

GCDAMP WIKI



OUR ONE STOP SHOP FOR INFORMATION

TWG: OCTOBER 18-19, 2016

ADMINISTRATIVE HISTORY AHG

The TWG established the Administrative History Ad Hoc Group in October 2012 with the purpose of gathering information and creating a history of the GCDAMP.

The group also felt it would be important to provide a "WIKI" website to serve as a collaborative resource tool to aid managers and to warehouse the program's historical information to assist stakeholders to learn and share knowledge in a user-friendly format.

The screenshot shows the GCDAMP AHAHG Wiki page. The page has a blue header with the 'WIKI' logo and navigation links: Administration | Communication | Learning | Documents | Media | Resources. Below the header is the title 'GCDAMP AHAHG Page'. The main content area features a large image of a man with a beard holding a tablet, with the text 'The Administrative History of the Glen Canyon Adaptive Management Program' overlaid. Below the image is a paragraph describing the group's purpose. The page also includes sections for 'Motion' and 'Charge'. At the bottom, there are tabs for 'AHAHG Motions', 'Background Information', and 'Wiki Overview Q & A'. A 'Group Members' list is provided, and a 'LINKS' section contains several links related to the program's history and management.

- Home Page
- Administration
- AdHoc Groups
- TWG AdHoc Groups
- AHAHG Page

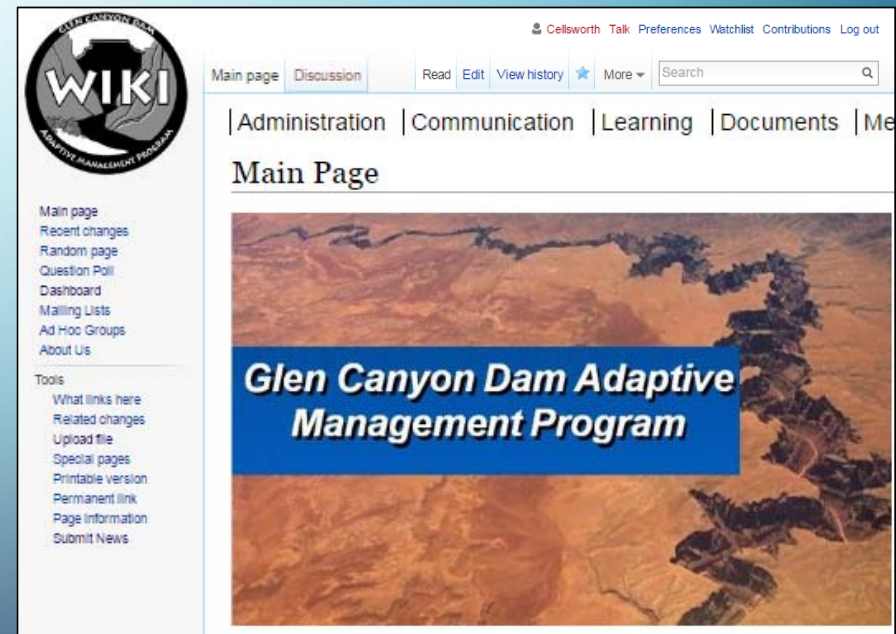


ADMINISTRATIVE HISTORY PROSPECTUS

- Create a focal point to access information about the AMP program
- Can be easily expanded and added to over time
- Accessible to outside researchers, educators, stakeholders, public
- Unbiased, integrated, well-annotated
- Contain a robust chronology of persons, concepts, decisions, actions, events, and reviews
- Improve understanding of inter-relationships among AMP issues and concepts
- Mechanism to allow new members to readily learn about the AMP's history
- Store interviews of key figures
- Search engine: compilation of existing documentation

