# Long-Term Experimental and Management Plan (LTEMP) Biological Opinion Conservation Measures Update

## Technical Work Group Meeting
## January 22, 2021


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# Incidental Take Parameters – Tier 1 Action Initiation Triggers

| TIER 1 – Early Intervention | TRIGGER | 2018 | 2019 | 2020 | 3-year average |
|---|---|---|---|---|---|
| 1A. Combined adult (≥200 mm) humpback Chub (HBC) in the mainstem Little Colorado River (LCR) aggregation and LCR | **≤ 9,000** | **15,000** | **12,000** | **11,000** | |
| **OR** | | | | | |
| 1B. Recruitment of sub-adult HBC (150-199 mm) does not equal or exceed estimated adult mortality | | | | | |
| 1) Sub-adult population estimate in LCR in spring* | **≤ 1,250 for 3 years** | **1,800** | **2,600** | **1,000*** | **1,800** |
| **OR** | | | | | |
| 2) Sub-adult population estimates in mainstem in Juvenile Chub Monitoring (JCM) Reach in fall | **≤ 810 for 3 years** | **1,100** | **500** | **200** | **600** |

Model estimates for adults are rounded to the nearest 1,000 and to the nearest 100 for sub-adults.

*No estimate was obtained for sub-adults in LCR in spring 2020 due to COVID-19 restrictions. The 2020 number was estimated by using data collected and abundance estimated from fall 2019.

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Preliminary data, subject to revision, do not cite

# Incidental Take Parameters – Tier 2 Action Triggers

| Tier 2 – Action Triggers | TRIGGER | 2018 | 2019 | 2020 |
|---|---|---|---|---|
| **Mechanical Removal implemented** | | | | |
| If adult HBC (≥200 mm) as estimated by the HBC population model | **<7,000** | **N/A** | **N/A** | **N/A** |
| **Terminate Mechanical Removal** | | | | |
| If predator index is | **<60 rainbow trout/km in JCM reach** | - | - | - |
| and immigration rate is | **Low (to be determined)** | - | - | - |
| **OR** | | | | |
| HBC population estimates | **> 7,500** | - | - | - |
| and survival rates of sub-adult chub | **exceeds adult mortality for at least 2 years** | - | - | - |

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# Two-Tier Approach

- **Tier 1** - emphasize conservation actions that take place during adult or sub-adult population declines.

- **Tier 2** - predator removal if conservation actions unsuccessful.

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# Humpback Chub – Tier 1 Action Triggers

- If the combined point estimate for adult HBC (≥200 mm) in the Colorado River mainstem-Little Colorado River (LCR) aggregation) and LCR <9,000

OR

- If recruitment of sub-adult HBC (150-199mm) ≤ estimated adult mortality such that:
  - a) Sub-adult abundance <1,250 fish (3-yr average) in the spring LCR population estimates.

OR

  - b) Sub-adult abundance <810 fish (3-yr average) in the fall mainstem Juvenile Chub Monitoring reach.

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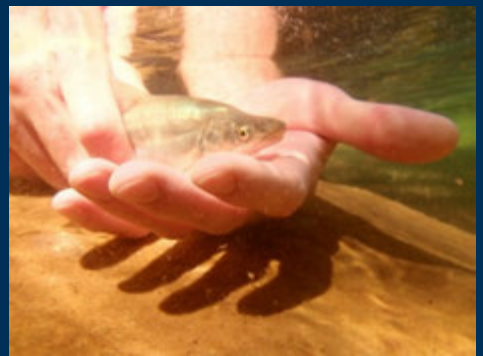
# LTEMP -Tier 1 Trigger Response

1. LCR - Expand translocation actions in the LCR by collecting an additional 300-600 young of the year (YOY) HBC and move to above Chute Falls in October.
2. LCR - Assess efficacy of transporting larval HBC (April/May) into Big Canyon and above Blue Springs in the LCR system. Evaluate growth and survival of these transplants.
3. Mainstem LCR Aggregation - Larval fish will be removed from LCR (April/May) and head-started at SNARRC. Once fish reach 150-200 mm they will be translocated to the mainstem LCR reach the following year (currently grow-out space at SNARRC is limited to 750 HBC, use of fish for this purpose would reduce numbers available for other actions, e.g. Havasu, Shinumo.);
4. Additional conservation actions as identified and evaluated.



