### Yellowtail Dam Water Supply and Projected Operations



#### February 2022



Bighorn River Basin Map Source: DEMIS Mapserver

February Operating Range							
Forecast		Minimum	Median	Maximum			
Monthly Aver	age	1 405	1 6 4 5	1 700			
Inflow (cfs	)	1,495	1,045	1,790			
Monthly Aver	age	2 340	2 340	2 340			
<b>River Release</b>	(cfs)	2,340	2,340	2,340			
End of Febru	ary	3616.0	3618 1	3610 /			
Elevation (fe	et)	5010.9	5010.1	3019.4			
April	throug	gh July	2022				
Infl	ow Fo	recast (	(kaf)				
April through J	uly Vol	ume	9	00			
Percent of Aver	age		7	73			
Water Year	Historie	c Inflow	Ra	ank			
2021	607	7	2	17			
2020	1,042	2	32				
2019	1,678	12					
2018	2,318	3		3			
30 Year Average	1,228	3					



#### **Climate Departure from Normal**

January 1 through January 31, 2022

#### Precipitation Departure from Normal (inches)



#### Temperature Departure from Normal (°F)



HPRCC using provisional data from NOAA Regional Climate Centers

# CLIMATE SUMMARY

Precipitation was near average while temperatures were above average during January in the Bighorn Basin above Yellowtail Dam. Drought conditions persist throughout the Basin.

The climate outlook shows there is an equal chance precipitation and temperatures will be either average, above average, or below average during February.

-0.9

-1.2 -1.5

#### **February Climate Outlook**







droughtmonitor.unl.edu

# SNOWPACK SUMMARY

The snow water equivalent (SWE) graphs are a composite of SNOTEL sites within the Bighorn River Basin managed by the Natural Resources Conservation Service (NRCS).



Statistical shading breaks at 10th, 30th,50th, 70th, and 90th Percentiles Normal ('81-'10) – Official median calculated from 1981-2010 data Normal (POR) – Unofficial mean calculated from Period of Record data



# FORECAST SUMMARY

Streamflow data and planned releases from Boysen and Buffalo Bill Reservoirs are used to compute an inflow forecast for Bighorn Lake. Actual January inflow was greater than the maximum inflow forecast.



### OPERATIONS REVIEW (October 1, 2021 through January 31, 2022)

River releases were increased to 2,290 cfs during January based on forecasted inflows and the March 31, 2022 carryover storage target of 3617 feet. The storage in Bighorn Lake decreased 4.4 feet during January.

February 1 Storage Conditions								
	Elevation	Storage	Percent of	Percent				
	feet	acre-feet	Average	Full				
Bighorn Lake	3623.1	839,100	104	83				
Buffalo Bill	5358.1	387,648	92	60				
Boysen	4718.8	626,771	115	85				



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	Monthly Avg	Percent of		Monthly Avg	Percent of
	cfs	Average		cfs	Average
Bighorn Lake	1,595	90	<b>Bighorn River</b>	2,245	90
Buffalo Bill	185	73	<b>Buffalo Bill Total Releas</b>	<b>e</b> 205	73
Boysen	625	101	<b>Boysen Release</b>	705	90



## OPERATIONS OUTLOOK (February 1, 2022 through July 31, 2022)

Releases during February will increase to 2,360 cfs based on actual January inflows being higher than the maximum inflow forecast and the March 31, 2022, storage target of 3617 feet. Additional release changes (increases or decreases) will depend on changes to forecasted inflows, actual inflows, and storage conditions.

#### Median Inflow Conditions (April through July Inflow: 900 kaf)

	Feb	Mar	Apr	May	Jun	Jul
Boysen Release (cfs)	700	1,000	1,050	2,148	2,286	1,665
Buffalo Bill Release (cfs)	205	205	684	1,680	1,901	1,976
Tributary Gain (cfs)	738	968	518	694	1,573	-1,286
Monthly Inflow (cfs)	1,643	2,173	2,252	4,522	5,760	2,355
Monthly Inflow (kaf)	91.3	133.6	134.0	278.1	342.7	144.8
Monthly Release (kaf)	130.0	144.6	141.4	225.1	198.1	181.4
Afterbay Release (cfs)	2,342	2,352	2,377	3,661	3,329	2,950
River Release (cfs)	2,342	2,352	2,352	3,461	2,929	2,500
End-of-Month Content (kaf)	804.2	797.5	794.2	851.5	1,000.3	968.0
End-of-Month Elevation (feet)	3618.1	3617.1	3616.6	3624.8	3639.2	3636.7

