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Fall Steady Flow Experiment Science Plan

August 12, 2009 AMWG Meeting, Tempe, AZ

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Grand Canyon Monitoring and Research Center

U.S. Department of the Interior
U.S. Geological Survey

2008 Biological Opinion
Fall Steady Flows

"Operations for the proposed experimental 5-year period would deviate from the 1996 ROD in only 2 ways: 1) a March 2008 experimental high flow test; and 2) **stable flow releases in September and October from 2008-2012**." (U.S. Fish and Wildlife Service, February 27, 2008)

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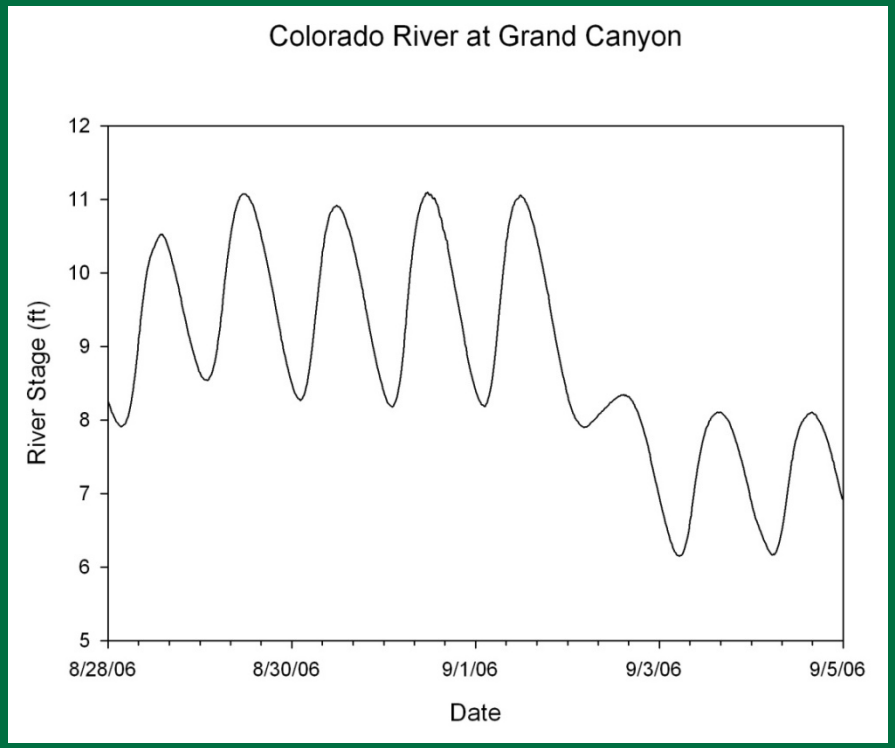
2008 Biological Opinion
Monthly Flow Transition Study

"Transitions between monthly flow volumes can often result in drastic changes to nearshore habitats…..and may be detrimental to fishes and food base for fish…..Reclamation has committed to adjusting daily flows between months to attempt to attenuate these transitions such that they are more gradual, and to studying the biological effects of these transitions, in particular to humpback chub."



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AMWG Motion (May 23, 2008)

"…AMWG further recommends to the Secretary that he direct the GCMRC to, by July 2009,

- Complete the design and development of a September/October Steady Flow Science Plan for 2009-2012, including a recommended range of flow parameters,
- Work with the AMWG and TWG to establish measures of scientific success as part of the Science Plan, and
- Report to AMWG by June 1 of each year on the projects included in the Science Plan for review and possible revision"

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Fall Steady Flow Science Plan

- **We hypothesize the effects of this experiment will be subtle because the proposed flows represent '*a conservative approach to changes in dam releases*' (2008 BO)**
- **As such, our science plan:**
  - **Incorporates multiple lines of evidence to evaluate humpback chub response**
  - **Includes measurements of explanatory variables (i.e., water temperature and food resources)**
  - **Includes rainbow trout studies in Lees Ferry**
    - **Flows may strongly benefit juvenile survival**
    - **Insights on fish—flow interactions may apply downstream**