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# Trigger Response & Next Steps

- Trigger met does not mean take was exceeded
- Conservation actions implemented in the LCR or adjacent mainstem
- Next Steps
  - Initial conversations with FWS
  - Small group to discuss triggers & response
- 5-year review of action triggers

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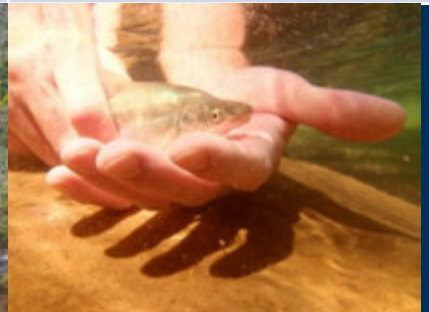
# Conservation Measures

## Described in the 2016 LTEMP ROD and Biological Opinion

| Resource | Conservation Measures |
|---|---|
| Humpback chub | Translocations<br>Monitoring<br>Non-native fish removal<br>Refuge support<br>Disease & parasite monitoring |
| Razorback sucker | Monitoring |
| All native aquatic species | Evaluate non-native fish management<br>Evaluate temperature control<br>Evaluate fish passage |
| Southwestern willow flycatcher | Monitor every 2 years |
| Yuma Ridgway's rail | Monitor every 3 years |



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# Humpback Chub

| Conservation Measures | 2020 Updates |
|---|---|
| Translocations | 415 translocated to Bright Angel Creek |
| Monitoring | 2 trips to Shinumo Creek (July, September)<br>1 trip to Havasu Creek (October) |
| Non-native fish removal | 312 brown trout & 1,001 rainbow trout (electrofishing)<br>4 brown trout & 7 rainbow trout (weir) |
| Refuge Support | Collections scheduled for spring 2020 cancelled<br>HBC translocated fish to Bright Angel in June were reared by SNARRC (originally collected in LCR in 2019) |
| Disease & parasite monitoring | Monitoring for Asian fish tapeworm did not occur in 2020 due to restricted access to the Little Colorado River on Navajo Nation lands |

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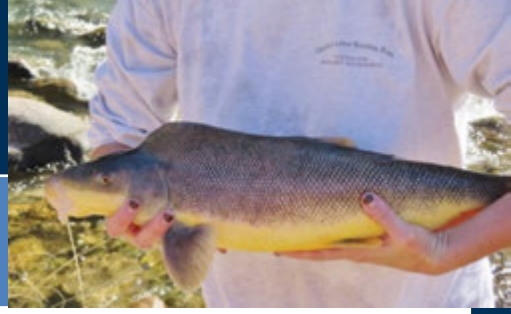
# Razorback Sucker



| Conservation Measure | 2020 Updates |
|---|---|
| Monitoring | • Monitoring Trips in March (larval only), June, July (2), August, September (small-bodied only)<br>• No small-bodied razorback suckers<br>• 0 larval razorback suckers (but typically identified in April & May) |

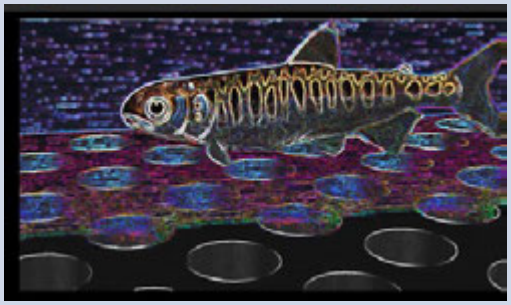
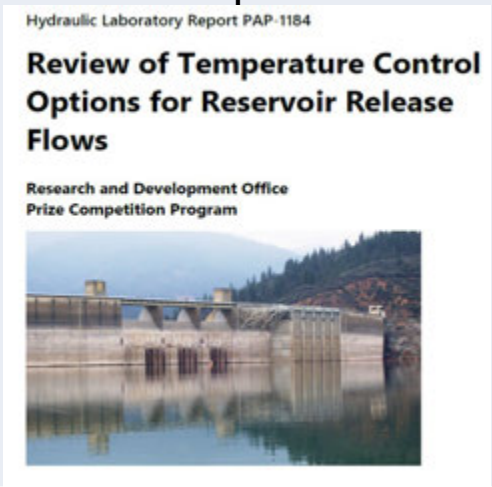
## Other Species Identified on Monitoring Trips

