Yellowtail Dam Water Supply and Projected Operations

BUREAU OF RECLAMATION

March 2022

Bighorn River Basin Map Source: DEMIS Mapserver

March Operating Range			
Forecast	**Minimum**	**Median**	**Maximum**
Monthly Average Inflow (cfs)	1,750	1,870	2,095
Monthly Average River Release (cfs)	2,055	2,140	2,435
End of March Elevation (feet)	3615.8	3616.3	3615.5

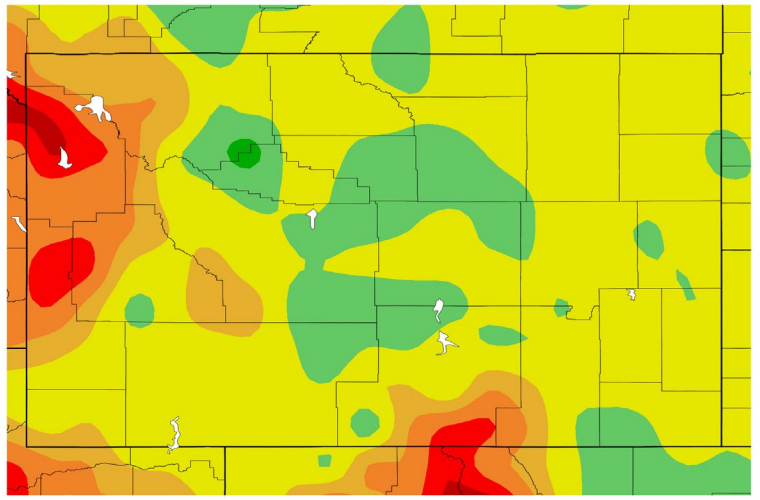
April through July 2022 Inflow Forecast (kaf)		
April through July Volume		860
Percent of Average		70
Water Year	**Historic Inflow**	**Rank**
2021	607	47
2020	1,042	32
2019	1,678	12
2018	2,318	3
30 Year Average	1,228	

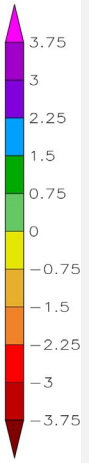
Climate Departure from Normal

February 1 through February 28, 2022

Precipitation

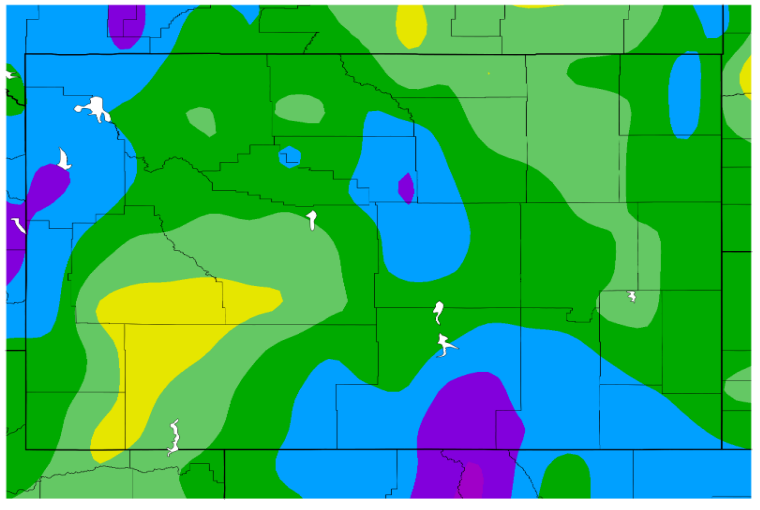
Departure from Normal (inches)

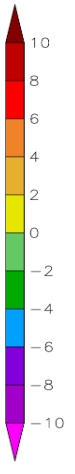




Temperature

Departure from Normal (°F)





HPRCC using provisional data from NOAA Regional Climate Centers

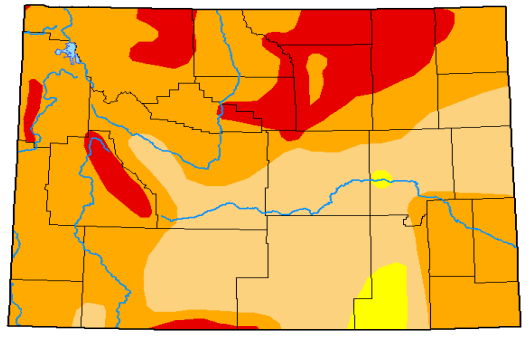
CLIMATE SUMMARY

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

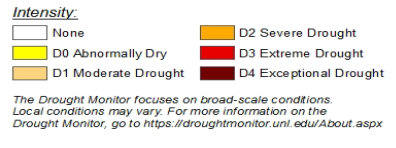
The climate outlook shows there is a 33 to 40 percent chance precipitation will be above average during March. There is a 40 to 50 percent chance temperatures will be below average.

