Food base Workplan Proposal

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GCDAMP BAHG Call
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Grand Canyon Monitoring and Research Center
Southwest Biological Science Center
U.S. Geological Survey
U.S. Department of the Interior

Overarching Questions

Q1. What is condition of food base for fishes?

Q2. Are Bug Flows “successful”? In what way?

Q3. How else can we improve food base?

USGS

F.1: Grand Canyon Monitoring

- Citizen Science Light Traps
  - ~1000 samples per year, 2012-present
  - Cheap, effective, basis for Bug Flows
  - Includes concurrent bat sampling
- Canyon-wide Drift trips
  - Every ~3 miles (~80 samples), 2017-present
  - Metric for Bug Flows, fish condition
  - Spring only (no more Fall)

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F.2: Glen Canyon Monitoring

- **Drift, Light, Sticky Traps**
  - **“Monthly” (cutting some winter months)**
  - **Spatially extensive (Dam to Badger Rapid)**
  - **2007 (drift), 2013 (light, sticky) – Present**
  - **Track changes in Ferry fishery**
  - **Best indicator of fish condition/growth**

    (Korman unpublished)

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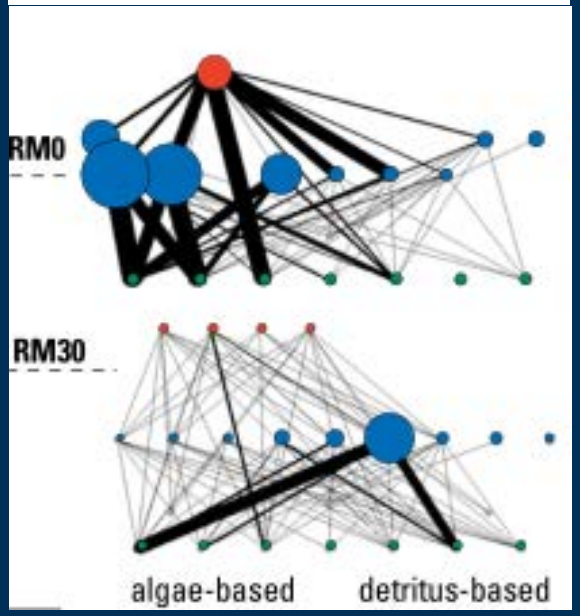
F.3: Native Fish Food Webs

- New start: Get diets of chub, suckers
  - LCR, Fall Canyon during seasonal JCM sampling
  - Does food base → native fish increases?
  - Non-lethal lavage for chub
  - Relatively cheap, insight into food web

Colorado River Food Webs ca. 2008



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F.4: Bug Flows Weekend Analysis

- Synthesize existing samples
  - Weekdays vs. Weekends in Lees Ferry, 2018-2020
  - Drift, trout diets
  - No new sample collection
  - Small piece of the Bug Flows story

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F.5: Insect taxa in Grand Canyon

- Re-sample tributaries (1996, 2014)
  - Is species pool changing, moving?
  - What taxa are not present that might be candidates for repatriation?
- Monitor food web change in Bright Angel
  - Chub translocation, ongoing trout removal

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F.6: Habitat / Substrate Studies

- Dam maintenance/overflight low flows
  - Treat cobble bars in Ferry: remove sed/veg.
  - Measure invertebrate response in treated patches
  - Labor intensive and costly
  - But unique opportunity

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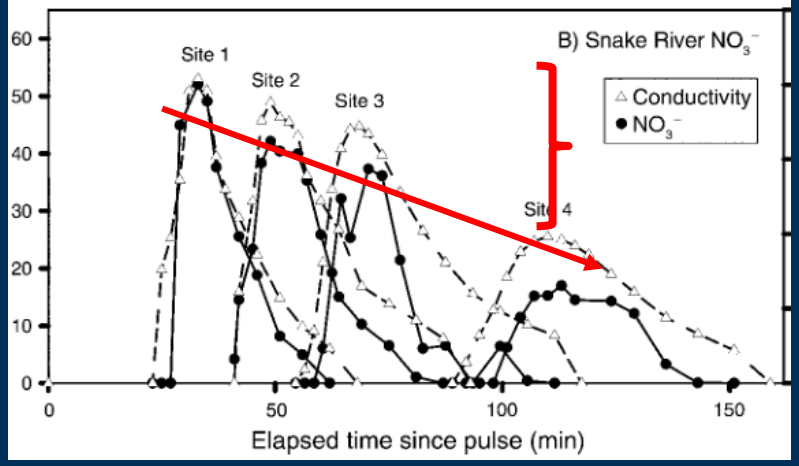
F.7: Nutrient Supplementation

- Pulse addition as an experiment
  - Determine "uptake length"
    - How long is treatment reach?
  - Critical to design of long-term nutrient addition

Example nutrient addition



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