THE WIKI CAN HELP

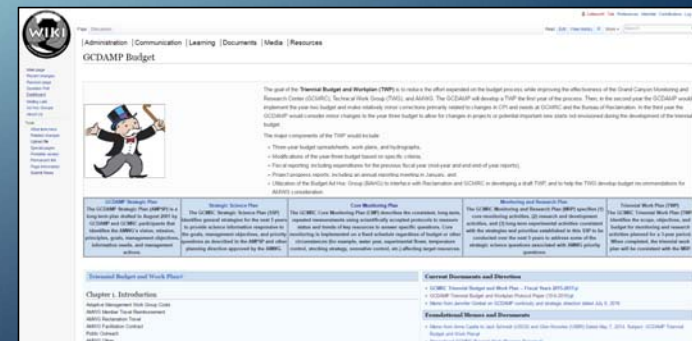
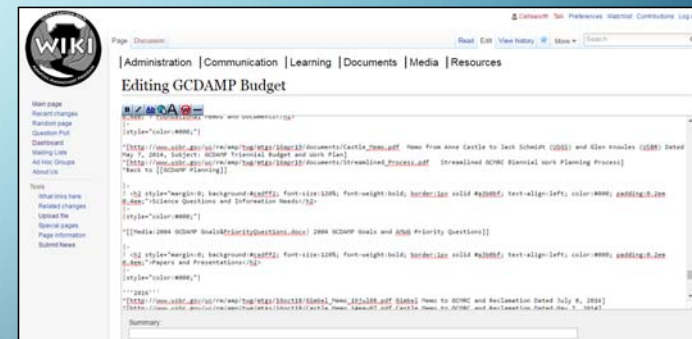
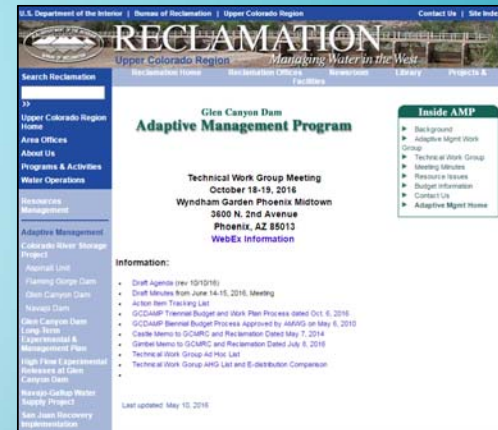
- **Clearing House:** One centralized place to go where AMP-related information can be shared, learned, understood, and conveyed in a collaborative format.
 - Links to public sites
- **Administrative History**
 - Each stakeholder can add information
 - Show decision process
- **Forum to share Stakeholder Perspectives**
- **Forum for share and understand Science**
 - Organized by resource
 - Links resources
- **Searchable**