Wyoming Drought Monitor Map

March 1, 2022



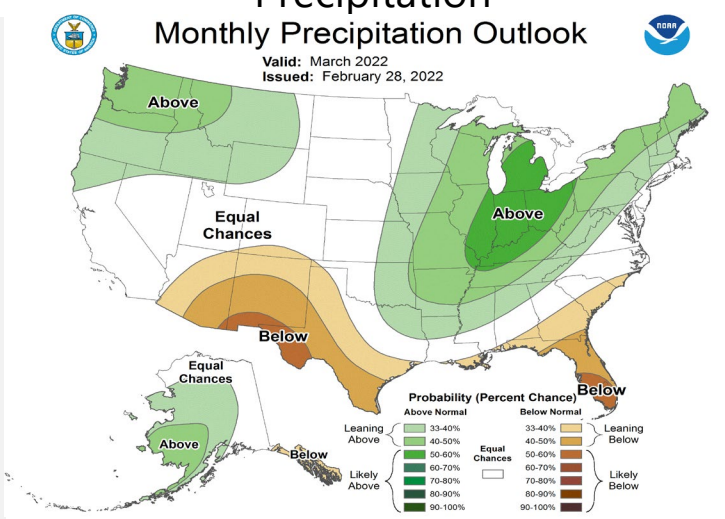
droughtmonitor.unl.edu



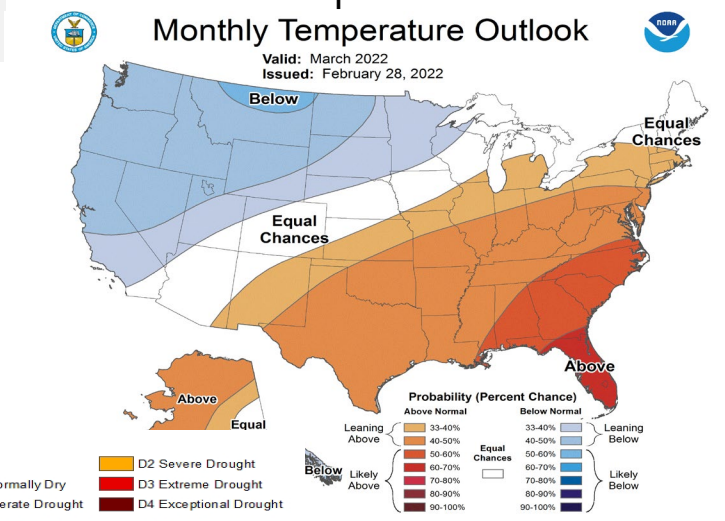
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

