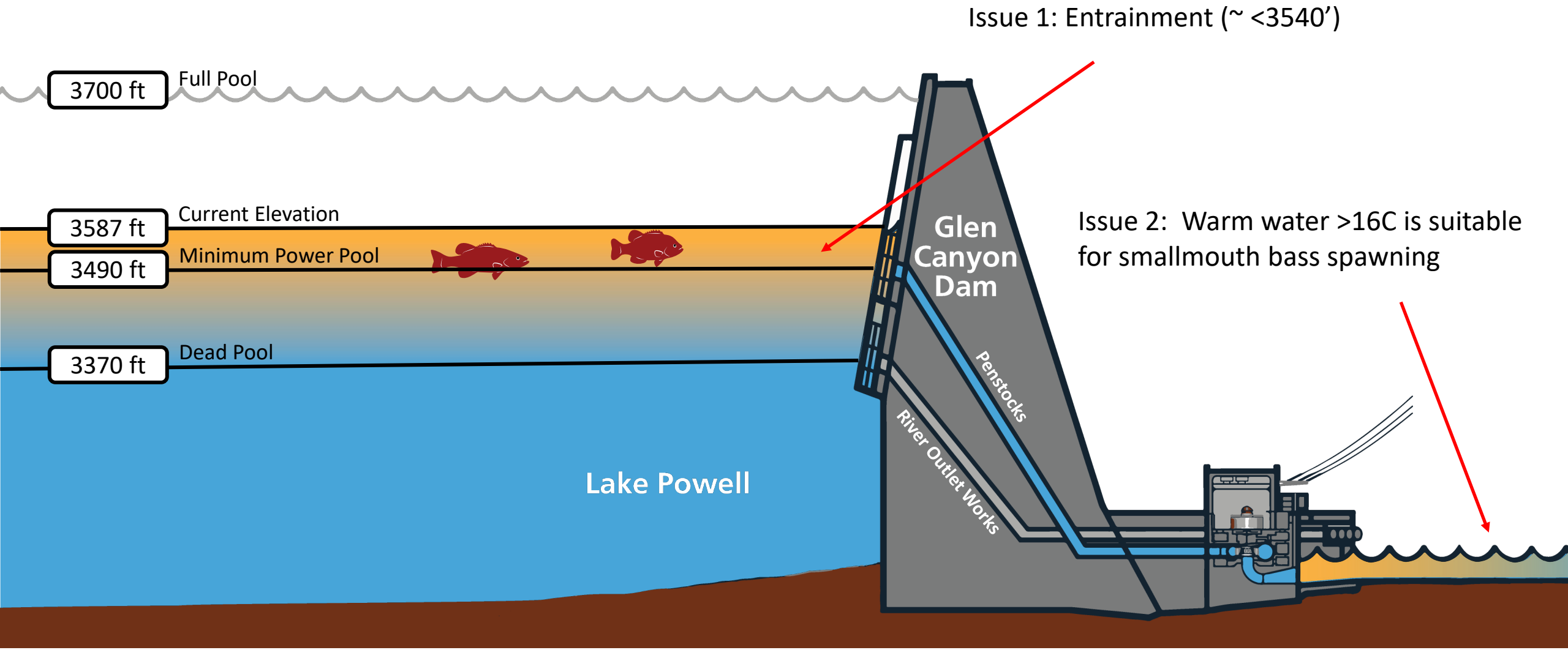
BUREAU OF RECLAMATION

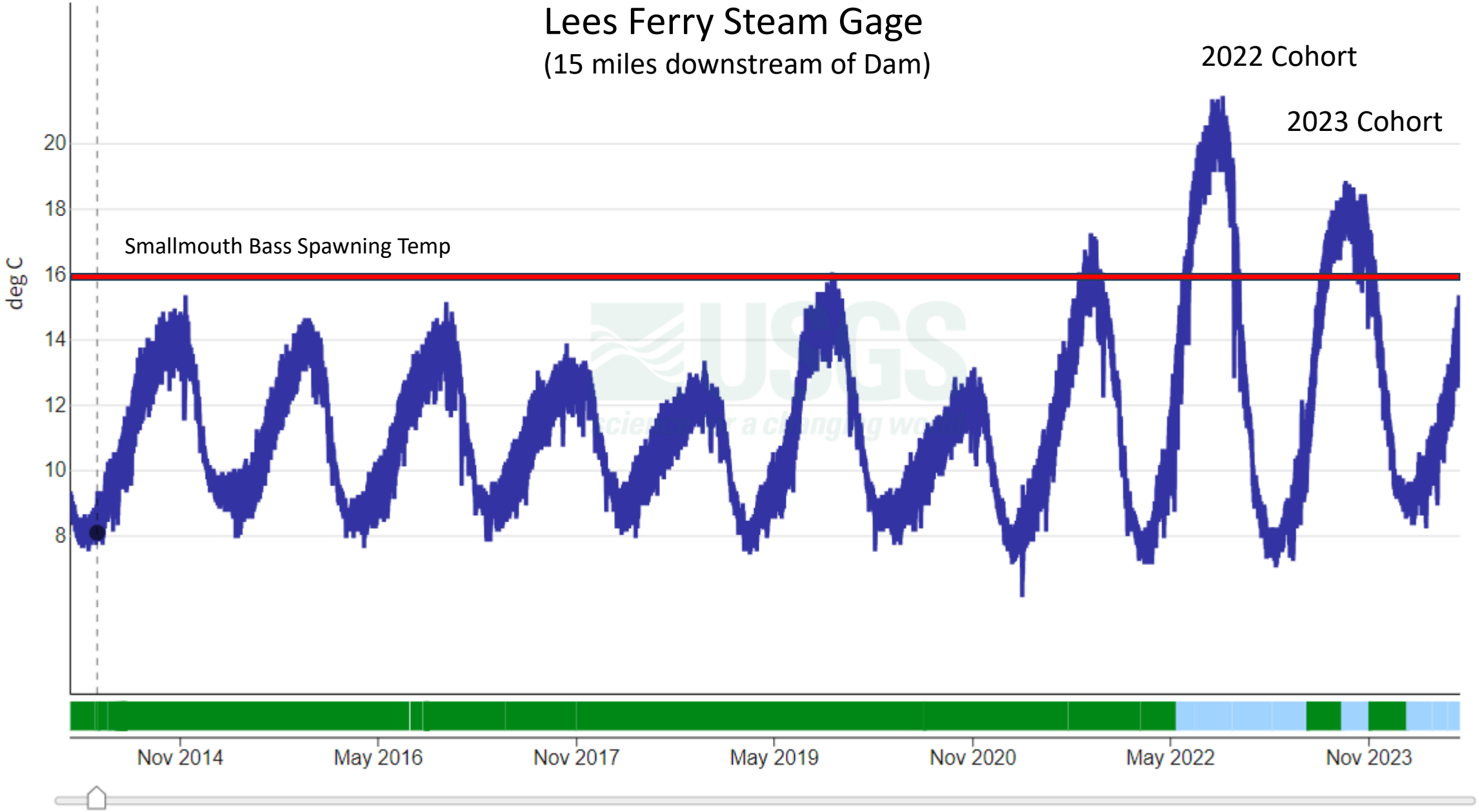
LTEMP SEIS Update

July 10, 2024

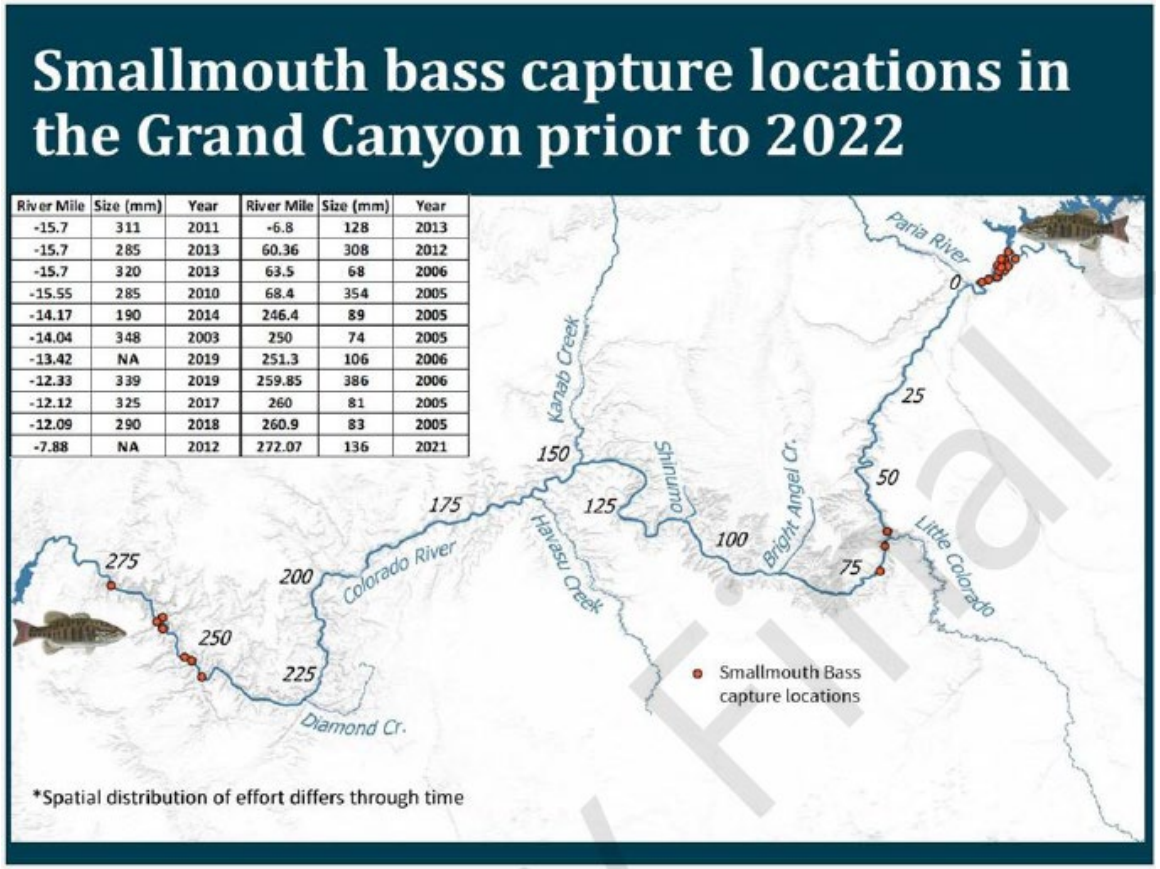
Bill Stewart, US Bureau of Reclamation

Invasive Threat to Native Fish



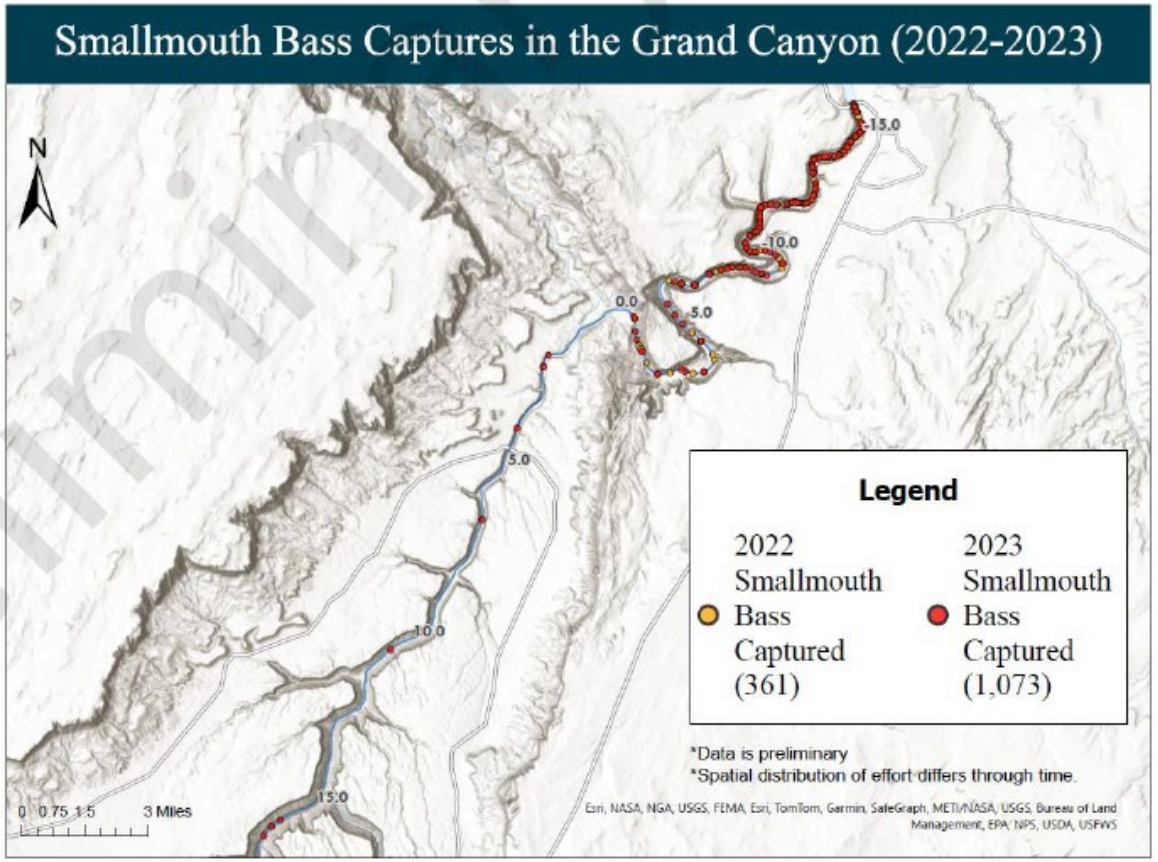

Lees Ferry Steam Gage
(15 miles downstream of Dam)
2022 Cohort
2023 Cohort
Smallmouth Bass Spawning Temp
deg C
20
18
16
14
12
10
8
Nov 2014
May 2016
Nov 2017
May 2019
Nov 2020
May 2022
Nov 2023

Past and Current Known Distribution of Smallmouth Bass



River Mile	Size (mm)	Year	River Mile	Size (mm)	Year
-15.7	311	2011	-6.8	128	2013
-15.7	285	2013	60.36	308	2012
-15.7	320	2013	63.5	68	2006
-15.55	285	2010	68.4	354	2005
-14.17	190	2014	246.4	89	2005
-14.04	348	2003	250	74	2005
-13.42	NA	2019	251.3	106	2006
-12.33	339	2019	259.85	386	2006
-12.12	325	2017	260	81	2005
-12.09	290	2018	260.9	83	2005
-7.88	NA	2012	272.07	136	2021