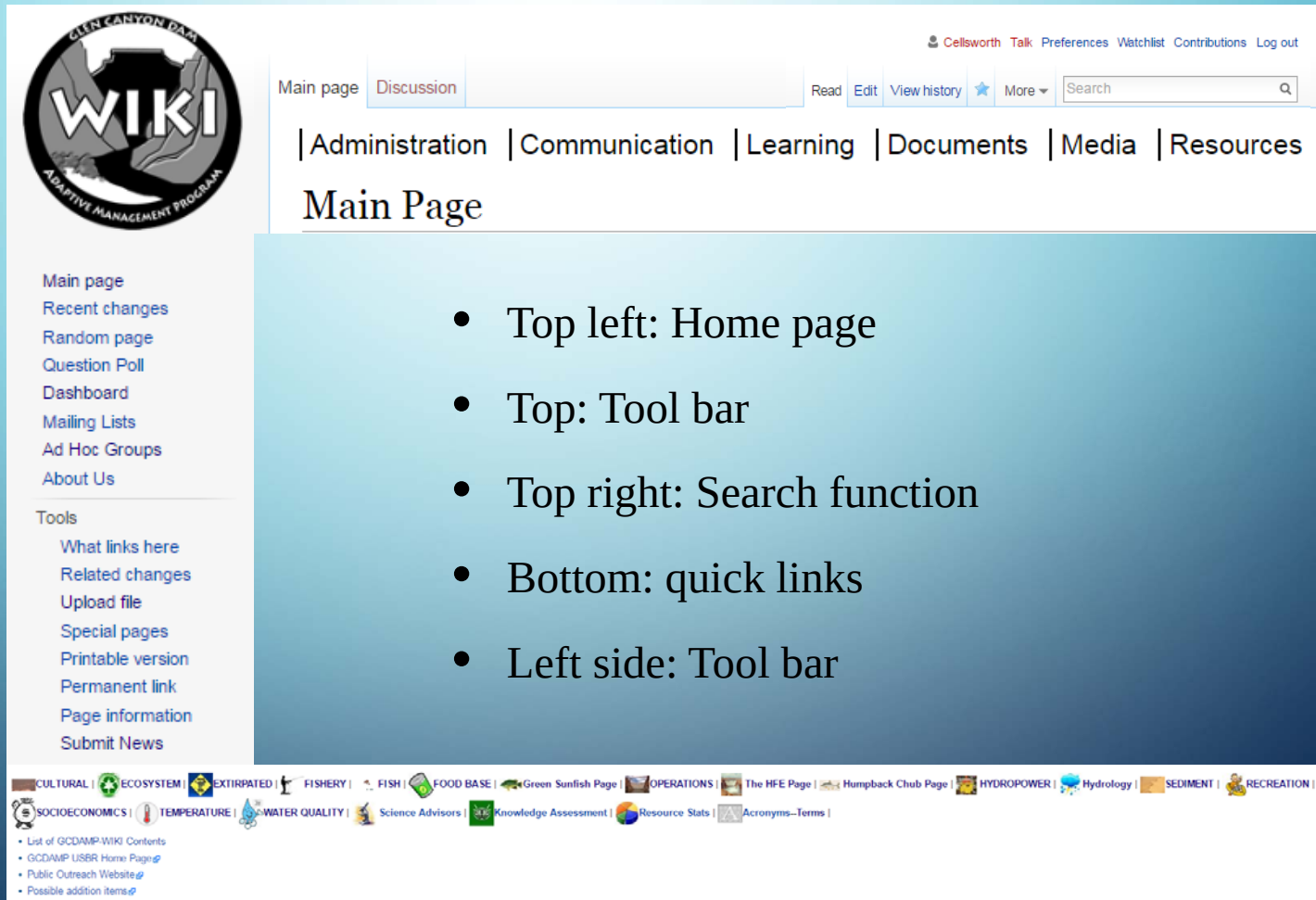
GCDAMP.com

WHAT IS THE WIKI?

- Wiki is short for Wikipedia.
- Simple web-based programming.
- Wiki allows for users to create and edit Web page content using any Web browser.
- Wiki has a simple text syntax with web support for developing web pages.
- Allows for linking to both internal and external web pages.
- Allows us to organize work being done by the Program by resource



NAVIGATING THE WIKI



The screenshot shows the GCDAMP Wiki homepage. At the top left is the logo for the GLEN CANYON DAM ADAPTIVE MANAGEMENT PROGRAM WIKI. To the right of the logo is a navigation bar with links for 'Main page' (selected), 'Discussion', 'Read', 'Edit', 'View history', and a 'More' dropdown menu. A search box is located to the right of the 'More' menu. Below the navigation bar is a horizontal menu with links for 'Administration', 'Communication', 'Learning', 'Documents', 'Media', and 'Resources'. The main content area is titled 'Main Page'. On the left side of the main content area is a sidebar with links for 'Main page', 'Recent changes', 'Random page', 'Question Poll', 'Dashboard', 'Mailing Lists', 'Ad Hoc Groups', and 'About Us'. Below these links is a 'Tools' section with links for 'What links here', 'Related changes', 'Upload file', 'Special pages', 'Printable version', 'Permanent link', 'Page information', and 'Submit News'. At the bottom of the page is a footer with a row of icons and links for various topics: CULTURAL, ECOSYSTEM, EXTIRPATED, FISHERY, FISH, FOOD BASE, Green Sunfish Page, OPERATIONS, The HFE Page, Humpback Chub Page, HYDROPOWER, Hydrology, SEDIMENT, and RECREATION. Below this row are links for SOCIOECONOMICS, TEMPERATURE, WATER QUALITY, Science Advisors, Knowledge Assessment, Resource Stats, and Acronyms-Terms. At the very bottom are links for 'List of GCDAMP Wiki Contents', 'GCDAMP USBR Home Page', 'Public Outreach Website', and 'Possible addition items'.

