# LIBBY DAM SUMMER OPERATIONS 2020

17 June 2020
TMT Meeting

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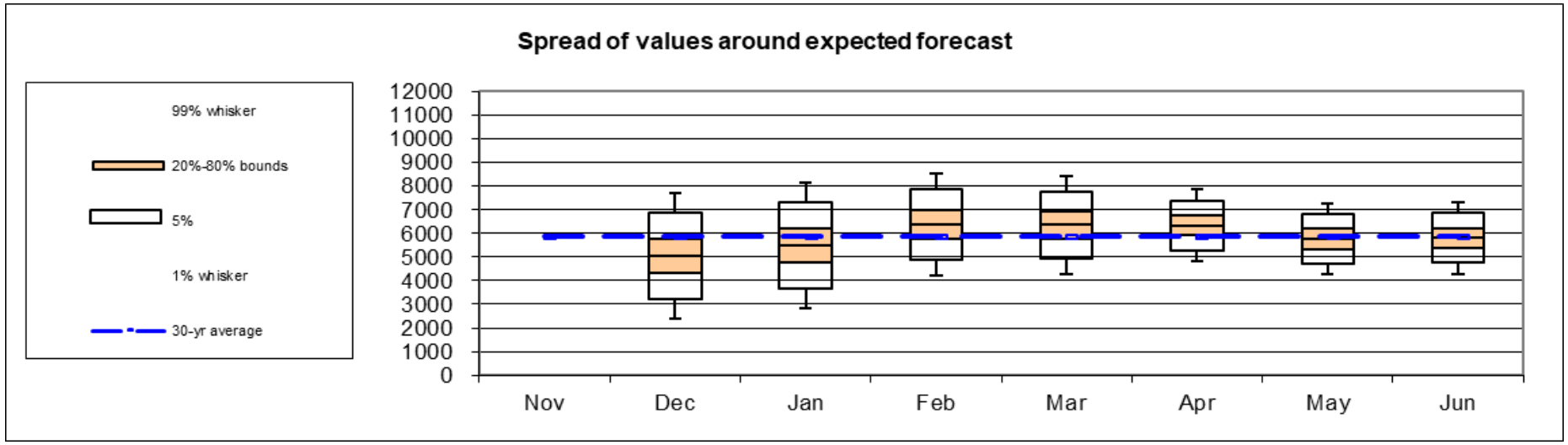
US Army Corps of Engineers®

# MAY 1ST WATER SUPPLY FORECAST AND BIOP OBJECTIVES

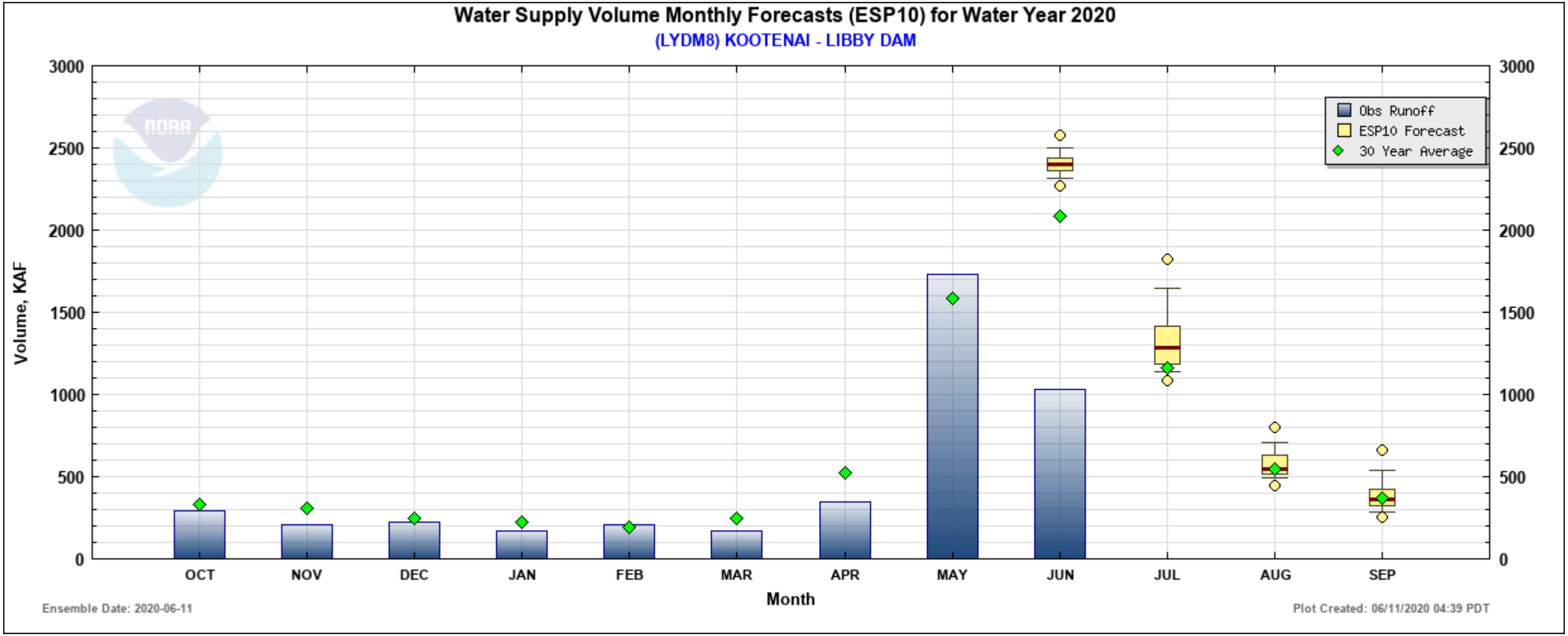
- April-August inflow forecast for Libby Dam is 5.76 million acre-feet (MAF)
  - Forecast is 98% of average
  - Sturgeon Volume is 0.92 MAF
  - Bull trout minimum flows following the Sturgeon Pulse through Aug 31 is 7 kcfs
  - May VarQ Flow 17,500 cfs