March Climate Outlook

Precipitation



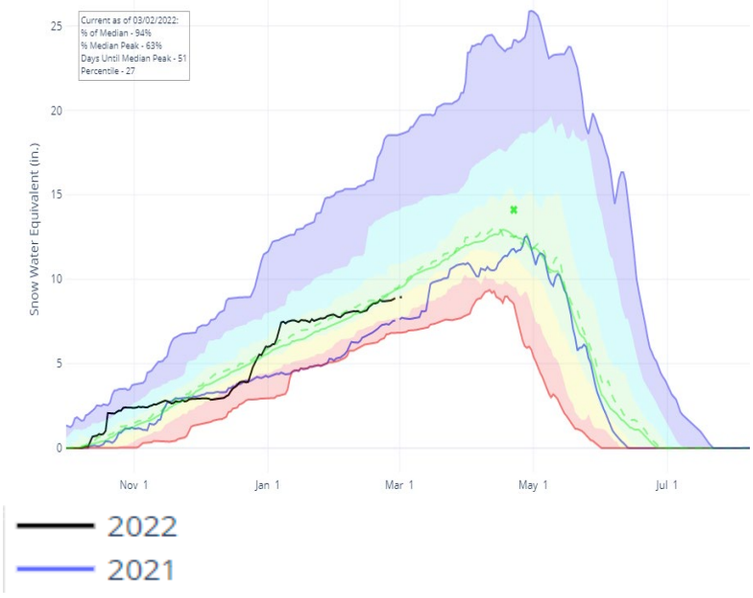
Temperature

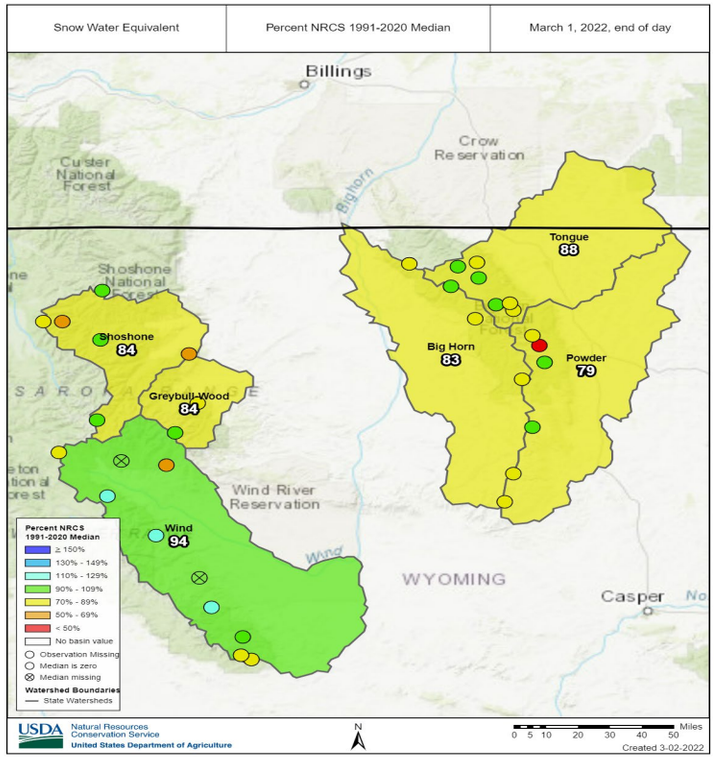


SNOWPACK SUMMARY

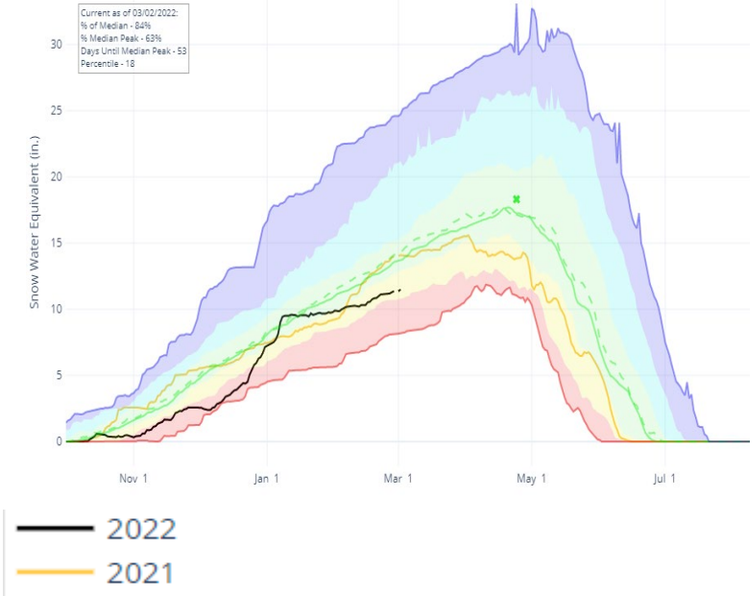
The snow water equivalent (SWE) graphs are a composite of SNOTEL sites within the Bighorn River Basin managed by the Natural Resources Conservation Service (NRCS).

Wind River

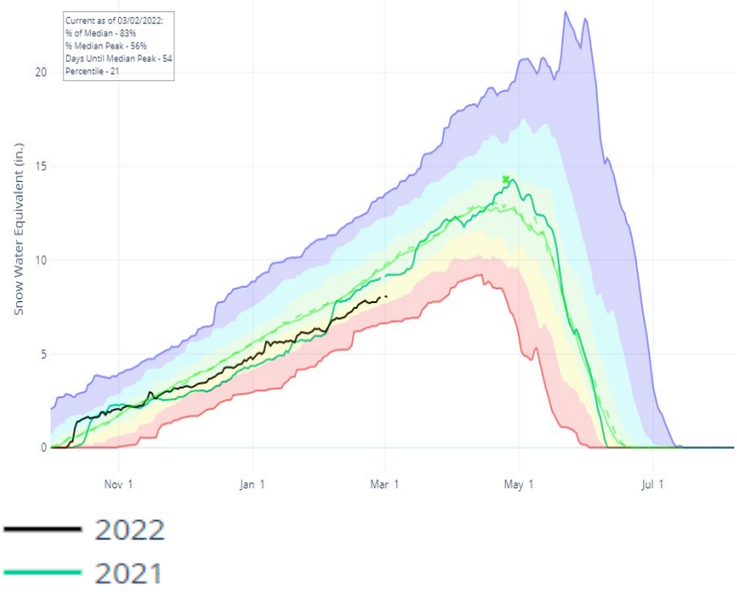




Shoshone River

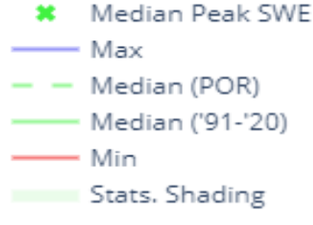


Bighorn River



NRCS Montana Snow Survey Website: https://www.nrcs.usda.gov/wps/portal/nrcs/mt/snow/