22 smallmouth bass captured from 2011 to 2021



Over 1,400 smallmouth bass captured in 2022 and 2023

LTEMP Supplemental Environmental Impact Statement Timeline

- **Winter/Spring 2022 –** Smallmouth bass task force
- **August 2022** – Acting Secretary Designee to AMWG proposed undertaking of an EA
- **February 24-March 10, 2023 –** Small Mouth Bass Flow Options Environmental Assessment public comment period.
- **June 19, 2023** – Reclamation was directed to prepare a **Supplemental Environmental Impact Statement** (SEIS)
- **October 4, 2023** - **Notice of Intent** was published in the *Federal Register* announcing the LTEMP SEIS and requesting scoping input
- **February 9, 2024 – Notice of Availability** was published in the *Federal Register*
- **May 31, 2024 – Final SEIS Published**
- **July 3, 2024 – Record of Decision Signed**

Alternatives Considered and Analyzed

- No Action – Glen Canyon Dam operations will continue as defined in the 2016 LTEMP ROD.

Cold Water Alternatives

- **Cool Mix Alternative (Preferred Alternative)**
- **Cool Mix with Flow Spike Alternative**
- **Cold Shock Alternative**
- **Cold Shock with Flow Spike Alternative**

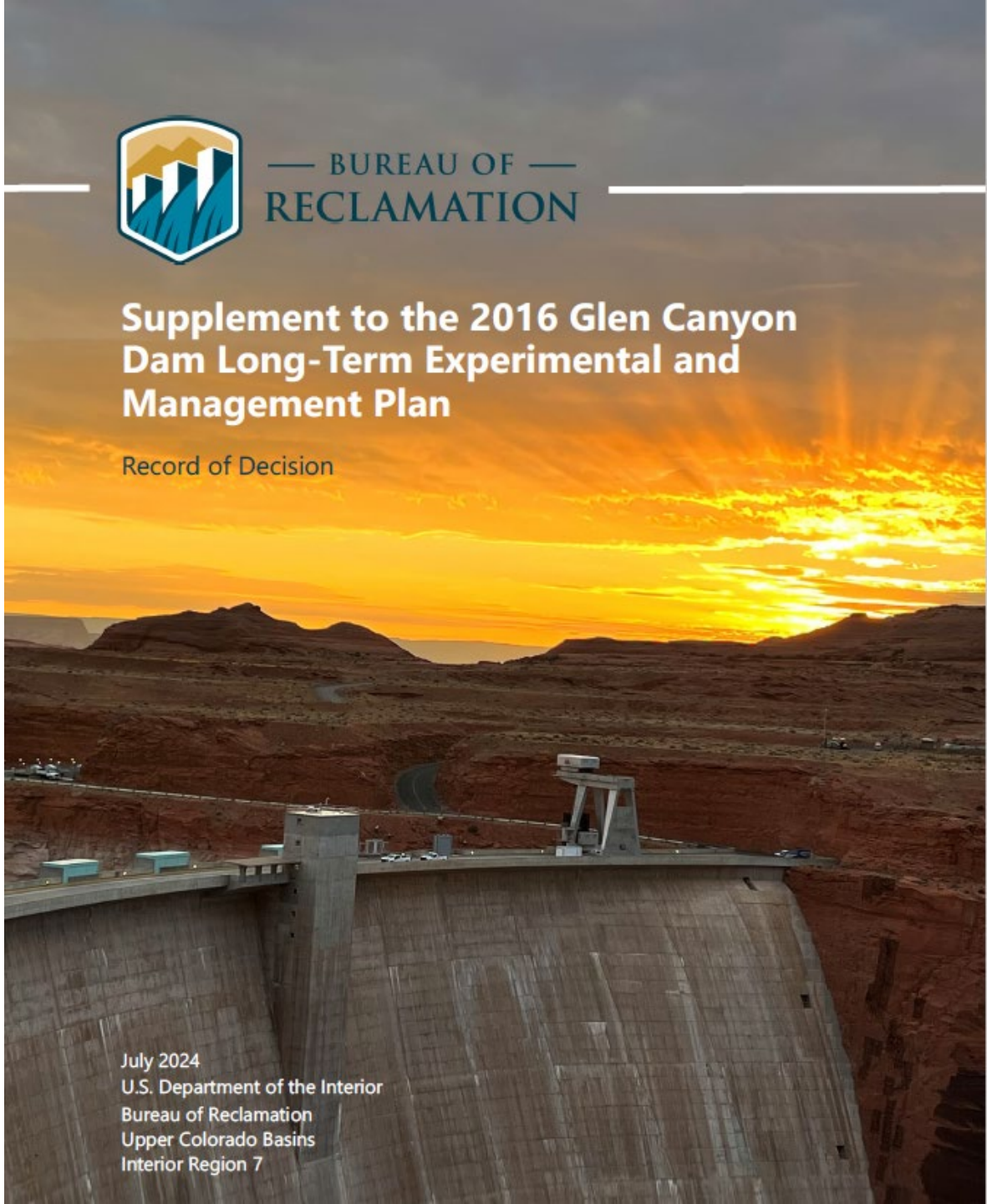
- **Non-Bypass Alternative**

HFE Protocol Update is Common to all Action Alternatives

Record of Decision

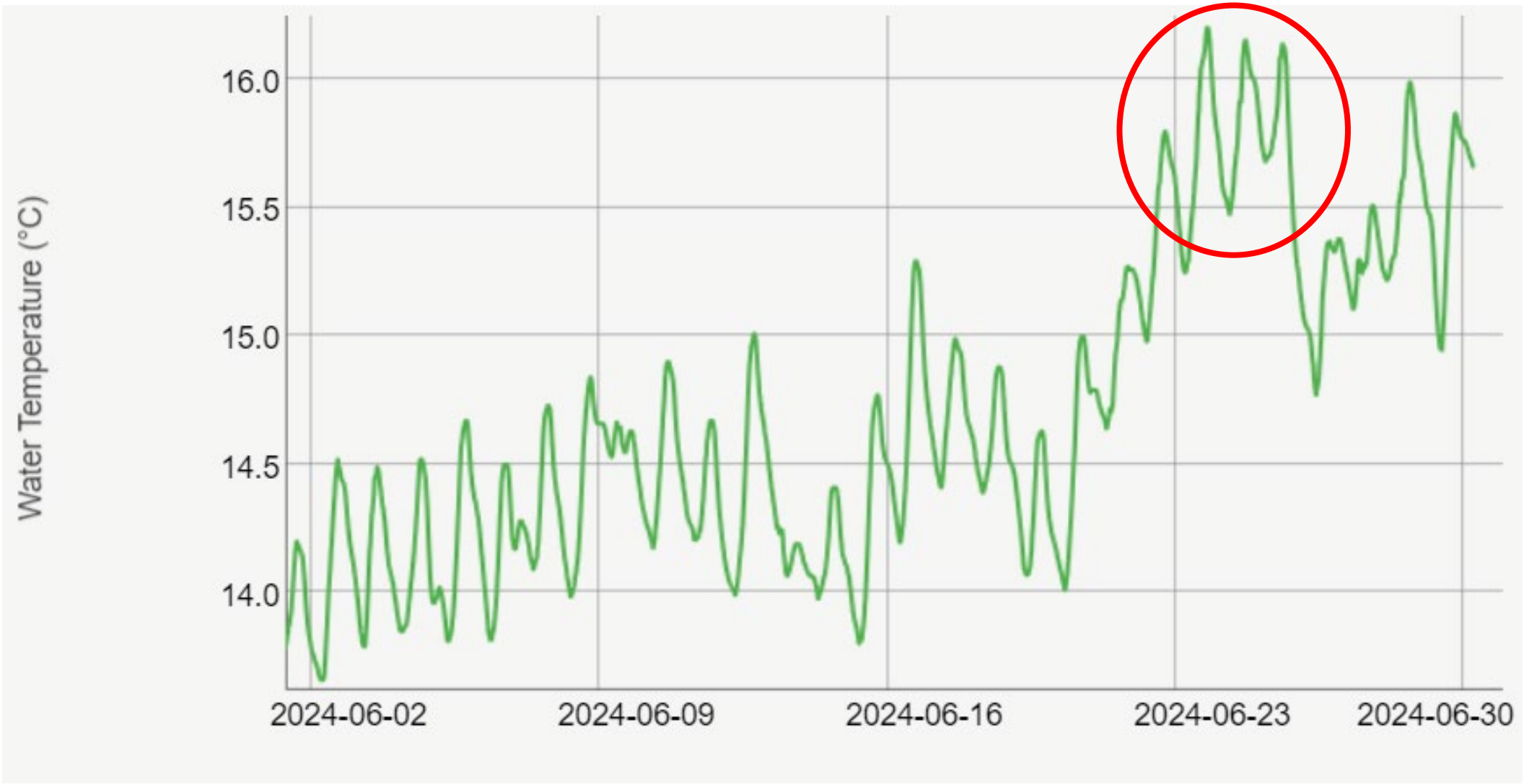
- Operational Flows (2024-2027)
  - Cool mix is the preferred alternative for 2024
  - Cool Mix Alternative and the other alternatives possible in 2025-2027 (if needed).

- HFE Protocol Revision (2024-2036)



