



Expanded Non-Native Aquatic Species Management Plan Environmental Assessment

U.S. Department of the Interior
National Park Service

Grand Canyon National Park
Glen Canyon National Recreation Area
Intermountain Region



Expanded Non-Native Aquatic Species Management Plan below Glen Canyon Dam

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Background

- Increasing threats from potentially harmful non-native species
 - Green Sunfish and Brown Trout documented as increasing since 2014, more significantly since 2016).
 - Walleye, striped bass, and smallmouth bass are periodically caught in the river below the dam
- This EA identifies new tools and a tiered management approach to control non-native fish and other aquatic organisms, in addition to the LTEMP and CFMP tools, in order to protect native fish in Glen and Grand Canyon and recreational trout fishery in the Glen Canyon Reach



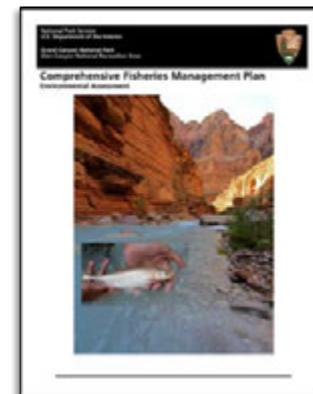
Green sunfish found below dam 2015–2018



Brown Trout currently spawning in Lees Ferry Reach



Smallmouth bass - very high threat



2013 CFMP



2016 LTEMP



Cooperating Agencies

- Arizona Game and Fish Department
- Bureau of Reclamation
- Colorado River Board of California
- Colorado River Commission of Nevada
- Pueblo of Zuni
- Southern Nevada Water Authority
- Upper Colorado River Commission
- U.S. Fish and Wildlife Service
- Utah Associated Municipal Power Systems
- Western Area Power Administration



Balancing Major Issues

Concerns from Cooperators, Tribes and Public

- One side: Flexibility and Responsiveness to protect native species & endangered fish
- Other side: Tribal concerns about the taking of life and angler concerns about incidental effects to the Glen Canyon Reach rainbow trout fishery

1. Incentivized Harvest
2. Mechanical Removal
3. Sloughs at RM -12
4. Live Transport/Relocation
5. Chemical Treatment
6. Biological Control – YY males



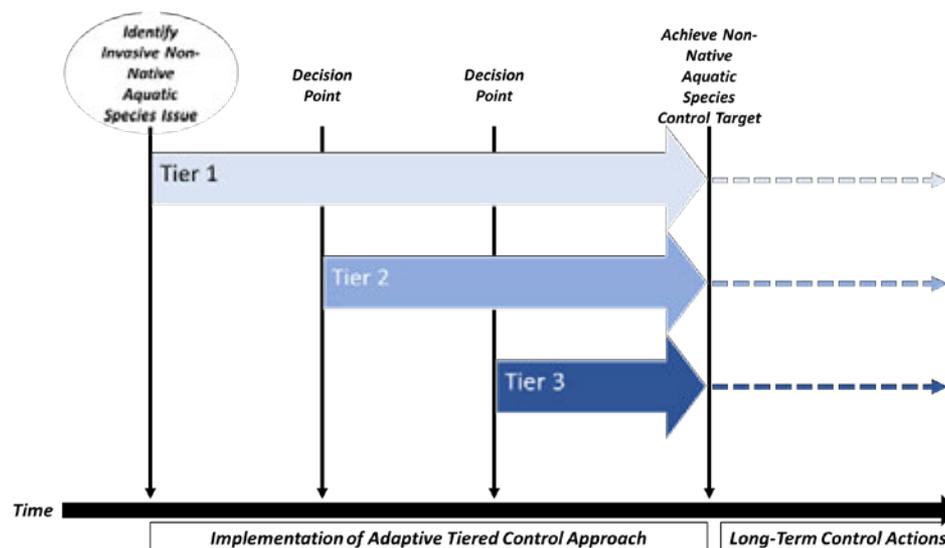
Other tools:

Invasive plant removal options, small scale temperature alterations in streams, acoustic fish guidance systems, quagga mussel repellants, etc.