Cellsworth Talk Preferences Watchlist Contributions Log out

Main page Discussion Read Edit View history More Search

| Administration | Communication | Learning | Documents | Media | Resources

Main Page

- Top left: Home page
- Top: Tool bar
- Top right: Search function
- Bottom: quick links
- Left side: Tool bar

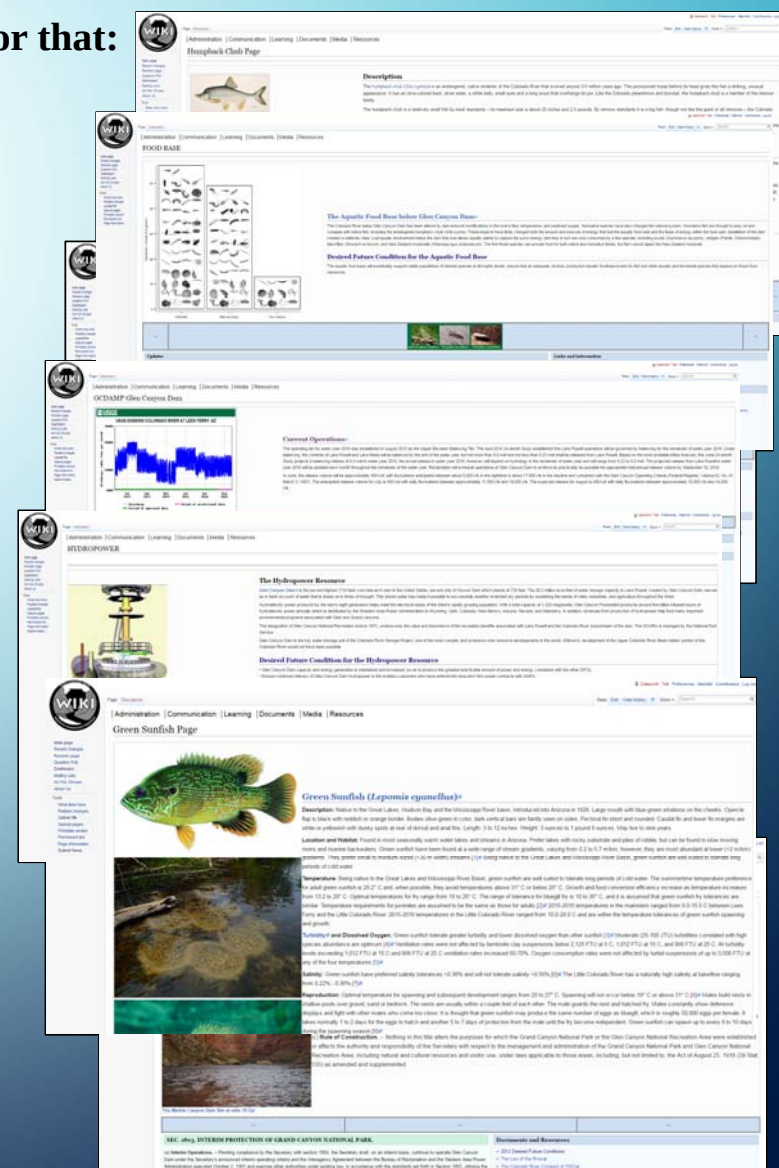
CULTURAL | ECOSYSTEM | EXTIRPATED | FISHERY | FISH | FOOD BASE | Green Sunfish Page | OPERATIONS | The HFE Page | Humpback Chub Page | HYDROPOWER | Hydrology | SEDIMENT | RECREATION |

SOCIOECONOMICS | TEMPERATURE | WATER QUALITY | Science Advisors | Knowledge Assessment | Resource Stats | Acronyms-Terms |

- List of GCDAMP Wiki Contents
- GCDAMP USBR Home Page
- Public Outreach Website
- Possible addition items



- Humpback chub
- Foodbase
- Lees Ferry fishery
- Operations
- Hydropower
- Sediment
- Recreation
- HFEs
- LSSF, FSS
- Temperature
- Green sunfish
- Budget
- LTEMP
- GCPA of 1992
- AdHoc Groups
- Fact Sheets
- GCMRC Library
- Trivia



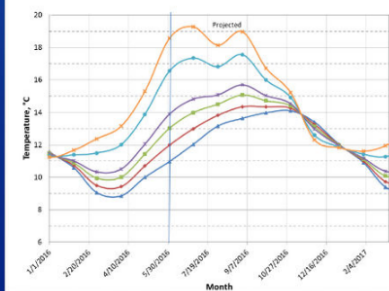
WHY DID WE DO THAT?