2024 Implementation

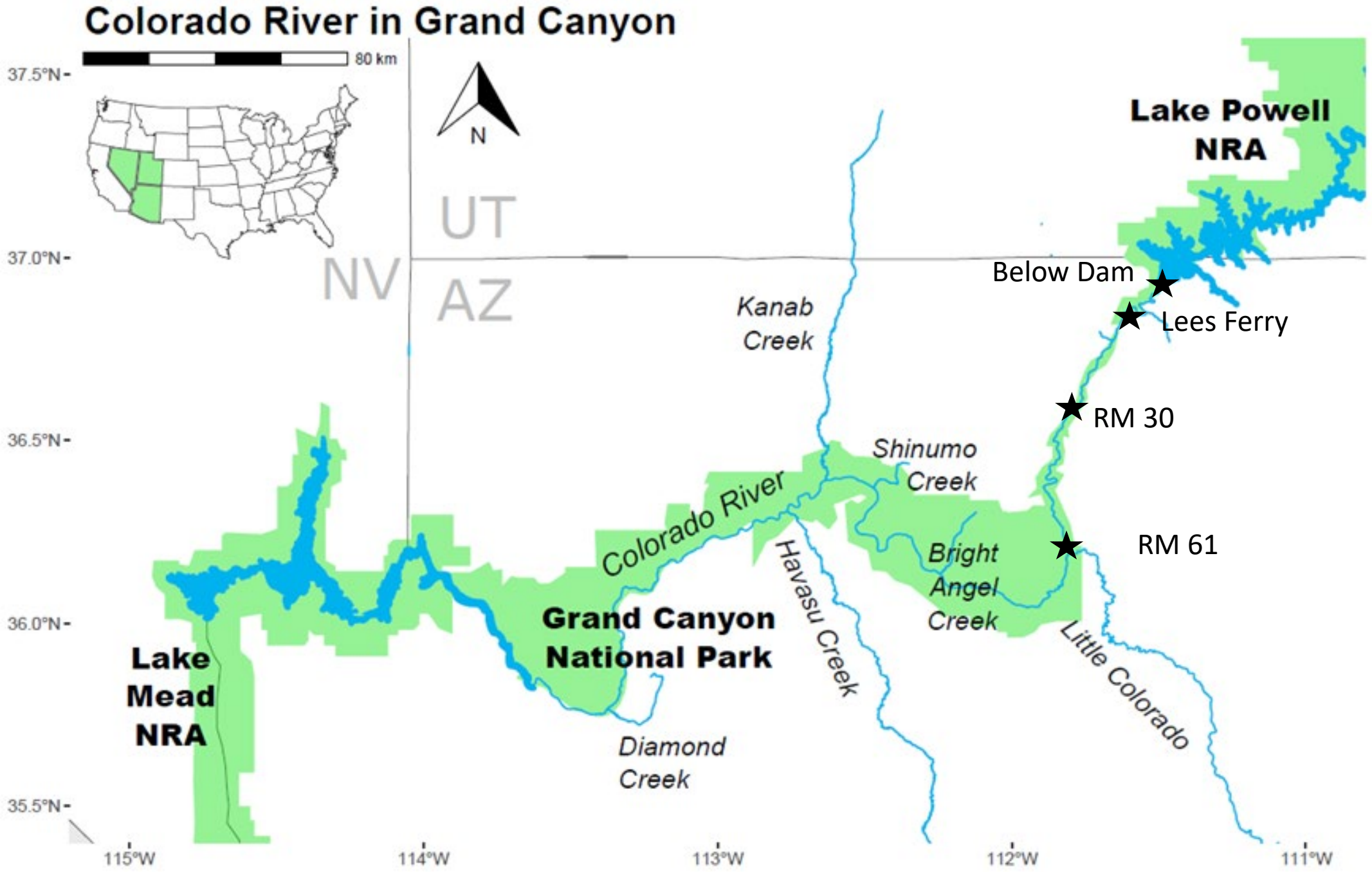
- 2024 (Cool Mix)
  - ROD provided guidance specific to 2024
    - "A cool mix would occur when the average daily temperature at river mile 61 exceeds 15.5°C (60°F) for 3 consecutive days. "
    - "The Cool Mix Alternative would be implemented until the mean daily water temperature (without bypass) falls below 15.5°C (60°F) at river mile 61"…or
    - "Potential off-ramp conditions will be monitored and considered to determine whether conditions warrant ending any experimental flows, as determined through the planning and implementation process. "
    - "A monitoring plan for 2024 has been outlined by the Department agencies and will serve as guidance for determining the status and effectiveness of the action."



River Mile 61

2025-2027 Implementation

- **ROD provided guidance 2025-2027**
  - "For smallmouth bass flows in 2025–2027, and as described in the preferred alternative, a broader range of smallmouth bass flows analyzed in the 2024 LTEMP SEIS will be considered for implementation, if conditions warrant, beyond the Cool Mix Alternative. "
  - "Reclamation will consider the same factors described in the 2024 LTEMP SEIS, including any new information from previous years' experiments, to refine the criteria, implementation procedures, and off-ramps. "
  - "To assess potential smallmouth bass flows to be implemented, Reclamation, in coordination with the Service, will prepare an analysis of current conditions, including the hydrology, water quality, Basin Fund (in coordination with WAPA), and fish populations. "
  - "Reclamation will coordinate with the planning and implementation team as defined in the 2016 LTEMP ROD to ensure all pertinent resources are analyzed prior to implementing a proposed flow. The implementation process will include formal stakeholder engagement, including consultations with the Tribes. "


Colorado River in Grand Canyon
80 km
N
37.5°N
37.0°N
36.5°N
36.0°N
35.5°N
115°W
114°W
113°W
112°W
111°W
UT
NV
AZ
Lake Powell NRA
Below Dam
Lees Ferry
RM 30
RM 61
Kanab Creek
Shinumo Creek
Colorado River
Bright Angel Creek
Havasu Creek
Little Colorado
Grand Canyon National Park
Lake Mead NRA
Diamond Creek

