda	18.84	74	159,307	160,397	1,090	167,901	7/20	157,829	11/14	66,976	47
Cedar Bluff	19.43	91	83,230	72,874	-10,356	83,464	1/22	72,594	12/12	7,955	70

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

JANUARY - JULY 2024

Reservoir	Precip. Inches	Percent Of Average %	Storage 7/31/2023 AF	Storage 7/31/2024 AF	Gain or Loss AF	Inflow AF	Percent Of Most Probable %
Bonny	13.51	114	0	0	0	1,085	34
Enders	11.30	85	8,406	8,184	(222)	2,477	73
Swanson	14.09	104	54,612	59,221	4,609	21,324	100
Hugh Butler	16.46	126	15,900	15,029	(871)	5,159	78
Harry Strunk	16.88	120	31,055	28,526	(2,529)	20,527	76
Keith Sebelius	18.44	115	16,996	16,178	(818)	4,737	99
Harlan County	17.05	113	233,787	251,681	17,894	83,409	106
Lovewell	14.46	83	21,656	25,994	4,338	24,910	86

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

TABLE 3
HARLAN COUNTY LAKE

Year	Inflow (AF)	Outflow (AF)	Gross Evap. (AF)	Precip. (Inches)	Precipitation Harlan County Dam* (% of Average)	Precipitation Rep. Basin Dams (% of Average)	End of Year Content (AF)	**Projected Irrig. Water Supply On June 30th (AF)**
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**
2023	95,417	65,068	36,126	28.30	121%	102%	219,693	**119,000**

NOTE: On June 30, 2024 Projected Irrigation Water Supply was 119,000 AF.
* Average Annual Precipitation at Harlan County Dam is 23.13 inches