  - Libby Water Supply Forecast Trend:

- Water supply forecast issued on May 7 for The Dalles is 87.3 MAF (100% of normal).
  - Libby flow augmentation draft to 10 ft from full (2449 ft) end of September

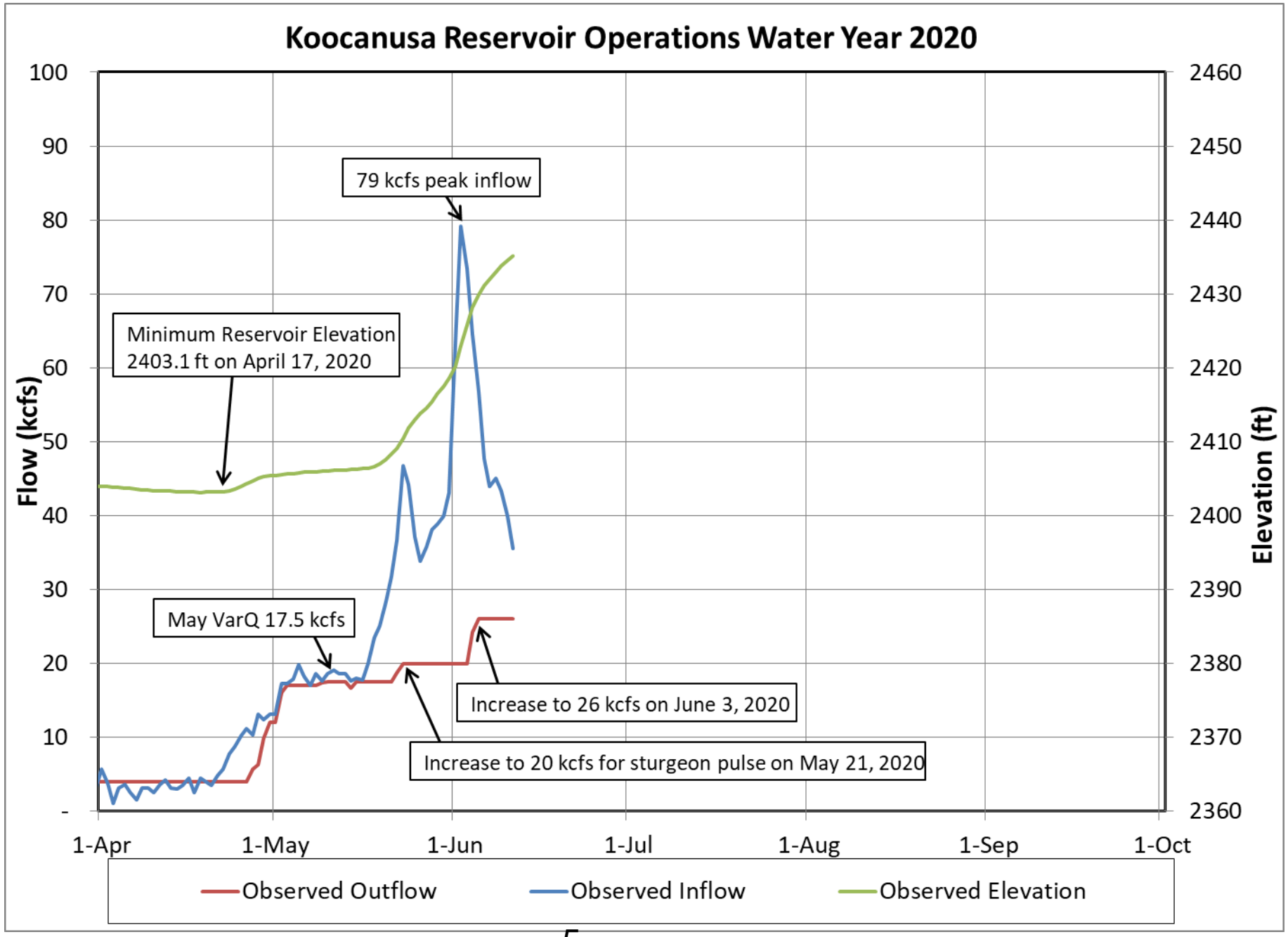


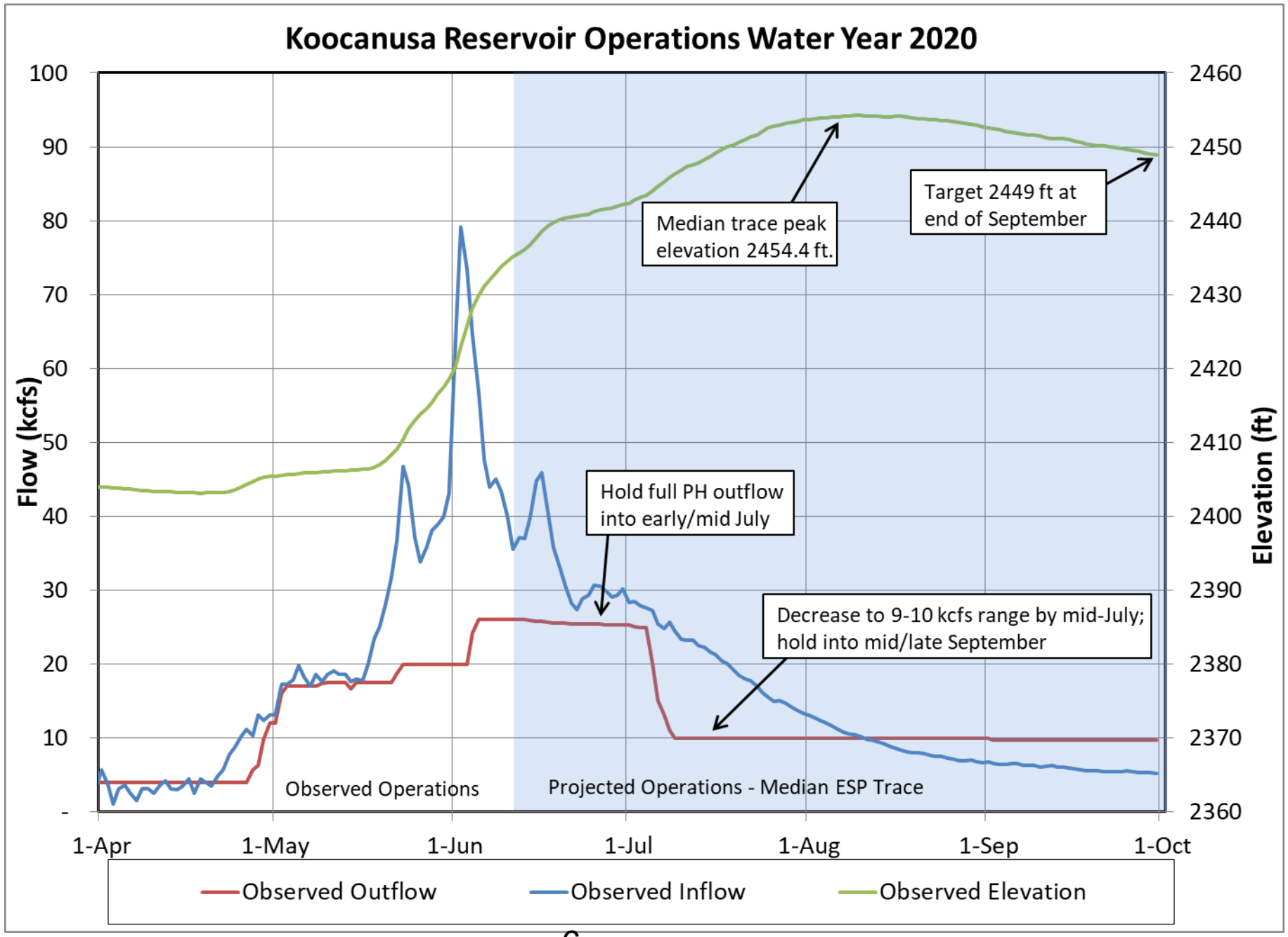
# ESP MONTHLY WATER SUPPLY VOLUME



# SUMMER OUTFLOW LIMITATIONS

- No request this year for 6 kcfs outflow in September for restoration work, as has occurred in previous years.
- Libby Dam will have a maximum powerhouse outflow capacity of 10 kcfs from mid-July through early September, due to transmissions maintenance work.
- Currently releasing 26 kcfs (approximately full powerhouse) to release more of the summer outflow volume early in the season.
- Plan to lower Libby outflow to 10 kcfs or less by mid-July.
- Once flow is decreased to 10 kcfs or less, seek to avoid increasing outflows in September after unit outage is completed.


Koocanusa Reservoir Operations Water Year 2020
Flow (kcfs)
Elevation (ft)
100
90
80
70
60
50
40
30
20
10
-
2460
2450
2440
2430
2420
2410
2400
2390
2380
2370
2360
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
79 kcfs peak inflow
Minimum Reservoir Elevation
2403.1 ft on April 17, 2020
May VarQ 17.5 kcfs
Increase to 26 kcfs on June 3, 2020
Increase to 20 kcfs for sturgeon pulse on May 21, 2020
Observed Outflow
Observed Inflow
Observed Elevation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2370
2360
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
Median trace peak elevation 2454.4 ft.
Target 2449 ft at end of September
Hold full PH outflow into early/mid July
Decrease to 9-10 kcfs range by mid-July; hold into mid/late September
Observed Operations
Projected Operations - Median ESP Trace
Observed Outflow
Observed Inflow
Observed Elevation

# 2449’ END OF SEPTEMBER TARGET

- Constrained outflows during late summer will limit ability to adapt to late-summer inflow uncertainty.
- Must set operation in mid-July to target 2449’ end of September. Set operation to meet this target based on **median** ESP trace.
- Once outflows are lowered in mid-July, hold in 9-10 kcfs range.
- If late summer inflows are higher or lower than expected, buffer with reservoir to maintain target outflow range.
  - Current modeling indicates an end of September elevation range of 2449 +/- 3 feet is likely under this operation.
- Potential to reduce outflows during September if reservoir elevations below 2446’ are expected by end of month.