| Species | # of Juveniles | # of Larvae |
|---|---|---|
| Bluehead Sucker | 507 | 3,632 |
| Flannelmouth Sucker | 4,499 | 7,992 |
| Humpback Chub | 313 | 177 |
| YOY Sucker | 574 | 2,427 |
| Bluegill | 12 | 0 |
| Brown Trout | 1 | 0 |
| Common Carp | 1 | 0 |

| Species | # of Juveniles | # of Larvae |
|---|---|---|
| Fathead Minnow | 425 | 459 |
| Plains Killifish | 347 | 3 |
| Green Sunfish | 33 | 17 |
| Western Mosquitofish | 49 | 28 |
| Red Shiner | 77 | 256 |
| Rainbow Trout | 33 | 15 |

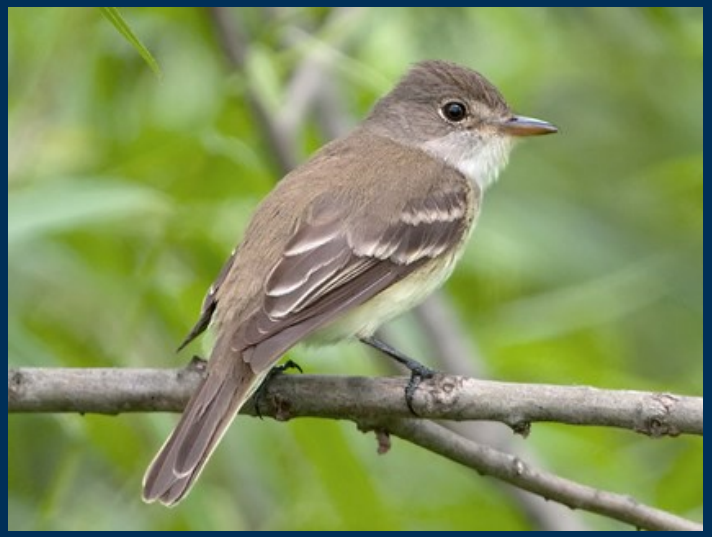
Preliminary data, subject to revision, do not cite