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

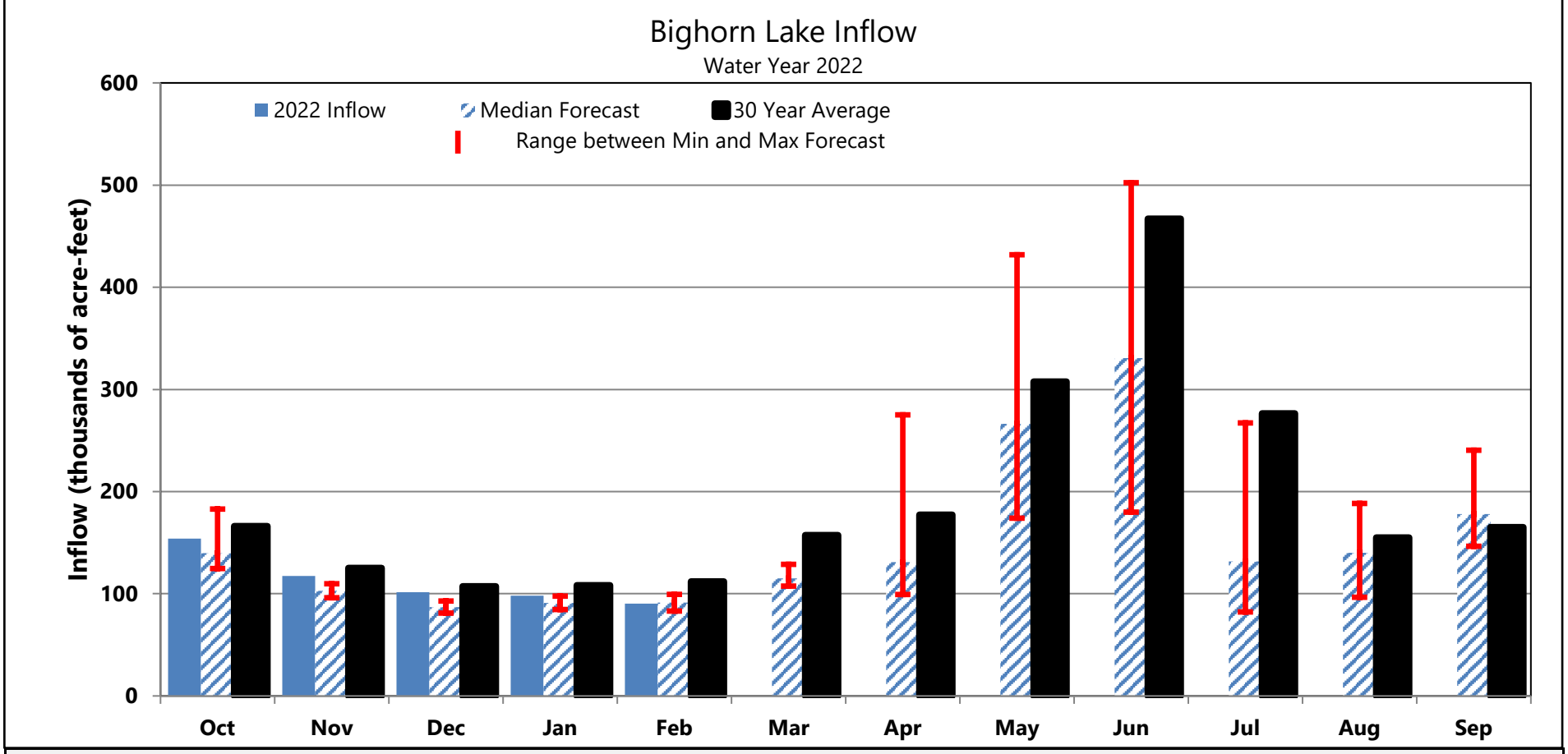


FORECAST SUMMARY

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

February Forecast Review

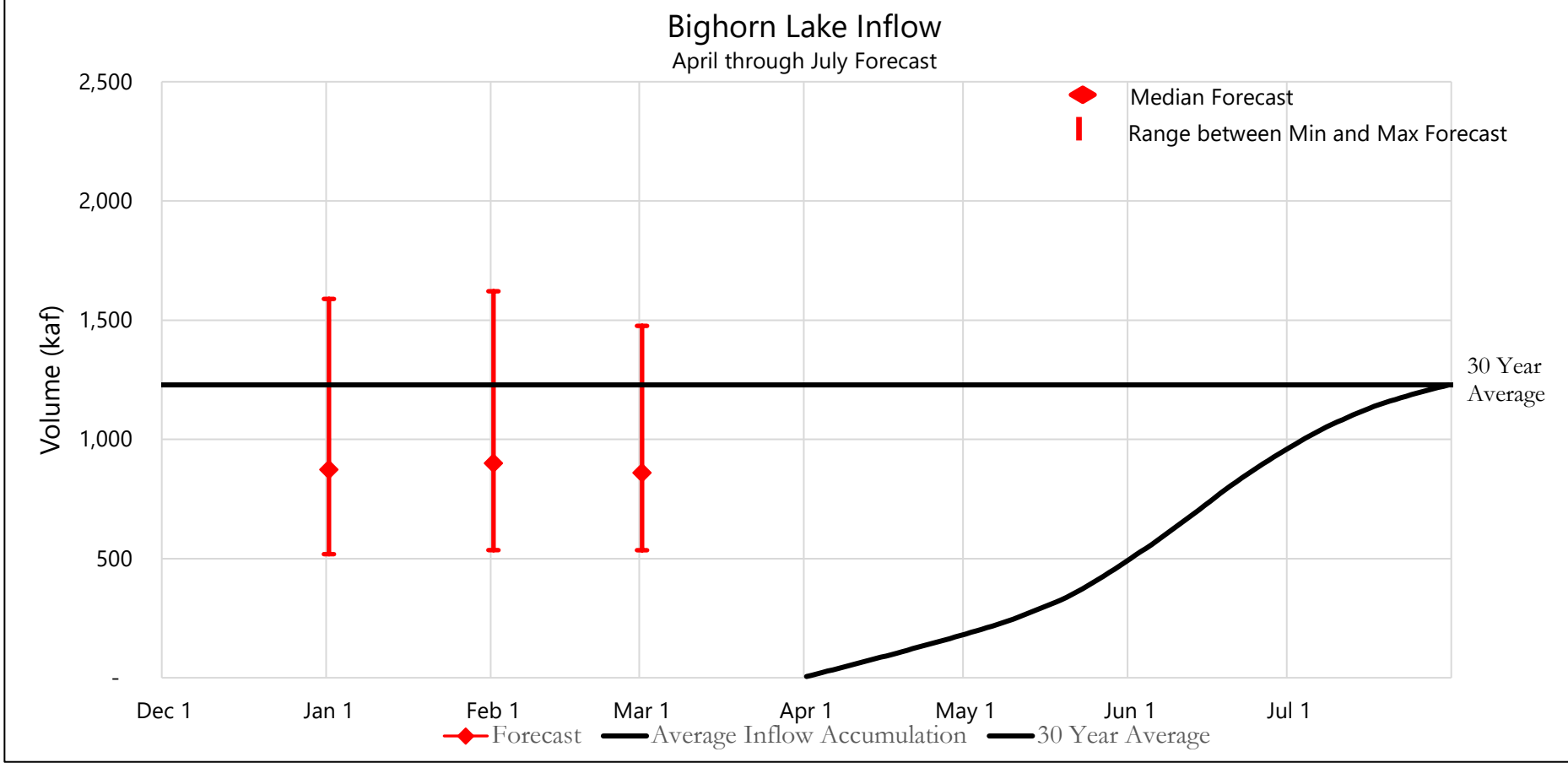
	Median Forecast (kaf)	Actual (kaf)	Difference (kaf)	Actual (% of Avg)
February Inflow	91.3	90.4	(0.9)	81



April through July Inflow Forecast for March 1

	Median Forecast (kaf)	% of Average	Minimum Forecast (kaf)	Maximum Forecast (kaf)