Modeled using current ESP traces as of 06/11/20

# Libby Dam Outflow - Probability Chart

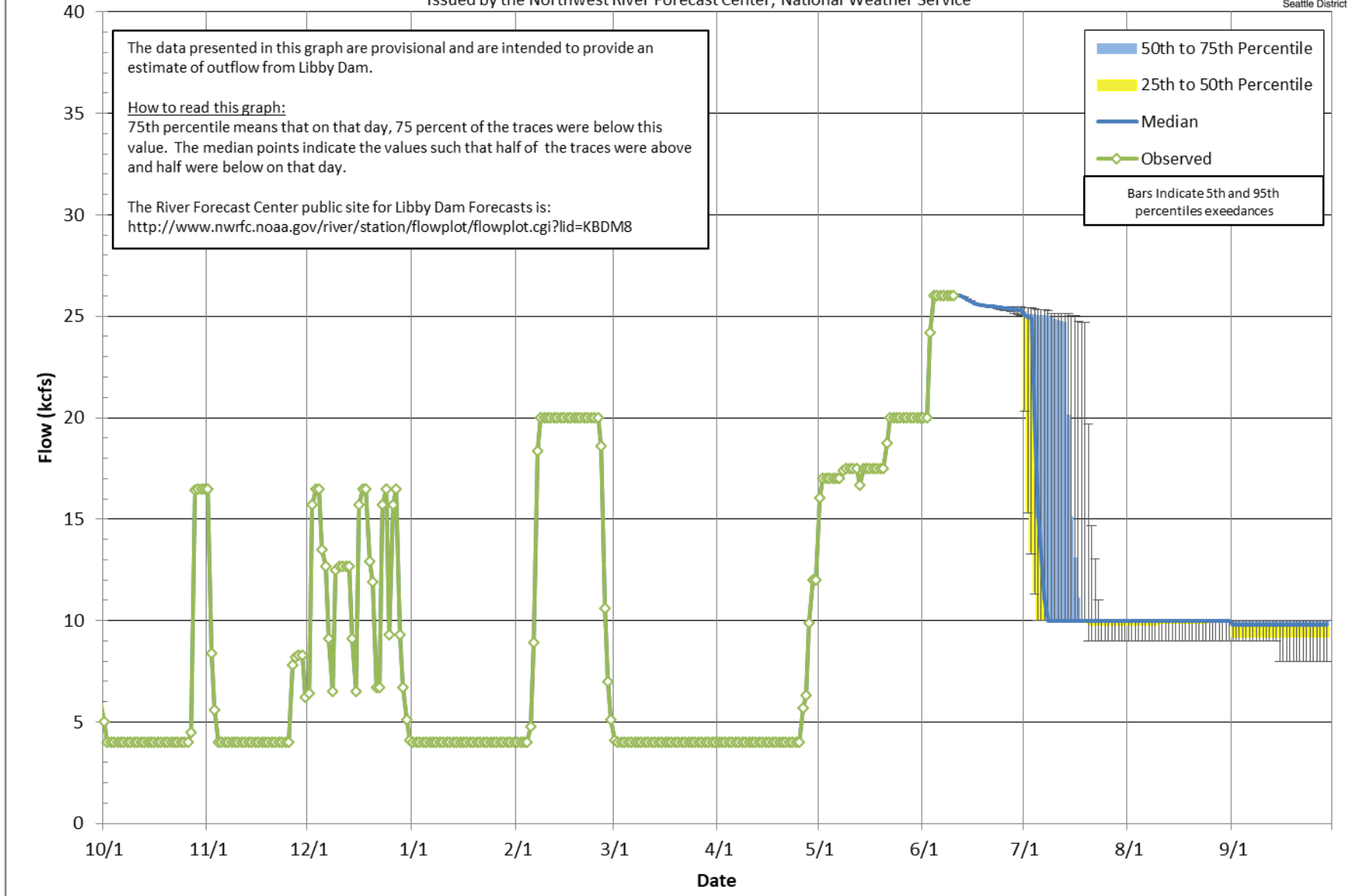
Corps of Engineers Projections Based on the 39 Ensemble Streamflow Prediction Traces
Issued by the Northwest River Forecast Center, National Weather Service

US Army Corps of Engineers
Seattle District

The data presented in this graph are provisional and are intended to provide an estimate of outflow from Libby Dam.

How to read this graph:
75th percentile means that on that day, 75 percent of the traces were below this value. The median points indicate the values such that half of the traces were above and half were below on that day.

The River Forecast Center public site for Libby Dam Forecasts is:
http://www.nwrfc.noaa.gov/river/station/flowplot/flowplot.cgi?lid=KBDM8