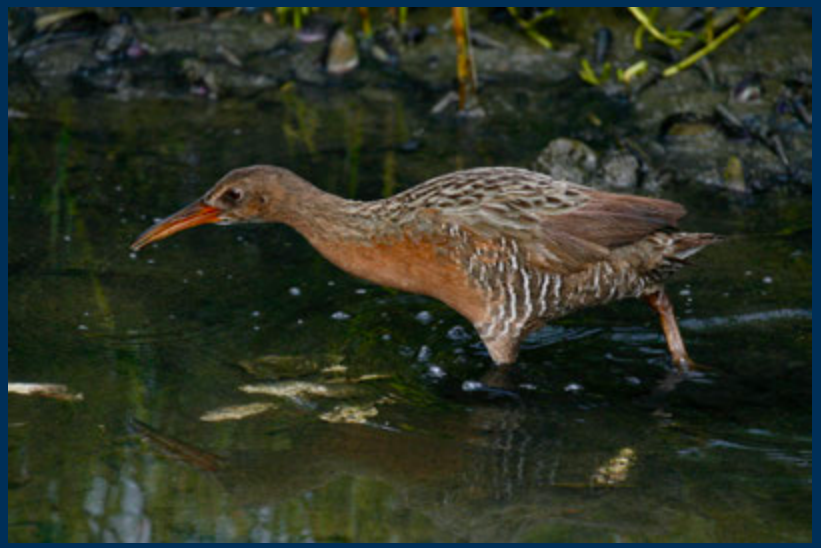
# All Native Aquatic Species

| Conservation Measures | 2020 Updates<br>(Research & Development Office – Denver) |
|---|---|
| Evaluate fish passage<br>  | Reclamation partnered with DOE Water-Power Technologies Office to launch fish protection prize.<br>1. Deal with the Devil Fish: Biometric Screen<br>2. Fish Diversion Materials & Inspection Improvement Coating<br>3. The Center Sender<br><br>https://americanmadechallenges.org/fishprotection/pitch.html |
| Evaluate temperature control<br>  | (https://www.usbr.gov/tsc/techreferences/hydraulics_lab/pubs/PAP/PAP-1184.pdf)<br><br>Reclamation partnered with yet2 to complete a technology search to explore innovative water temperature control devices. https://www.yet2.com/active-projects/exploring-water-temperature-control-devices/ |

# Avian Surveys

| Resource | 2020 Updates |
|---|---|
| Southwestern Willow Flycatcher | No surveys planned or conducted – *next survey planned for May & June 2021* |
| Yuma Ridgway's Rail | No surveys planned or conducted – *next survey planned for 2022* |





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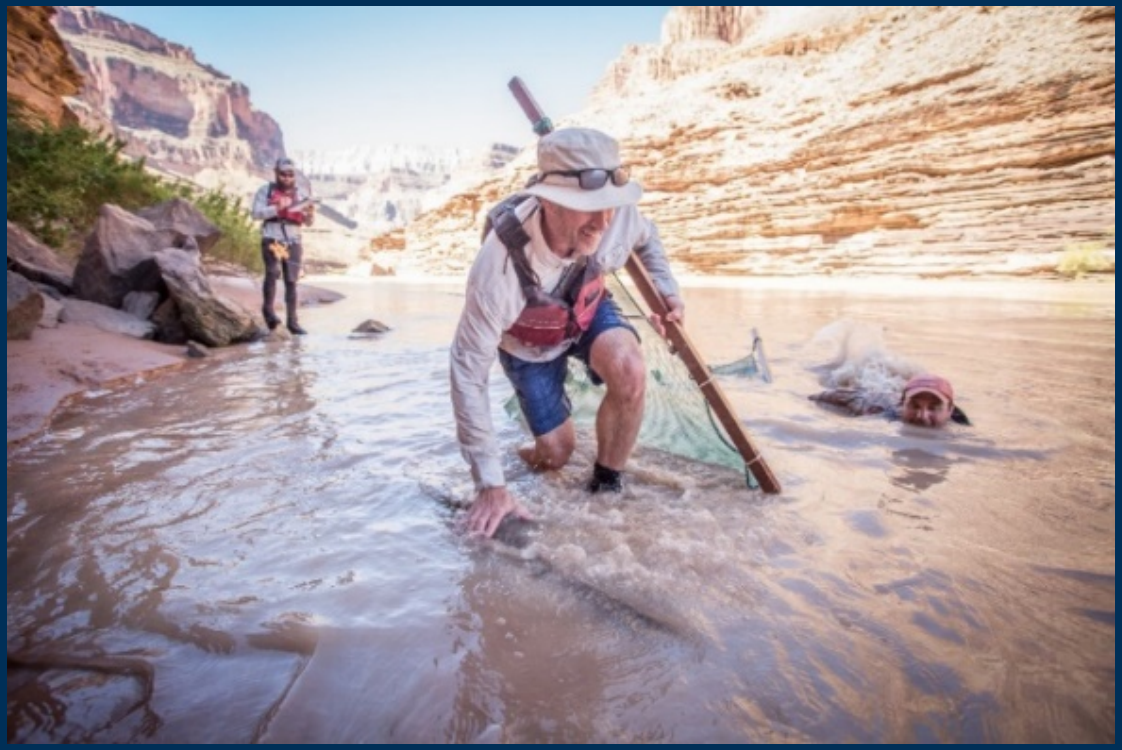
# Questions?



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