National Park Service
U.S. Department of the Interior

Green Sunfish Rapid Response Non-native Fish Control in Glen Canyon National Recreation Area

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Partners!

- Volunteers


Lake Powell
GSF slough
Page
Lechee
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GSF - Background

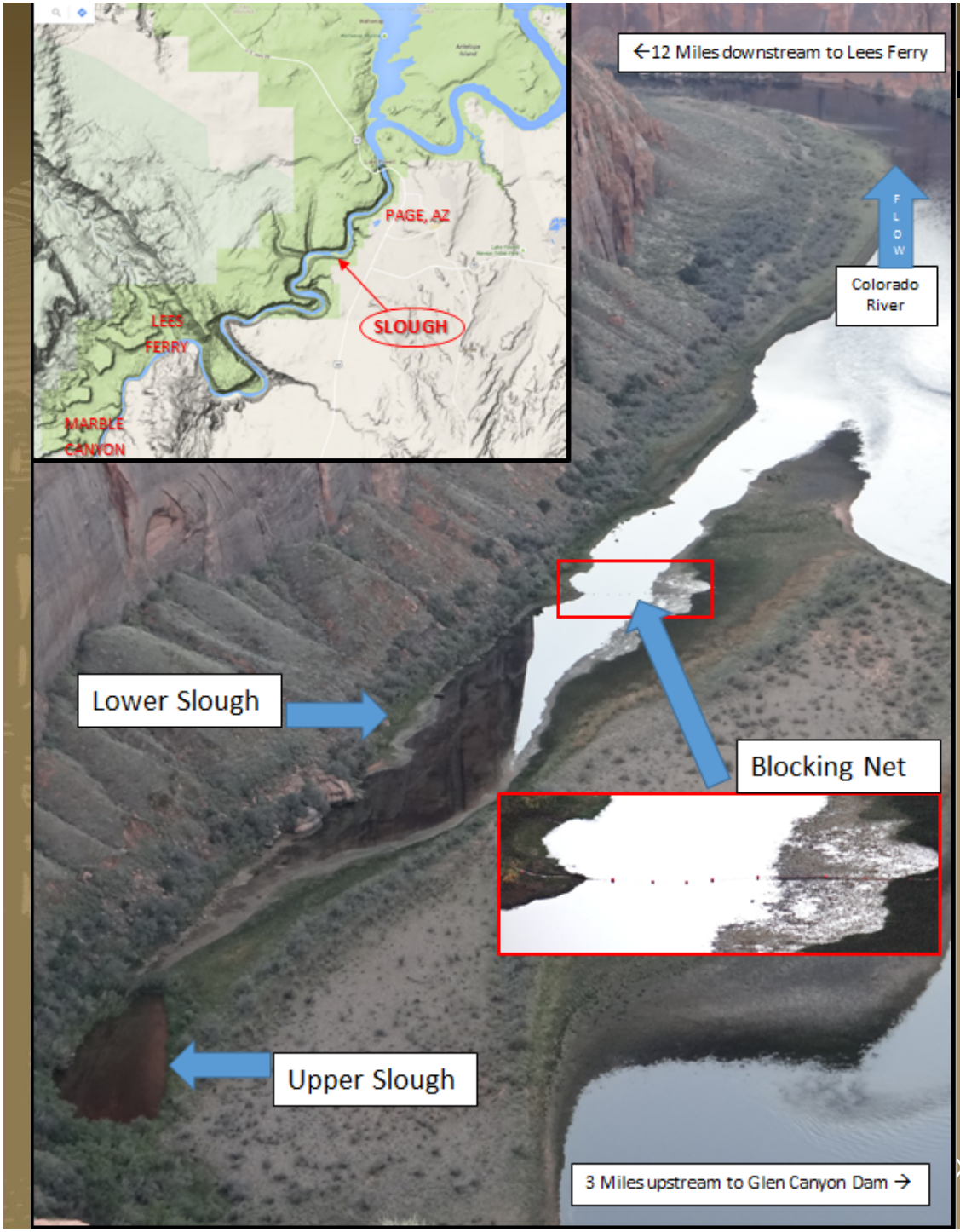
- In July 2015, AGFD discovered an unusually large number of nonnative Green Sunfish in a large backwater in the Lees Ferry Reach – 43 fish, compared to 7 in previous decades in this reach.
- Partner agency biologists agreed that elimination of this invasive species from the backwater sloughs is necessary and urgent due to the risk of negative interactions with native fish, particularly the Humpback Chub if GSF disperse downstream in large numbers.
- Two subsequent removal trips using electrofishing, seining and trapping, methods consistent with the Comprehensive Fisheries Management Plan (CFMP), failed to deplete the population despite removing over 3000 fish.
- Agency biologists conferred and agreed that these methods were not likely to successfully eradicate this species.