Modeled using current ESP traces as of 06/11/20

# Lake Koocanusa Elevation - Probability Chart

Corps of Engineers Projections Based on the 39 Ensemble Streamflow Prediction Traces
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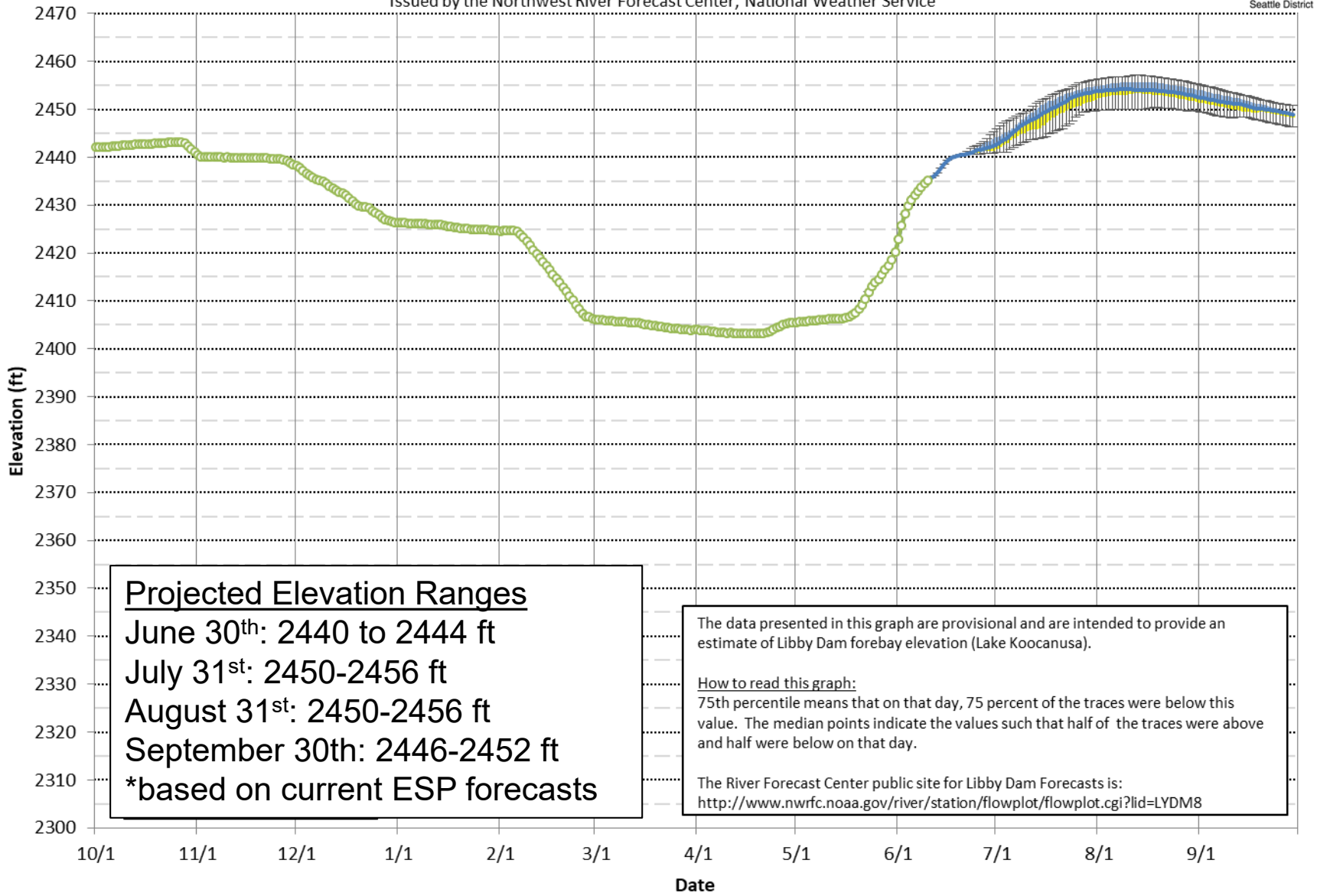


**Projected Elevation Ranges**
June 30th: 2440 to 2444 ft
July 31st: 2450-2456 ft
August 31st: 2450-2456 ft
September 30th: 2446-2452 ft
*based on current ESP forecasts

The data presented in this graph are provisional and are intended to provide an estimate of Libby Dam forebay elevation (Lake Koocanusa).

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http://www.nwrfc.noaa.gov/river/station/flowplot/flowplot.cgi?lid=LYDM8