April through July Inflow	860	70	535	1,476

Historic Maximum (2017)	2,953 kaf	**Historic Minimum (2004)**	392 kaf	**Average**	1,228 kaf

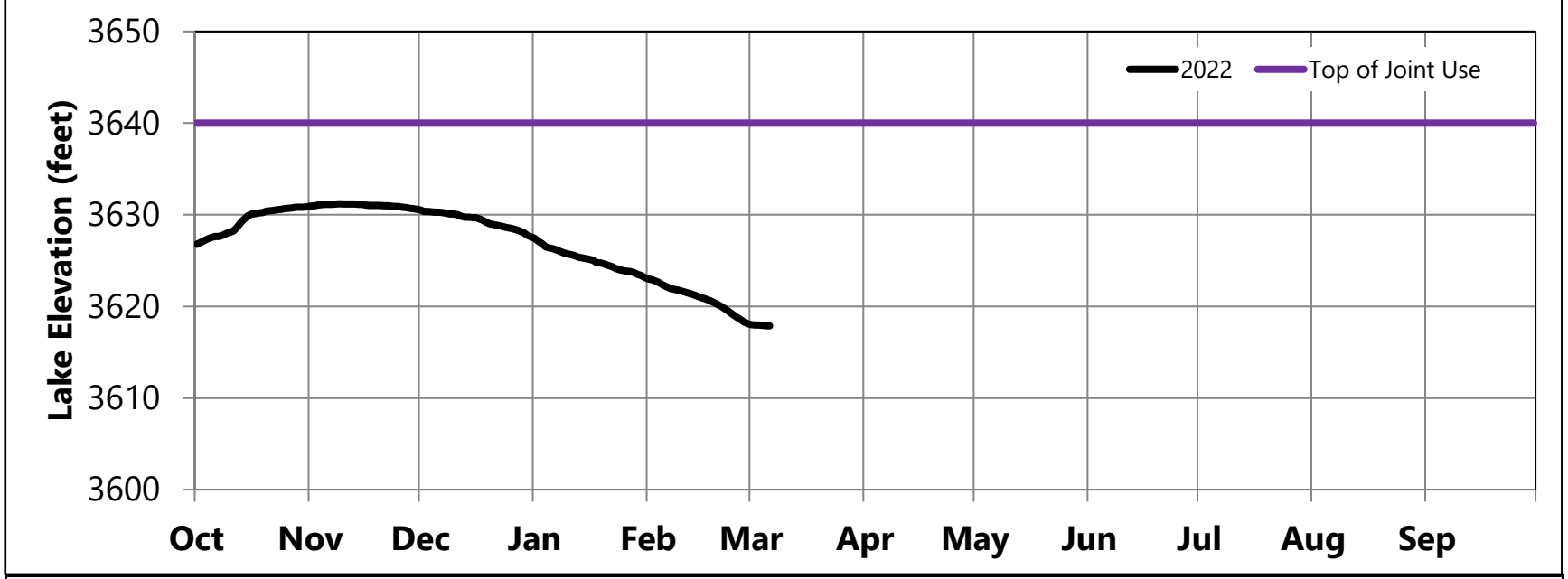


OPERATIONS REVIEW (October 1, 2021 through February 28, 2022)

River releases were increased to 2,360 cfs during February based on forecasted inflows and the March 31, 2022 carryover storage target of 3617 feet. The storage in Bighorn Lake decreased 5.0 feet during February.