- 2000 Low Summer Flow
- 2009-2011 Fall Steady Flows

Other Stuff

- **2000 LSSF Report, Page 33:** The results from Korman and others (2004) report suggest YOY fish might benefit more from a low steady flow period that started later in the summer season, such as August. The delayed timing might benefit YOY fishes entering the mainstem from tributaries during monsoon flooding. The resulting reduction in base flow in August compared to MLFF could provide maximum shoreline habitats coupled with warmer water released from Lake Powell (fig. 2-1; Vernieu and others, 2005) and greater ambient air temperatures (Wright and others, 2008; see link for [Temperature](#)). For more information on the development of an experiment to test fall steady flows, go to the link for the [2009-2012 Fall Steady Flow Experiment](#).

Colorado River, Grand Canyon Water Temperatures
Projections based on June 2016, Most Probable Hydrology



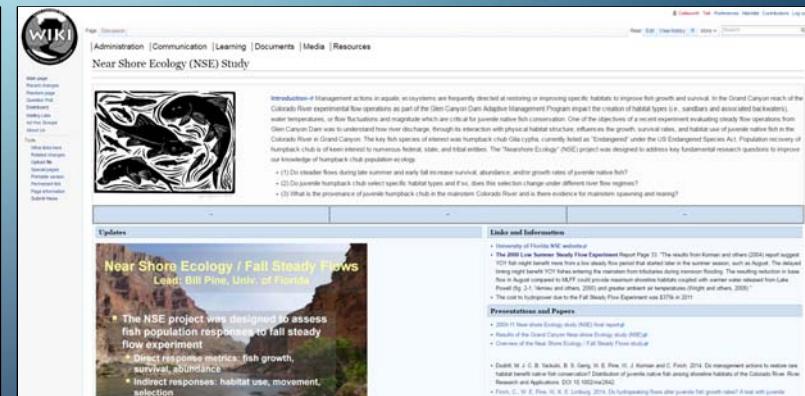
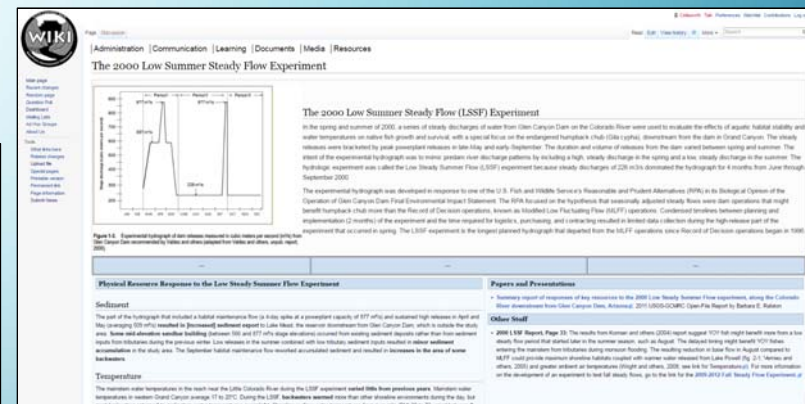
RECLAMATION

Conclusions

The NSE project developed a sampling and analytical framework to directly assess juvenile humpback chub population responses to management actions at smaller fish sizes than were previously possible. This framework is important, as the key outcome from many different types of management actions in the Colorado River is to improve survival of juvenile humpback chub, increasing overall abundance and accelerating the population to recovery. The NSE project also documented that **small juvenile humpback chub can survive and rear in the mainstem Colorado River**. This information is important because adult humpback chub numbers (age 4+) have increased over the past decade, possibly due to improved survival in the mainstem Colorado River (Coggins and Walters 2009).