Modeled using current ESP traces as of 06/11/20

# Libby Dam Reservoir Elevations - Probability Chart

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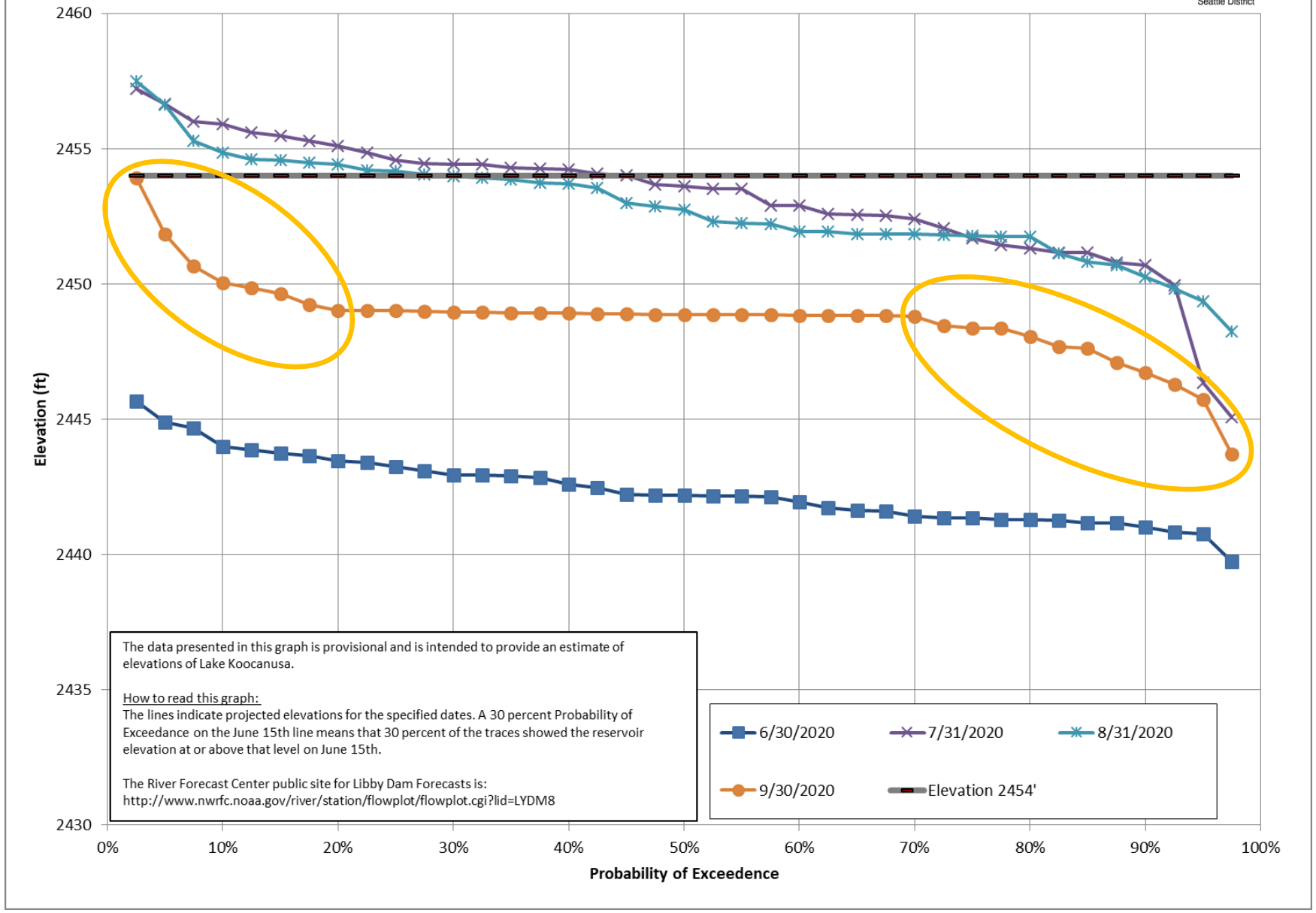
Seattle District




The data presented in this graph is provisional and is intended to provide an estimate of elevations of Lake Koocanusa.

How to read this graph:
The lines indicate projected elevations for the specified dates. A 30 percent Probability of Exceedance on the June 15th line means that 30 percent of the traces showed the reservoir elevation at or above that level on June 15th.

The River Forecast Center public site for Libby Dam Forecasts is:
http://www.nwrfc.noaa.gov/river/station/flowplot/flowplot.cgi?lid=LYDM8

