Glen Canyon Dam Adaptive Management Work Group
Agenda Item Information
August 26-27, 2015

Agenda Item

Lees Ferry Management Plan Update

Action Requested

Information item only. We will answer questions; no action is requested.

Presenter

John Jordan, International Federation of Fly Fishers/Trout Unlimited
John Hamill, Arizona Field Representative, Theodore Roosevelt Conservation Partnership

Previous Action Taken

N/A

Relevant Science

N/A

Summary of Presentation and Background Information

The National Park Service Comprehensive Fishery Management Plan (CFMP) Environmental Assessment (EA) for the Colorado River between Glen Canyon Dam and Lake Mead was published May 2014. The intent of the CFMP is to maintain a thriving native fish community within Grand Canyon National Park (GCNP) and a highly valued recreational trout fishery in the Glen Canyon National Recreation Area (GCNRA). The CFMP was developed with supportive participation from angling and area guiding and business communities, including national and state fishing organizations and individual anglers. The CFMP acknowledges that within the plan area there are two geographically divided fisheries: the cold water post-dam recreational trout fishery primarily located within GCNRA and the resident pre-dam warm water fishery primarily located within GCNP.

The AMWG recreational fishing representation and the angling community, with the cooperative participation of Arizona Game and Fish Department (AZGFD), recognized that the provisions of the CFMP for both the recreational trout fishery and the fishery as a whole would benefit from an expansion of the goals in the CFMP to include more detailed proposed actions. With that in mind, the angling community, supported by AZGFD, prepared the Lees Ferry Recreational Trout Fishery Management Recommendations (LFMR). The goals of the LFMR include that it be consistent with and fit within the CFMP and that any proposed actions be based on the best contemporary science available. The draft LFMR was provided to interested agencies and organizations for review, suggestions, and comment. Among the responses received were those from AZGFD, Grand Canyon Monitoring and Research Center, U.S. Fish and Wildlife Service, Basin States, Colorado River Energy Distributors Association, and Western Area Power Administrative. Some of the major comments on the review draft related to: the efficacy and criteria for the use of Trout Management

Flows, the feasibility of enhancing the aquatic food base, concerns about proposed adjustments to Lake Powell-Lake Mead equalization guidelines, the use of anglers to control trout populations in both Lees Ferry and Marble Canyon, the use of trout stocking in Lees Ferry in the event of a collapse of the trout fishery, and the costs and priorities of the recommendations. Responses were considered, and when appropriate, incorporated into the LFMR. The final report will be available in early August 2015.

An executive summary of the Recommendations Report is attached.

Executive Summary-- Lees Ferry Recreational Trout Fishery Management Recommendations

The 15.5-mile stretch of Colorado River winding through Glen Canyon between the Glen Canyon Dam and the beginning of Marble Canyon (within Grand Canyon National Park) is commonly referred to as Lees Ferry. Since 1964, with the completion of the Glen Canyon Dam, this unique tailwater has hosted a recreational trout fishery that has grown in importance and reputation locally, regionally, nationally, and internationally. This blue ribbon recreational sport fishery has also become a financial and economic mainstay for the small community of Marble Canyon and Coconino County, supporting fishing guide services, hotels, restaurants, fishing and outdoor recreation equipment and supplies, and visitor services.

A primary purpose of the Lees Ferry Recreational Fisheries Management Recommendations is to complement and augment the National Park Service's (NPS) 2014 Comprehensive Fisheries Management Plan (CFMP) for the Colorado River below Glen Canyon Dam. Additionally, the recommendations are provided for the consideration of the Arizona Game and Fish Department (AZGFD), Bureau of Reclamation (USBR), Glen Canyon Dam Adaptive Management Work Group (AMWG), and Department of Interior (USDOI) to inform decisions about future management of Glen Canyon Dam and the blue ribbon rainbow trout fishery in Glen Canyon National Recreation Area. Another key purpose is to help shape alternatives in the Glen Canyon Dam Long Term Experimental and Management Plan (LTEMP) Environmental Impact Statement.
These recommendations are intended to:

1. Maintain and enhance a wild (self-sustaining) blue ribbon rainbow trout fishery at Lees Ferry that does not adversely affect the native aquatic community in Grand Canyon National Park.

2. Provide a dependable, high-quality recreational trout fishery that sustains local businesses and the economy of Coconino County.