Proposed Action – Adaptive Tiered Approach

Control actions applied stepwise according to tiers

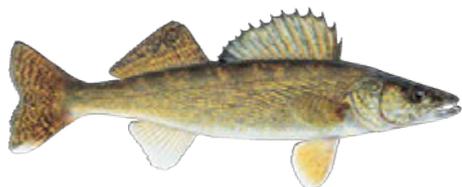
- Tier 1 Actions
 - Less management intensive actions first
 - Incentives, respectful harvesting, and beneficial use address Taking of Life concerns
- Tier 2 Actions
 - Moderate management intensity (includes beneficial use)
 - Applied only after Tier 1 actions are determined to be ineffective as stand-alone
- Tier 3 & 4 Actions
 - More management intensive (still includes beneficial use)
 - May include modifications of habitat or registered piscicides
 - “Last resorts” applied only after lower tiers ineffective





Ranking of Potentially Harmful Non-Native Aquatic Species

Species	Category	Threat Level
Brown Trout	Fish	1-Very High
Smallmouth Bass (<i>Micropterus dolomieu</i>)	Fish	1- Very High
Walleye (<i>Sander vitreous</i>)	Fish	1-Very High
Northern Pike (<i>Esox lucius</i>)	Fish	2-High
Striped Bass (<i>Morone saxatilis</i>)	Fish	2-High
Gizzard Shad (<i>Dorosoma cepedianum</i>)	Fish	6-Low



8 walleye collected by AZGFD in both 2015 & 2016 at base of dam



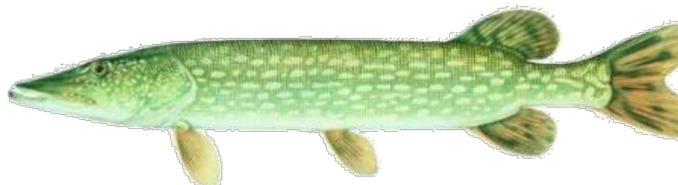
Green sunfish found in 2015 - 2018



Smallmouth bass - very high threat



Brown Trout currently spawning in Lees Ferry Reach



Northern Pike in Lake Powell & Upper Colorado



Completion of Consultations for ESA and 106

ESA section 7 consultation (IMR lead)

- We worked closely with USFWS throughout the project
- The BA concluded:
- Not likely to adversely affect 5 listed birds (MSO, Condors, SWFL, Ridgway's Rail, Cuckoo)
- Likely to adversely affect 2 listed fish (humpback chub and razorback sucker) – (USFW providing incidental take estimates and permit with BO)
- No effect on other species
- There are extensive conservation measures, but these were expected and are consistent with past projects (CFMP and LTEMP) and they were discussed in great detail with resource and planning staff at GRCA and GLCA
- BO being finalized, expected very soon

NHPA section 106 consultation (GLCA lead)

- We worked closely with Tribes throughout the project
- NPS prepared a Programmatic Agreement (PA) that incorporates and combines the NPS responsibilities from the CFMP with the NNAS into one PA while staying consistent with the LTEMP PA.
- Provided to Tribes and SHPO for two rounds of comments
- Consultations occurred in person with Zuni and Hopi in spring/summer of 2018
- Final consultations scheduled with Zuni, Hopi, Navajo Nation within the new few weeks to discuss PA.