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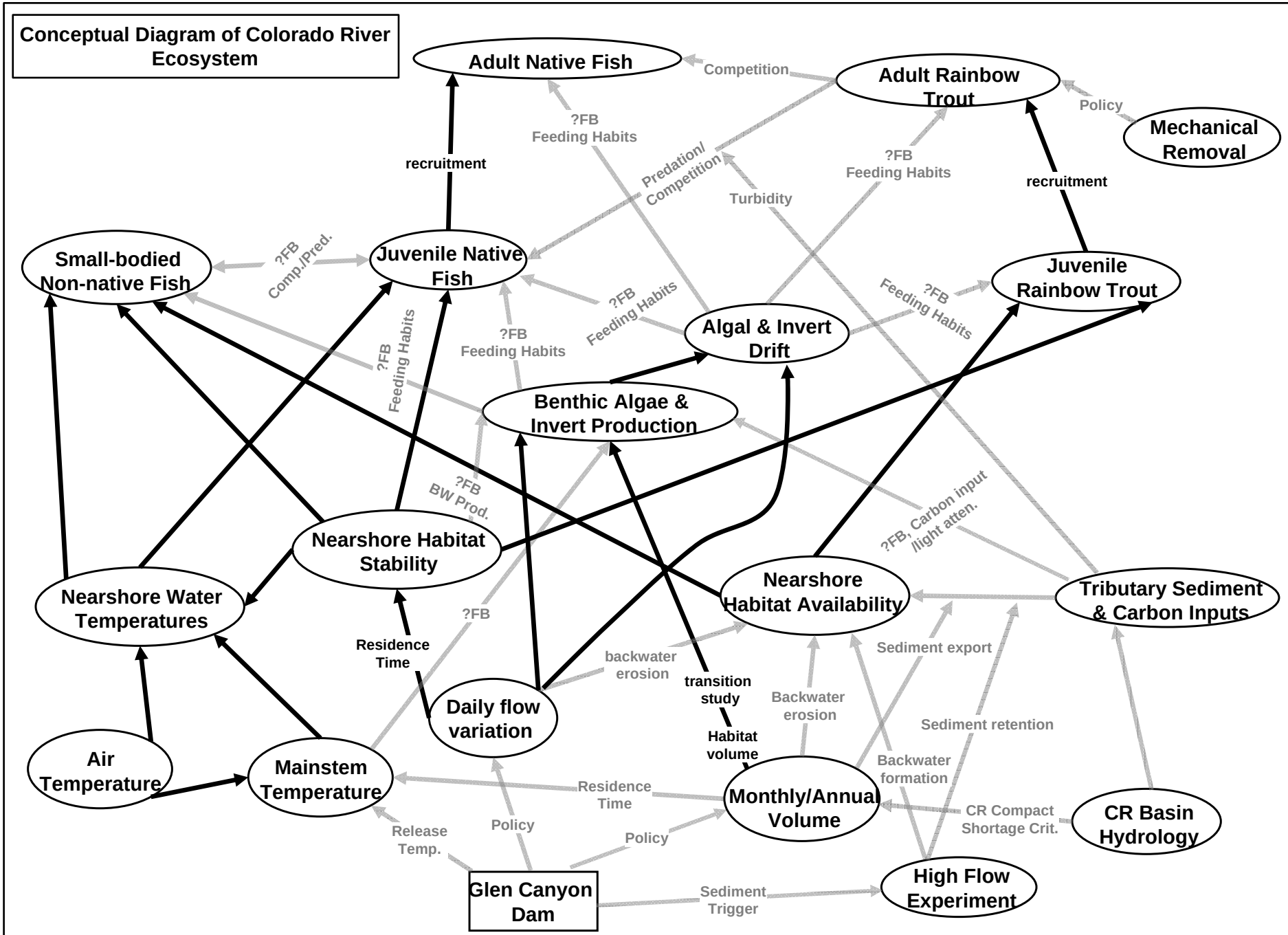
Conceptual Diagram of Colorado River Ecosystem
Adult Native Fish
Competition
Adult Rainbow Trout
Policy
Mechanical Removal
?FB Feeding Habits
recruitment
Predation/ Competition
?FB Feeding Habits
Turbidity
recruitment
Small-bodied Non-native Fish
?FB Comp./Pred.
Juvenile Native Fish
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?FB, Carbon input /light atten.
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Nearshore Water Temperatures