We identified **chemical markers that can distinguish fish use of Little Colorado River** from mainstem use. Humpback chub in this reach of Grand Canyon originate overwhelmingly from the Little Colorado. Mainstem adult otoliths showed evidence that longer rearing in the Little Colorado promotes better growth and recruitment. The combination of otolith chemistry and growth increment analysis together produced a good natural marker that could be used as a tag to follow fish movements between the mainstem and Little Colorado River. Further work will be needed to extend this methodology to other humpback chub aggregations within Grand Canyon and possibly to other native fish species assessments.

The results of the NSE project suggest that **juvenile humpback chub survival, growth, abundance, and habitat use are robust (did not change) to the fall steady flows observed during 2009-2011**. It is likely that more extreme flow treatments (e.g. higher or lower discharges, longer duration) are required before changes in these metrics would be observed. This research demonstrates the apparent flexibility of juvenile humpback chub in habitat selection regardless of fluctuating or steady river flows. Our development and application of methods to assess the growth, survival, and persistence of juvenile humpback chub in the mainstem Colorado River are key new additions to the body of knowledge available for managing the Colorado River and understanding how juvenile fish populations respond to hydropower operations in regulated rivers globally.



WHAT HAPPENED WHEN?

HFE Page

- 2013 HFE
 - Dates
 - Sediment
 - Peak Flow
 - Costs
 - Estimate
 - Actual (link)
- Documents
- Photos

WIKI

Page | Discussion

Administration | Communication | Learning | Documents

GCDAMP- HFE 2013

Contents (print)

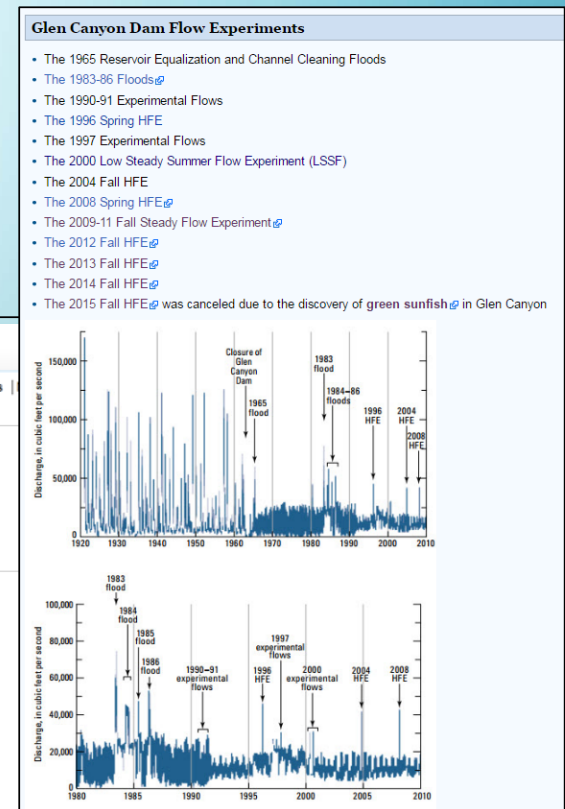
- 1 HFE DETAILS
- 2 SUPPORTING DOCUMENTS
- 3 COMPLIANCE
- 4 CONCERNS
- 5 SEDIMENT
- 6 ADDITIONAL

HFE DETAILS [edit]

- Dates: November 11-16, 2013 (Water Year 2014)
- Start Upstream: November 11, 8am
- Open Bypass Tubes: November 11, 1pm
- Full Capacity: November 11, 8pm - November 15, 8pm
- Finish HFE: November 16, 3pm
- Total HFE duration: 5 days, 3 hrs
- Sediment in the system: 1.5 Million metric tons
- Units available: 6
- Powerplant capacity = ~19,100 cfs
- Peak CFS = ~34,100
- November volume = 670 kaf
- Estimated acre-feet of water bypassed during HFE: approx. 129,000 af
- Hourly Releases before and after HFE: fluctuate between 5,000 to 8,000 cfs
- Initial estimate of costs to Hydropower: \$1.74 million
- Actual cost to Hydropower: \$2,593 million
- Direct expenses for removal of concession assets: \$9,961