The TOOLBOX

Action Numbers in NNAP	Tier of Use	Description of Tool/Action
Chemical		
C1	3	Overwhelm ecosystem-cycling capabilities (ammonia, oxygen, CO2, pH, etc.)
C2	3	Rapid response application of piscicides
C3	4	Application of registered piscicides for high/very high threat species
C4	2	Application of piscicide for native fishery renovation
C5	1	Application of herbicides on nonnative plants
C6	1	Application of mollusk repellants and non-toxic anti-fouling paints
Harvest		
H1,	1	Incentivized harvest
Mechanical		
M1,	2	Mechanical disruption of early life stages
M2	1	Mechanical Removal
M2	2, 3	Mechanical Removal
M3	1	Acoustic guiding devices
M4	1	Mechanical harvesting of nonnative aquatic plants
Physical		
P1	1	Short-term dewatering using high volume pumps
P2	1	Placement of Selective Weirs
P3	1	Placement of non-selective barriers to Exclude Aquatic Species
P4	4	Dredging at RM -12 to connect sloughs and install water control structure
P5	Experimental	Experimental Only - Small scale temperature changes in small tributaries
Biological		
B1	Experimental	Experimental Only – Introduction of YY males as population control



Incentivized Harvest 3-Pronged Approach on Researching the use of this Tool

1. Arrange for up to 10 youth and 2 Tribal Elders to participate in 1-day guided angling trips for Brown Trout. (Nov. – Feb.)
 2. Schedule 1-2 Angling Tournaments focused on removing Brown Trout. Some funding for awards and logistics.
 3. “Restoration Rewards” program for Anglers turning in brown trout. Will operate for 4 to 12 months depending on success of program. Rewards will be between \$25 & \$50. Possibility of doing monthly drawings for “gift card prizes” to increase participation.
- *Current AGFD reg’s for Lees Ferry: No limit on Brown’s, artificial flies & lures only, barbless hooks – all in place to protect rainbow fishery



Next Steps

- Completion of 106 process
 - Consultations meetings with Pueblo of Zuni, Hopi Tribe and Navajo Nation
 - Hoping to complete and sign Programmatic Agreement
- Signature and Release of FONSI
- Possibly meet with AGFD Commission to “Introduce” Incentivized Harvest Program as united partners (AGFD – Angling Groups – NPS)
- Implement the Tiered process starting with Incentivized Harvest for Brown Trout in Fall of 2019 or 2020.
- Address any Green Sunfish issues.



Questions?

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Public and Cooperator Responses to Sept EA

Public Meetings & Comments

- Public attendance at the meetings in Sept 2018 for the EA release were much lower than at scoping (from 69 at scoping down to 18 for EA).
- The number of letters received for Sept 2018 was also much lower than for scoping (from 428 at scoping to 59 for EA).
- This may mean that we were at least somewhat successful in working through concerns with cooperators, tribes and stakeholders.



Public and Cooperator Responses to Sept EA

- **AGFD** – raised a number of concerns in EA comments – we have met with them several times since then and believe we have worked through all the major concerns. We will Continue to work with AGFD on their key role in implementing the Incentivized Harvest tools and educating the angling community so that they can help with addressing the brown trout issues so that the higher tiered intensive fish removal by government agencies does not need to be implemented.
- **Angler Groups** – generally their reception of the EA was significantly better than the scoping material. Their concerns were primarily about three things: 1. concerns mechanical removal could impact the rainbow trout fishery, concern that treatment of the spawning beds for brown trout could impact rainbow trout, and that we were underestimating the potential economic impact. We believe many are supportive of incentivized harvest.
- **Tribes** – Zuni and Hopi tribes have expressed concerns regarding the lethal management of non-native species. We consulted in person with both last summer and have meetings scheduled within the next month with them to work through concerns on a PA. Navajo Nation has also requested consultation.



Public and Cooperator Responses to Sept EA

- **USFWS** – some comments on modeling of YY male action and wording of conservation measures. We have worked through all concerns as part of section 7 consultation.
- **UCRC/Basin States** – a few specific concerns about cumulative impact wording, we believe we addressed sufficiently.
- **WAPA** – raised a few specific concerns mainly about green sunfish, we believe we addressed sufficiently.
- **Reclamation** – raised a few specific concerns mainly about coordination, we believe we addressed sufficiently.