Currently, the Lees Ferry trout fishery is ecologically unstable due to an impaired aquatic food base and high levels of trout recruitment resulting in a population that exceeds the carrying capacity of the river. Specific management recommendations are provided for:

- Establishing a more diverse aquatic food base by repatriating the Lees Ferry reach with native aquatic invertebrates.
- Continuing the current modified low-fluctuating flow regime with adjustments to develop a more diverse aquatic food base.
- Conducting spring and fall high flow experiments to restore more natural flow regimes to the river, enhance the aquatic food base, and improve trout survival/recruitment when needed.
- Carefully testing trout management flows to help achieve desired trout recruitment and abundance targets.
- Developing an action plan to respond to low dissolved oxygen conditions that are lethal to rainbow trout in Lees Ferry.
- Assessing the feasibility of adjusting Lake Powell-Lake Mead equalization guidelines to better manage trout survival and recruitment.
- Enacting fishing regulations to provide for a quality fishery and help manage the Lees Ferry trout population.

- Explore ways to use tribal members, local guides, and recreational anglers to harvest rainbow trout in Marble Canyon as means of reducing downstream emigration of rainbow trout, and enhancing recreational use and employment and business opportunities in the local community.
- Restocking of rainbow trout in Lees Ferry in the event of a catastrophic loss of the fishery.
- Implementing a water temperature control device at Glen Canyon Dam to maintain a water temperature regime that will support a healthy trout and native fish population in Lees Ferry and downriver.
- Introducing turbidity at the confluence of the Paria and Colorado rivers as a means of controlling trout populations below the Paria River.
- Evaluating the feasibility of making structural modifications to the bypass tubes at Glen Canyon Dam to allow for water temperature regulation, mitigation of low DO levels, and electrical generation when the bypass tubes are in use.
- Conducting long-term resource monitoring to support adaptive management and to measure progress toward achieving goals and desired future condition

The Recommendations are consistent with and will benefit many other Colorado River resource values below Glen Canyon Dam including humpback chub recovery, sand conservation, hydropower generation, and cultural resource protection.

Lees Ferry Recreational Trout Fishery Management Recommendations: The Voice of Lees Ferry Anglers, Guides, and Businesses.

by

John Jordan. AMWG Representative
Trout Unlimited and International Federation of Fly Fishers

John Hamill, Arizona Field Representative
Theodore Roosevelt Conservation Partnership

Adaptive Management Work Group

August 26, 2015

Tempe AZ

NPS Fishery Management Plan

Glen Canyon Recreation Area Desired Conditions

- Opportunities for anglers to have a memorable experience.
- Habitat that supports a rainbow trout population with a size structure indicative of a stable population.

GCD AMP Desired Future Conditions

- Establish a high-quality sustainable recreational trout fishery in the river corridor in GCNRA, while minimizing emigration of non-native fishes.
- Operate Glen Canyon Dam (GCD) to achieve the greatest benefit to the trout fishery in GCNRA without causing excessive detriment to other resources.

