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Brown Trout Research and Monitoring Activities Included in the GCDAMP FY 2018-20 Triennial Workplan

Brown Trout Workshop
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Brown Trout Research and Monitoring

- Element F.5. Shifts in the Glen Canyon prey base facilitating expansion of brown trout?
- Element G.3. Juvenile chub monitoring near the LCR confluence
- Element H.1. Experimental flow assessment of trout recruitment
- Element H.2. Rainbow and brown trout recruitment and outmigration model
- Element H.3. Otolith early life history and growth data to inform management of rainbow trout and brown trout populations in Glen Canyon
- Element H.4. Rainbow trout monitoring in Glen Canyon
- Element I.1. System-wide native fish and invasive aquatic species monitoring

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Project Element F.5. Are undesirable shifts in the Glen Canyon prey base facilitating expansion of brown trout?

- **Objectives**
  - **1) compare and contrast prey utilization and selection by rainbow trout and brown trout and**
  - **2) use this information on trout foraging ecology to model and predict how these two species will respond to changes in the physical template of Glen Canyon (e.g., increases in water temperature) and changes in the prey base (e.g., New Zealand mudsnails vs. aquatic insects).**

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Project Element G.3. Juvenile chub monitoring near the LCR confluence

- **Objectives**
  - **Estimate survival, growth and abundance of multiple size classes of humpback chub…also allows us to estimate rainbow trout and brown trout abundance in this same reach**

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Project Element H.1. Experimental flow assessment of trout recruitment

Objectives

- Determine the effects of LTEMP ROD flows on the recruitment of YOY rainbow and brown trout in Glen Canyon, the growth rate of juveniles and adults, and dispersal of YOY trout from Glen Canyon
- Increase understanding of the key factors (trout density and recruitment, prey availability, nutrients, etc.) that control the abundance and growth of the Glen Canyon trout population (rainbow and brown).

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Project Element H.2. Rainbow and brown trout recruitment and outmigration model

Objectives

- improve upon the fisheries models used to evaluate LTEMP alternatives. This model will:
  - 1) provide predictions for recruitment in upcoming years as one trigger for trout management flows,
  - 2) synthesize and update understanding of the drivers of fisheries population dynamics, including the relative role of experimental flow treatments, as new data are collected, and
  - 3) provide a framework to incorporate components not included in past modeling (e.g., brown trout, nutrients).

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Project Element H.3. Using early life history and physiological growth data from otoliths to inform management of rainbow trout and brown trout populations in Glen Canyon

Objectives

- Determine trout early life-history strategies and growth responses to experimental flow manipulation to inform management of brown trout and rainbow trout in Glen Canyon. Otoliths will be used to examine:
  - 1) rainbow trout early life history vital rates to inform recruitment models;
  - 2) brown trout hatch and emergence dates to inform the timing of experimental flows;
  - 3) the immediate physiological response of brown trout to HFEs and TMFs, including variations in responses due to flow timing and duration.
- Results will identify when brown trout are most vulnerable to flow manipulation to develop tools to manage this aquatic invader.

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Project Element H.4. Rainbow trout monitoring in Glen Canyon

Objectives

- **Track the status and trends of rainbow trout in the Lees Ferry section of Glen Canyon National Recreation Area and continue to gather long-term trend data on relative abundance, size composition, distribution, recruitment, and angler satisfaction and catch quality.**
- **Conduct sampling focused on the detection, status, and population trends of rare nonnative species including brown trout in Glen Canyon**

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Project Element I.1. System-wide native fish and invasive aquatic species monitoring

Objectives

- Provide long-term data collection on the longitudinal distribution and status of the fish community (including **brown trout**) in the mainstem Colorado River from Lees Ferry (RM 0) to Lake Mead (RM 281).

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