March 1 Storage Conditions

	Elevation feet	Storage acre-feet	Percent of Average	Percent Full
Bighorn Lake	3618.1	804,149	103	80
Buffalo Bill	5357.7	384,912	93	60
Boysen	4718.3	619,285	114	84

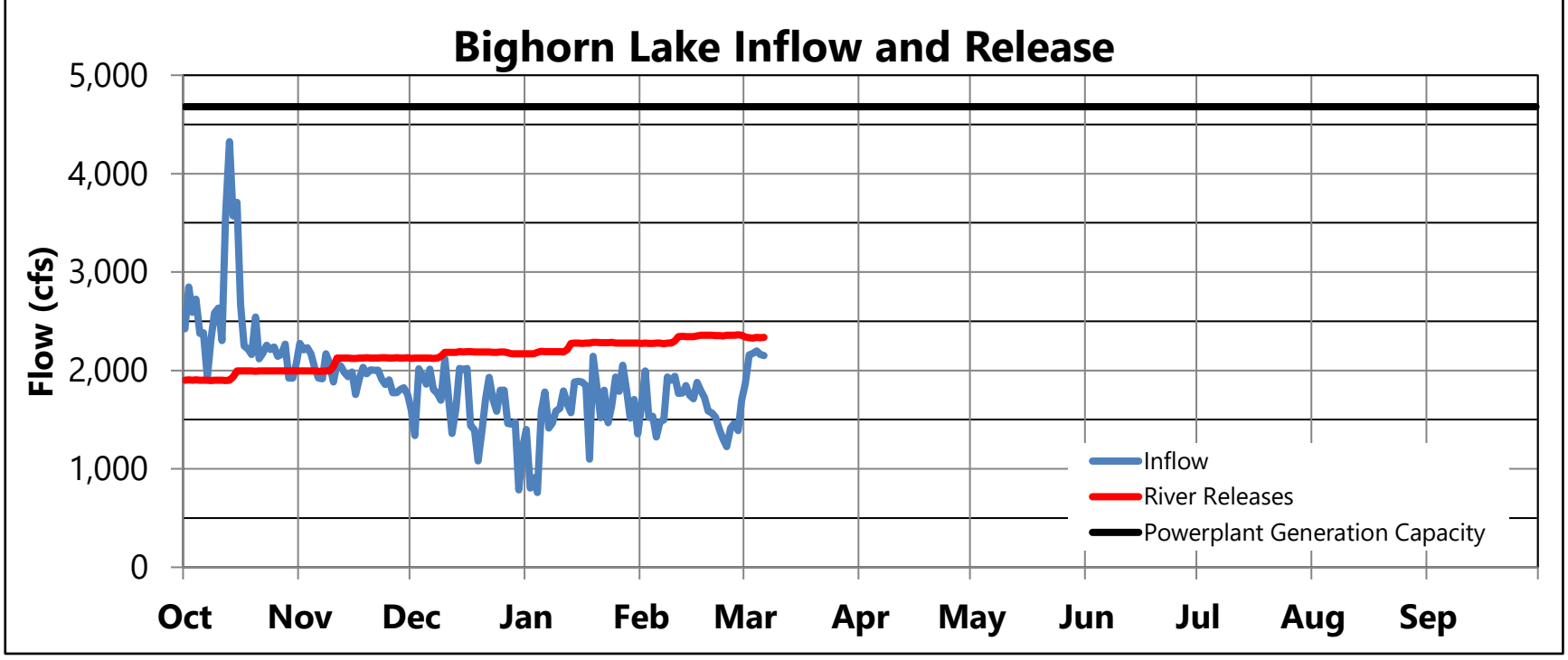


Average February Inflow

	Monthly Avg cfs	Percent of Average
Bighorn Lake	1,625	82
Buffalo Bill	155	65
Boysen	580	84

Average February Release

	Monthly Avg cfs	Percent of Average
Bighorn River	2,325	91
Buffalo Bill Total Release	205	67
Boysen Release	715	93



OPERATIONS OUTLOOK (March 1, 2022 through July 31, 2022)

Releases during March will decrease to 2,250 cfs on March 8 based on a reduced inflow forecast and the end of April storage target of 3617 feet. Additional release changes (increases or decreases) will depend on changes to forecasted inflows, actual inflows, and storage conditions. River releases range between 1,750 cfs and 3,500 cfs during March between the three operating plans.