A Collaborative Planning Process

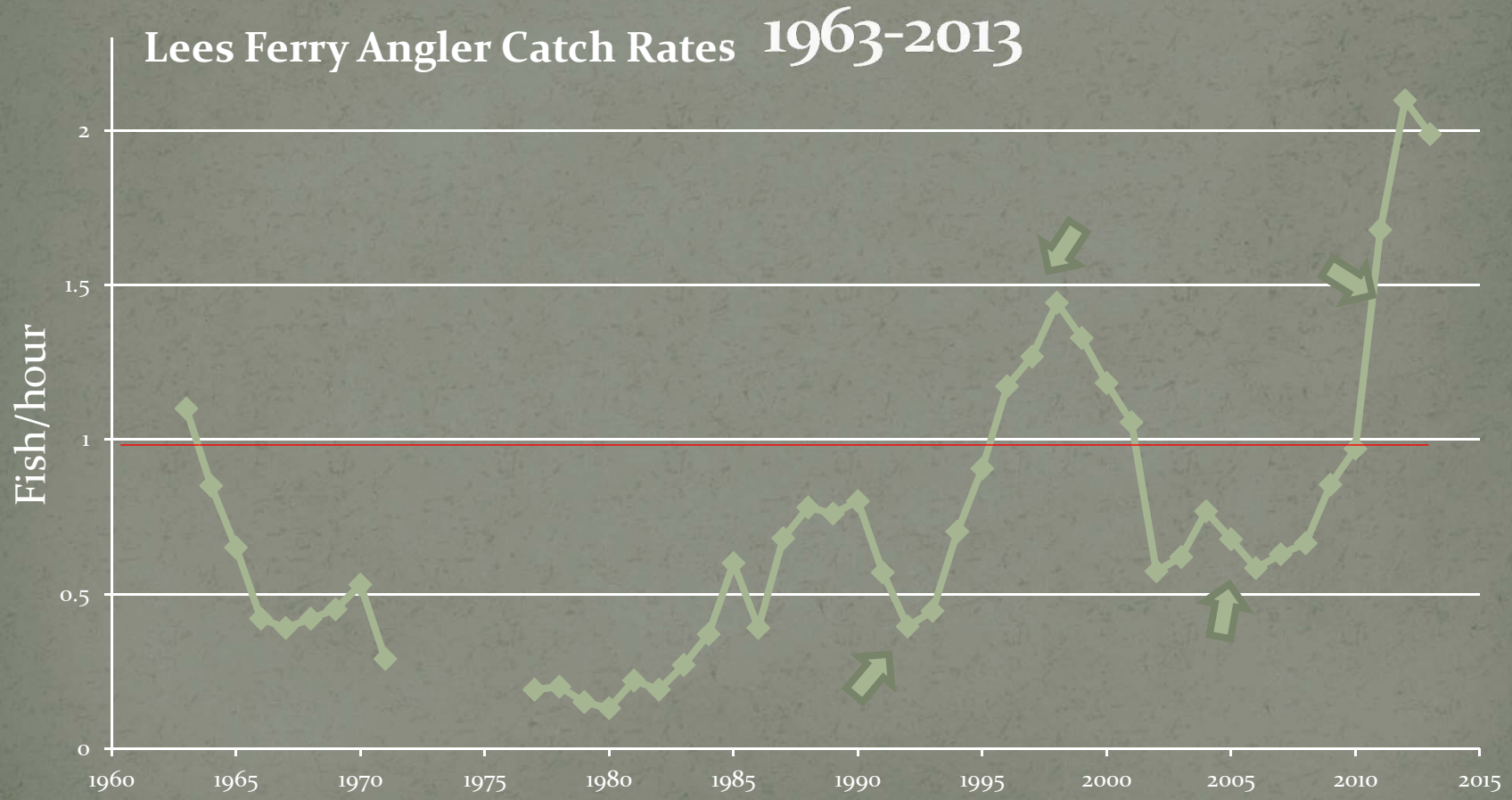
- Recommendations were developed collaboratively by recreational anglers, fishing guides and Marble Canyon businesses
- Full consultation with the Arizona Game and Fish Department and the Grand Canyon Monitoring and Research Center.
- Draft report reviewed by AZGFD, GCMRC, U.S. Fish and Wildlife Service, Basin States, Colorado River Energy Distributors Association, and Western Area Power Administrative—GCMRC comments shared with AMWG
- Final Recommendations formally supported by 50 conservation and sportsmen groups, guides and businesses

Goals

1. Maintain and enhance a self-sustaining Blue Ribbon rainbow trout fishery consistent with the protection and recovery of the native aquatic community in Grand Canyon National Park.

2. Provide a dependable, high-quality recreational trout fishery that sustains local businesses and the economy of Coconino County.
   - Lees Ferry fishery contributed in excess of $16.8 million to the State's economy and supported 251 jobs in Arizona

An Unstable Trout Fishery



Recommendations

- Report contains 15 recommendations—only several discussed today
- Focus on three major issues
  - Aquatic food base
  - Excessive recruitment of young trout
  - Water temperatures
- Recommendations will benefit humpback chub, riparian wildlife species, hydropower production, sand conservation, and archaeological site preservation

USGS
science for a changing world

Native and Nonnative Fish Populations of the Colorado River are Food Limited—Evidence from New Food Web Analyses

