Low Steady Summer Flows 2000 Synthesis Project

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GCD Hydrograph from March - December 2000

Discharge

Month
Introduction & Background

- February 2000: Completion of Plan of Experimental Flows for Endangered Fish (SWCA 2000)
- April - September 2000: Implementation of experimental hydrograph
- 25 Studies initiated to evaluate flows on physical, biological and cultural resources
- August 2007: AMWG requested synthesis of information
Hypotheses by Season and Hydrograph

- Hydrograph designed around life history of native fishes
- Spawning in Spring
- Summer larval development
- Early fall exotic fish disturbance
Three Phase Approach
(Accelerated Schedule)

- **Synopsis:**
  - Phase I. Summary of individual studies, Completed Summer 2008.
  - Phase II. Workshop for secondary analysis

- **Synthesis:**
  - Phase II (cont’d). Synopsis and synthesis. USGS Publication FY 09.
  - Phase III. Incorporate results of synthesis into fall steady flows science plan July 09.
Current Status 2008

**March** – Initiated synopsis and data consolidation through cooperative agreement with Northern Arizona University

**July** – Draft summary completed

**August** – Workshop conducted: Physical and Biological resources

**October** – Workshop planned: Social Sciences, October 8, 2008, AWRD 8:30 am – 4:30pm
General Conclusions Workshop I

- Water temperatures in near shore appear most warmed by low volumes and direct sunlight; fluctuations of limited influence
- Maximum young of year native fish habitat at mouth of LCR observed at 13 kcfs; ponding at higher flows did not occur
- Flows greater than 8 kcfs appear to be the threshold for exporting more sand

Preliminary results, subject to review and revision
New Zealand mudsnail numbers increased during 2000, but impacts to other species not observed

Warm water appears to support algae and diatom growth, but fluctuations can negate growth gains

*Chlodophora* recovers quickly following disruption

*Preliminary results, subject to review and revision*
General Conclusions Workshop I

- Primary productivity and invertebrates in Lees Ferry largely unaffected by test flows
- Lees Ferry rainbow trout appear to have had successful reproduction in 2000; year class appears to have persisted for five years
- Tamarisk expanded initially in 2000, but have persisted in only limited areas

Preliminary results, subject to review and revision
General Conclusions Workshop I

- Native sucker species and nonnative fathead minnows appear to have reproduced in summer 2000
- Humpback chub may have benefitted from 2000 flows, but ageing is imperfect

Preliminary results, subject to review and revision
Aug. ’08 Workshop Outcome

- New OFR to be developed in FY09 (draft March 2009) – accelerated schedule
  - Executive Summary
  - Experiment Overview
  - Synopsis (July ’08 - completed)
  - Synthesizing results – augmenting knowledge assessment document and following Knowledge Assessment format
  - Recommendations for future studies
New Synthesis Topics (subject to revision following Oct. workshop):

- Quantify areal extent of warm near shore habitats associated with Thermal Infrared Data
- Quantify ponding at mouth of LCR
- Reanalyze fish capture data to clarify effects of fall 31k spike
- Synthesize fish and water temperature data (incorporate more recent monitoring data)
- Vegetation effects on the ecosystem
Budget Summary

- FY 08: 100k
- FY 09: 80k
  - 40k carry over
  - 40k new
  - Sufficient for project