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Residence Time
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transition study
Backwater erosion
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Backwater formation
CR Compact Shortage Crit.
CR Basin Hydrology
Release Temp.
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Policy
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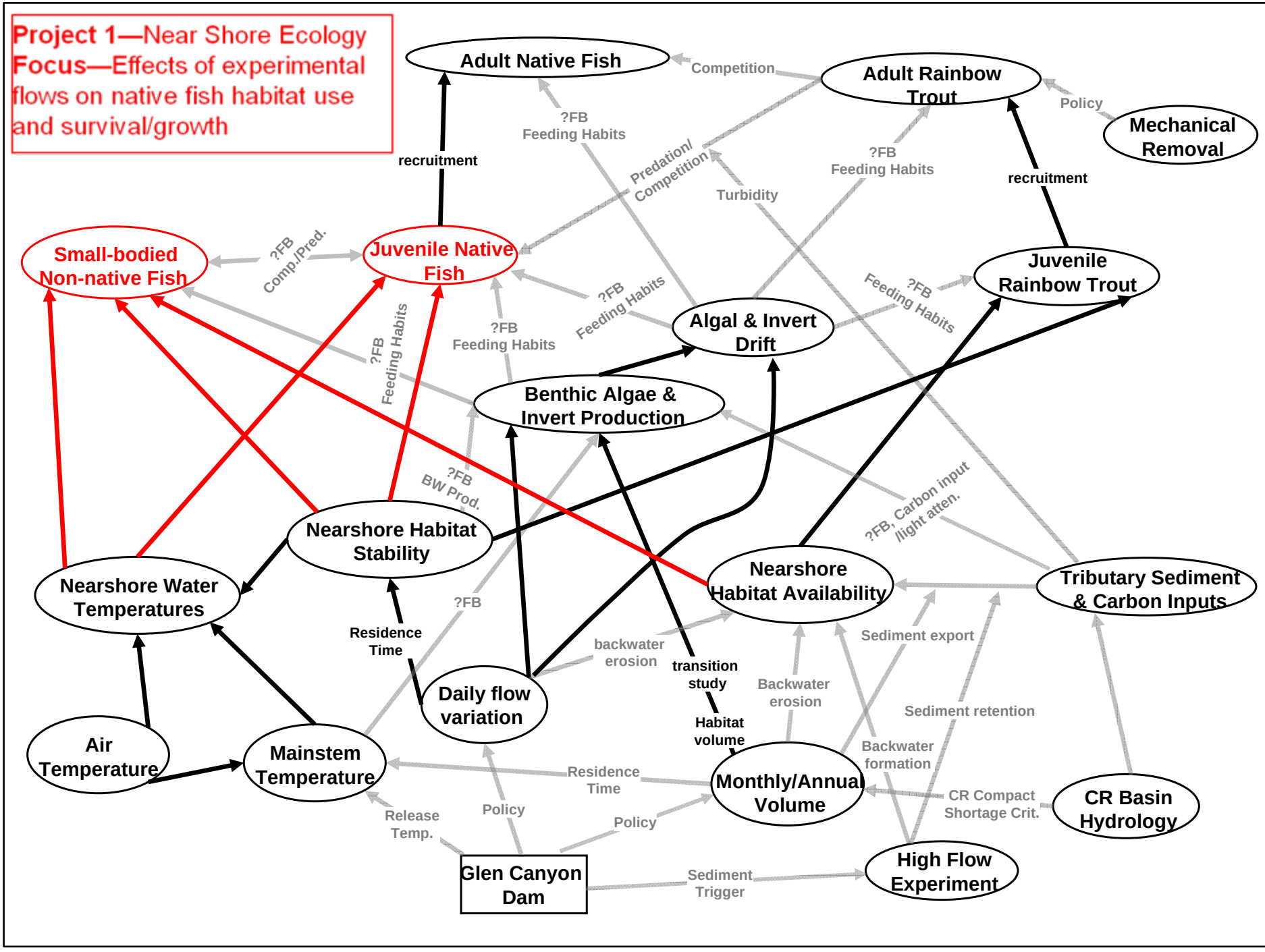
Sediment Trigger
High Flow Experiment