Implementation (Hydrograph Development)

1. Required to operate within the 2017 Glen Canyon Operating Criteria

2. Temperature target

3. Operational parameters for bypass

4. Other potential constraints (Rapid temperature changes (ex. >4°C/hr) could have negative impacts to HBC)

Hour System Time (MST)	Bypass Release (cfs)	Penstock Release (cfs)	Total Release (cfs)
0:00	5,000	4,480	9,480
1:00	5,000	4,480	9,480
2:00	5,000	4,480	9,480
3:00	5,000	4,480	9,480
4:00	5,000	4,480	9,480
5:00	5,000	4,480	9,480
6:00	5,000	4,480	9,480
7:00	5,000	4,480	9,480
8:00	5,000	4,480	9,480
9:00	5,000	4,480	9,480
10:00	5,000	4,480	9,480
11:00	5,000	4,480	9,480
12:00	5,000	6,086	11,086
13:00	5,000	10,086	15,086
14:00	0	15,086	15,086
15:00	0	15,086	15,086
16:00	0	15,086	15,086
17:00	0	15,086	15,086
18:00	0	15,086	15,086
19:00	0	15,086	15,086
20:00	0	15,086	15,086
21:00	0	14,480	14,480
22:00	5,000	6,980	11,980
23:00	5,000	4,480	9,480

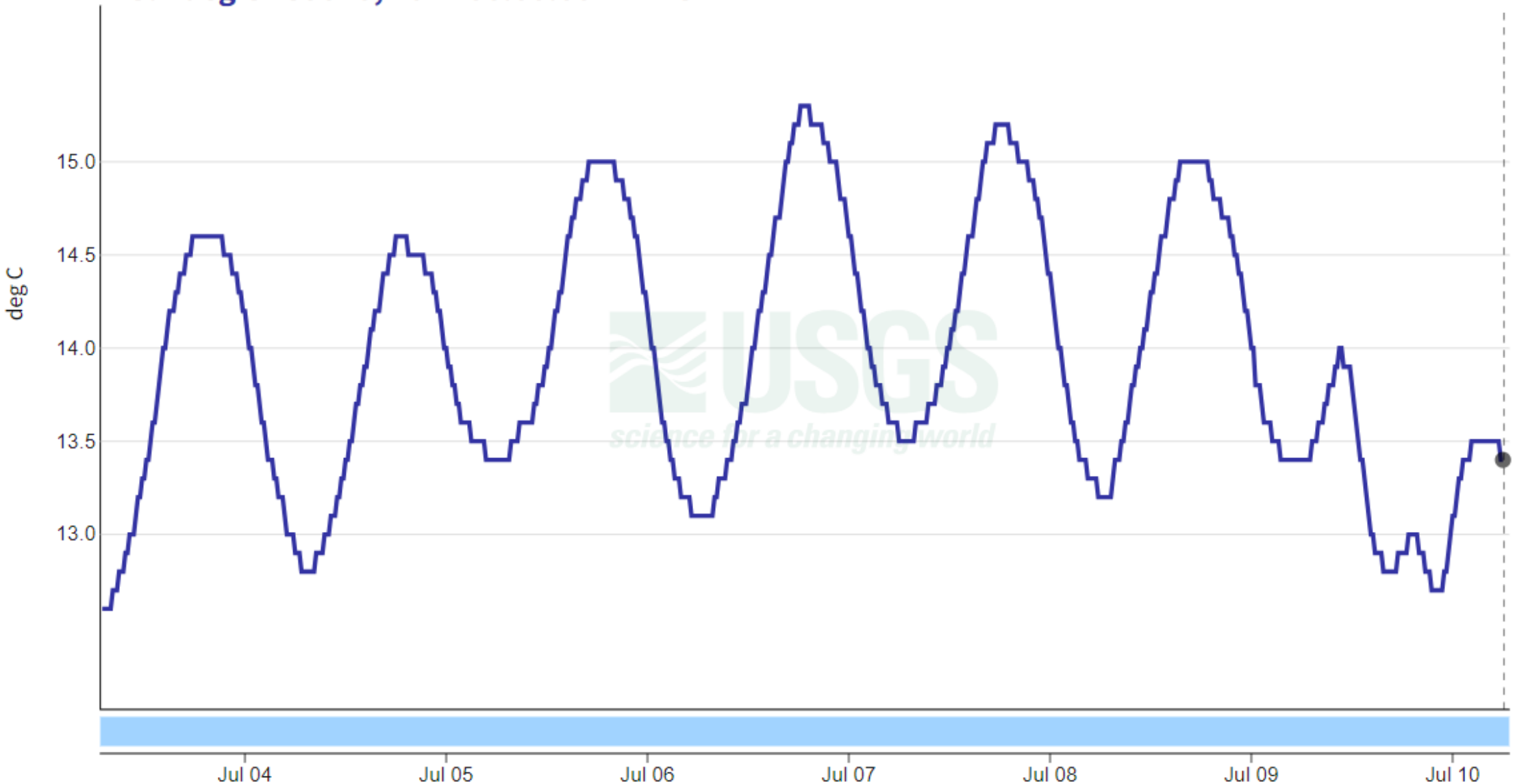
Orange = bypass release
Blue = penstock release