SUPPORTING DOCUMENTS [edit]

- Financial analyses of experimental releases conducted at Glen Canyon Dam during Water Year 2014 (i.e. the 2013 HFE)
- Final HFE Memo to Larry Walkowiak 10-25-13 with attachment
- Fall 2013 HFE Protocol Decision Process
- 2013 HFE Locations and dates of hydrograph routing
- System Overview to Basin States- USGS Schmidt
- USGS Science Overview- Fisheries and Aquatic Ecology to Basin States- Shaniderkoci



Green Sunfish Page

- Temperature

- Turbidity

- Salinity

- Updates

- Links

- Presentations

- Papers

- Photos

Scribble - Help Contents - Recent Changes

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Green Sunfish Page

Main page
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Green Sunfish (*Lepomis cyanellus*)^s

Description: Native to the Great Lakes, Hudson Bay and the Mississippi River basin. Introduced into Arizona in 1920. Large mouth with blue-green strations on the cheeks. Opercle flap is black with reddish or orange border. Bodies olive green in color; dark vertical bars are faintly seen on sides. Pectoral fin short and rounded. Caudal fin and lower fin margins are white or yellowish with dusky spots in dorsal and anal fins. Length: 3 to 12 inches. Weight: 3 ounces to 1 pound 8 ounces. May live to nine years.

Location and Habitat: Found in most seasonally warm water lakes and streams in Arizona. Prefer lakes with rocky substrate and piles of rubble, but can be found in slow moving rivers and riverine backwaters. Green sunfish have been found at a wide range of stream gradients, varying from 0.2 to 5.7 m/km; however, they are most abundant at lower (<12 m/km) gradients. They prefer small-to-medium sized (<30 m width) streams [1] or being native to the Great Lakes and Mississipi River Basin, green sunfish are well suited to tolerate long periods of cold water.

Temperature: Being native to the Great Lakes and Missisippi River Basin, green sunfish are well suited to tolerate long periods of cold water. The summertime temperature preference for adult green sunfish is 28° C and, when possible, they avoid temperatures above 31° C or below 20° C. Growth and food conversion efficiency increase as temperature increases from 13.2 to 28° C. Optimal temperatures for fry range from 18 to 26° C. The range of tolerance for blaugy fry is 10 to 30° C, and it is assumed that green sunfish by tolerances are similar. Temperature requirements for juveniles are assumed to be the same as those for adults [2] In 2015-2016 temperatures in the marismas ranged from 6.0–15.5 °C between Lees Ferry and the Little Colorado River, 2015-2016 temperatures in the Marismas River ranged from 10.9–29.0 °C and in the warmer tolerances of green sunfish spawning and growth.

Turbidity & Dissolved Oxygen: Green sunfish tolerate greater turbidity and lower dissolved oxygen than other sunfish [3] At Moderate (25-100 JTU), turbidities comatated with high species abundance are optimum[4]. Ventilation rates were not affected by benthos like cup suspensions below 2.125 FTU at 5 °C, 1.012 FTU at 15 °C, and 868 FTU at 25 °C. At turbidity levels exceeding 1.012 FTU at 15 °C and 868 FTU at 25 °C ventilation rates increased 50-70%. Oxygen consumption rates were not affected by turbid suspensions of up to 3,500 FTU at any of the four temperatures [5][6]

Salinity: Green sunfish have preferred salinity tolerances <0.3‰ and will not tolerate salinity >0.56‰ [6] At the Little Colorado River has a naturally high salinity at baseflow ranging from 0.22‰ - 0.36‰ [7][8]

Reproduction: Optima temperature for spawning and subsequent development ranges from 20 to 27 °C, spawning will not occur below 10° C or above 31° C [9] Males build nests in shallow pools over gravel, sand or bedrock. The nests are usually within a couple feet of each other. The male guards the nest and fedded by males constantly chase downstream chub eggs and fight with other males who come too close. It is thought that green sunfish may produce the same number of eggs as largemouth, which is roughly 50,000 eggs per female. It takes normally 1 to 2 days for the eggs to hatch and another 5 to 7 days of protection from the male until the fry become independent. Green sunfish can spawn up to every 8 to 10 days during the spawning season [10]

Food: Green sunfish will eat anything they can catch and swallow. Aquatic and terrestrial insects and invertebrates are the most common food items. Small crayfish, humpback chub, and frogs are all in danger when green sunfish are present. Young life stages of chub do not persist in streams occupied by Green Sunfish. No recruitment of young-of-year Gila Chub (*Gila intermedia*) occurred in the presence of sunfish in Sabino Creek, Arizona (Dudley and Matter, 2000).