Median Inflow Conditions (April through July Inflow: 860 kaf)

	Mar	Apr	May	Jun	Jul
Boysen Release (cfs)	699	1,000	1,960	2,081	1,451
Buffalo Bill Release (cfs)	205	684	1,680	1,901	1,976
Tributary Gain (cfs)	968	518	694	1,573	-1,286
Monthly Inflow (cfs)	1,872	2,202	4,334	5,555	2,141
Monthly Inflow (kaf)	115.1	131.0	266.5	330.5	131.6
Monthly Release (kaf)	131.4	130.9	209.1	186.9	181.4
Afterbay Release (cfs)	2,138	2,201	3,400	3,141	2,950
River Release (cfs)	2,138	2,176	3,200	2,741	2,500
End-of-Month Content (kaf)	792.1	796.3	858.1	1,005.9	960.4
End-of-Month Elevation (feet)	3616.3	3616.9	3625.6	3639.6	3636.0

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

	Mar	Apr	May	Jun	Jul
Boysen Release (cfs)	699	701	1,025	1,200	1,150
Buffalo Bill Release (cfs)	205	684	1,680	1,901	1,976
Tributary Gain (cfs)	844	284	125	-77	-1,789
Monthly Inflow (cfs)	1,748	1,669	2,830	3,024	1,337
Monthly Inflow (kaf)	107.5	99.3	174.0	179.9	82.2
Monthly Release (kaf)	126.5	108.6	119.9	127.9	135.3
Afterbay Release (cfs)	2,057	1,825	1,950	2,150	2,200
River Release (cfs)	2,057	1,750	1,700	1,700	1,700
End-of-Month Content (kaf)	789.5	784.3	842.8	898.9	850.2
End-of-Month Elevation (feet)	3615.8	3615.0	3623.6	3630.3	3624.6

Maximum Inflow Conditions (April through July Inflow: 1,476 kaf)

	Mar	Apr	May	Jun	Jul
Boysen Release (cfs)	800	2,250	3,341	3,341	2,539
Buffalo Bill Release (cfs)	205	1,513	2,109	2,230	2,306
Tributary Gain (cfs)	1,090	860	1,573	2,870	-499
Monthly Inflow (cfs)	2,095	4,623	7,023	8,441	4,346
Monthly Inflow (kaf)	128.8	275.1	431.8	502.3	267.2
Monthly Release (kaf)	149.8	301.6	416.6	326.2	227.9
Afterbay Release (cfs)	2,436	5,069	6,775	5,483	3,706
River Release (cfs)	2,436	5,069	6,625	5,133	3,306
End-of-Month Content (kaf)	787.5	765.1	784.6	964.8	1,008.4
End-of-Month Elevation (feet)	3615.5	3611.7	3615.0	3636.4	3639.8

OPERATIONS OUTLOOK (March 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)

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

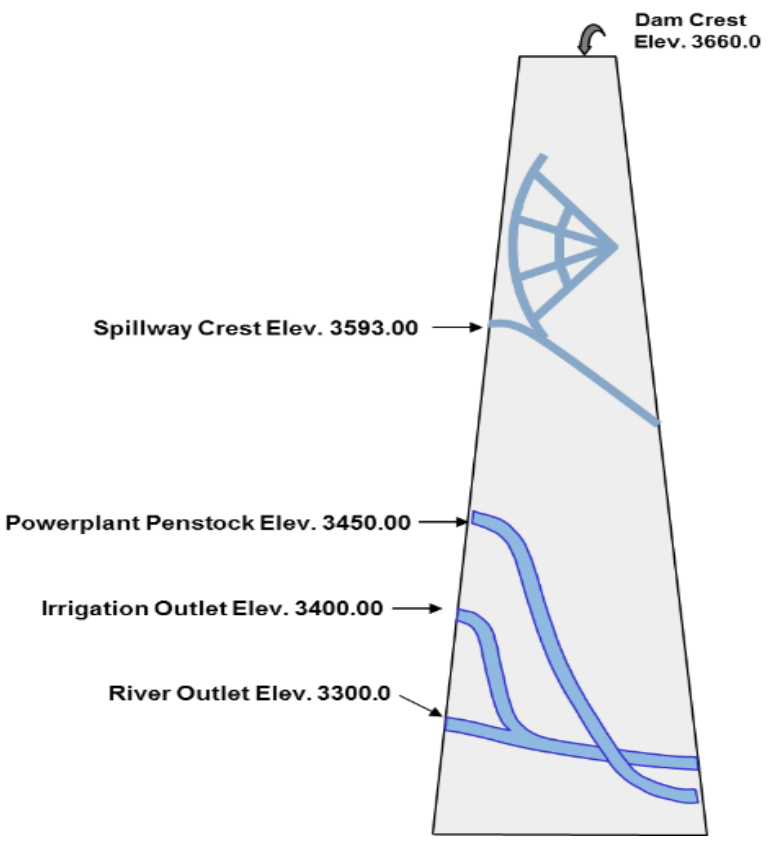
	Mar	Apr	May	Jun	Jul
Median Forecast	2,068	2,131	3,330	3,071	2,880
Minimum Forecast	1,987	1,755	1,880	2,080	2,130
Maximum Forecast	2,366	4,765	4,900	4,673	3,636