### Minimum Inflow Conditions (April through July Inflow: 535 kaf)

	Feb	Mar	Apr	Мау	Jun	Jul
Boysen Release (cfs)	700	600	701	1,025	1,200	1,150
Buffalo Bill Release (cfs)	205	205	684	1,680	1,901	1,976
Tributary Gain (cfs)	591	844	284	125	-77	-1,789
Monthly Inflow (cfs)	1,496	1,649	1,669	2,830	3,024	1,337
Monthly Inflow (kaf)	83.1	101.4	99.3	174.0	179.9	82.2
Monthly Release (kaf)	130.0	115.0	102.6	116.8	125.0	132.2
Afterbay Release (cfs)	2,342	1,871	1,725	1,900	2,100	2,150
River Release (cfs)	2,342	1,871	1,650	1,650	1,650	1,650
End-of-Month Content (kaf)	796.0	786.7	787.5	849.0	908.1	862.4
End-of-Month Elevation (feet)	3616.9	3615.4	3615.5	3624.4	3631.2	3626.1

# Maximum Inflow Conditions (April through July Inflow: 1,621 kaf)

	Feb	Mar	Apr	Мау	Jun	Jul
Boysen Release (cfs)	700	1,600	2,250	2,996	2,995	3,677
Buffalo Bill Release (cfs)	205	745	1,513	2,749	2,870	2,944
Tributary Gain (cfs)	884	1,090	860	1,573	2,870	-499
Monthly Inflow (cfs)	1,789	3,435	4,623	7,318	8,735	6,122
Monthly Inflow (kaf)	99.4	211.2	275.1	449.9	519.8	376.4
Monthly Release (kaf)	130.0	269.2	279.2	447.4	323.6	335.5
Afterbay Release (cfs)	2,342	4,378	4,692	7,276	5,439	5,457
River Release (cfs)	2,342	4,378	4,692	7,126	5,089	5,057
End-of-Month Content (kaf)	812.3	758.6	758.7	765.6	965.9	1,011.1
End-of-Month Elevation (feet)	3619.4	3610.6	3610.6	3611.8	3636.5	3640.0

## OPERATIONS OUTLOOK (February 1, 2022 through July 31, 2022)

There is approximately 70 cfs of gain between Yellowtail Dam and Yellowtail Afterbay Dam from springs flowing into Yellowtail Afterbay. Total release from Yellowtail Dam is 70 cfs less than total release from Yellowtail Afterbay Dam.

### **Irrigation Demands Outlook**

Bighorn Canal (cfs)

	Feb	Mar	Apr	May	Jun	Jul
Median Forecast	0	0	25	200	400	450
Minimum Forecast	0	0	75	250	450	500
Maximum Forecast	0	0	0	150	350	400

### **Power Generation Outlook**

Current Number of Units Available: 3 of 4

Approximate Yellowtail Powerplant Turbine Capacity: 6,150 cfs

Approximate Yellowtail Powerplant Scheduled Generation Limit: 4,680 cfs

Yellowtail Powerplant Release (cfs)

	Feb	Mar	Apr	May	Jun	Jul
Median Forecast	2,272	2,282	2,307	3,591	3,259	2,880
Minimum Forecast	2,272	1,801	1,655	1,830	2,030	2,080
Maximum Forecast	2,272	4,308	4,622	4,918	4,695	4,623
Yellowtail Powerplant Genera	ation (gwh)			м	Ţ	
	Feb	Mar	Apr	May	Jun	Jul
Median Forecast	49.2	54.3	53.1	86.3	78.4	73.3
Minimum Forecast	49.1	42.6	38.0	43.8	47.6	50.4
Maximum Forecast	49.2	101.5	103.4	113.8	110.2	113.8
Yellowtail Spill (cfs)	Feb	Mar	Apr	Mav	Iun	Tul
Median Forecast	0	0	0	0	0	0
Minimum Forecast	0	Ő	Ő	Ő	Ő	Ő
Maximum Forecast	0	0	0	2,288	674	764



# **Release Outlook by Outlet**

All releases are currently going through the powerplant and are expected to go through the powerplant under median and minimum inflow conditions. Under maximum conditions, a bypass release is expected to start in May.

## OPERATIONS OUTLOOK (February 1, 2022 through July 31, 2022)

Projected elevations and the range of river releases are based on the median, minimum, and maximum inflow forecasts. End-ofmonth elevations and river releases vary based on the difference between forecasted inflow scenarios.



Monthly Operating Plans, Current Conditions, Snowpack and Other Water Management Information https://www.usbr.gov/gp/lakes\_reservoirs/wareprts/main\_menu.html