Risk: Green sunfish may temporarily be displaced into colder more unfavorable environments where survival might be lower, but the fish that do survive will seek out warm backwaters and tributaries after moving downstream. An upstream source that continues to allow new individuals to disperse downstream and colonize tributaries, when they are not in flood stage, greatly increases the likelihood of sunfish establishment in tributaries of the CRE. If no action is taken, there is a high risk of sunfish spreading downstream and becoming established in and near other tributaries, primarily the Little Colorado River, where negative impacts to the endangered humpback chub will occur. (Green Sunfish Risk Assessment)

Rainbow Trout

Fish species of the Colorado River in Lower Glen Canyon and Grand Canyon

Covered listing(s)
[Fish photos, information, and maps »](#)

Brown Trout

Updates

2016

The NPS is holding a webinar on October 17, 2016 for stakeholders and interested parties to develop a range of options for Long Term Risk Reduction for Green Sunfish in the 12 NM reaches, and other invasive fish species and solutions in the Lees Ferry Reach of Glen Canyon National Recreation Area. This transboundary session will provide the basis for developing a range of alternatives to be analyzed in a Long Tern Risk Reduction Plan and Environmental Assessment to be completed and implemented by October 2017. For more information contact Melissa Trammell at melissa_trammell@nps.gov

Sampling results from September 1-2, 2016

- 622 cfp/ lake (cfs) in the upper stretch, n=1 in the lowest; three YOY size classes + adults
- 22 CRP trout (21 in upper, 1 in lower)
- 7 larval salmonids (all upper)
- 3 BWT (all lower)

Links and Information

- * Habitat Suitability Index Indices, Green Sunfish[1]
- * Demo video that shows how to do an ammonia treatment to remove disease aquatic species[2]
- * The High Plains Experiment (HPE) Project

Presentations and Papers

2016

- * Grand Canyon Monitoring and Research Center Backwater Initiative (BCI) Communications: Trout Updates, Green Sunfish, Fishless PIT PIT, Arroyo de San Juan
- * Green Sunfish Removal in a Colorado River Backwater Below Glen Canyon Dam[3]
- * Colorado River Slopey Green Sunfish Removal[4]
- * Green Sunfish Rapid Response Treatment, Nov 2-6 and Nov 12-13, 2015 Brief Treatment Summary[5]

... and we can have fun

O **Humpback Chub Page**

http://gcdamp.com/index.php?title=Humpback_Chub_Page

O **Other Stuff**

O **“Songs of the humpback chub”**

Other Stuff

LCR remote PIT tag arrays



- What happened to humpback chub after the 2009-2012 Fall Steady Flow Experiment? [↗](#)
- Photos of talus shoreline habitat used by humpback chub
- Humpback Chub Translocation in Little Colorado River 2015 [↗](#)
- Colorado River Humpback Chub Aggregation Monitoring 2015 [↗](#)
- AZDGF monitoring in the LCR [↗](#)
- Grand Canyon National Park translocations [↗](#) (more information) [↗](#)
- NMSU Student Researches Humpback Chub in Grand Canyon [↗](#)
- Lower Colorado River Multi-Species Conservation Program (LCR MSCP) [↗](#)
- Songs of the humpback chub [↗](#) (NPR interview) [↗](#)

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Host: www.hostgator.com

Storage: Unlimited

Wiki Custodian: Colorado River Commission of Nevada

Cost: \$250 / 2 years (donated by CRC)

Wiki Lead: Craig Ellsworth (WAPA)

Technical support: Joe Dabrowski (CRC)

AMP Historian:

Also, just a little shout out to [Jason](#)... who's great idea this was.