Yellowtail Powerplant Generation (gwh)

	Mar	Apr	May	Jun	Jul
Median Forecast	48.9	48.5	80.6	74.4	73.3
Minimum Forecast	47.0	40.2	44.8	48.6	51.4
Maximum Forecast	56.3	107.6	113.8	110.2	90.7

Yellowtail Spill (cfs)

	Mar	Apr	May	Jun	Jul
Median Forecast	0	0	0	0	0
Minimum Forecast	0	0	0	0	0
Maximum Forecast	0	234	1,805	740	0

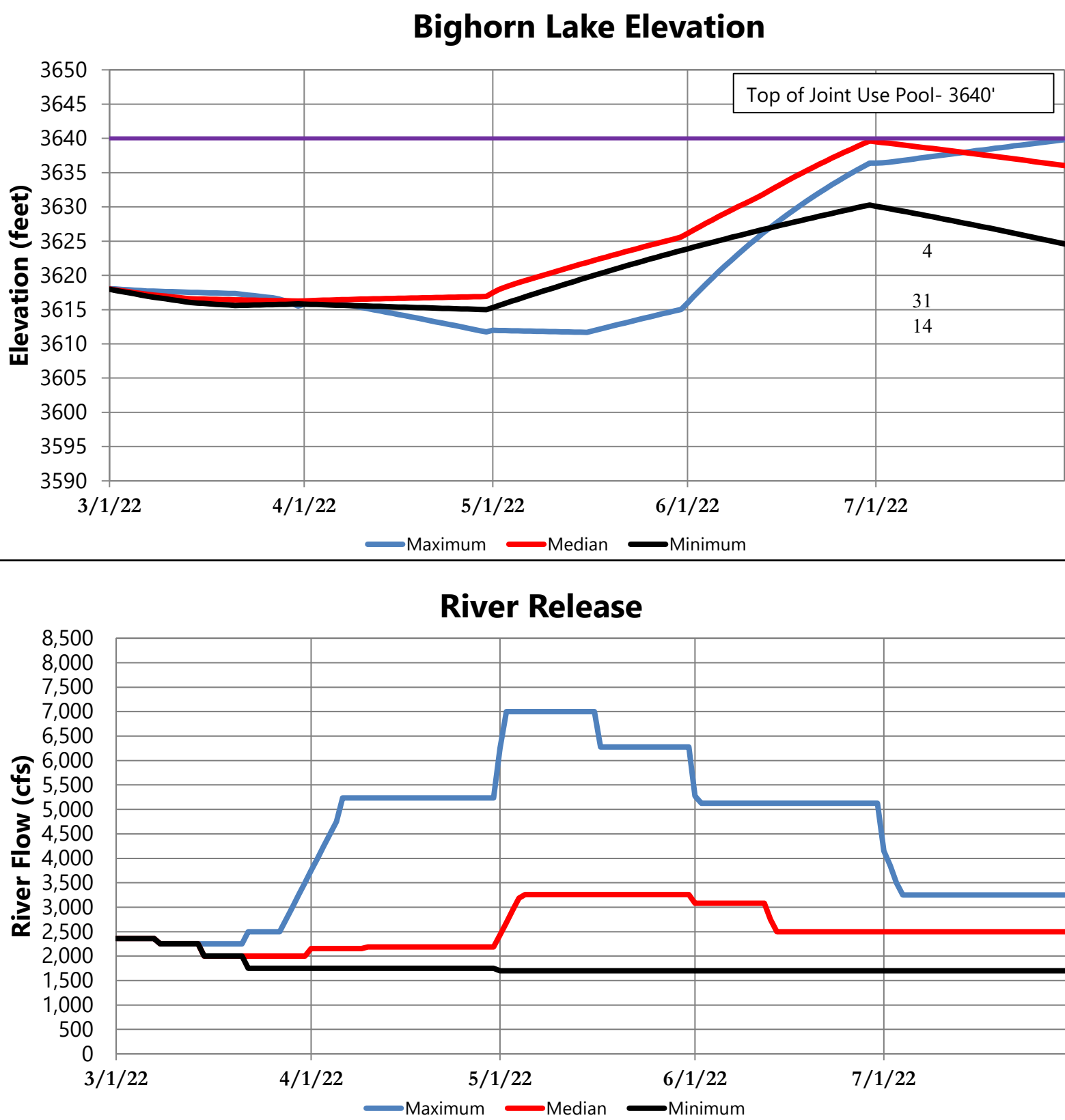


Release Outlook by Outlet

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 April.

OPERATIONS OUTLOOK (March 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-of-month elevations and river releases vary based on the difference between forecasted inflow scenarios.



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Monthly Operating Plans, Current Conditions, Snowpack and Other Water Management Information
https://www.usbr.gov/gp/lakes_reservoirs/wareprts/main_menu.html