Project 1—Near Shore Ecology
Focus—Effects of experimental flows on native fish habitat use and survival/growth
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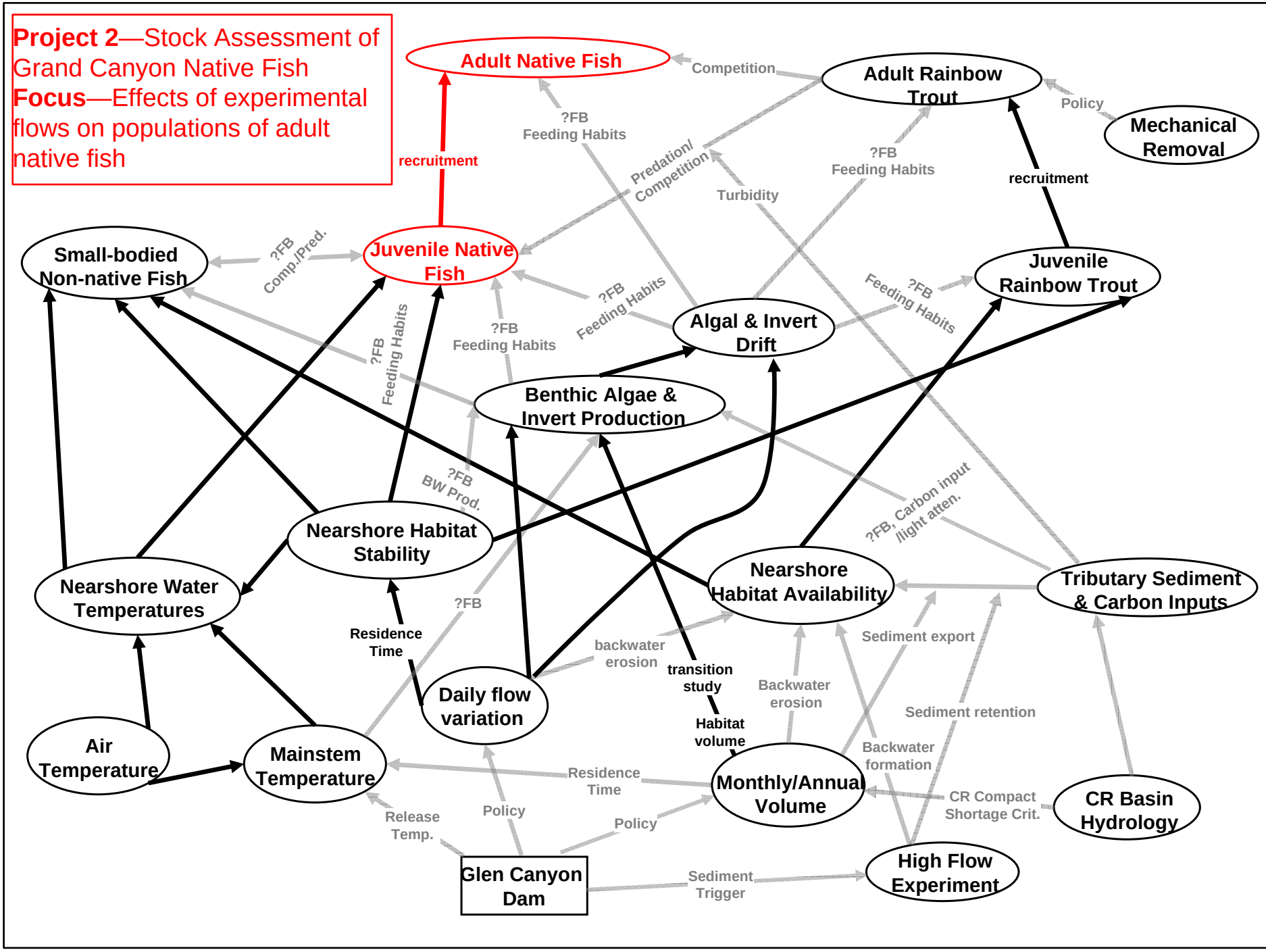
Project 2—Stock Assessment of Grand Canyon Native Fish
Focus—Effects of experimental flows on populations of adult native fish
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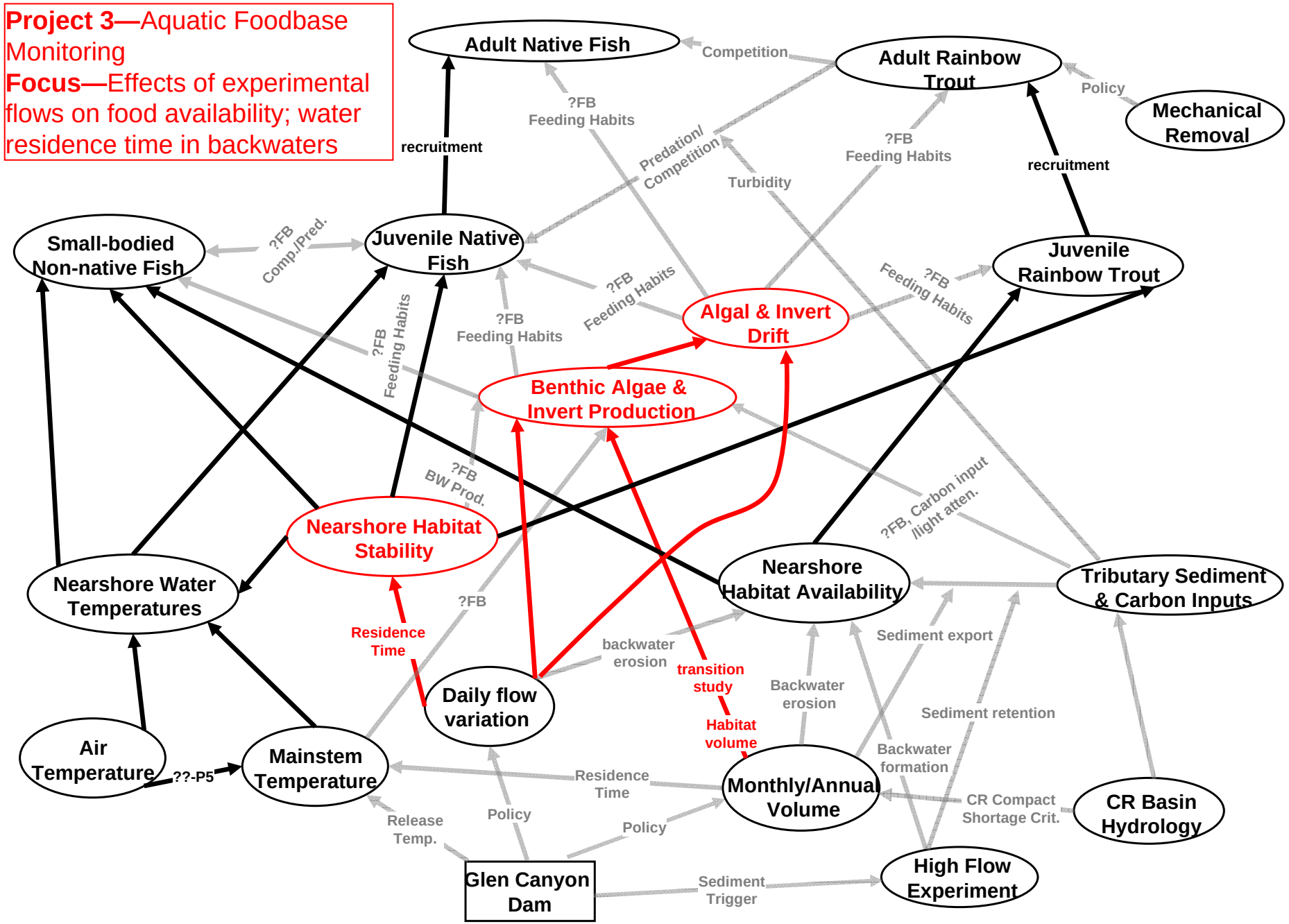