Fish populations in the Colorado River downstream from Glen Canyon Dam appear to be limited by the availability of high-quality invertebrate prey. Midge and blackfly production is low and nonnative rainbow trout in Glen Canyon and native fishes in Grand Canyon consume virtually all of the midge and blackfly biomass that is produced annually. In Glen Canyon, the invertebrate assemblage is dominated by nonnative New Zealand mudsnails, the food web has a simple structure, and transfers of energy from the base of the web (algae) to the top of the web (rainbow trout) are inefficient. The food webs in Grand Canyon are more complex relative to Glen Canyon, because, on average, each species in the web is involved in more interactions and feeding connections. Based on theory and on studies from other ecosystems, the structure and organization of Grand Canyon food webs should make them more stable and less susceptible to large changes following perturbations of the flow regime relative to food webs in Glen

As one of the most carefully managed river systems in the world, the aquatic ecosystem of the Colorado River in the Grand Canyon has been heavily influenced by Glen Canyon Dam and the decades of controlled release of water for power generation. Photo by Robert O. Hall, Jr., used with permission.

to also describe responses by invertebrate prey resources. Food webs depict the flow of energy through an ecosystem by

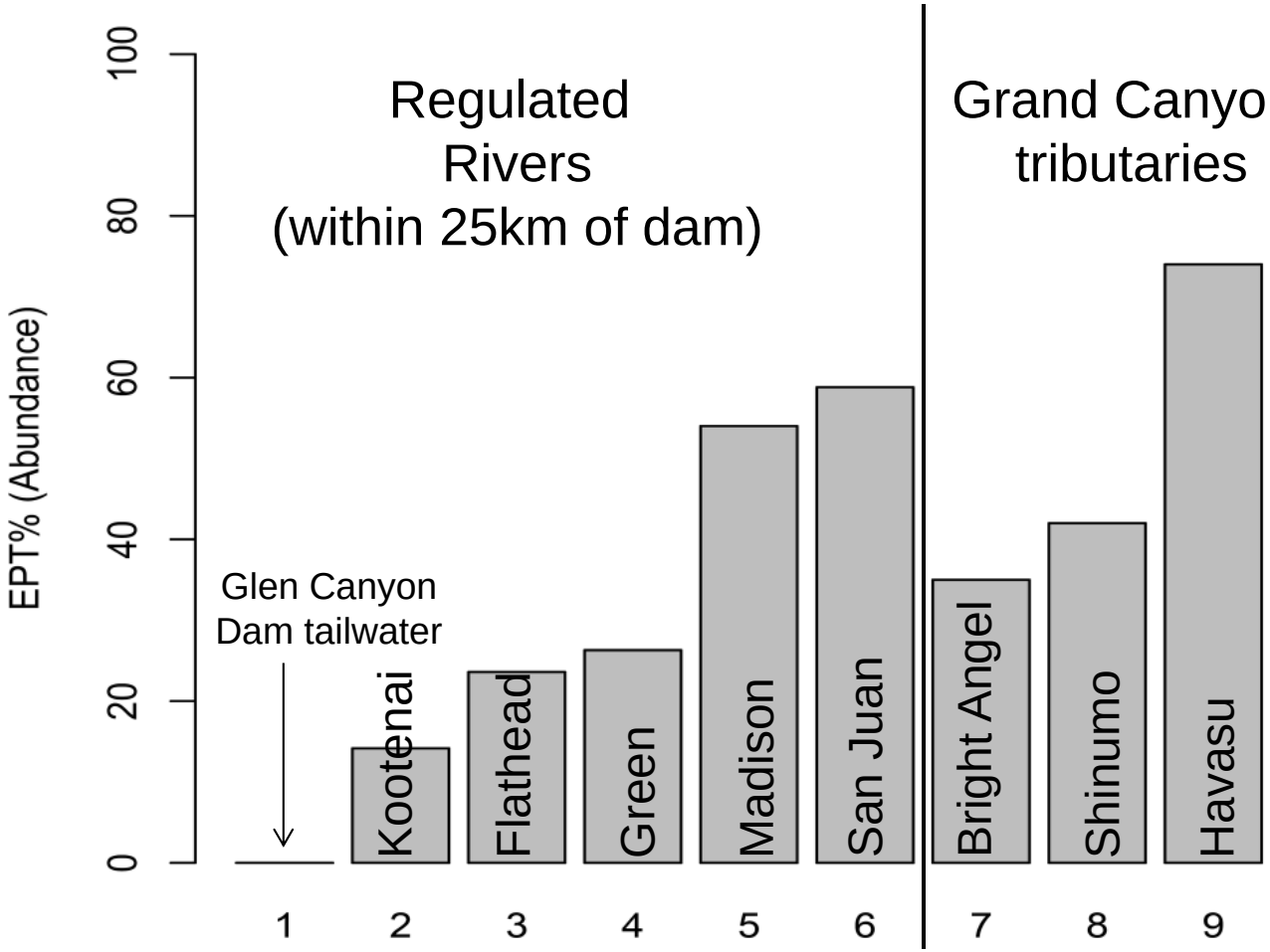
consumption by fish to understand the efficiency of energy transfer within the food web. Fish consumption was calculated