Specific Responses to Comments

Taking of Aquatic Life Issue

- Concerns from tribes about taking of life of fish and other aquatic organisms for reasons other than human consumption (for mechanical and chemical tools)
- Response: NPS worked extensively on incorporating the tiered adaptive approach into the entire plan in order to address the taking of aquatic life and to first use tools that reduce this concern. NPS consulted with Tribes and SHPO and decided to use a Programmatic Agreement approach for 106. NPS also removed a tool particularly objectionable to the tribes, sonic concussive devices, and replaced with a non-lethal acoustic guidance device. NPS also added text requested by Pueblo of Zuni regarding their objections and a council resolution passed regarding their concerns.

Live Transport/Relocation of Non-Native Green Sunfish from Lees Ferry to Lake Powell (part of M1)

- Concerns from tribes about taking of life of fish would be addressed by this action, but AGFD concerns about consistency with AIS policy and transmission of pathogens
- Response: NPS re-consulted with AGFD, and AGFD talked to Utah and we updated language to make it clear that NPS would apply for state permits and use state methods to test for pathogens prior to considering any re-location action.

YY male biocontrol for brown trout and possibly other non-native fish (B1)

- Concerns from Basin States, CREDA, some Anglers, Tribes; support from AGFD and other anglers
- Response: NPS re-consulted with AGFD and USFWS and with researchers. Revised modeling per AGFD and USFWS suggestions in consultation with GCMRC. Added pilot project for YY males in tributary as a possible first action and added additional conservation measures, off-ramps, mitigations and communication steps.



Specific Responses to Comments

Socioeconomics analysis

- Concerns from Anglers and AGFD about underestimated impacts to rainbow trout fishery
- Response: NPS re-consulted with AGFD and GCMRC and made some revisions to the socioeconomic section to ensure full disclosure of all expected impacts.

Incentivized Harvest

- Concerns from Anglers, AGFD regarding costs, other implementation issues
- Response: NPS added text to provide a range of cost for this program and added text regarding continued coordination on this issue with AGFD, angling groups and Tribes. NPS has submitted proposals for NPS funding, has begun talks on possible BOR/AMWG funding, and is asking AGFD and other partners to also seek funds.

Other (Sec. Zinke Memo, Root Causes, Accuracy of Trout estimates, and Cumulative Impacts)

- Concerns about a number of other technical and policy issues
- Response: NPS re-checked issues with solicitors, GCMRC, and cooperators and made a number of smaller edits to address these issues.



Specific Responses to Comments

Mechanical Disruption of Spawning (M2)

- Concerns from Anglers and AGFD about impacts to rainbow trout fishery
- Response: NPS re-consulted with GCMRC to verify impact levels but GCMRC concurred with our determination. Added text that NPS will plan a spawning bed disruption pilot experiment with AGFD and GCMRC and work with both on mapping beds and we would conduct during the time of year when least likely to impact rainbow trout.

Mechanical Removal (M1)

- Concerns from Anglers and AGFD about impacts to rainbow trout fishery
- Response: NPS re-consulted with GCMRC to verify impact levels and GCMRC concurred with our determination regarding expected impact – suggested no further edits. Added text that NPS will try incentivized harvest for 3 years before considering mechanical removal for brown trout in Lees Ferry, has a specific trigger written in consultation with AGFD, USFWS and others, would conduct the work in non-peak fishing season and would use gear setting to minimize impact to non-target species like rainbow trout.

Chemical Controls (C1, C2, C3, C4)

- Concerns from Anglers and AGFD about impacts to rainbow trout fishery and proper permits, concerns from Basin States that we have too many restrictions and need to retain flexibility to use this tool
- Response: NPS will seek permits from AGFD for chemical treatment, will co-plan with AGFD for experimental treatments, built in a 5 year max for treatment in same location.