# QUESTIONS?

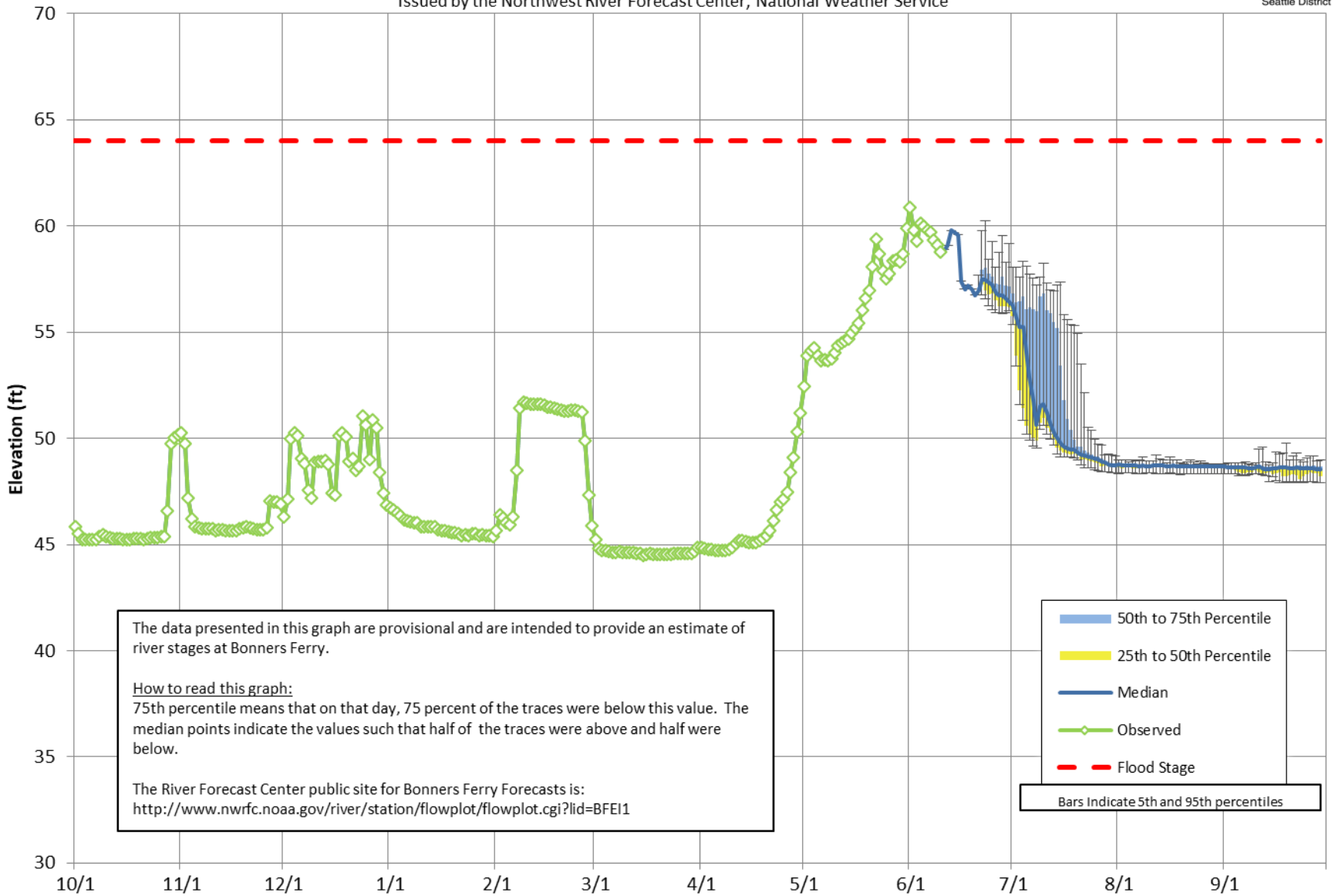
# ADDITIONAL PLOTS FOR REFERENCE

Modeled using current ESP traces as of 06/11/20

# Bonners Ferry Stage

Corps of Engineers Projections Based on the 39 Ensemble Streamflow Prediction Traces
Issued by the Northwest River Forecast Center, National Weather Service

US Army Corps of Engineers
Seattle District




The data presented in this graph are provisional and are intended to provide an estimate of river stages at Bonners Ferry.

How to read this graph:
75th percentile means that on that day, 75 percent of the traces were below this value. The median points indicate the values such that half of the traces were above and half were below.

The River Forecast Center public site for Bonners Ferry Forecasts is:
http://www.nwrfc.noaa.gov/river/station/flowplot/flowplot.cgi?lid=BFEI1

Modeled using current ESP traces as of 06/11/20

# Libby Dam Inflow- Probability Chart

Corps of Engineers Projections Based on the 39 Ensemble Streamflow Prediction Traces
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Seattle District

The data presented in this graph are provisional and are intended to provide an estimate of inflow to Libby Dam.

How to read this graph:
75th percentile means that on that day, 75 percent of the traces were below this value. The median points indicate the values such that half of the traces were above and half were below on that day.

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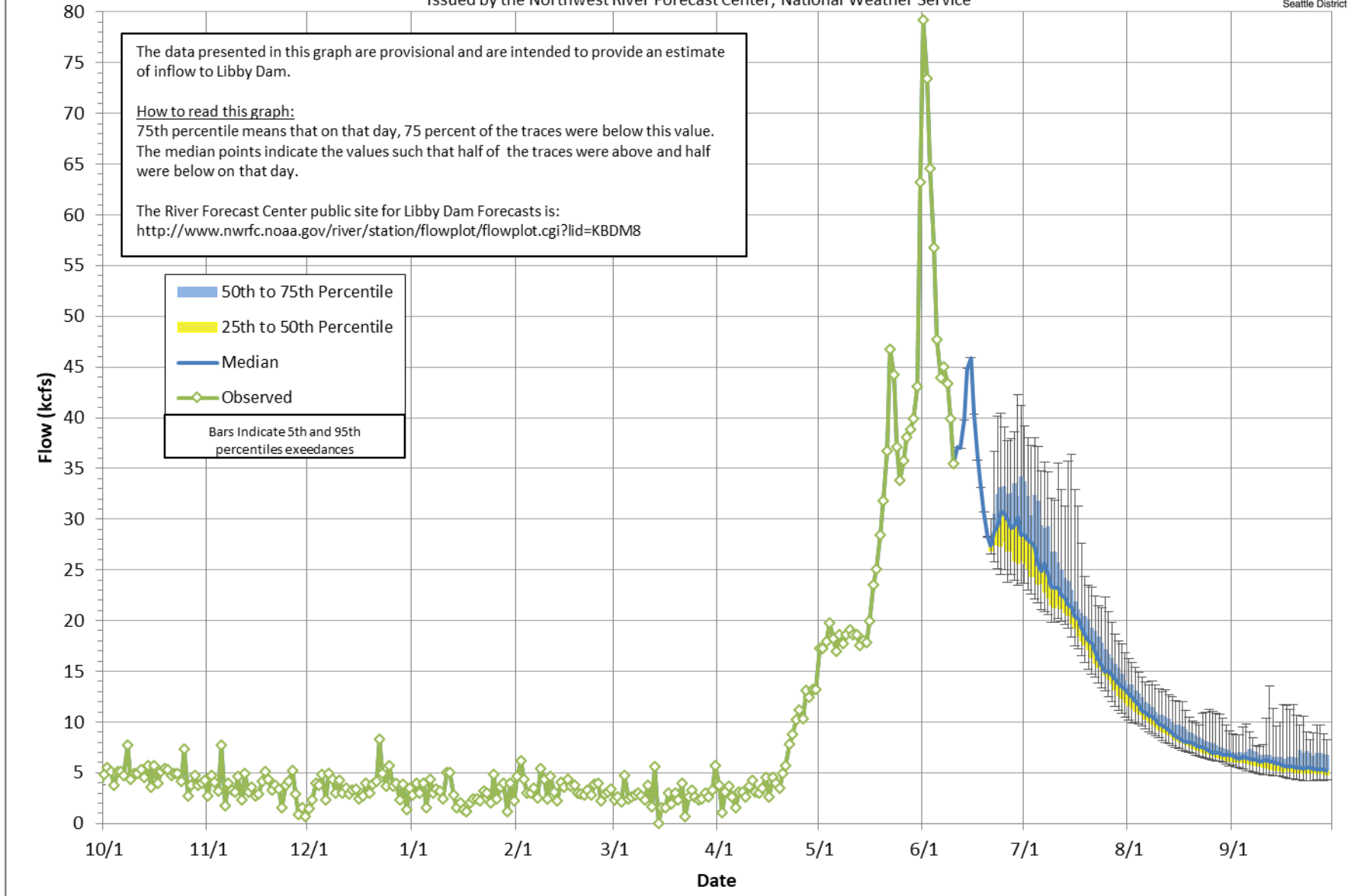
http://www.nwrfc.noaa.gov/river/station/flowplot/flowplot.cgi?lid=KBDM8