The EPT Index

- EPT stands for Ephemeroptera, Plecoptera, Tricoptera -- three orders of aquatic insects commonly referred to as mayflies, stone flies and caddis flies.

- The EPT Index is a widely accepted measure of stream quality based upon the abundance of these aquatic insects.

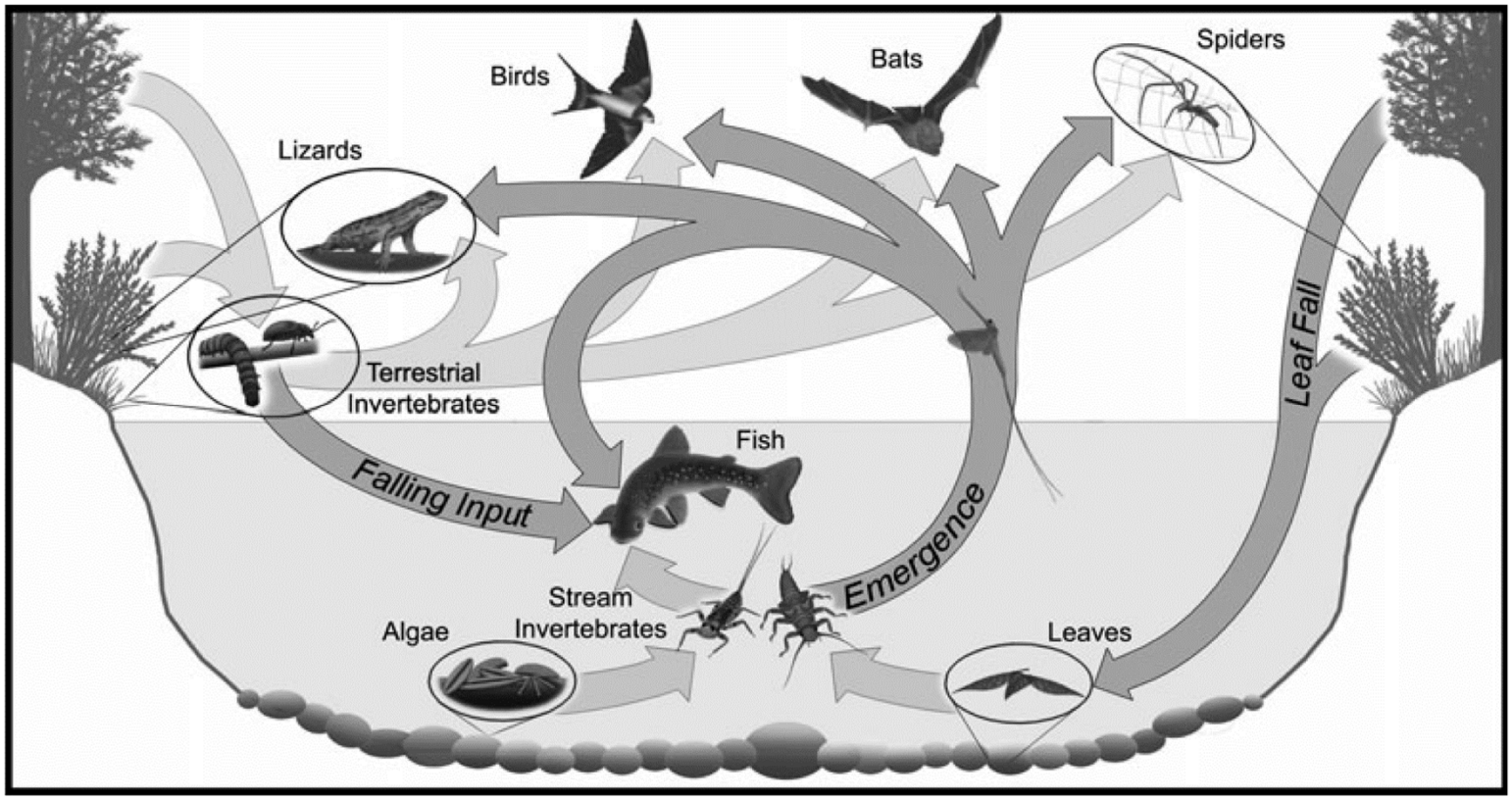
Having only two types of insects (and no EPT) is unusual