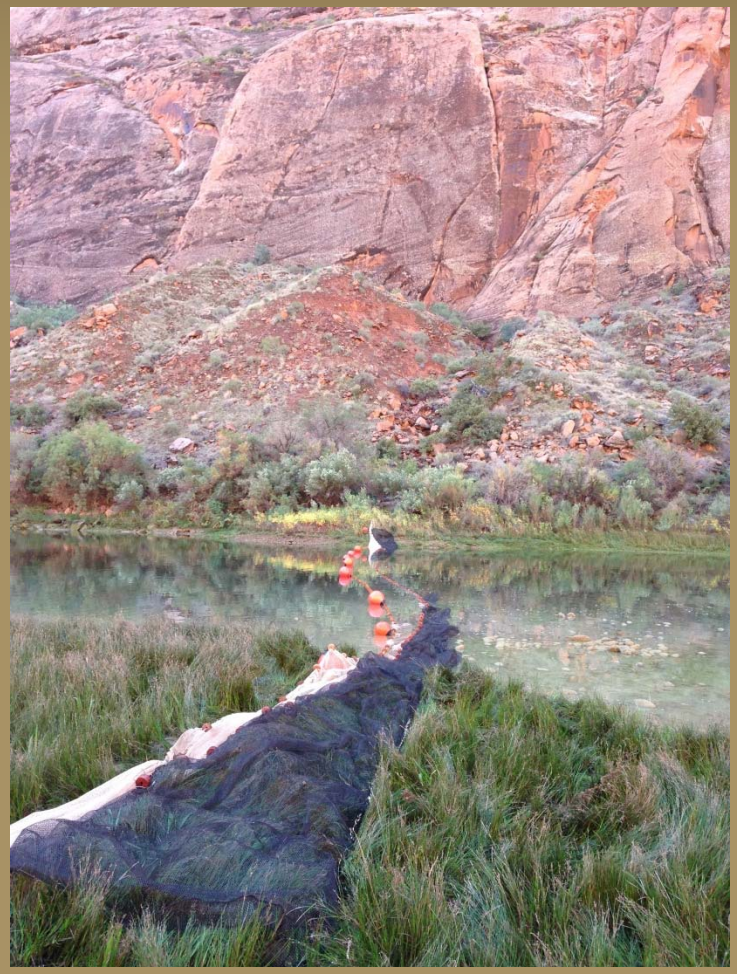
GSF - Background

- Potential methods to eradicate Green Sunfish from Glen Canyon that were considered include mechanical approaches like electrofishing, netting, or concussive methods and chemical treatments such as piscicides or carbon dioxide
- While additional methods of removal and control were considered, an immediate need to contain the Green Sunfish was recognized.
- On Oct 7, biologists from NPS and AGFD constructed and installed a large block net at the downstream end of the main slough to minimize escapement of Green Sunfish until a more complete removal can be effected.

Temporary Block Net

Temporary Block Net





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GSF and HFE

- Agency Biologists agreed that chemical treatments provide the greatest likelihood of success (Risk Assessment - Ward 2015).
- High level of planning and State and Federal regulatory compliance is necessary before initiating treatment – time to process.
- Slough becomes flowing side channel at flows between 20,000 and 30,000 cubic feet per second (cfs); The temporary block net will not be adequate to contain the Green Sunfish if the side channel begins to flow.
- Eradication of GSF is necessary to eliminate the risk of dispersal and subsequent establishment of this harmful nonnative in the Colorado River or any of its tributaries in Grand Canyon before an HFE.
- HFE not recommended for November 2015

Chemical Piscicide Treatment: Rotenone

- Only method that can achieve complete eradication
- Not size selective
- Only registered piscicide in USA (EPA requirement)
- Long established and important tool in fisheries management
- FAQs developed by Arizona, available on website:
- http://www.azgfd.gov/h_f/rotenone.shtml

Proposed Chemical Piscicide Treatment: Rotenone

- Rotenone is derived from an extract of certain plants in the family Legumosinae (beans)
- Degrades quickly in the environment
- Can be detoxified by potassium permanganate, ($KMnO_4$) which is also used to purify water in drinking water treatment systems
- Would not harm Wildlife and Birds if consumed
- Would not harm plants

Processes and Permits

- AGFD permit to apply rotenone
  - Requires State Certified Applicator
- Arizona DEQ
- NEPA compliance – NPS action – GCNRA
  - NPS leadership determined that Categorical Exclusion was appropriate
  - "NPS 2015 NEPA Handbook 3.3(C)(2): *Restoration of noncontroversial native species into suitable habitats within their historic range and* ***elimination of exotic species***.
- Numerous other permits and processes
- Detailed Implementation Plan
- TIMELINE (Proposed)

Detailed Implementation Plan

- Documentation for CE, FWS, AZ permits
- Public communications plan
- Public and worker Safety Plan
- Logistics
- Detailed Treatment Plan
- Protect Human Health, Wildlife and Livestock
- Tribal Consultations
- Mitigative Measures

Proposed DIP - Timeline

- Pre-Treatment Oct 27-29
  - Pre-treatment population estimate
    - Allows scientific evaluation of mechanical removal efficacy and treatment efficacy
  - Remove as many fish as possible
    - Return non-target fish to the river alive
    - Provide Green Sunfish to Pueblo of Zuni for beneficial use
- Two Treatments Necessary
  - To allow fertilized fish eggs to hatch after first treatment
  - November 2-6 and November 12-16
    - Day 1 travel, pre treatment safety meetings
    - Day 2 project set up, Install turbidity curtain, bioassays
    - Day 3 Application
    - Day 4 Detoxification
    - Day 5 Detox and cleanup
    - Day 6+ monitoring of water and soil until chemical level back to baseline

Turbidity Curtain

- Impermeable
- Floats on top edge
- Heavy chain at bottom
- Anchored to shoreline
- Minimize exchange of water from slough to river