Project 3—Aquatic Foodbase Monitoring
Focus—Effects of experimental flows on food availability; water residence time in backwaters
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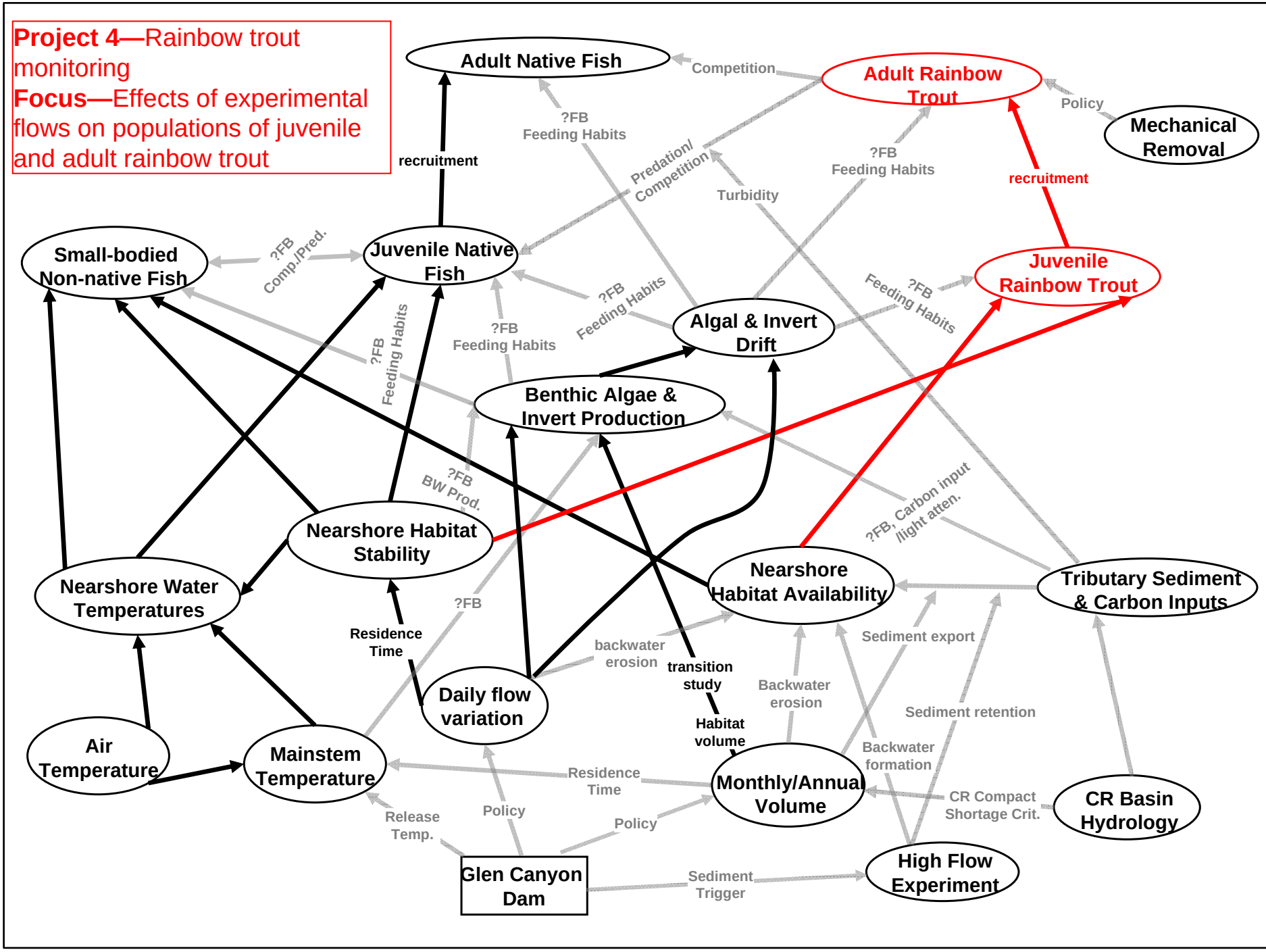
Project 4—Rainbow trout monitoring
Focus—Effects of experimental flows on populations of juvenile and adult rainbow trout
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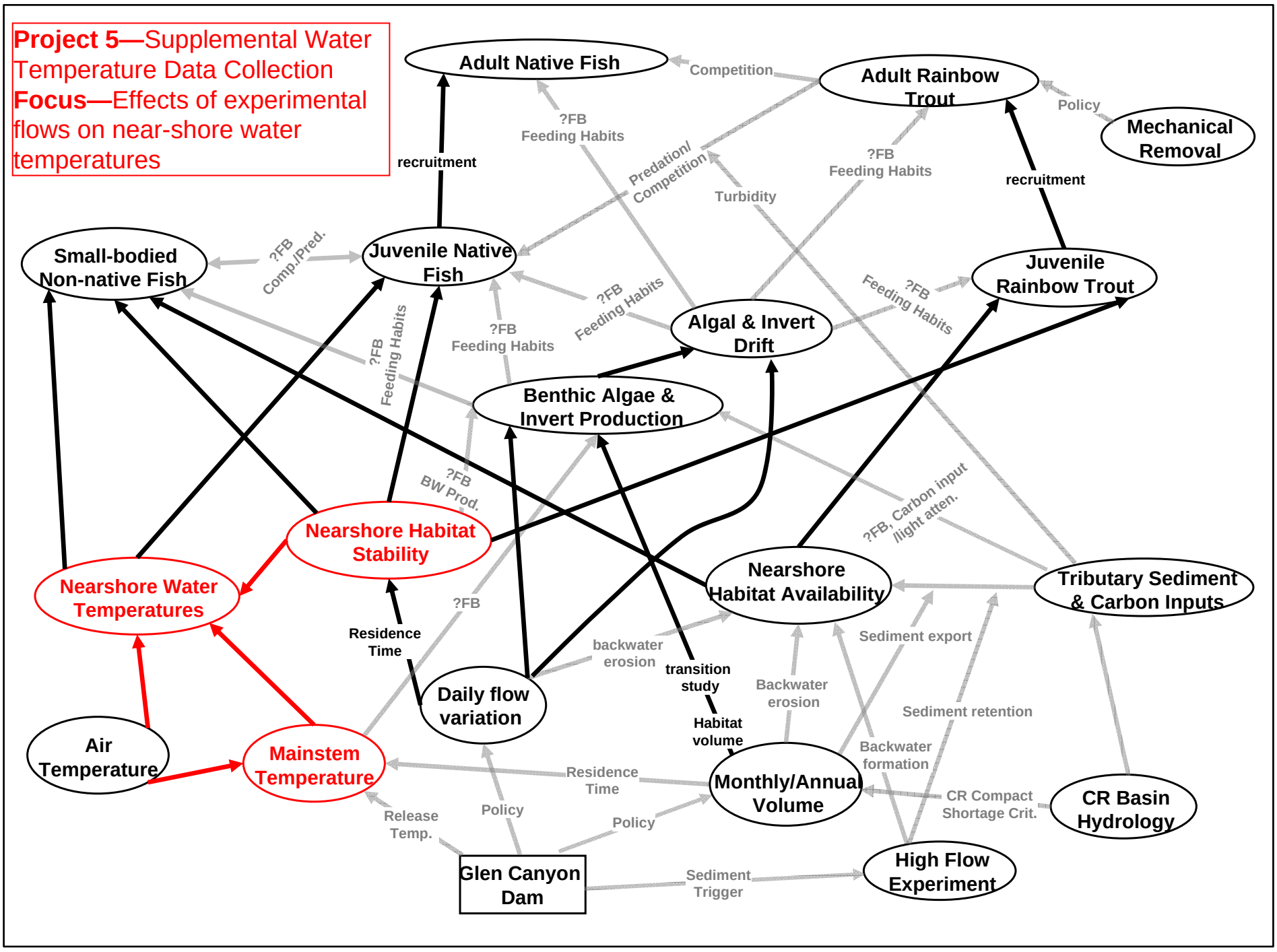
Project 5—Supplemental Water Temperature Data Collection
Focus—Effects of experimental flows on near-shore water temperatures
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Linkages to FY10-11 Workplan

- Projects elements
  - Nearshore ecology (Bio 2.R15)
  - Stock assessment of Grand Canyon native fish (Bio 2.R7)
  - Aquatic foodbase monitoring (Bio 1.R1 & R4)
  - Rainbow trout monitoring (Bio 4.M1)
  - Water temperature data collection (requires supplemental funding)
- Reporting
  - Annual reporting on each project
  - Final Synthesis in 2013

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Status and Next Steps

- August 7—GCMRC distributed revised plan to TWG
- September 4—Comments from TWG due to GCMRC
- September 29-30—GCMRC and TWG discuss Science Plan during fall meeting

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