Grand Canyon tributary data courtesy of Brian Healy, NPS. Regulated rivers data courtesy of Kim Dibble, USGS, and Scott Miller USU BugLab

Unpublished data, subject to revision, do not cite

Potential Benefits of Healthier Assemblage



-Healthier riparian food webs that support more birds, bats, lizards, and spiders

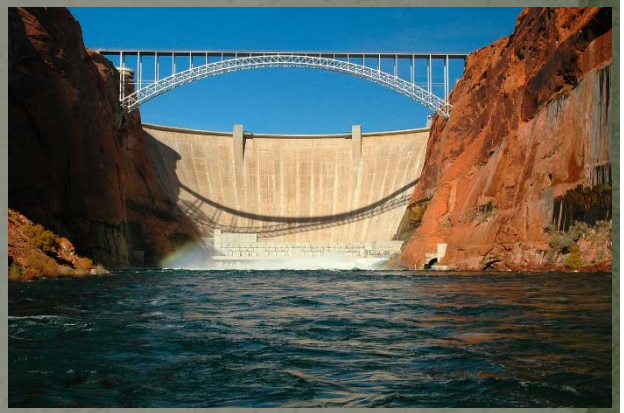
From: Baxter et al., 2005, Freshwater Biology

Recommendation: Aquatic Food Base Enhancement

- Experimental "Bug Flows" -- steady flows on weekends from May through August
  - Currently included in the approved 2015-17 GCD AMP work plan
  - Needs to be included in LTEMP EIS
- Reintroduce (repatriate) native may-, caddis- and stone flies – captured from Grand Canyon tributaries or Colorado River upstream of Lake Powell
  - NPS approval would be needed

Recommendations: Dam Operations

- **Dam operations:** Maintain the current MLFF release pattern.
- **Fall high flows:** Implement as part of an experimental plan to further evaluate their affect on trout, the aquatic food base and other resources.
- **Spring high flows:** Further assess trout and food base response that was observed in 2008. Recognize spring HFEs in the EIS as a potential tool for improving the aquatic food base and enhancing trout recruitment, if needed.
- **Trout Management Flows.** Carefully test trout management flows as a means to control the density of young trout and possibly benefit humpback chub by reducing downstream trout migration.
  - Use only if the trout population is stable and impacts to other resources are fully assessed
  - Recognize TMF's in EIS as a tool for managing the trout fishery (not just managing trout migration)
  - Involve AGFD



Recommendation: Water Temperature Control

- The amount of water in Lake Powell will likely decrease in the future.
- Lower Lake Powell levels will result in warmer water releases from dam resulting in:
  - Invasions of cool and warm water fishes into Grand Canyon National Park
  - Serious/catastrophic impacts to native fish and the Lees Ferry trout fishery
- Recommendations
  - Implement a water temperature control device that has the capacity to release both cold and warm
  - Modify outlet works to allow for electrical generation on the bypass tubes

Other Recommendations

1. Minimum flows from GCD
2. Lake Powell-Lake Mead Equalization Flows
3. Lees Ferry fishing regulations
4. Marble canyon trout fishery
5. Riparian vegetation restoration
6. Trout stocking
7. Low dissolved oxygen response protocol
8. Turbidity enhancement
9. Monitoring protocols

Conclusions and Next Steps

- The trout fishery is a valuable resource
- A healthy, more stable trout fishery is compatible with a healthy native fish population
- Recommended next steps
  - GCMRC assessment of the technical merits of the recommendations
  - TWG review of GCMRC assessment (Oct 2015 meeting)