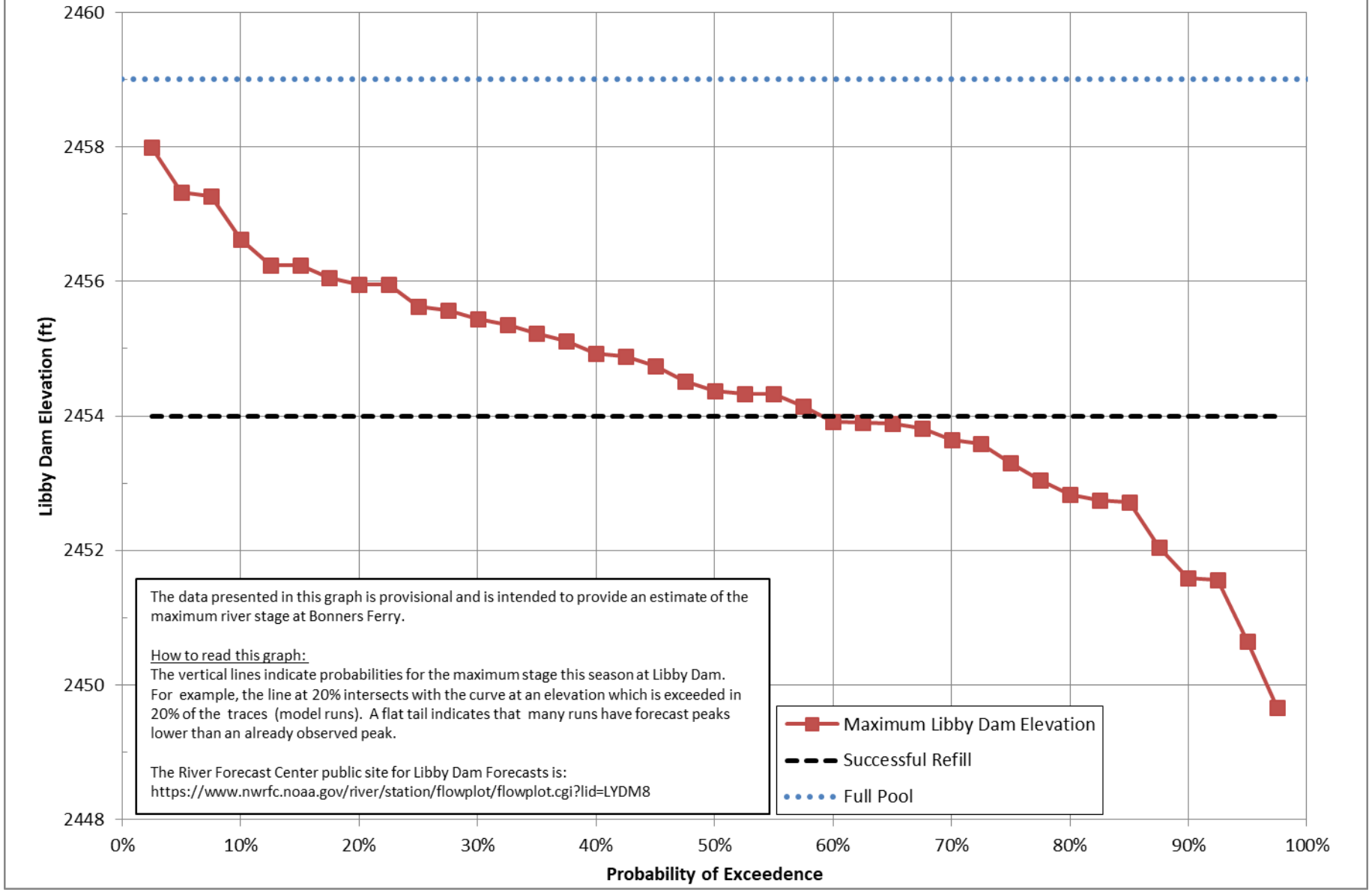


Modeled using current ESP traces as of 06/11/20

# Maximum April-September Libby Dam Pool Elevation- Probability Chart

Corps of Engineers Projections Based on the 39 Ensemble Streamflow Prediction Traces
Issued by the Northwest River Forecast Center, National Weather Service

US Army Corps of Engineers
Seattle District




The data presented in this graph is provisional and is intended to provide an estimate of the maximum river stage at Bonners Ferry.

How to read this graph:
The vertical lines indicate probabilities for the maximum stage this season at Libby Dam. For example, the line at 20% intersects with the curve at an elevation which is exceeded in 20% of the traces (model runs). A flat tail indicates that many runs have forecast peaks lower than an already observed peak.

The River Forecast Center public site for Libby Dam Forecasts is:
https://www.nwrfc.noaa.gov/river/station/flowplot/flowplot.cgi?lid=LYDM8