Colorado River at Lees Ferry, AZ - 09380000

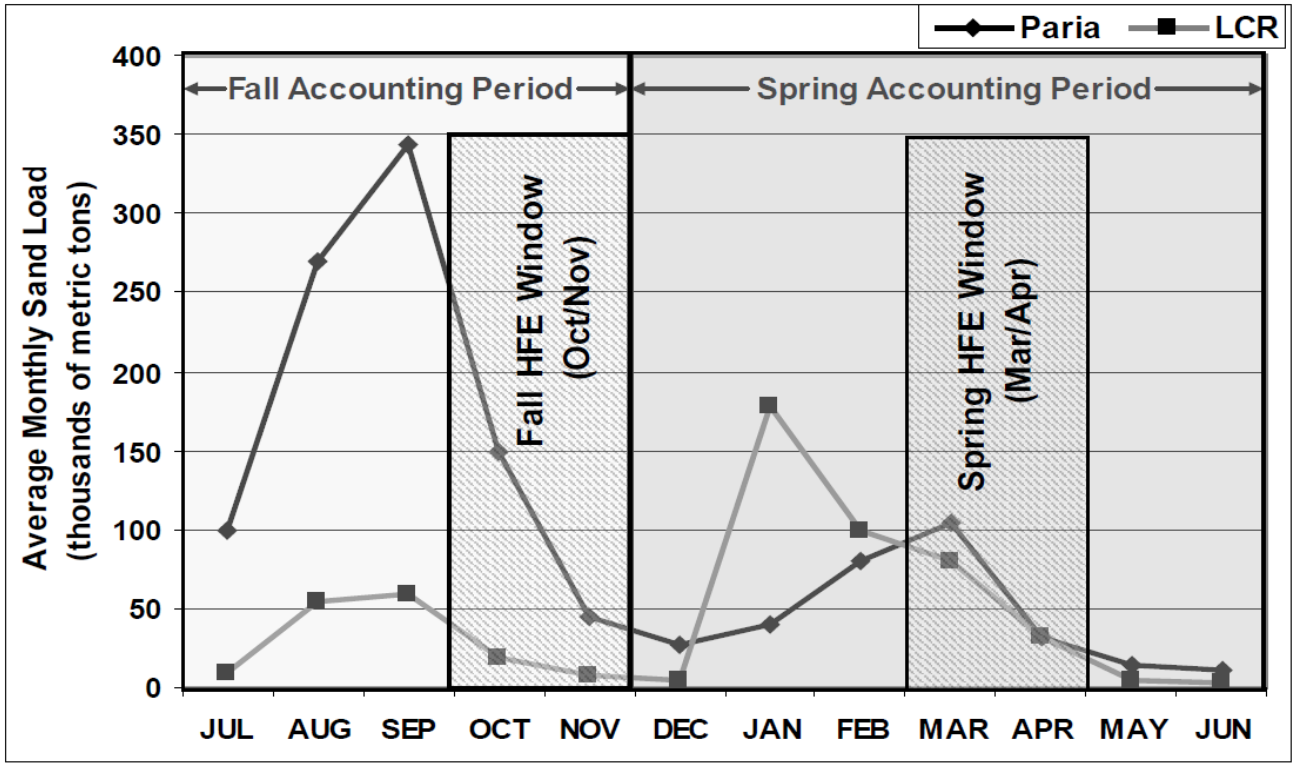
July 3, 2024 - July 10, 2024

Temperature, water, degrees Celsius

13.4 deg C - Jul 10, 2024 06:00:00 AM MST



Revised HFE Protocol



Old Protocol

Proposal to Amend the High-Flow Experiment Protocol and Other Considerations

Developed by the Flow Ad Hoc Group, through the Technical Work Group of the Glen Canyon Dam Adaptive Management Program in partnership with the Grand Canyon Monitoring and Research Center and the Bureau of Reclamation.

Accepted by the Technical Work Group on August 9, 2023 and forwarded to the Adaptive Management Work Groupon August 10, 2023 for consideration.

Map derived from the GCDAMP Wiki and modified by Mel Fegler, Wyoming State Engineer's Office

Revised HFE Protocol

- Planning for HFE releases will follow the planning and implementation process.
- Sand budget models will be run throughout the fall to determine whether sufficient sediment is available to conduct an HFE release.
- If sufficient sediment is available in the fall, the planning and implementation team may recommend conducting the fall HFE release (October or November) or defer implementation to the spring implementation window (March-June).
- Prior to the spring implementation window, the planning and implementation process will again be used to provide a recommendation on the duration, magnitude, and timing of the spring HFE release.
- If the HFE release is conducted, sediment accounting will restart on July 1.
- If, through the planning and implementation process, the recommendation is not to conduct an HFE release despite sufficient sediment, the remaining mass balance at the end of June will be carried into the new accounting period.

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